May 2016
Project No. 16-119

45CSR13 PERMIT MODIFICATION APPLICATION

R13-2581

STOCKMEIER URETHANES, INC.
CLARKSBURG FACILITY
PLANT ID # 033-00150

PREPARED BY:

MSES Consultants, Inc.
P.O. Drawer 190
Clarksburg, West Virginia 26302-0190
(304) 624-9700

TABLE OF CONTENTS

LIST OF ATTACHMENTS

Attachment	Description
A	Business Certificate
B	Map(s)
E	Plot Plan
F	Detailed Process Flow Diagram(s)
G	Process Description
I	Equipment List Form
J	Emission Points Data Summary Sheet
K	Fugitive Emissions Data Summary Sheet
L	Emission Unit Data Sheet
M	Air Pollution Control Device Sheet(s)
N	Detailed Emissions Calculations
P	Public Notice

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☐ **CONSTRUCTION** ☒ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☒ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
Stockmeier Urethanes, Inc.

2. Federal Employer ID No. ***(FEIN):***
760733380

3. Name of facility *(if different from above):*
Clarksburg Facility

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
P.O. Box 1456
Clarksburg, WV 26302-1456

5B. Facility's present physical address:
20 Columbia Boulevard
Clarksburg, WV 26301

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**

- If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**
- If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: **Stockmeier Kunststoffe GmbH & Co. KG, Germany**

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**

- If **YES,** please explain: **Applicant owns the facility**
- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): polyurethane manufacturing facility

10. North American Industry Classification System **(NAICS)** code for the facility:
325211

11A. DAQ Plant ID No. (for existing facilities only):
033-00150

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
R13-2581

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A.

- For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B.**

From I-79 exit 119. Follow US Route 50 West towards Clarksburg. Turn right at first stop light onto Bridgeport Hill Road. Continue to the right. Turn left onto Columbia Blvd. and follow the road downhill to the facility on the right.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
Not Applicable	**Clarksburg**	**Harrison**
12.E. UTM Northing (KM): **4348.122**	12F. UTM Easting (KM): **560.882**	12G. UTM Zone: **17**

13. Briefly describe the proposed change(s) at the facility:
Add storage and process equipment to increase the throughput for the facility and install two emergency generators

14A. Provide the date of anticipated installation or change:	14B. Date of anticipated Start-Up if a permit is granted:
– If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: 01/01/2015	**02/01/2015**

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
Hours Per Day **24** Days Per Week **7** Weeks Per Year **52**

16. Is demolition or physical renovation at an existing facility involved? ☒ **YES** ☐ **NO**

17. **Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18. **Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) .
– Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**
– Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

– For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☒ Bulk Liquid Transfer Operations	☐ Haul Road Emissions	☐ Quarry
☒ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☒ Storage Tanks
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	

☒ General Emission Unit, specify: G60-C emergency generator engine data sheet

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☐ Baghouse	☐ Flare
☒ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☐ Other Collectors, specify

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ **YES** ☒ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative**, hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE _____ *(Please use blue ink)* DATE: 5/15/16 *(Please use blue ink)*

35B. Printed name of signee: Christian Marktinkat		35C. Title: President / CEO
35D. E-mail: c.martinkat@stockmeier.us.com	36E. Phone: 304-624-7002	36F. FAX: 304-624-7020
36A. Printed name of contact person (if different from above): Rocky Romine		36B. Title: Director of Operations & EHS
36C. E-mail r.romine@stockmeier.us.com	36D. Phone: 304-624-7002 ext. 126	36E. FAX: 304-624-7020

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ Attachment A: Business Certificate
- ☒ Attachment B: Map(s)
- ☐ Attachment C: Installation and Start Up Schedule
- ☐ Attachment D: Regulatory Discussion
- ☒ Attachment E: Plot Plan
- ☒ Attachment F: Detailed Process Flow Diagram(s)
- ☒ Attachment G: Process Description
- ☒ Attachment H: Material Safety Data Sheets (MSDS)
- ☒ Attachment I: Emission Units Table
- ☒ Attachment J: Emission Points Data Summary Sheet
- ☒ Attachment K: Fugitive Emissions Data Summary Sheet
- ☒ Attachment L: Emissions Unit Data Sheet(s)
- ☒ Attachment M: Air Pollution Control Device Sheet(s)
- ☒ Attachment N: Supporting Emissions Calculations
- ☐ Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans
- ☒ Attachment P: Public Notice
- ☐ Attachment Q: Business Confidential Claims
- ☐ Attachment R: Authority Forms
- ☐ Attachment S: Title V Permit Revision Information
- ☒ Application Fee

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ *Forward 1 copy of the application to the Title V Permitting Group and:*
- ☐ *For Title V Administrative Amendments:*
  - ☐ *NSR permit writer should notify Title V permit writer of draft permit,*
- ☐ *For Title V Minor Modifications:*
  - ☐ *Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,*
  - ☐ *NSR permit writer should notify Title V permit writer of draft permit.*
- ☐ *For Title V Significant Modifications processed in parallel with NSR Permit revision:*
  - ☐ *NSR permit writer should notify a Title V permit writer of draft permit,*
  - ☐ *Public notice should reference both 45CSR13 and Title V permits,*
  - ☐ *EPA has 45 day review period of a draft permit.*

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

ATTACHMENT A

Business Certificate

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
STOCKMEIER URETHANES U S A INC
20 COLUMBIA BLVD
CLARKSBURG, WV 26301-9606

BUSINESS REGISTRATION ACCOUNT NUMBER: **1051-6692**

This certificate is issued on: **06/29/2010**

This certificate is issued by the West Virginia State Tax Commissioner in accordance with W.Va. Code § 11-12.

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

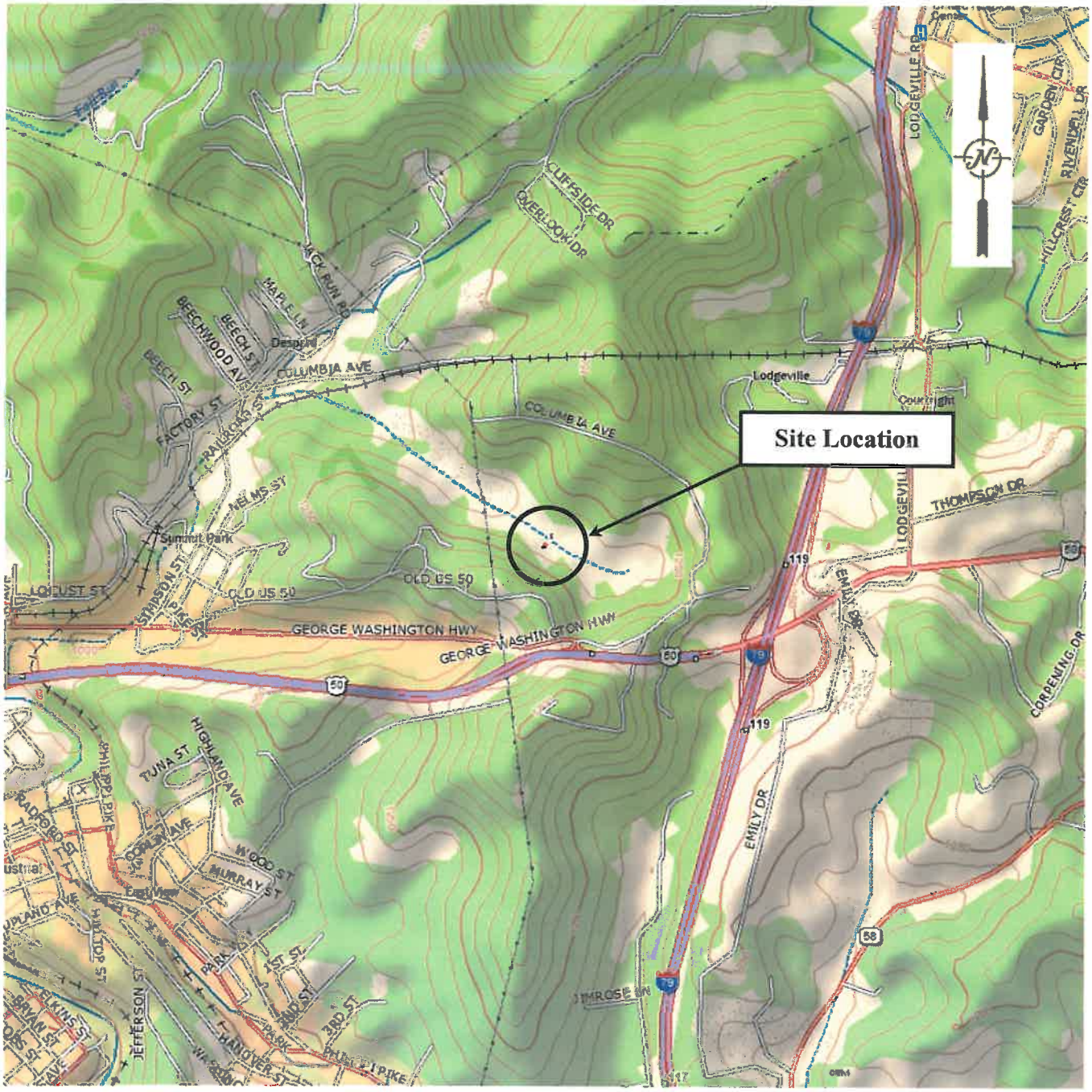
Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them. CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

atL006 v.1
L1244248832

ATTACHMENT B

Map(s)



Reference:
3-D TopoQuads © DeLorme, Yarmouth, Me 04096

Source Data:
7.5 Minute USGS Topographic Quadrangles

Clarksburg, WV

Vicinity Map

Scale 1" = 2000'

MSES Consultants, Inc.
Clarksburg, West Virginia

STOCKMEIER URETHANES

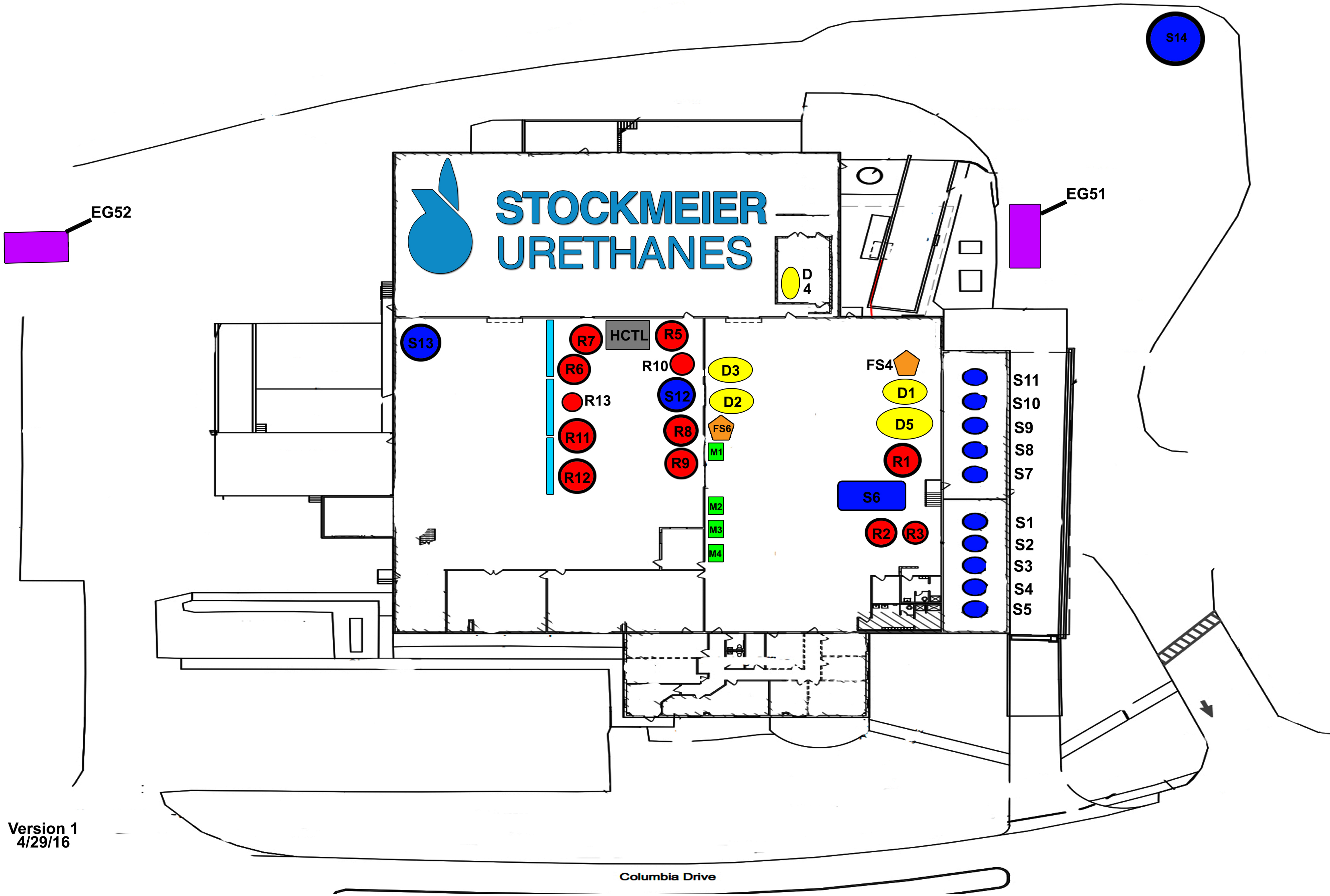
Air Permit Application

Project No. 13-472

Attachment B

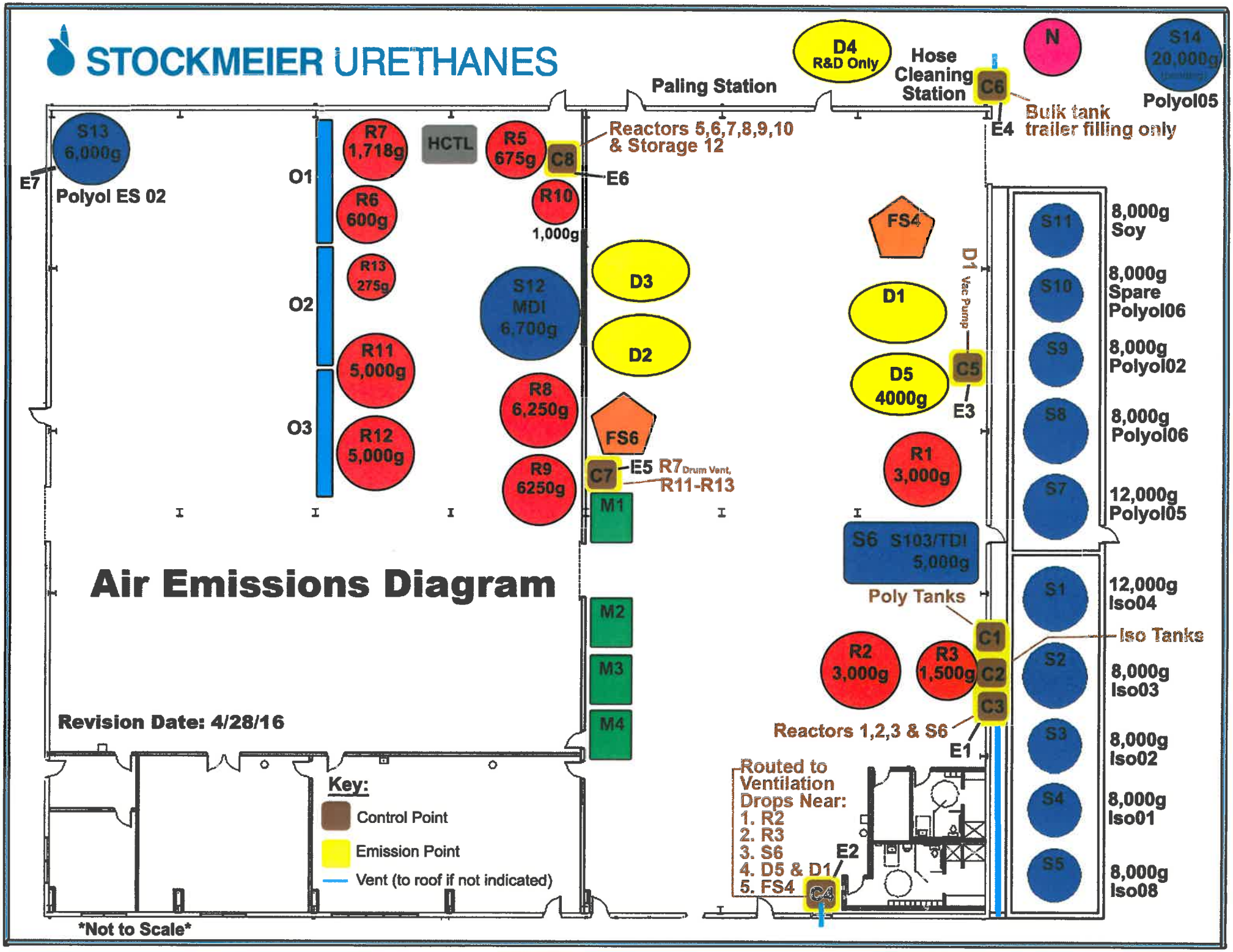
ATTACHMENT E

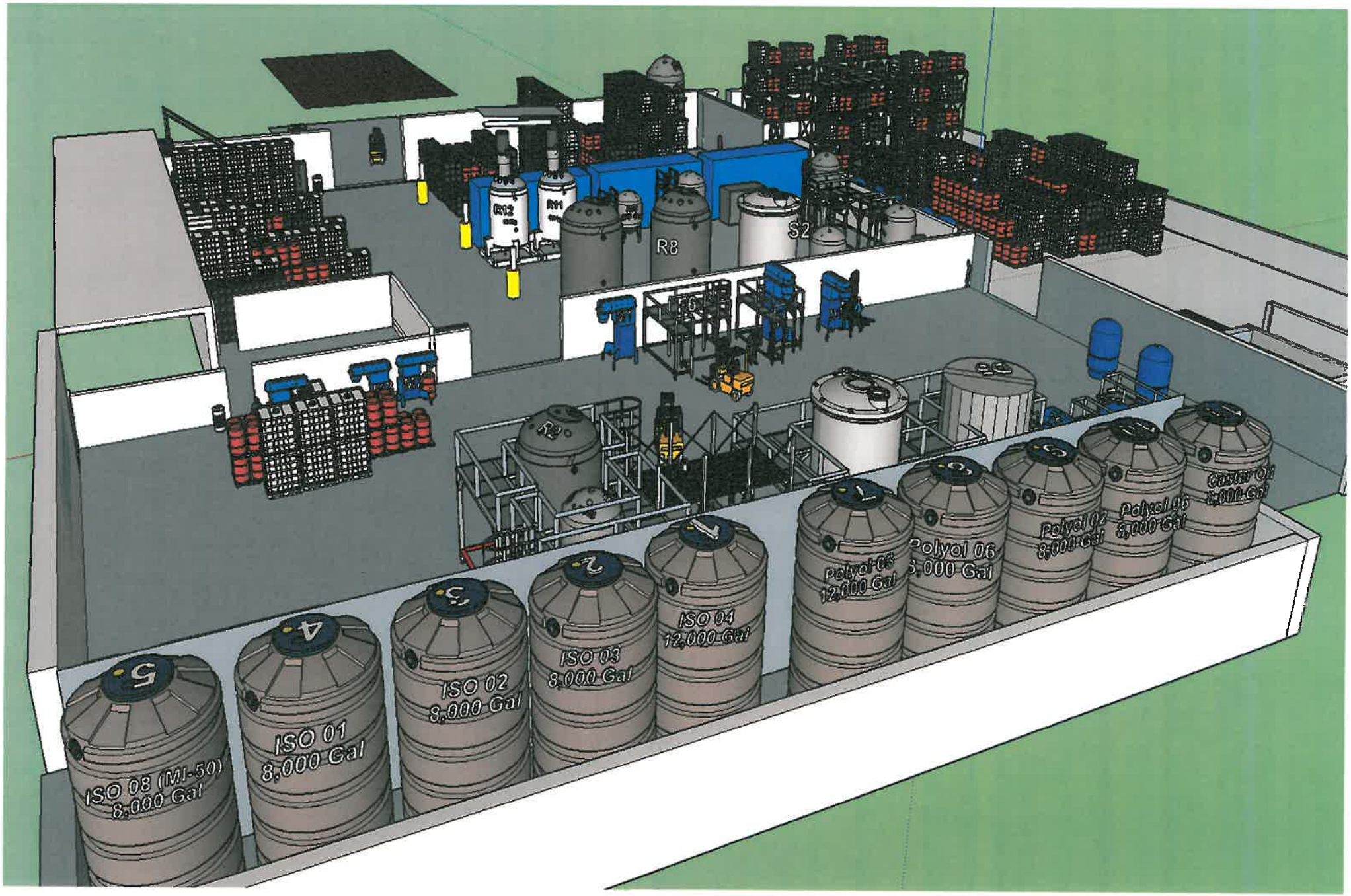
Plot Plan



Version 1
4/29/16

STOCKMEIER URETHANES




R12
R11
R8
S2
R9
ISO 08 (MI-50)
8,000 Gal
ISO 01
8,000 Gal
ISO 02
8,000 Gal
ISO 03
8,000 Gal
ISO 04
12,000 Gal
Polyol 05
12,000 Gal
Polyol 06
8,000 Gal
Polyol 04
8,000 Gal
Polyol 03
8,000 Gal
Castor Oil
8,000 Gal

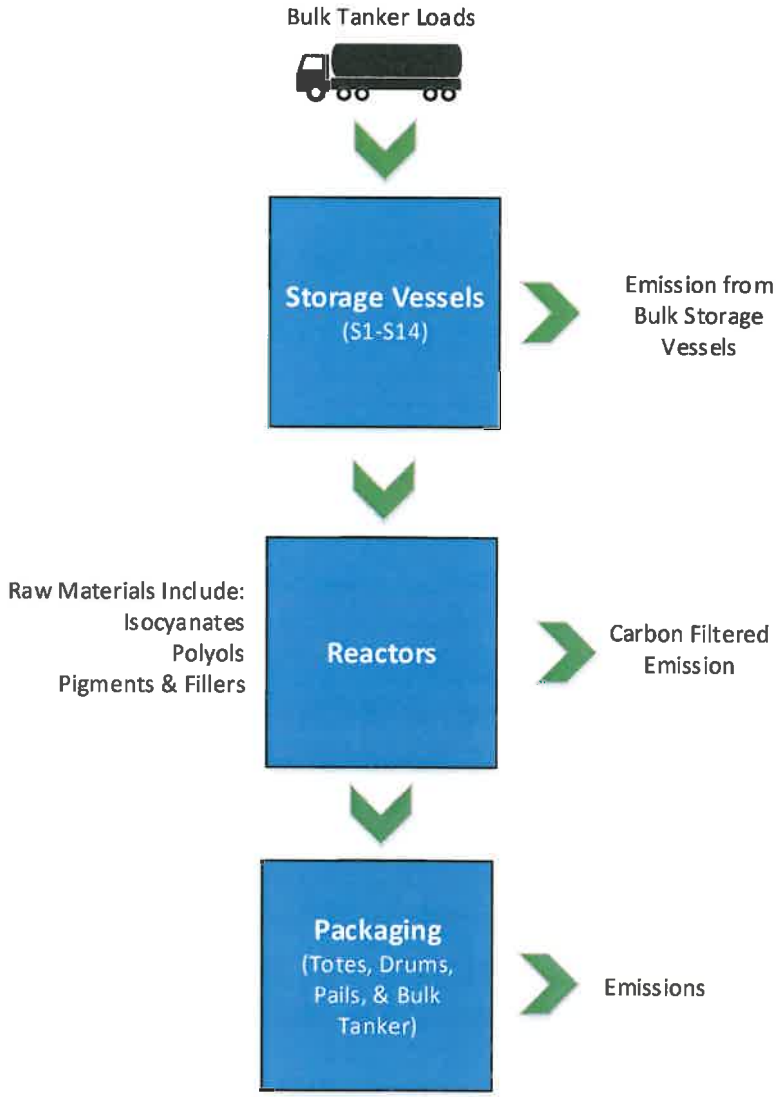
ATTACHMENT F

Detailed Process Flow Diagram(s)

STOCKMEIER URETHANES

Process & Emissions Overview Diagram

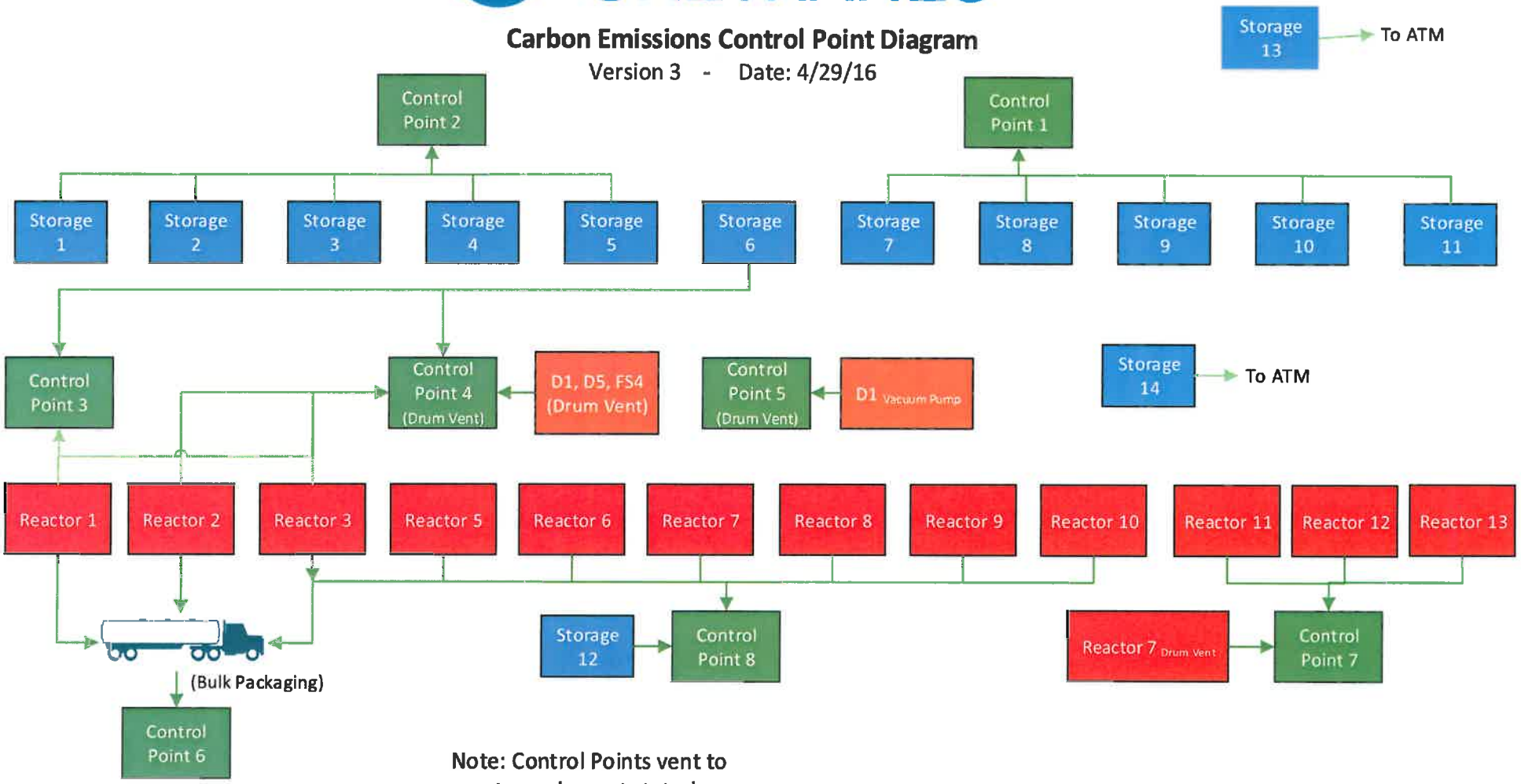
Version 2 - Date: 4/28/16



STOCKMEIER URETHANES

Carbon Emissions Control Point Diagram

Version 3 - Date: 4/29/16



Note: Control Points vent to atmosphere at stated Emission Points.

ATTACHMENT G

Process Description

ATTACHMENT G

Process Description

Stockmeier Urethanes USA is an automated Chemical Blending Facility that produces *CASE* (Coatings, Adhesives, Sealants and Elastomers) Urethanes for use in sports surfaces such as running tracks, children's playgrounds and artificial turf; decorative surfaces; weather-resistant elastomers for roofs, parking decks and trucks; structural adhesives for industrial applications; casting resins for cable, electrical and other technical applications; and ancillary products such as cleaners and catalysts.

Stockmeier bulk raw are unloaded from tanker trucks (TT) to various bulk storage tanks on site. Bulk Isocyanates are unloaded into storage tanks S1-S5 and S12. Bulk polyols are unloaded into storage tanks S7-S10 and S13. Additive AD-144233-PLS is unloaded into storage tank S11.

The bulk Isocyanates (Bulk: ISO 01, ISO 02, ISO 03, 04, MI 50 and ISO 06) are used in Reactors R1 - R13 where they are mixed with various Polyols including (Bulk Polyols: Poly 02, 05, 06, ES 02 & Soy), bulk additive AD-144233-PLS and various other small component packaged items to manufacture our products. Polyols and powders (dry materials) are blended in dispersion machines D1- D5 to manufacture non-reacted dispersions. The processing conditions may include: nitrogen or atmospheric conditions, heating, cooling, pressurization and vacuum. After various mixing and/or reacting processing steps, the final products are transferred to drums, pails, intermediate bulk containers (IBC's), or bulk tanker trucks (TT) for shipment to our customers.

New equipment included in this air permit update includes: One 6,000 gallon polyol storage tank (S13), one 6,700 gallon MDI storage tank (S12), and eight reactors (R5-8, R10-13) ranging in size from 275 gallons to 6,250 gallons, and one 4,000 gallon dispersion vessel (D5). Prospective new equipment included in this air permit update includes: A 20,000 gallon polyol storage tank for offloading railcars, and one 6,250 gallon reactor (R9).

Due to the addition of various pieces of equipment and new products, several new emission points and carbon adsorption control devices have been added to the manufacturing area.

The facility is currently in the process of installing an emergency backup generator, which will be powered by 909 horsepower, 600 kW diesel fired engine with a 1000 gallon fuel cell. The existing 149 horsepower backup generator will be maintained in storage for potential use in the future. The administration office building currently has a Cummins 176 horsepower natural gas backup generator in use.
04/28/2016

ATTACHMENT H

Material Safety Data Sheets (MSDS)

STOCKMEIER URETHANES

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/18/2014

Reviewed on 06/18/2014

1 Identification

· **Product identifier**

· **Trade name: POLYOL PT 01**
· **Relevant identified uses of the substance or mixture and uses advised against** No further relevant information available.

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Stockmeier Urethanes USA
20 Columbia Boulevard
Clarksburg, WV 26301-9606
USA
Telephone: (304) 624-7002
Fax: (304) 624-7020

· **Information department:** Product Development Department
· **Emergency telephone number:** During Normal Business Hours: 1-304-624-7002

2 Hazard(s) identification

· **Classification of the substance or mixture**
The substance is not classified according to the Globally Harmonized System (GHS).

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC** Not applicable.
· **Information concerning particular hazards for human and environment:** Not applicable.

· **Label elements**

· **Labelling according to EU guidelines:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.

· **Safety phrases:**
Keep container in a well-ventilated place.
Do not breathe fumes.
Do not breathe vapour/spray.
Avoid contact with skin and eyes.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 1
Fire = 1
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 1
Fire = 1
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
Polyether Polyol

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 1)

4 First-aid measures

· **Description of first aid measures**
· **General information:** Do not induce the patient to vomit, if they are unconscious.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness, place patient stably in side position for transportation.
· **After skin contact:**
Product is generally not a skin irritant
Instantly wash with water and soap and rinse thoroughly. Remove any contaminated clothing. If skin irritation persists, seek medical advice.
For hot product, immediately immerse in or flush affected area with cold water to dissipate heat and then cover with clean cotton wrapping. No attempt should be made to remove the material as the bonded skin can be easily torn. Seek immediate medical attention.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
For hot product, flush eyes with water for at least 20 minutes while holding eyelids open. Treat as resin or wax burn. Seek immediate medial attention.
· **After swallowing:**
May cause gastrointestinal discomfort.
Do not induce vomiting unless directed to do so by medical personnel.
Do not induce vomiting; immediately call for medical help.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** CO2, extinguishing powder or water spray. Fight larger fires with water spray.
· **Special hazards arising from the substance or mixture**
Nitrogen oxides (NOx)
Oxides of Carbon
· **Advice for firefighters**
· **Protective equipment:**
Wear breathing apparatus
Wear full protective suit with self-contained breathing apparatus
See section 8
· **Additional information** Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Environmental precautions:** Do not allow product to reach sewage system or bodies of water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Contaminated material must be disposed of as waste (See section 13).
· **Reference to other sections**
No dangerous substances are released.
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
No special measures required.
Ensure good ventilation/exhaust at the workplace.
· **Information about protection against explosions and fires:**
No special measures required.
Pay attention to the general rules of internal fire prevention.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Storage temperature:
< 95 °C (203 °F)
· **Information about storage in one common storage facility:** Store away from foodstuffs.
· **Further information about storage conditions:**
Store in dry conditions.
Protect from frost.
Protect from humidity and water.
Keep container tightly sealed.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:** Not required.
· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Provide loacal exhaust ventilation to control vapors/mists.
Do not eat or drink while working.
Do not inhale gases / fumes / aerosols.
Do not inhale dust / smoke / mist.
· **Breathing equipment:**
In case of inadequate ventillation or high vapor concentration, wear a NIOSH-certified (or equivalent) organic vapor/ particulate respirator as needed. Observe OSHA regulations for respirator use (29 CFR 1910.134).
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
The following glove types are recommended: neoprene, nitrile rubber, PVC or butyl rubber. Thin, disposable latex gloves should be avoided for repeated or long term handling of the material. Recommended thickness of the glove material: 5 - 6 mil
Selection of the glove material should be based on the consideration of penetration times, rates of diffusion and the degradation

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:** Safety glasses
· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Viscous Liquid to Solid
Color:	Whitish
· **Odor:**	Odorless
· **Odour threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	26 °C (79 °F)
Boiling point/Boiling range:	> 250 °C (> 482 °F)
· **Flash point:**	240 °C (464 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	> 245 °C
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure at 20 °C (68 °F):**	< 0.1 hPa (< 0 mm Hg)
· **Density at 30 °C (86 °F):**	0.982 g/cm³ (8.195 lbs/gal)
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Not miscible or difficult to mix.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Kinematic:	Not determined.
· **Other information**	No further relevant information available.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Conditions to avoid** Storage > 100 °C
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** Tetrahydrofuran

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
Oral	LD50	> 2000 mg/kg (rabbit)
Dermal	LD50	> 2000 mg/kg (rabbit)
Inhalative	LC50/4 h	> 5 mg/l (rabbit)

· **Primary irritant effect:**
· **on the skin:** May cause slight irritation after extended exposure.
· **on the eye:** Eye irritation may occur with overexposure.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
The substance is not subject to classification.

· **Carcinogenic categories**
· **IARC (International Agency for Research on Cancer)** Substance is not listed.
· **NTP (National Toxicology Program)** Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:** Water hazard class 1 (Self-assessment): slightly hazardous for water
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Smaller quantities can be disposed of with household waste.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

14 Transport information

· **UN-Number**	Void
· **UN proper shipping name**	Void
· **Transport hazard class(es)**	Void
· **Packing group**	Void
· **Environmental hazards:** · **Marine pollutant:**	No
· **Special precautions for user**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**
· **Section 355 (extremely hazardous substances):** Substance is not listed.
· **Section 313 (Specific toxic chemical listings):** Substance is not listed.
· **TSCA (Toxic Substances Control Act):** Substance is listed.
· **Proposition 65**
· **Chemicals known to cause cancer:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for females:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for males:** Substance is not listed.
· **Chemicals known to cause developmental toxicity:** Substance is not listed.

· **Cancerogenity categories**
· **EPA (Environmental Protection Agency)** Substance is not listed.
· **TLV (Threshold Limit Value established by ACGIH)** Substance is not listed.
· **NIOSH-Ca (National Institute for Occupational Safety and Health)** Substance is not listed.
· **OSHA-Ca (Occupational Safety & Health Administration)** Substance is not listed.

· **Product related hazard informations:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.

· **Safety phrases:**
Keep container in a well-ventilated place.
Do not breathe fumes.
Do not breathe vapour/spray.
Avoid contact with skin and eyes.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Product Development Department
· **Contact:** Bryan R. Morris
· **Abbreviations and acronyms:**
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

STOCKMEIER URETHANES

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/23/2014

Reviewed on 06/18/2014

1 Identification

· **Product identifier**

· **Trade name: POLYOL ES 04**
· **Relevant identified uses of the substance or mixture and uses advised against** No further relevant information available.

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Stockmeier Urethanes USA
20 Columbia Boulevard
Clarksburg, WV 26301-9606
USA
Telephone: (304) 624-7002
Fax: (304) 624-7020

· **Information department:** Product Development Department
· **Emergency telephone number:** During Normal Business Hours: 1-304-624-7002

2 Hazard(s) identification

· **Classification of the substance or mixture**
The substance is not classified according to the Globally Harmonized System (GHS).

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC** Not applicable.
· **Information concerning particular hazards for human and environment:** Not applicable.

· **Label elements**

· **Labelling according to EU guidelines:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.

· **Safety phrases:**
Keep container in a well-ventilated place.
Do not breathe fumes.
Do not breathe vapour/spray.
Avoid contact with skin and eyes.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 0
Fire = 1
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 0
Fire = 1
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
Polyester Polyol

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 1)

4 First-aid measures

· **Description of first aid measures**
· **General information:** Do not induce the patient to vomit, if they are unconscious.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness, place patient stably in side position for transportation.
· **After skin contact:**
Product is generally not a skin irritant
Instantly wash with water and soap and rinse thoroughly. Remove any contaminated clothing. If skin irritation persists, seek medical advice.
For hot product, immediately immerse in or flush affected area with cold water to dissipate heat and then cover with clean cotton wrapping. No attempt should be made to remove the material as the bonded skin can be easily torn. Seek immediate medical attention.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
For hot product, flush eyes with water for at least 20 minutes while holding eyelids open. Treat as resin or wax burn. Seek immediate medial attention.
· **After swallowing:**
May cause gastrointestinal discomfort.
Do not induce vomiting unless directed to do so by medical personnel.
Do not induce vomiting; immediately call for medical help.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Water, Foam or Dry Chemical
· **For safety reasons unsuitable extinguishing agents:** Carbon dioxide
· **Special hazards arising from the substance or mixture**
Toxic and irritating gases/fumes may be given off during burning or thermal decomposition.
Use cold water spray to cool fire-exposed containers to minimize the risk of rupture.
Product is a granular solid at ambient temperature. If ground into powder form, conditions may exist for a dust explosion.
Avoid dusting
· **Advice for firefighters**
· **Protective equipment:**
Wear breathing apparatus
Wear full protective suit with self-contained breathing apparatus
See section 8
· **Additional information** Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Environmental precautions:** Do not allow product to reach sewage system or bodies of water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Contaminated material must be disposed of as waste (See section 13).
· **Reference to other sections**
No dangerous substances are released.
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

7 Handling and storage

· **Handling:**
· **Precautions for safe handling** Ensure good ventilation/exhaust at the workplace.
· **Information about protection against explosions and fires:** Pay attention to the general rules of internal fire prevention.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Storage temperature:
Maximum: 50 °C (122 °F)
· **Information about storage in one common storage facility:** Store away from foodstuffs.
· **Further information about storage conditions:**
Store in dry conditions.
Protect from frost.
Protect from humidity and water.
Keep container tightly sealed.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:** Not required.
· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Provide loacal exhaust ventilation to control vapors/mists.
Do not eat or drink while working.
Do not inhale gases / fumes / aerosols.
Do not inhale dust / smoke / mist.
· **Breathing equipment:**
In case of inadequate ventillation or high vapor concentration, wear a NIOSH-certified (or equivalent) organic vapor/ particulate respirator as needed. Observe OSHA regulations for respirator use (29 CFR 1910.134).
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
The following glove types are recommended: neoprene, nitrile rubber, PVC or butyl rubber. Thin, disposable latex gloves should be avoided for repeated or long term handling of the material. Recommended thickness of the glove material: 5 - 6 mil
Selection of the glove material should be based on the consideration of penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **Eye protection:** Safety glasses
· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Solid
Color:	Amber colored
· **Odor:**	Nearly odorless
· **Odour threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	40 - 50 °C (104 - 122 °F)
Boiling point/Boiling range:	> 230 °C (> 446 °F)
· **Flash point:**	175 °C (347 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	
Decomposition temperature:	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not determined.
· **Density at 25 °C (77 °F):**	1.1 g/cm³ (9.18 lbs/gal)
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Not miscible or difficult to mix.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Conditions to avoid** Keep away from sources of heat and sparks.
· **Incompatible materials:**
Avoid contact with oxidizing materials. Avoid contact with: Strong acids and strong bases. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **Hazardous decomposition products:** Carbon monoxide and carbon dioxide

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**
· **Primary irritant effect:**
· **on the skin:** May cause slight irritation after extended exposure.
· **on the eye:** Eye irritation may occur with overexposure.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
The substance is not subject to classification.

· **Carcinogenic categories**
· **IARC (International Agency for Research on Cancer)** Substance is not listed.
· **NTP (National Toxicology Program)** Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:** Water hazard class 1 (Self-assessment): slightly hazardous for water
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Smaller quantities can be disposed of with household waste.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	Void
· **UN proper shipping name**	Void
· **Transport hazard class(es)**	Void
· **Packing group**	Void
· **Environmental hazards:** · **Marine pollutant:**	 No
· **Special precautions for user**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**
· **Section 355 (extremely hazardous substances):** Substance is not listed.
· **Section 313 (Specific toxic chemical listings):** Substance is not listed.
· **TSCA (Toxic Substances Control Act):** Substance is listed.
· **Proposition 65**
· **Chemicals known to cause cancer:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for females:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for males:** Substance is not listed.
· **Chemicals known to cause developmental toxicity:** Substance is not listed.

· **Cancerogenity categories**
· **EPA (Environmental Protection Agency)** Substance is not listed.
· **TLV (Threshold Limit Value established by ACGIH)** Substance is not listed.
· **NIOSH-Ca (National Institute for Occupational Safety and Health)** Substance is not listed.
· **OSHA-Ca (Occupational Safety & Health Administration)** Substance is not listed.

· **Product related hazard informations:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.

· **Safety phrases:**
Keep container in a well-ventilated place.
Do not breathe fumes.
Do not breathe vapour/spray.
Avoid contact with skin and eyes.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Product Development Department
· **Contact:** Bryan R. Morris
· **Abbreviations and acronyms:**
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)

STOCKMEIER URETHANES

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/23/2014

Reviewed on 06/18/2014

1 Identification

· **Product identifier**

· **Trade name: POLYOL ES 03**
· **Relevant identified uses of the substance or mixture and uses advised against** No further relevant information available.

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Stockmeier Urethanes USA
20 Columbia Boulevard
Clarksburg, WV 26301-9606
USA
Telephone: (304) 624-7002
Fax: (304) 624-7020

· **Information department:** Product Development Department
· **Emergency telephone number:** During Normal Business Hours: 1-304-624-7002

2 Hazard(s) identification

· **Classification of the substance or mixture**
The substance is not classified according to the Globally Harmonized System (GHS).

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC** Not applicable.
· **Information concerning particular hazards for human and environment:** Not applicable.

· **Label elements**

· **Labelling according to EU guidelines:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.

· **Safety phrases:**
Keep container in a well-ventilated place.
Do not breathe fumes.
Do not breathe vapour/spray.
Avoid contact with skin and eyes.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 0
Fire = 1
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 0
Fire = 1
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
Polyester Polyol

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 1)

4 First-aid measures

· **Description of first aid measures**
· **General information:** Do not induce the patient to vomit, if they are unconscious.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness, place patient stably in side position for transportation.
· **After skin contact:**
Product is generally not a skin irritant
Instantly wash with water and soap and rinse thoroughly. Remove any contaminated clothing. If skin irritation persists, seek medical advice.
For hot product, immediately immerse in or flush affected area with cold water to dissipate heat and then cover with clean cotton wrapping. No attempt should be made to remove the material as the bonded skin can be easily torn. Seek immediate medical attention.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
For hot product, flush eyes with water for at least 20 minutes while holding eyelids open. Treat as resin or wax burn. Seek immediate medial attention.
· **After swallowing:**
May cause gastrointestinal discomfort.
Do not induce vomiting unless directed to do so by medical personnel.
Do not induce vomiting; immediately call for medical help.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Water, Foam or Dry Chemical
· **For safety reasons unsuitable extinguishing agents:** Carbon dioxide
· **Special hazards arising from the substance or mixture**
Toxic and irritating gases/fumes may be given off during burning or thermal decomposition.
Use cold water spray to cool fire-exposed containers to minimize the risk of rupture.
Product is a granular solid at ambient temperature. If ground into powder form, conditions may exist for a dust explosion.
Avoid dusting
· **Advice for firefighters**
· **Protective equipment:**
Wear breathing apparatus
Wear full protective suit with self-contained breathing apparatus
See section 8
· **Additional information** Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Environmental precautions:** Do not allow product to reach sewage system or bodies of water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Contaminated material must be disposed of as waste (See section 13).
· **Reference to other sections**
No dangerous substances are released.
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

7 Handling and storage

· **Handling:**
· **Precautions for safe handling** Ensure good ventilation/exhaust at the workplace.
· **Information about protection against explosions and fires:** Pay attention to the general rules of internal fire prevention.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Storage temperature:
Maximum: 50 °C (122 °F)
· **Information about storage in one common storage facility:** Store away from foodstuffs.
· **Further information about storage conditions:**
Store in dry conditions.
Protect from frost.
Protect from humidity and water.
Keep container tightly sealed.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:** Not required.
· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Provide loacal exhaust ventilation to control vapors/mists.
Do not eat or drink while working.
Do not inhale gases / fumes / aerosols.
Do not inhale dust / smoke / mist.
· **Breathing equipment:**
In case of inadequate ventillation or high vapor concentration, wear a NIOSH-certified (or equivalent) organic vapor/ particulate respirator as needed. Observe OSHA regulations for respirator use (29 CFR 1910.134).
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
The following glove types are recommended: neoprene, nitrile rubber, PVC or butyl rubber. Thin, disposable latex gloves should be avoided for repeated or long term handling of the material. Recommended thickness of the glove material: 5 - 6 mil
Selection of the glove material should be based on the consideration of penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **Eye protection:** Safety glasses
· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Flakes Granulate
Color:	Yellowish
· **Odor:**	Nearly odorless
· **Odour threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	40 - 50 °C (104 - 122 °F)
Boiling point/Boiling range:	Undetermined.
· **Flash point:**	238 °C (460 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	
Decomposition temperature:	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not determined.
· **Density at 25 °C (77 °F):**	1.15 g/cm³ (9.597 lbs/gal)
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Not miscible or difficult to mix.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Conditions to avoid** Keep away from sources of heat and sparks.
· **Incompatible materials:**
Avoid contact with oxidizing materials. Avoid contact with: Strong acids and strong bases. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **Hazardous decomposition products:** Carbon monoxide and carbon dioxide

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**
· **Primary irritant effect:**
· **on the skin:** May cause slight irritation after extended exposure.
· **on the eye:** Eye irritation may occur with overexposure.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
The substance is not subject to classification.

· **Carcinogenic categories**
· **IARC (International Agency for Research on Cancer)** Substance is not listed.
· **NTP (National Toxicology Program)** Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:** Water hazard class 1 (Self-assessment): slightly hazardous for water
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Smaller quantities can be disposed of with household waste.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	Void
· **UN proper shipping name**	Void
· **Transport hazard class(es)**	Void
· **Packing group**	Void
· **Environmental hazards:** · **Marine pollutant:**	 No
· **Special precautions for user**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**
· **Section 355 (extremely hazardous substances):** Substance is not listed.
· **Section 313 (Specific toxic chemical listings):** Substance is not listed.
· **TSCA (Toxic Substances Control Act):** Substance is listed.
· **Proposition 65**
· **Chemicals known to cause cancer:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for females:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for males:** Substance is not listed.
· **Chemicals known to cause developmental toxicity:** Substance is not listed.

· **Cancerogenity categories**
· **EPA (Environmental Protection Agency)** Substance is not listed.
· **TLV (Threshold Limit Value established by ACGIH)** Substance is not listed.
· **NIOSH-Ca (National Institute for Occupational Safety and Health)** Substance is not listed.
· **OSHA-Ca (Occupational Safety & Health Administration)** Substance is not listed.

· **Product related hazard informations:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.

· **Safety phrases:**
Keep container in a well-ventilated place.
Do not breathe fumes.
Do not breathe vapour/spray.
Avoid contact with skin and eyes.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Product Development Department
· **Contact:** Bryan R. Morris
· **Abbreviations and acronyms:**
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)

STOCKMEIER URETHANES

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/23/2014

Reviewed on 06/18/2014

1 Identification

· **Product identifier**

· **Trade name: POLYOL ES 02**
· **Relevant identified uses of the substance or mixture and uses advised against** No further relevant information available.

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Stockmeier Urethanes USA
20 Columbia Boulevard
Clarksburg, WV 26301-9606
USA
Telephone: (304) 624-7002
Fax: (304) 624-7020

· **Information department:** Product Development Department
· **Emergency telephone number:** During Normal Business Hours: 1-304-624-7002

2 Hazard(s) identification

· **Classification of the substance or mixture**
The substance is not classified according to the Globally Harmonized System (GHS).

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC** Not applicable.
· **Information concerning particular hazards for human and environment:** Not applicable.

· **Label elements**

· **Labelling according to EU guidelines:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.

· **Safety phrases:**
Keep container in a well-ventilated place.
Do not breathe fumes.
Do not breathe vapour/spray.
Avoid contact with skin and eyes.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 0
Fire = 1
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 0
Fire = 1
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
Polyester Polyol

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 1)

4 First-aid measures

· **Description of first aid measures**
· **General information:** Do not induce the patient to vomit, if they are unconscious.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness, place patient stably in side position for transportation.
· **After skin contact:**
Product is generally not a skin irritant
Instantly wash with water and soap and rinse thoroughly. Remove any contaminated clothing. If skin irritation persists, seek medical advice.
For hot product, immediately immerse in or flush affected area with cold water to dissipate heat and then cover with clean cotton wrapping. No attempt should be made to remove the material as the bonded skin can be easily torn. Seek immediate medical attention.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
For hot product, flush eyes with water for at least 20 minutes while holding eyelids open. Treat as resin or wax burn. Seek immediate medial attention.
· **After swallowing:**
May cause gastrointestinal discomfort.
Do not induce vomiting unless directed to do so by medical personnel.
Do not induce vomiting; immediately call for medical help.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Water, Foam or Dry Chemical
· **For safety reasons unsuitable extinguishing agents:** Carbon dioxide
· **Special hazards arising from the substance or mixture**
Toxic and irritating gases/fumes may be given off during burning or thermal decomposition.
Use cold water spray to cool fire-exposed containers to minimize the risk of rupture.
Product is a granular solid at ambient temperature. If ground into powder form, conditions may exist for a dust explosion.
Avoid dusting
· **Advice for firefighters**
· **Protective equipment:**
Wear breathing apparatus
Wear full protective suit with self-contained breathing apparatus
See section 8
· **Additional information** Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Environmental precautions:** Do not allow product to reach sewage system or bodies of water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Contaminated material must be disposed of as waste (See section 13).
· **Reference to other sections**
No dangerous substances are released.
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
No special measures required.
Ensure good ventilation/exhaust at the workplace.
· **Information about protection against explosions and fires:**
No special measures required.
Pay attention to the general rules of internal fire prevention.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Storage temperature:
Maximum: 50 °C (122 °F)
· **Information about storage in one common storage facility:** Store away from foodstuffs.
· **Further information about storage conditions:**
Store in dry conditions.
Protect from frost.
Protect from humidity and water.
Keep container tightly sealed.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:** Not required.
· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Provide loacal exhaust ventilation to control vapors/mists.
Do not eat or drink while working.
Do not inhale gases / fumes / aerosols.
Do not inhale dust / smoke / mist.
· **Breathing equipment:**
In case of inadequate ventillation or high vapor concentration, wear a NIOSH-certified (or equivalent) organic vapor/ particulate respirator as needed. Observe OSHA regulations for respirator use (29 CFR 1910.134).
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
The following glove types are recommended: neoprene, nitrile rubber, PVC or butyl rubber. Thin, disposable latex gloves should be avoided for repeated or long term handling of the material. Recommended thickness of the glove material: 5 - 6 mil
Selection of the glove material should be based on the consideration of penetration times, rates of diffusion and the degradation

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:** Safety glasses
· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Waxy-Like Appearance
Color:	Light Yellow to Amber
· **Odor:**	Nearly odorless
· **Odour threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	40 - 50 °C (104 - 122 °F)
Boiling point/Boiling range:	> 230 °C (> 446 °F)
· **Flash point:**	175 °C (347 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	> 245 °C
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not determined.
· **Density at 25 °C (77 °F):**	1.1 g/cm³ (9.18 lbs/gal)
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Not miscible or difficult to mix.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
· **Other information**	No further relevant information available.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Conditions to avoid** Keep away from sources of heat and sparks.
· **Incompatible materials:**
Avoid contact with oxidizing materials. Avoid contact with: Strong acids and strong bases. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.
· **Hazardous decomposition products:** Carbon monoxide and carbon dioxide

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**
· **Primary irritant effect:**
· **on the skin:** May cause slight irritation after extended exposure.
· **on the eye:** Eye irritation may occur with overexposure.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
The substance is not subject to classification.

· **Carcinogenic categories**
· **IARC (International Agency for Research on Cancer)** Substance is not listed.
· **NTP (National Toxicology Program)** Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:** Water hazard class 1 (Self-assessment): slightly hazardous for water
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Smaller quantities can be disposed of with household waste.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**
· **DOT, ADR, IMDG** UN3257

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

· **UN proper shipping name**	
· **DOT**	Elevated temperature liquid, n.o.s.
· **ADR**	3257 Elevated temperature liquid, n.o.s. (Polyester Polyol)
· **IMDG**	ELEVATED TEMPERATURE LIQUID, N.O.S.
· **Transport hazard class(es)**	
· **DOT**	
· **Class**	9 Miscellaneous dangerous substances and articles.
· **Packing group**	
· **DOT**	III
· **Environmental hazards:**	
· **Marine pollutant:**	No
· **Special precautions for user**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **UN "Model Regulation":**	UN3257, Elevated temperature liquid, n.o.s. (Polyester Polyol)

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**
· **Section 355 (extremely hazardous substances):** Substance is not listed.
· **Section 313 (Specific toxic chemical listings):** Substance is not listed.
· **TSCA (Toxic Substances Control Act):** Substance is listed.
· **Proposition 65**
· **Chemicals known to cause cancer:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for females:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for males:** Substance is not listed.
· **Chemicals known to cause developmental toxicity:** Substance is not listed.

· **Cancerogenity categories**
· **EPA (Environmental Protection Agency)** Substance is not listed.
· **TLV (Threshold Limit Value established by ACGIH)** Substance is not listed.
· **NIOSH-Ca (National Institute for Occupational Safety and Health)** Substance is not listed.
· **OSHA-Ca (Occupational Safety & Health Administration)** Substance is not listed.

· **Product related hazard informations:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.

· **Safety phrases:**
Keep container in a well-ventilated place.
Do not breathe fumes.
Do not breathe vapour/spray.
Avoid contact with skin and eyes.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Product Development Department
· **Contact:** Bryan R. Morris

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 6)

· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)

STOCKMEIER URETHANES

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/19/2014

Reviewed on 06/18/2014

1 Identification

· **Product identifier**

· **Trade name: POLYOL ES 01**
· **Relevant identified uses of the substance or mixture and uses advised against** No further relevant information available.

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Stockmeier Urethanes USA
20 Columbia Boulevard
Clarksburg, WV 26301-9606
USA
Telephone: (304) 624-7002
Fax: (304) 624-7020

· **Information department:** Product Development Department
· **Emergency telephone number:** During Normal Business Hours: 1-304-624-7002

2 Hazard(s) identification

· **Classification of the substance or mixture**
The substance is not classified according to the Globally Harmonized System (GHS).

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC** Not applicable.
· **Information concerning particular hazards for human and environment:** Not applicable.

· **Label elements**

· **Labelling according to EU guidelines:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.

· **Safety phrases:**
Keep container in a well-ventilated place.
Do not breathe fumes.
Do not breathe vapour/spray.
Avoid contact with skin and eyes.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 0
Fire = 1
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 0
Fire = 1
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
Polyester Polyol

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 1)

4 First-aid measures

· **Description of first aid measures**
· **General information:** Do not induce the patient to vomit, if they are unconscious.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness, place patient stably in side position for transportation.
· **After skin contact:**
Product is generally not a skin irritant
Instantly wash with water and soap and rinse thoroughly. Remove any contaminated clothing. If skin irritation persists, seek medical advice.
For hot product, immediately immerse in or flush affected area with cold water to dissipate heat and then cover with clean cotton wrapping. No attempt should be made to remove the material as the bonded skin can be easily torn. Seek immediate medical attention.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
For hot product, flush eyes with water for at least 20 minutes while holding eyelids open. Treat as resin or wax burn. Seek immediate medial attention.
· **After swallowing:**
May cause gastrointestinal discomfort.
Do not induce vomiting unless directed to do so by medical personnel.
Do not induce vomiting; immediately call for medical help.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Water, Foam or Dry Chemical
· **For safety reasons unsuitable extinguishing agents:** Carbon dioxide
· **Special hazards arising from the substance or mixture**
Toxic and irritating gases/fumes may be given off during burning or thermal decomposition.
Use cold water spray to cool fire-exposed containers to minimize the risk of rupture.
Product is a granular solid at ambient temperature. If ground into powder form, conditions may exist for a dust explosion.
Avoid dusting
· **Advice for firefighters**
· **Protective equipment:**
Wear breathing apparatus
Wear full protective suit with self-contained breathing apparatus
See section 8
· **Additional information** Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Environmental precautions:** Do not allow product to reach sewage system or bodies of water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Contaminated material must be disposed of as waste (See section 13).
· **Reference to other sections**
No dangerous substances are released.
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

7 Handling and storage

· **Handling:**
· **Precautions for safe handling** Ensure good ventilation/exhaust at the workplace.
· **Information about protection against explosions and fires:** Pay attention to the general rules of internal fire prevention.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Storage temperature:
Maximum: 50 °C (122 °F)
· **Information about storage in one common storage facility:** Store away from foodstuffs.
· **Further information about storage conditions:**
Store in dry conditions.
Protect from frost.
Protect from humidity and water.
Keep container tightly sealed.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:** Not required.
· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Provide loacal exhaust ventilation to control vapors/mists.
Do not eat or drink while working.
Do not inhale gases / fumes / aerosols.
Do not inhale dust / smoke / mist.
· **Breathing equipment:**
In case of inadequate ventillation or high vapor concentration, wear a NIOSH-certified (or equivalent) organic vapor/ particulate respirator as needed. Observe OSHA regulations for respirator use (29 CFR 1910.134).
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
The following glove types are recommended: neoprene, nitrile rubber, PVC or butyl rubber. Thin, disposable latex gloves should be avoided for repeated or long term handling of the material. Recommended thickness of the glove material: 5 - 6 mil
Selection of the glove material should be based on the consideration of penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **Eye protection:** Safety glasses
· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Waxy-Like Appearance
Color:	Light Yellow to Amber
· **Odor:**	Nearly odorless
· **Odour threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	40 - 50 °C (104 - 122 °F)
Boiling point/Boiling range:	> 230 °C (> 446 °F)
· **Flash point:**	175 °C (347 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	> 245 ℃
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not determined.
· **Density at 25 °C (77 °F):**	1.1 g/cm³ (9.18 lbs/gal)
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Not miscible or difficult to mix.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Conditions to avoid** Keep away from sources of heat and sparks.
· **Incompatible materials:**
Avoid contact with oxidizing materials. Avoid contact with: Strong acids and strong bases. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **Hazardous decomposition products:** Carbon monoxide and carbon dioxide

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
Oral	LD50	> 5000 mg/kg (rat)

· **Primary irritant effect:**
· **on the skin:** May cause slight irritation after extended exposure.
· **on the eye:** Eye irritation may occur with overexposure.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
The substance is not subject to classification.

· **Carcinogenic categories**
· **IARC (International Agency for Research on Cancer)** Substance is not listed.
· **NTP (National Toxicology Program)** Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:** Water hazard class 1 (Self-assessment): slightly hazardous for water
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Smaller quantities can be disposed of with household waste.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	Void
· **UN proper shipping name**	Void
· **Transport hazard class(es)**	Void
· **Packing group**	Void
· **Environmental hazards:** · **Marine pollutant:**	 No
· **Special precautions for user**	Not applicable.

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable.

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**
· **Section 355 (extremely hazardous substances):** Substance is not listed.
· **Section 313 (Specific toxic chemical listings):** Substance is not listed.
· **TSCA (Toxic Substances Control Act):** Substance is listed.
· **Proposition 65**
· **Chemicals known to cause cancer:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for females:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for males:** Substance is not listed.
· **Chemicals known to cause developmental toxicity:** Substance is not listed.

· **Cancerogenity categories**
· **EPA (Environmental Protection Agency)** Substance is not listed.
· **TLV (Threshold Limit Value established by ACGIH)** Substance is not listed.
· **NIOSH-Ca (National Institute for Occupational Safety and Health)** Substance is not listed.
· **OSHA-Ca (Occupational Safety & Health Administration)** Substance is not listed.

· **Product related hazard informations:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.

· **Safety phrases:**
Keep container in a well-ventilated place.
Do not breathe fumes.
Do not breathe vapour/spray.
Avoid contact with skin and eyes.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Product Development Department
· **Contact:** Bryan R. Morris
· **Abbreviations and acronyms:**
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

STOCKMEIER URETHANES

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 05/30/2014

Reviewed on 06/18/2009

1 Identification

· **Product identifier**

· **Trade name: POLYOL 06**
· **Relevant identified uses of the substance or mixture and uses advised against** No further relevant information available.

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Stockmeier Urethanes USA
20 Columbia Boulevard
Clarksburg, WV 26301-9606
USA
Telephone: (304) 624-7002
Fax: (304) 624-7020

· **Information department:** Product Development Department
· **Emergency telephone number:** During Normal Business Hours: 1-304-624-7002

2 Hazard(s) identification

· **Classification of the substance or mixture**
The substance is not classified according to the Globally Harmonized System (GHS).

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC** Not applicable.
· **Information concerning particular hazards for human and environment:** Not applicable.

· **Label elements**

· **Labelling according to EU guidelines:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 1
Fire = 1
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 1
Fire = 1
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
Polyether Polyol

4 First-aid measures

· **Description of first aid measures**
· **General information:** Do not induce the patient to vomit, if they are unconscious.
· **After inhalation:**
Not expected to be hazardous due to low vapor pressure.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 1)

Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness, place patient stably in side position for transportation.
· **After skin contact:**
Product is generally not a skin irritant
Rinse with soap and water.
Wash contaminated clothing prior to resuse
· **After eye contact:** Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:**
Do not induce vomiting unless directed to do so by medical personnel.
If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** CO2, extinguishing powder or water spray. Fight larger fires with water spray.
· **Special hazards arising from the substance or mixture**
Formation of toxic gases is possible during heating or in case of fire.
Use cold water spray to cool fire exposed containers to minimize the risk of rupture.
· **Advice for firefighters**
· **Protective equipment:**
Wear breathing apparatus
Wear full protective suit with self-contained breathing apparatus
See section 8
· **Additional information** Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Environmental precautions:** Do not allow product to reach sewage system or bodies of water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Contaminated material must be disposed of as waste (See section 13).
· **Reference to other sections**
No dangerous substances are released.
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling** No special measures required.
· **Information about protection against explosions and fires:**
No special measures required.
Pay attention to the general rules of internal fire prevention.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Storage temperature:
Minimum: 20 °C (68 °F)
Minimum: 60 °C (140 °F)
Prevent any seepage into the ground.
· **Information about storage in one common storage facility:** Store away from foodstuffs.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

· **Further information about storage conditions:**
Store in dry conditions.
Protect from frost.
Keep container tightly sealed.
Protect from humidity and water.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:** Not required.
· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
The usual precautionary measures for handling chemicals should be followed.
Wash hands before breaks and at the end of work.
Do not eat or drink while working.
· **Breathing equipment:** Not required.
· **Protection of hands:**
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
The following glove types are recommended: neoprene, nitrile rubber, PVC or butyl rubber. Thin, disposable latex gloves should be avoided for repeated or long term handling of the material. Recommended thickness of the glove material: 5 - 6 mil
Selection of the glove material should be based on the consideration of penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:** Safety glasses
· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Liquid
Color:	Colorless, Opaque
· **Odor:**	Odorless
· **Odour threshold:**	Not determined.
· **pH-value:**	4.5 - 7.5
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	Undetermined.
· **Flash point:**	> 200 °C (> 392 °F)

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	
Decomposition temperature:	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not determined.
· **Density at 20 °C (68 °F):**	1.04 g/cm³ (8.679 lbs/gal)
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Not miscible or difficult to mix.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:**
By fire and thrmal decomposition: Carbon Dioxide (CO2), Carbon Monoxide (CO), Oxides of Nitrogen (NOx), dense black smoke and other undetermined compounds.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
Oral	LD50	> 2000 mg/kg (rabbit)
Dermal	LD50	> 2000 mg/kg (rabbit)
Inhalative	LC50/4 h	> 5 mg/l (rabbit)

· **Primary irritant effect:**
· **on the skin:** May cause slight irritation after extended exposure.
· **on the eye:** Eye irritation may occur with overexposure.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
The substance is not subject to classification.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **Carcinogenic categories**
· **IARC (International Agency for Research on Cancer)** Substance is not listed.
· **NTP (National Toxicology Program)** Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:** Water hazard class 1 (Self-assessment): slightly hazardous for water
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Smaller quantities can be disposed of with household waste.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	Void
· **UN proper shipping name**	Void
· **Transport hazard class(es)**	Void
· **Packing group**	Void
· **Environmental hazards:** · **Marine pollutant:**	No
· **Special precautions for user**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**
· **Section 355 (extremely hazardous substances):** Substance is not listed.
· **Section 313 (Specific toxic chemical listings):** Substance is not listed.
· **TSCA (Toxic Substances Control Act):** Substance is listed.
· **Proposition 65**
· **Chemicals known to cause cancer:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for females:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for males:** Substance is not listed.
· **Chemicals known to cause developmental toxicity:** Substance is not listed.

· **Cancerogenity categories**
· **EPA (Environmental Protection Agency)** Substance is not listed.

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

· **TLV (Threshold Limit Value established by ACGIH)** Substance is not listed.
· **NIOSH-Ca (National Institute for Occupational Safety and Health)** Substance is not listed.
· **OSHA-Ca (Occupational Safety & Health Administration)** Substance is not listed.

· **Product related hazard informations:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Product Development Department
· **Contact:** Bryan R. Morris
· **Abbreviations and acronyms:**
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

STOCKMEIER URETHANES

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 05/30/2014

Reviewed on 06/18/2009

1 Identification

· **Product identifier**

· **Trade name: POLYOL 05**
· **Relevant identified uses of the substance or mixture and uses advised against** No further relevant information available.

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Stockmeier Urethanes USA
20 Columbia Boulevard
Clarksburg, WV 26301-9606
USA
Telephone: (304) 624-7002
Fax: (304) 624-7020

· **Information department:** Product Development Department
· **Emergency telephone number:** During Normal Business Hours: 1-304-624-7002

2 Hazard(s) identification

· **Classification of the substance or mixture**
The substance is not classified according to the Globally Harmonized System (GHS).

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC** Not applicable.
· **Information concerning particular hazards for human and environment:** Not applicable.

· **Label elements**

· **Labelling according to EU guidelines:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 1
Fire = 1
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 1
Fire = 1
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
Polyether Polyol

4 First-aid measures

· **Description of first aid measures**
· **General information:** Do not induce the patient to vomit, if they are unconscious.
· **After inhalation:**
Not expected to be hazardous due to low vapor pressure.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 1)

Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness, place patient stably in side position for transportation.

· **After skin contact:**
Product is generally not a skin irritant
Rinse with soap and water.
Wash contaminated clothing prior to resuse

· **After eye contact:** Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

· **After swallowing:**
Do not induce vomiting unless directed to do so by medical personnel.
If symptoms persist consult doctor.

· **Information for doctor:**

· **Most important symptoms and effects, both acute and delayed** No further relevant information available.

· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**

· **Suitable extinguishing agents:** CO2, extinguishing powder or water spray. Fight larger fires with water spray.

· **Special hazards arising from the substance or mixture**
Formation of toxic gases is possible during heating or in case of fire.
Use cold water spray to cool fire exposed containers to minimize the risk of rupture.

· **Advice for firefighters**

· **Protective equipment:**
Wear breathing apparatus
Wear full protective suit with self-contained breathing apparatus
See section 8

· **Additional information** Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Environmental precautions:** Do not allow product to reach sewage system or bodies of water.

· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Contaminated material must be disposed of as waste (See section 13).

· **Reference to other sections**
No dangerous substances are released.
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling:**

· **Precautions for safe handling** No special measures required.

· **Information about protection against explosions and fires:**
No special measures required.
Pay attention to the general rules of internal fire prevention.

· **Conditions for safe storage, including any incompatibilities**

· **Storage:**

· **Requirements to be met by storerooms and receptacles:**
Storage temperature:
Minimum: 20 °C (68 °F)
Minimum: 60 °C (140 °F)
Prevent any seepage into the ground.

· **Information about storage in one common storage facility:** Store away from foodstuffs.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

· **Further information about storage conditions:**
Store in dry conditions.
Protect from frost.
Keep container tightly sealed.
Protect from humidity and water.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:** Not required.
· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
The usual precautionary measures for handling chemicals should be followed.
Wash hands before breaks and at the end of work.
Do not eat or drink while working.
· **Breathing equipment:** Not required.
· **Protection of hands:**
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
The following glove types are recommended: neoprene, nitrile rubber, PVC or butyl rubber. Thin, disposable latex gloves should be avoided for repeated or long term handling of the material. Recommended thickness of the glove material: 5 - 6 mil
Selection of the glove material should be based on the consideration of penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:** Safety glasses
· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Liquid
Color:	Colorless
· **Odor:**	Odorless
· **Odour threshold:**	Not determined.
· **pH-value:**	4.5 - 7.5
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	Undetermined.
· **Flash point:**	> 200 °C (> 392 °F)

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	
Decomposition temperature:	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not determined.
· **Density at 20 °C (68 °F):**	1.02 g/cm³ (8.512 lbs/gal)
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Not miscible or difficult to mix.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:**
By fire and thrmal decomposition: Carbon Dioxide (CO2), Carbon Monoxide (CO), Oxides of Nitrogen (NOx), dense black smoke and other undetermined compounds.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
Oral	LD50	> 2000 mg/kg (rabbit)
Dermal	LD50	> 2000 mg/kg (rabbit)
Inhalative	LC50/4 h	> 5 mg/l (rabbit)

· **Primary irritant effect:**
· **on the skin:** May cause slight irritation after extended exposure.
· **on the eye:** Eye irritation may occur with overexposure.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
The substance is not subject to classification.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **Carcinogenic categories**
· **IARC (International Agency for Research on Cancer)** Substance is not listed.
· **NTP (National Toxicology Program)** Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:** Water hazard class 1 (Self-assessment): slightly hazardous for water
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Smaller quantities can be disposed of with household waste.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	Void
· **UN proper shipping name**	Void
· **Transport hazard class(es)**	Void
· **Packing group**	Void
· **Environmental hazards:** · **Marine pollutant:**	No
· **Special precautions for user**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**
· **Section 355 (extremely hazardous substances):** Substance is not listed.
· **Section 313 (Specific toxic chemical listings):** Substance is not listed.
· **TSCA (Toxic Substances Control Act):** Substance is listed.
· **Proposition 65**
· **Chemicals known to cause cancer:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for females:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for males:** Substance is not listed.
· **Chemicals known to cause developmental toxicity:** Substance is not listed.

· **Cancerogenity categories**
· **EPA (Environmental Protection Agency)** Substance is not listed.

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

· **TLV (Threshold Limit Value established by ACGIH)** Substance is not listed.
· **NIOSH-Ca (National Institute for Occupational Safety and Health)** Substance is not listed.
· **OSHA-Ca (Occupational Safety & Health Administration)** Substance is not listed.

· **Product related hazard informations:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Product Development Department
· **Contact:** Bryan R. Morris
· **Abbreviations and acronyms:**
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

STOCKMEIER URETHANES

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 05/30/2014

Reviewed on 06/18/2009

1 Identification

· **Product identifier**

· **Trade name: POLYOL 02**
· **Relevant identified uses of the substance or mixture and uses advised against** No further relevant information available.

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Stockmeier Urethanes USA
20 Columbia Boulevard
Clarksburg, WV 26301-9606
USA
Telephone: (304) 624-7002
Fax: (304) 624-7020

· **Information department:** Product Development Department
· **Emergency telephone number:** During Normal Business Hours: 1-304-624-7002

2 Hazard(s) identification

· **Classification of the substance or mixture**
The substance is not classified according to the Globally Harmonized System (GHS).

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC** Not applicable.
· **Information concerning particular hazards for human and environment:** Not applicable.

· **Label elements**

· **Labelling according to EU guidelines:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 1
Fire = 1
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 1
Fire = 1
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
Polyether Polyol

4 First-aid measures

· **Description of first aid measures**
· **General information:** Do not induce the patient to vomit, if they are unconscious.
· **After inhalation:**
Not expected to be hazardous due to low vapor pressure.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 1)

Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness, place patient stably in side position for transportation.

· **After skin contact:**
Product is generally not a skin irritant
Rinse with soap and water.
Wash contaminated clothing prior to resuse

· **After eye contact:** Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

· **After swallowing:**
Do not induce vomiting unless directed to do so by medical personnel.
If symptoms persist consult doctor.

· **Information for doctor:**

· **Most important symptoms and effects, both acute and delayed** No further relevant information available.

· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**

· **Suitable extinguishing agents:** CO2, extinguishing powder or water spray. Fight larger fires with water spray.

· **Special hazards arising from the substance or mixture**
Formation of toxic gases is possible during heating or in case of fire.
Use cold water spray to cool fire exposed containers to minimize the risk of rupture.

· **Advice for firefighters**

· **Protective equipment:**
Wear breathing apparatus
Wear full protective suit with self-contained breathing apparatus
See section 8

· **Additional information** Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Environmental precautions:** Do not allow product to reach sewage system or bodies of water.

· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Contaminated material must be disposed of as waste (See section 13).

· **Reference to other sections**
No dangerous substances are released.
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling:**

· **Precautions for safe handling** No special measures required.

· **Information about protection against explosions and fires:**
No special measures required.
Pay attention to the general rules of internal fire prevention.

· **Conditions for safe storage, including any incompatibilities**

· **Storage:**

· **Requirements to be met by storerooms and receptacles:**
Storage temperature:
Minimum: 20 °C (68 °F)
Minimum: 60 °C (140 °F)
Prevent any seepage into the ground.

· **Information about storage in one common storage facility:** Store away from foodstuffs.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

· **Further information about storage conditions:**
Store in dry conditions.
Protect from frost.
Keep container tightly sealed.
Protect from humidity and water.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:** Not required.
· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
The usual precautionary measures for handling chemicals should be followed.
Wash hands before breaks and at the end of work.
Do not eat or drink while working.
· **Breathing equipment:** Not required.
· **Protection of hands:**
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
The following glove types are recommended: neoprene, nitrile rubber, PVC or butyl rubber. Thin, disposable latex gloves should be avoided for repeated or long term handling of the material. Recommended thickness of the glove material: 5 - 6 mil
Selection of the glove material should be based on the consideration of penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:** Safety glasses
· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Liquid
Color:	Colorless
· **Odor:**	Odorless
· **Odour threshold:**	Not determined.
· **pH-value:**	4.5 - 7.5
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	Undetermined.
· **Flash point:**	> 200 °C (> 392 °F)

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	
Decomposition temperature:	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not determined.
· **Density at 20 °C (68 °F):**	1.04 g/cm³ (8.679 lbs/gal)
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Not miscible or difficult to mix.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:**
By fire and thrmal decomposition: Carbon Dioxide (CO2), Carbon Monoxide (CO), Oxides of Nitrogen (NOx), dense black smoke and other undetermined compounds.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
Oral	LD50	> 2000 mg/kg (rabbit)
Dermal	LD50	> 2000 mg/kg (rabbit)
Inhalative	LC50/4 h	> 5 mg/l (rabbit)

· **Primary irritant effect:**
· **on the skin:** May cause slight irritation after extended exposure.
· **on the eye:** Eye irritation may occur with overexposure.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
The substance is not subject to classification.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **Carcinogenic categories**
· **IARC (International Agency for Research on Cancer)** Substance is not listed.
· **NTP (National Toxicology Program)** Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:** Water hazard class 1 (Self-assessment): slightly hazardous for water
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Smaller quantities can be disposed of with household waste.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	Void
· **UN proper shipping name**	Void
· **Transport hazard class(es)**	Void
· **Packing group**	Void
· **Environmental hazards:** · **Marine pollutant:**	No
· **Special precautions for user**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**
· **Section 355 (extremely hazardous substances):** Substance is not listed.
· **Section 313 (Specific toxic chemical listings):** Substance is not listed.
· **TSCA (Toxic Substances Control Act):** Substance is listed.
· **Proposition 65**
· **Chemicals known to cause cancer:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for females:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for males:** Substance is not listed.
· **Chemicals known to cause developmental toxicity:** Substance is not listed.

· **Cancerogenity categories**
· **EPA (Environmental Protection Agency)** Substance is not listed.

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

· **TLV (Threshold Limit Value established by ACGIH)** Substance is not listed.
· **NIOSH-Ca (National Institute for Occupational Safety and Health)** Substance is not listed.
· **OSHA-Ca (Occupational Safety & Health Administration)** Substance is not listed.

· **Product related hazard informations:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Product Development Department
· **Contact:** Bryan R. Morris
· **Abbreviations and acronyms:**
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

STOCKMEIER URETHANES

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/30/2014

Reviewed on 05/28/2014

1 Identification

· **Product identifier**

· **Trade name: ISOCYANATE 08**
· **Relevant identified uses of the substance or mixture and uses advised against**
· **Sector of Use** Diisocyanate components used for the production of polyurethanes

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Stockmeier Urethanes USA
20 Columbia Boulevard
Clarksburg, WV 26301-9606
USA
Telephone: (304) 624-7002
Fax: (304) 624-7020

· **Information department:** Product Development Department
· **Emergency telephone number:**
During Normal Business Hours: 1-304-624-7002
For Chemical Emergency
Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night.

Within USA and Canada: (800) 424-9300
Outside USA and Canada: +1 (703) 527-3887 (Collect Calls Not Accepted)

2 Hazard(s) identification

· **Classification of the substance or mixture**

GHS08 Health hazard

Resp. Sens. 1 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

GHS07

Skin Irrit. 2 H315 Causes skin irritation.
Eye Irrit. 2A H319 Causes serious eye irritation.
Skin Sens. 1 H317 May cause an allergic skin reaction.
STOT SE 3 H335 May cause respiratory irritation.

· **Storage:**
Store in a well-ventilated place. Keep container tightly closed. In closed containers, there may be a risk of pressure build up due to water contamination (Liberated CO2 Gas). Store locked up.

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

Harmful

Harmful by inhalation. Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Irritant

Irritating to eyes, respiratory system and skin. May cause sensitisation by inhalation and skin contact.
· **Information concerning particular hazards for human and environment:**
The product has to be labeled due to the calculation procedure of international guidelines.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/30/2014 Reviewed on 05/28/2014

Trade name: ISOCYANATE 08

(Contd. of page 1)

· **Classification system:**
The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

· **Label elements**

· **Labelling according to EU guidelines:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Code letter and hazard designation of product:**

Harmful

· **Hazard-determining components of labeling:**
methylenediphenyl diisocyanate (MDI) Mixed Isomers

· **Risk phrases:**
Harmful by inhalation.
Irritating to eyes, respiratory system and skin.
May cause sensitisation by inhalation and skin contact.
Harmful: danger of serious damage to health by prolonged exposure through inhalation.

· **Safety phrases:**
Keep locked up and out of the reach of children.
Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).
Avoid contact with skin and eyes.
Wear suitable gloves.
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Dispose of this material and its container to hazardous or special waste collection point.
In case of accident by inhalation: remove casualty to fresh air and keep at rest.

· **Special labeling of certain preparations:**
Contains isocyanates. See information supplied by the manufacturer.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 2
Fire = 1
Reactivity = 1

· **HMIS-ratings (scale 0 - 4)**

Health = *2
Fire = 1
Reactivity = 1

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
26447-40-5 methylenediphenyl diisocyanate (MDI) Mixed Isomers
· **Identification number(s)**
· **EC number:** 247-714-0

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

· **Index number:** 615-005-00-9
· **Chemical characterization: Mixtures**
· **Description:** Diphenylmethane Diisocyanate (MDI)

· **Dangerous components:**		
26447-40-5	methylenediphenyl diisocyanate (MDI) Mixed Isomers	50 - 100%

· **Additional information:** CAS 101-68-8 is an MDI isomer that is a component of CAS 26447-40-5

4 First-aid measures

· **Description of first aid measures**
· **General information:**
Symptoms of poisoning may even occur after several hours; therefore, medical observation is required for at least 48 hours after the accident.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of respiratory failure or breathing irregularities, commence resuscitation or administer oxygen.
In case of unconsciousness, place patient stably in side position for transportation.
· **After skin contact:**
Instantly wash with water and soap and rinse thoroughly. Remove any contaminated clothing. If skin irritation persists, seek medical advice.
· **After eye contact:** Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:**
Wash mouth out with water. Do not give anything by mouth to an unconscious person.
Do not induce vomiting; immediately call for medical help.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed**
Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g., fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.

Acute Skin Contact: Causes irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove.

Chronic Skin Contact: Prolonged contact can cause reddening, swelling, rash, and, in some cases, skin sensitization. Animal tests and other research indicate that skin contact with diisocyanates can play a role in causing sensitization and respiratory reaction.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** CO2, extinguishing powder or water spray. Fight larger fires with water spray.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture**
Can be released in case of fire:
Nitrogen Oxides (NOx)
Carbon Monoxide (CO)
Hydrogen Cyanide (HCN)

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **Advice for firefighters**
· **Protective equipment:**
Wear breathing apparatus
Wear full protective suit with self-contained breathing apparatus
See section 8
· **Additional information** Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Mount respiratory protective device.
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow product to reach sewage system or bodies of water.
· **Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Transfer to a waste container. Keep the material damp and exposed to the air in a secure area (CO2-formation!) until completely solidified. The waste can then be disposed of on an approved landfill or a special refuse dump. Ensure adequate ventilation.
In the event of a large spill, treat spill area with decontamination solution. Preparation of decontamination solution: Prepare a mixture of 0.2 - 0.5% liquid detergent and 3 - 8% concentrated ammonium hydroxide in water (5 - 10% sodium carbonate may be substituted for the ammonium hydroxide).
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaust at the workplace.
Keep containers tightly sealed.
Prevent formation of aerosols.
Exhaust ventilation required during spraying or when material is being used at temperatures above 100 degrees F.
· **Information about protection against explosions and fires:** Pay attention to the general rules of internal fire prevention.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Storage Temperature:
Minimum: 64 Degrees Fahrenheit
Maximum: 86 Degrees Fahrenheit
· **Information about storage in one common storage facility:**
Store away from oxidizing agents.
Store away from foodstuffs.
· **Further information about storage conditions:** Keep container tightly sealed.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
26447-40-5 methylenediphenyl diisocyanate (MDI) Mixed Isomers	
ACGIH TLV	Short-term value: 0.05 mg/m³

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

NIOSH REL/CEILING	Short-term value: 0.2 mg/m³
NIOSH REL/TWA	Short-term value: 0.05 mg/m³
OSHA PEL	Short-term value: 0.2 mg/m³

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
Gases fumes and aerosols should not be inhaled.
· **Breathing equipment:**
Aiborne MDI concentrations greater than the ACGIH TLV-TWA (TLV) or OSHA PEL-C (PEL) can occur in inadequately ventilated environments when MDI is sprayed, aerosolized or heated. In such cases, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air-purfying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or (b) a change out schedule, based on the objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL. The recommended APR cartridge is an organic vapor/particulate filter combination cartridge (OV/P100).
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
The following glove types are recommended: neoprene, nitrile rubber, PVC or butyl rubber. Thin, disposable latex gloves should be avoided for repeated or long term handling of the material. Recommended thickness of the glove material: 5 - 6 mil
Selection of the glove material should be based on the consideration of penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:**

Tightly sealed goggles

· **Body protection:** Protective work clothing

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Liquid
Color:	Light Yellow to Clear
· **Odor:**	Characteristic
· **Odour threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	Undetermined.
· **Flash point:**	> 110 °C (> 230 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	
Decomposition temperature:	Not determined.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not determined.
· **Density at 25 °C (77 °F):**	1.22 g/cm³ (10.181 lbs/gal)
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Insoluble, Reacts
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic at 25 °C (77 °F):	10 mPas
Kinematic:	Not determined.
· **Solvent content:**	
Organic solvents:	0.0 %
Solids content:	100.0 %
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions**
Exothermic reaction with amines and alcohols
Reacts with water to liberate CO2 gas which may build pressure in closed containers
· **Conditions to avoid** No further relevant information available.

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 6)

· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:**
By Fire and High Heat: Carbon Monoxide, Carbon Dioxide, Oxides of Nitrogen and traces of HCN.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
26447-40-5 methylenediphenyl diisocyanate (MDI) Mixed Isomers		
Oral	LD50	> 5000 mg/kg (rat)
Dermal	LD50	> 5000 mg/kg (rabbit)
Inhalative	LC50/4 h	2240 mg/l (rat)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitization:**
Sensitization possible through inhalation.
Sensitization possible through skin contact.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful
Irritant

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
None of the ingredients is listed.

· **NTP (National Toxicology Program)**
None of the ingredients is listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
This product is not miscible with water. Reacts with water at the interface producing CO2 gas and forming a solid and insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (eg. detergents) or by water-soluble solvents. Previous experience demonstrates that polyurea is inert and non-degradable.
Water hazard class 1 (self-assessment): slightly hazardous for water.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

(Contd. on page 8)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 7)

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Can be disposed of with household garbage after solidification following consultation with the waste disposal facility operator and the pertinent authorities and adhering to the necessary technical regulations.

· **Uncleaned packagings:**
· **Recommendation:**
Disposal must be made according to official regulations.
Empty containers may only be disposed of after neutralising any product remaining on the walls of the containers with a mixture of isopropanol, ammonia and water and removal of the warning labels. For preparation of decontamination solution, refer to section 6.

14 Transport information

· **UN-Number**	
· **DOT, ADR, IMDG, IATA**	UN3082
· **ADN**	Void
· **UN proper shipping name**	
· **DOT**	RQ Environmentally hazardous substances, liquid, n.o.s.
· **ADR**	3082 Environmentally hazardous substances, liquid, n.o.s.
· **ADN**	Void
· **IMDG, IATA**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
· **Transport hazard class(es)**	
· **DOT**	
· **Class**	9 Miscellaneous dangerous substances and articles.
· **ADR, ADN, IMDG, IATA**	
· **Class**	Void
· **Packing group**	
· **DOT**	III
· **ADR, IMDG, IATA**	Void
· **Environmental hazards:**	
· **Marine pollutant:**	No
· **Special precautions for user**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Hazardous substance:**	5000 lbs, 2270 kg Single containers less than 5,000 lbs are not regulated. Single containers with 5,000 lbs or more of 4,4' methylenediphenyl diisocyanate are regarded as class 9, NA3082, PG III.
· **UN "Model Regulation":**	UN3082, Environmentally hazardous substances, liquid, n.o.s.

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/30/2014 Reviewed on 05/28/2014

Trade name: ISOCYANATE 08

(Contd. of page 8)

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**
None of the ingredients is listed.

· **TSCA (Toxic Substances Control Act):**
All ingredients are listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**
None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**
None of the ingredients is listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**
None of the ingredients is listed.

· **TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients is listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients is listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients is listed.

· **Product related hazard informations:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Hazard symbols:**

Harmful

· **Hazard-determining components of labeling:**
methylenediphenyl diisocyanate (MDI) Mixed Isomers

· **Risk phrases:**
Harmful by inhalation.
Irritating to eyes, respiratory system and skin.
May cause sensitisation by inhalation and skin contact.
Harmful: danger of serious damage to health by prolonged exposure through inhalation.

· **Safety phrases:**
Keep locked up and out of the reach of children.
Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).

(Contd. on page 10)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 9)

Avoid contact with skin and eyes.
Wear suitable gloves.
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Dispose of this material and its container to hazardous or special waste collection point.
In case of accident by inhalation: remove casualty to fresh air and keep at rest.

· **Special labeling of certain preparations:**
Contains isocyanates. See information supplied by the manufacturer.
· **Chemical safety assessment:** *A Chemical Safety Assessment has not been carried out.*

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** *Product Development Department*
· **Contact:** *Bryan R. Morris*
· **Abbreviations and acronyms:**
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

STOCKMEIER URETHANES

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/26/2014

Reviewed on 06/18/2014

1 Identification

· **Product identifier**

· **Trade name: ISOCYANATE 06**
· **Relevant identified uses of the substance or mixture and uses advised against**
· **Sector of Use** Diisocyanate components used for the production of polyurethanes

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Stockmeier Urethanes USA
20 Columbia Boulevard
Clarksburg, WV 26301-9606
USA
Telephone: (304) 624-7002
Fax: (304) 624-7020

· **Information department:** Product Development Department
· **Emergency telephone number:**
During Normal Business Hours: 1-304-624-7002
For Chemical Emergency
Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night.

Within USA and Canada: (800) 424-9300
Outside USA and Canada: +1 (703) 527-3887 (Collect Calls Not Accepted)

2 Hazard(s) identification

· **Classification of the substance or mixture**

GHS08 Health hazard

Resp. Sens. 1 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

GHS07

Acute Tox. 4 H332 Harmful if inhaled.
Skin Irrit. 2 H315 Causes skin irritation.
Eye Irrit. 2A H319 Causes serious eye irritation.
Skin Sens. 1 H317 May cause an allergic skin reaction.
STOT SE 3 H335 May cause respiratory irritation.

· **Storage:**
Store in a well-ventilated place. Keep container tightly closed. In closed containers, there may be a risk of pressure build up due to water contamination (Liberated CO2 Gas). Store locked up.

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

Harmful

Harmful by inhalation. Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Irritant

Irritating to eyes, respiratory system and skin. May cause sensitisation by inhalation and skin contact.

· **Information concerning particular hazards for human and environment:**
The product has to be labeled due to the calculation procedure of international guidelines.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/26/2014 Reviewed on 06/18/2014

Trade name: ISOCYANATE 06

(Contd. of page 1)

· **Classification system:**
The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

· **Label elements**

· **Labelling according to EU guidelines:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Code letter and hazard designation of product:**

Harmful

· **Hazard-determining components of labeling:**
4,4'-methylenediphenyl diisocyanate

· **Risk phrases:**
Harmful by inhalation.
Irritating to eyes, respiratory system and skin.
May cause sensitisation by inhalation and skin contact.
Harmful: danger of serious damage to health by prolonged exposure through inhalation.

· **Safety phrases:**
Keep locked up and out of the reach of children.
Do not breathe dust.
Avoid contact with skin and eyes.
Wear suitable gloves.
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Dispose of this material and its container to hazardous or special waste collection point.
In case of accident by inhalation: remove casualty to fresh air and keep at rest.

· **Special labeling of certain preparations:**
Contains isocyanates. See information supplied by the manufacturer.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 2
Fire = 1
Reactivity = 1

· **HMIS-ratings (scale 0 - 4)**

Health = *2
Fire = 1
Reactivity = 1

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
101-68-8 4,4'-methylenediphenyl diisocyanate
· **Identification number(s)**
· **EC number:** 202-966-0

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

· **Index number:** 615-005-00-9
· **Chemical characterization: Mixtures**
· **Description:** Diphenylmethane Diisocyanate (MDI)

· **Dangerous components:**		
101-68-8	4,4'-methylenediphenyl diisocyanate	50 - 100%

4 First-aid measures

· **Description of first aid measures**
· **General information:**
Symptoms of poisoning may even occur after several hours; therefore, medical observation is required for at least 48 hours after the accident.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of respiratory failure or breathing irregularities, commence resuscitation or administer oxygen.
In case of unconsciousness, place patient stably in side position for transportation.
· **After skin contact:**
Instantly wash with water and soap and rinse thoroughly. Remove any contaminated clothing. If skin irritation persists, seek medical advice.
· **After eye contact:** Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:**
Wash mouth out with water. Do not give anything by mouth to an unconscious person.
Do not induce vomiting; immediately call for medical help.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed**
Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g., fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.

Acute Skin Contact: Causes irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove.

Chronic Skin Contact: Prolonged contact can cause reddening, swelling, rash, and, in some cases, skin sensitization. Animal tests and other research indicate that skin contact with diisocyanates can play a role in causing sensitization and respiratory reaction.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** CO2, extinguishing powder or water spray. Fight larger fires with water spray.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture**
Can be released in case of fire:
Nitrogen Oxides (NOx)
Carbon Monoxide (CO)
Hydrogen Cyanide (HCN)

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **Advice for firefighters**
· **Protective equipment:**
Wear breathing apparatus
Wear full protective suit with self-contained breathing apparatus
See section 8
· **Additional information** Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Mount respiratory protective device.
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow product to reach sewage system or bodies of water.
· **Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to item 13.
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Transfer to a waste container. Keep the material damp and exposed to the air in a secure area (CO2-formation!) until completely solidified. The waste can then be disposed of on an approved landfill or a special refuse dump. Ensure adequate ventilation.
In the event of a large spill, treat spill area with decontamination solution. Preparation of decontamination solution: Prepare a mixture of 0.2 - 0.5% liquid detergent and 3 - 8% concentrated ammonium hydroxide in water (5 - 10% sodium carbonate may be substituted for the ammonium hydroxide).
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaust at the workplace.
Keep containers tightly sealed.
Prevent formation of aerosols.
Exhaust ventilation required during spraying or when material is being used at temperatures above 100 degrees F.
· **Information about protection against explosions and fires:** Pay attention to the general rules of internal fire prevention.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Storage temperature:
Minimum: 43.3 ℃ (110 ℉)
Maximum: 45.6 ℃ (114 ℉)
Ideal: 45 ℃ (113 ℉)
· **Information about storage in one common storage facility:**
Store away from oxidizing agents.
Store away from foodstuffs.
· **Further information about storage conditions:** Keep container tightly sealed.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
101-68-8 4,4'-methylenediphenyl diisocyanate	
PEL	Ceiling limit value: 0.2 mg/m³, 0.02 ppm
REL	Long-term value: 0.05 mg/m³, 0.005 ppm Ceiling limit value: 0.2* mg/m³, 0.02* ppm *10-min
TLV	Long-term value: 0.051 mg/m³, 0.005 ppm

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
Gases fumes and aerosols should not be inhaled.
· **Breathing equipment:**
Aiborne MDI concentrations greater than the ACGIH TLV-TWA (TLV) or OSHA PEL-C (PEL) can occur in inadequately ventilated environments when MDI is sprayed, aerosolized or heated. In such cases, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air-purfying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or (b) a change out schedule, based on the objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL. The recommended APR cartridge is an organic vapor/particulate filter combination cartridge (OV/P100).
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
The following glove types are recommended: neoprene, nitrile rubber, PVC or butyl rubber. Thin, disposable latex gloves should be avoided for repeated or long term handling of the material. Recommended thickness of the glove material: 5 - 6 mil
Selection of the glove material should be based on the consideration of penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:**

Tightly sealed goggles

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Liquid
Color:	Light yellow
· **Odor:**	Characteristic
· **Odour threshold:**	Not determined.
· **pH-value:**	Not applicable.
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	> 300 °C (> 572 °F)
· **Flash point:**	202 °C (396 °F)
· **Flammability (solid, gaseous):**	Not determined.
· **Ignition temperature:**	601 °C (1114 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not applicable.
· **Density at 25 °C (77 °F):**	1.19 g/cm³ (9.931 lbs/gal)
· **Relative density**	Not determined.
· **Vapour density**	Not applicable.
· **Evaporation rate**	Not applicable.
· **Solubility in / Miscibility with**	
Water:	Insoluble, Reacts
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic at 40 °C (104 °F):	4.1 mPas
Kinematic:	Not applicable.
· **Solvent content:**	
Organic solvents:	0.0 %
Solids content:	100.0 %
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 6)

· **Possibility of hazardous reactions**
Exothermic reaction with amines and alcohols
Reacts with water to liberate CO2 gas which may build pressure in closed containers
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:**
By Fire and High Heat: Carbon Monoxide, Carbon Dioxide, Oxides of Nitrogen and traces of HCN.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
101-68-8 4,4'-methylenediphenyl diisocyanate		
Oral	LD50	2200 mg/kg (mouse)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitization:**
Sensitization possible through inhalation.
Sensitization possible through skin contact.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful
Irritant

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**		
101-68-8	4,4'-methylenediphenyl diisocyanate	3

· **NTP (National Toxicology Program)**
None of the ingredients is listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
This product is not miscible with water. Reacts with water at the interface producing CO2 gas and forming a solid and insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (eg. detergents) or by water-soluble solvents. Previous experience demonstrates that polyurea is inert and non-degradable.
Water hazard class 1 (self-assessment): slightly hazardous for water.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

(Contd. on page 8)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 7)

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Can be disposed of with household garbage after solidification following consultation with the waste disposal facility operator and the pertinent authorities and adhering to the necessary technical regulations.

· **Uncleaned packagings:**
· **Recommendation:**
Disposal must be made according to official regulations.
Empty containers may only be disposed of after neutralising any product remaining on the walls of the containers with a mixture of isopropanol, ammonia and water and removal of the warning labels. For preparation of decontamination solution, refer to section 6.
· **Recommended cleansing agent:** Water, if necessary with cleansing agents.

14 Transport information

· **UN-Number**	
· **DOT, ADR, IMDG, IATA**	UN3082
· **ADN**	Void
· **UN proper shipping name**	
· **DOT**	RQ Environmentally hazardous substances, liquid, n.o.s.
· **ADR**	3082 Environmentally hazardous substances, liquid, n.o.s.
· **ADN**	Void
· **IMDG, IATA**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
· **Transport hazard class(es)**	
· **DOT**	
· **Class**	9 Miscellaneous dangerous substances and articles.
· **ADR, ADN, IMDG, IATA**	
· **Class**	Void
· **Packing group**	
· **DOT**	III
· **ADR, IMDG, IATA**	Void
· **Environmental hazards:**	
· **Marine pollutant:**	No
· **Special precautions for user**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Hazardous substance:**	5000 lbs, 2270 kg Single containers less than 5,000 lbs are not regulated. Single containers with 5,000 lbs or more of 4,4' methylenediphenyl diisocyanate are regarded as class 9, NA3082, PG III.
· **UN "Model Regulation":**	UN3082, Environmentally hazardous substances, liquid, n.o.s.

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 8)

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**
All ingredients are listed.

· **TSCA (Toxic Substances Control Act):**
All ingredients are listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**
None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**
None of the ingredients is listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**

101-68-8	4,4'-methylenediphenyl diisocyanate	D, CBD

· **TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients is listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients is listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients is listed.

· **Product related hazard informations:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Hazard symbols:**

Harmful

· **Hazard-determining components of labeling:**
4,4'-methylenediphenyl diisocyanate

· **Risk phrases:**
Harmful by inhalation.
Irritating to eyes, respiratory system and skin.
May cause sensitisation by inhalation and skin contact.
Harmful: danger of serious damage to health by prolonged exposure through inhalation.

· **Safety phrases:**
Keep locked up and out of the reach of children.
Do not breathe dust.

(Contd. on page 10)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 9)

Avoid contact with skin and eyes.
Wear suitable gloves.
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Dispose of this material and its container to hazardous or special waste collection point.
In case of accident by inhalation: remove casualty to fresh air and keep at rest.

· **Special labeling of certain preparations:**
Contains isocyanates. See information supplied by the manufacturer.
· **Chemical safety assessment:** *A Chemical Safety Assessment has not been carried out.*

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** *Product Development Department*
· **Contact:** *Bryan R. Morris*
· **Abbreviations and acronyms:**
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

STOCKMEIER URETHANES

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/26/2014

Reviewed on 09/27/2012

1 Identification

· **Product identifier**

· **Trade name: ISOCYANATE 04**
· **Relevant identified uses of the substance or mixture and uses advised against**
· **Sector of Use** Diisocyanate components used for the production of polyurethanes

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Stockmeier Urethanes USA
20 Columbia Boulevard
Clarksburg, WV 26301-9606
USA
Telephone: (304) 624-7002
Fax: (304) 624-7020

· **Information department:** Product Development Department
· **Emergency telephone number:**
During Normal Business Hours: 1-304-624-7002
For Chemical Emergency
Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night.

Within USA and Canada: (800) 424-9300
Outside USA and Canada: +1 (703) 527-3887 (Collect Calls Not Accepted)

2 Hazard(s) identification

· **Classification of the substance or mixture**

GHS08 Health hazard

Resp. Sens. 1 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

GHS07

Acute Tox. 4 H332 Harmful if inhaled.
Skin Irrit. 2 H315 Causes skin irritation.
Eye Irrit. 2A H319 Causes serious eye irritation.
Skin Sens. 1 H317 May cause an allergic skin reaction.
STOT SE 3 H335 May cause respiratory irritation.

· **Storage:**
Store in a well-ventilated place. Keep container tightly closed. In closed containers, there may be a risk of pressure build up due to water contamination (Liberated CO2 Gas). Store locked up.

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

Harmful

Harmful by inhalation and in contact with skin. Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Irritant

Irritating to eyes, respiratory system and skin. May cause sensitisation by inhalation and skin contact.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/26/2014 Reviewed on 09/27/2012

Trade name: ISOCYANATE 04

(Contd. of page 1)

· **Information concerning particular hazards for human and environment:**
The product has to be labeled due to the calculation procedure of international guidelines.
· **Classification system:**
The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

· **Label elements**

· **Labelling according to EU guidelines:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Code letter and hazard designation of product:**

Harmful

· **Hazard-determining components of labeling:**
methylenediphenyl diisocyanate (MDI) Mixed Isomers
Polymeric Diphenylmethane Diisocyanate
4,4'-methylenediphenyl diisocyanate

· **Risk phrases:**
Harmful by inhalation and in contact with skin.
Irritating to eyes, respiratory system and skin.
May cause sensitisation by inhalation and skin contact.
Harmful: danger of serious damage to health by prolonged exposure through inhalation.

· **Safety phrases:**
Keep locked up and out of the reach of children.
Do not breathe dust.
Wear suitable protective clothing and gloves.
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Dispose of this material and its container to hazardous or special waste collection point.
In case of accident by inhalation: remove casualty to fresh air and keep at rest.

· **Special labeling of certain preparations:**
Contains isocyanates. See information supplied by the manufacturer.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 2
Fire = 1
Reactivity = 1

· **HMIS-ratings (scale 0 - 4)**

Health = *2
Fire = 1
Reactivity = 1

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:** Diphenylmethane Diisocyanate (MDI)

· **Dangerous components:**		
26447-40-5	methylenediphenyl diisocyanate (MDI) Mixed Isomers	50 - 100%
9016-87-9	Polymeric Diphenylmethane Diisocyanate	25 - 50%
101-68-8	4,4'-methylenediphenyl diisocyanate	1 - 5%

· **Additional information:** CAS 101-68-8 is an MDI isomer that is a component of CAS 26447-40-5

4 First-aid measures

· **Description of first aid measures**
· **General information:**
Symptoms of poisoning may even occur after several hours; therefore, medical observation is required for at least 48 hours after the accident.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness, place patient stably in side position for transportation.
In case of respiratory failure or breathing irregularities, commence resuscitation or administer oxygen.
· **After skin contact:**
Instantly wash with water and soap and rinse thoroughly. Remove any contaminated clothing. If skin irritation persists, seek medical advice.
· **After eye contact:** Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:**
Wash mouth out with water. Do not give anything by mouth to an unconscious person.
Do not induce vomiting; immediately call for medical help.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed**
Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g., fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.

Acute Skin Contact: Causes irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove.

Chronic Skin Contact: Prolonged contact can cause reddening, swelling, rash, and, in some cases, skin sensitization. Animal tests and other research indicate that skin contact with diisocyanates can play a role in causing sensitization and respiratory reaction.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** CO2, extinguishing powder or water spray. Fight larger fires with water spray.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture**

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

Can be released in case of fire:
Nitrogen Oxides (NOx)
Carbon Monoxide (CO)
Hydrogen Cyanide (HCN)
· **Advice for firefighters**
· **Protective equipment:**
Wear breathing apparatus
Wear full protective suit with self-contained breathing apparatus
See section 8
· **Additional information** *Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.*

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Mount respiratory protective device.
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** *Do not allow product to reach sewage system or bodies of water.*
· **Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Transfer to a waste container. Keep the material damp and exposed to the air in a secure area (CO2-formation!) until completely solidified. The waste can then be disposed of on an approved landfill or a special refuse dump. Ensure adequate ventilation.
In the event of a large spill, treat spill area with decontamination solution. Preparation of decontamination solution: Prepare a mixture of 0.2 - 0.5% liquid detergent and 3 - 8% concentrated ammonium hydroxide in water (5 - 10% sodium carbonate may be substituted for the ammonium hydroxide).
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaust at the workplace.
Keep containers tightly sealed.
Prevent formation of aerosols.
Exhaust ventilation required during spraying or when material is being used at temperatures above 100 degrees F.
· **Information about protection against explosions and fires:** *Pay attention to the general rules of internal fire prevention.*

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Storage Temperature:
Minimum: 64 Degrees Fahrenheit
Maximum: 86 Degrees Fahrenheit
· **Information about storage in one common storage facility:**
Store away from oxidizing agents.
Store away from foodstuffs.
· **Further information about storage conditions:** *Keep container tightly sealed.*
· **Specific end use(s)** *No further relevant information available.*

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** *No further data; see item 7.*

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
26447-40-5 methylenediphenyl diisocyanate (MDI) Mixed Isomers	
ACGIH TLV	Short-term value: 0.05 mg/m³
NIOSH REL/CEILING	Short-term value: 0.2 mg/m³
NIOSH REL/TWA	Short-term value: 0.05 mg/m³
OSHA PEL	Short-term value: 0.2 mg/m³
101-68-8 4,4'-methylenediphenyl diisocyanate	
PEL	Ceiling limit value: 0.2 mg/m³, 0.02 ppm
REL	Long-term value: 0.05 mg/m³, 0.005 ppm Ceiling limit value: 0.2* mg/m³, 0.02* ppm *10-min
TLV	Long-term value: 0.051 mg/m³, 0.005 ppm

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
Gases fumes and aerosols should not be inhaled.
· **Breathing equipment:**
Aiborne MDI concentrations greater than the ACGIH TLV-TWA (TLV) or OSHA PEL-C (PEL) can occur in inadequately ventilated environments when MDI is sprayed, aerosolized or heated. In such cases, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air-purfying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or (b) a change out schedule, based on the objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL. The recommended APR cartridge is an organic vapor/particulate filter combination cartridge (OV/P100).
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
The following glove types are recommended: neoprene, nitrile rubber, PVC or butyl rubber. Thin, disposable latex gloves should be avoided for repeated or long term handling of the material. Recommended thickness of the glove material: 5 - 6 mil
Selection of the glove material should be based on the consideration of penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

· **Eye protection:**

Tightly sealed goggles

· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Liquid
Color:	Light to dark amber
· **Odor:**	Characteristic
· **Odour threshold:**	Not determined.
· **pH-value:**	Not applicable.
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	Undetermined.
· **Flash point:**	> 110 °C (> 230 °F)
· **Flammability (solid, gaseous):**	Not determined.
· **Ignition temperature:**	520 °C (968 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not applicable.
· **Density at 25 °C (77 °F):**	1.22 g/cm³ (10.181 lbs/gal)
· **Relative density**	Not determined.
· **Vapour density**	Not applicable.
· **Evaporation rate**	Not applicable.
· **Solubility in / Miscibility with**	
Water:	Insoluble, Reacts
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic at 25 °C (77 °F):	25 mPas
Kinematic:	Not applicable.
· **Solvent content:**	
Organic solvents:	0.0 %
Solids content:	100.0 %
· **Other information**	No further relevant information available.

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 6)

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions**
Exothermic reaction with amines and alcohols
Reacts with water to liberate CO2 gas which may build pressure in closed containers
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:**
By Fire and High Heat: Carbon Monoxide, Carbon Dioxide, Oxides of Nitrogen and traces of HCN.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
26447-40-5 methylenediphenyl diisocyanate (MDI) Mixed Isomers		
Oral	LD50	> 5000 mg/kg (rat)
Dermal	LD50	> 5000 mg/kg (rabbit)
Inhalative	LC50/4 h	2240 mg/l (rat)
101-68-8 4,4'-methylenediphenyl diisocyanate		
Oral	LD50	2200 mg/kg (mouse)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitization:**
Sensitization possible through inhalation.
Sensitization possible through skin contact.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful
Irritant

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**		
9016-87-9	Polymeric Diphenylmethane Diisocyanate	3
101-68-8	4,4'-methylenediphenyl diisocyanate	3

· **NTP (National Toxicology Program)**
None of the ingredients is listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.

(Contd. on page 8)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 7)

· **Additional ecological information:**
· **General notes:**
This product is not miscible with water. Reacts with water at the interface producing CO2 gas and forming a solid and insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (eg. detergents) or by water-soluble solvents. Previous experience demonstrates that polyurea is inert and non-degradable.
Water hazard class 1 (self-assessment): slightly hazardous for water.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Can be disposed of with household garbage after solidification following consultation with the waste disposal facility operator and the pertinent authorities and adhering to the necessary technical regulations.

· **Uncleaned packagings:**
· **Recommendation:**
Disposal must be made according to official regulations.
Empty containers may only be disposed of after neutralising any product remaining on the walls of the containers with a mixture of isopropanol, ammonia and water and removal of the warning labels. For preparation of decontamination solution, refer to section 6.

14 Transport information

· **UN-Number**	
· **DOT, ADR, IMDG, IATA**	UN3082
· **ADN**	Void
· **UN proper shipping name**	
· **DOT**	RQ Environmentally hazardous substances, liquid, n.o.s.
· **ADR**	3082 Environmentally hazardous substances, liquid, n.o.s.
· **ADN**	Void
· **IMDG, IATA**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
· **Transport hazard class(es)**	
· **DOT**	
· **Class**	9 Miscellaneous dangerous substances and articles.
· **ADR, ADN, IMDG, IATA**	
· **Class**	Void
· **Packing group**	
· **DOT**	III
· **ADR, IMDG, IATA**	Void
· **Environmental hazards:**	
· **Marine pollutant:**	No
· **Special precautions for user**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 8)

· **Transport/Additional information:**

· **DOT**

· **Hazardous substance:**	5000 lbs, 2270 kg Single containers less than 5,000 lbs are not regulated. Single containers with 5,000 lbs or more of 4,4' methylenediphenyl diisocyanate are regarded as class 9, NA3082, PG III.
· **UN "Model Regulation":**	UN3082, Environmentally hazardous substances, liquid, n.o.s.

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**

· **Sara**

· **Section 355 (extremely hazardous substances):**

None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**

9016-87-9	Polymeric Diphenylmethane Diisocyanate
101-68-8	4,4'-methylenediphenyl diisocyanate

· **TSCA (Toxic Substances Control Act):**

All ingredients are listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**

None of the ingredients is listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**

9016-87-9	Polymeric Diphenylmethane Diisocyanate	CBD
101-68-8	4,4'-methylenediphenyl diisocyanate	D, CBD

· **TLV (Threshold Limit Value established by ACGIH)**

None of the ingredients is listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients is listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

· **Product related hazard informations:**

The product has been classified and marked in accordance with directives on hazardous materials.

(Contd. on page 10)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 9)

· **Hazard symbols:**

Harmful

· **Hazard-determining components of labeling:**
methylenediphenyl diisocyanate (MDI) Mixed Isomers
Polymeric Diphenylmethane Diisocyanate
4,4'-methylenediphenyl diisocyanate

· **Risk phrases:**
Harmful by inhalation and in contact with skin.
Irritating to eyes, respiratory system and skin.
May cause sensitisation by inhalation and skin contact.
Harmful: danger of serious damage to health by prolonged exposure through inhalation.

· **Safety phrases:**
Keep locked up and out of the reach of children.
Do not breathe dust.
Wear suitable protective clothing and gloves.
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Dispose of this material and its container to hazardous or special waste collection point.
In case of accident by inhalation: remove casualty to fresh air and keep at rest.

· **Special labeling of certain preparations:**
Contains isocyanates. See information supplied by the manufacturer.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Product Development Department
· **Contact:** Bryan R. Morris
· **Abbreviations and acronyms:**
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

STOCKMEIER URETHANES

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 05/30/2014

Reviewed on 05/29/2014

1 Identification

· **Product identifier**

· **Trade name: ISOCYANATE 03**
· **Relevant identified uses of the substance or mixture and uses advised against**
· **Sector of Use** Diisocyanate components used for the production of polyurethanes

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Stockmeier Urethanes USA
20 Columbia Boulevard
Clarksburg, WV 26301-9606
USA
Telephone: (304) 624-7002
Fax: (304) 624-7020

· **Information department:** Product Development Department
· **Emergency telephone number:**
During Normal Business Hours: 1-304-624-7002
For Chemical Emergency
Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night.

Within USA and Canada: (800) 424-9300
Outside USA and Canada: +1 (703) 527-3887 (Collect Calls Not Accepted)

2 Hazard(s) identification

· **Classification of the substance or mixture**

GHS06 Skull and crossbones

Acute Tox. 3 H331 Toxic if inhaled.

GHS08 Health hazard

Resp. Sens. 1 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

GHS07

Skin Irrit. 2 H315 Causes skin irritation.
Eye Irrit. 2A H319 Causes serious eye irritation.
Skin Sens. 1 H317 May cause an allergic skin reaction.
STOT SE 3 H335 May cause respiratory irritation.

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

Very toxic

Very toxic by inhalation.

Harmful

Limited evidence of a carcinogenic effect. Danger of serious damage to health by prolonged exposure.

Irritant

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 05/30/2014 Reviewed on 05/29/2014

Trade name: ISOCYANATE 03

(Contd. of page 1)

Irritating to eyes, respiratory system and skin. May cause sensitisation by inhalation and skin contact.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

· **Information concerning particular hazards for human and environment:**
The product has to be labeled due to the calculation procedure of international guidelines.

· **Classification system:**
The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

· **Label elements**

· **Labelling according to EU guidelines:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Code letter and hazard designation of product:**

Very toxic

· **Hazard-determining components of labeling:**
Toluene-diisocyanate (Mixed isomers)

· **Risk phrases:**
Very toxic by inhalation.
Irritating to eyes, respiratory system and skin.
Limited evidence of a carcinogenic effect.
May cause sensitisation by inhalation and skin contact.
Danger of serious damage to health by prolonged exposure.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

· **Safety phrases:**
Keep locked up and out of the reach of children.
Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).
After contact with skin, wash immediately with plenty of soap and water.
Do not empty into drains, dispose of this material and its container at hazardous or special waste collection point.
Wear suitable protective clothing, gloves and eye/face protection.
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
In case of accident by inhalation: remove casualty to fresh air and keep at rest.

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 3
Fire = 1
Reactivity = 1

· **HMIS-ratings (scale 0 - 4)**

Health = *3
Fire = 1
Reactivity = 1

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:** Toluene Diisocyanate (TDI)

· **Dangerous components:**		
26471-62-5	Toluene-diisocyanate (Mixed isomers)	50 - 100%

4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
Remove breathing apparatus only after contaminated clothing have been completely removed.
In case of irregular breathing or respiratory arrest provide artificial respiration.
Symptoms of poisoning may even occur after several hours; therefore, medical observation is required for at least 48 hours after the accident.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of respiratory failure or breathing irregularities, commence resuscitation or administer oxygen.
In case of unconsciousness, place patient stably in side position for transportation.
· **After skin contact:**
Instantly wash with water and soap and rinse thoroughly. Remove any contaminated clothing. If skin irritation persists, seek medical advice.
For severe exposures, immediately get under safety shower and begin rinsing.
· **After eye contact:** Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:**
Wash mouth out with water. Do not give anything by mouth to an unconscious person.
Do not induce vomiting; immediately call for medical help.
· **Information for doctor:**
Eyes: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic/steroid preparation as needed. Workplace vapors could produce reversible corneal epithelial edema impairing vision. Skin: This compound is a skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burn. Ingestion: Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of the compound. Inhalation: Treatment is essentially symptomatic. An individual having a dermal or pulmonary sensitization reaction to this material should be removed from further exposure to any diisocyanate.
· **Most important symptoms and effects, both acute and delayed**
Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g., fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.

Acute Skin Contact: Causes irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove.

Chronic Skin Contact: Prolonged contact can cause reddening, swelling, rash, and, in some cases, skin sensitization. Animal tests and other research indicate that skin contact with diisocyanates can play a role in causing sensitization and respiratory reaction.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** CO2, extinguishing powder or water spray. Fight larger fires with water spray.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture**
Can be released in case of fire:
Nitrogen Oxides (NOx)
Carbon Monoxide (CO)
Hydrogen Cyanide (HCN)
· **Advice for firefighters**
Firefighters should wear NFPA compliant structural firefighting protective equipment, including self-contained breathing apparatus and NFPA compliant helmet, hood, boots and gloves. Avoid contact with product. Decontaminate equipment and protective clothing prior to reuse. During a fire, isocyanate vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. Exposure to heated diisocyanate can be extremely dangerous.
· **Protective equipment:**
Wear breathing apparatus
Wear full protective suit with self-contained breathing apparatus
See section 8
· **Additional information** Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Mount respiratory protective device.
Wear protective equipment. Keep unprotected persons away.
Clean-up should only be performed by trained personnel. Personnel dealing with major spills should wear appropriate protective equipment including, but not limited to, the following items: Gloves, goggles and respiratory protection equipment.
· **Environmental precautions:** Do not allow product to reach sewage system or bodies of water.
· **Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Transfer to a waste container. Keep the material damp and exposed to the air in a secure area (CO2-formation!) until completely solidified. The waste can then be disposed of on an approved landfill or a special refuse dump. Ensure adequate ventilation.
In the event of a large spill, treat spill area with decontamination solution. Preparation of decontamination solution: Prepare a mixture of 0.2 - 0.5% liquid detergent and 3 - 8% concentrated ammonium hydroxide in water (5 - 10% sodium carbonate may be substituted for the ammonium hydroxide).
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaust at the workplace.
Open and handle receptacle with care.
· **Information about protection against explosions and fires:**
Keep respiratory protective device available.
Pay attention to the general rules of internal fire prevention.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Storage Temperature:
Minimum: 64 Degrees Fahrenheit
Maximum: 86 Degrees Fahrenheit
· **Information about storage in one common storage facility:**
Store away from oxidizing agents.
Store away from foodstuffs.
· **Further information about storage conditions:** Store in cool, dry conditions in well sealed receptacles.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
26471-62-5 Toluene-diisocyanate (Mixed isomers)	
PEL	Ceiling limit value: 0.14 mg/m³, 0.02 ppm
REL	LFC
TLV	Short-term value: (0.14) NIC-0.021* mg/m³, (0.02) NIC-0.003* ppm Long-term value: (0.036) NIC-0.007* mg/m³, (0.005) NIC-0.001* ppm *(IFV) SEN; NIC-Skin; A3

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
Gases fumes and aerosols should not be inhaled.
· **Breathing equipment:**
At normal room temperatures, airborne TDI can exceed the ACGIH TLV-TWA; therefore, in inadequately ventilated environments, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air-purifying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or(b) a change out schedule, based on objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL. An organic vapor (OV) cartridge is recommended for APR use.
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

The following glove types are recommended: neoprene, nitrile rubber, PVC or butyl rubber. Thin, disposable latex gloves should be avoided for repeated or long term handling of the material. Recommended thickness of the glove material: 5 - 6 mil
Selection of the glove material should be based on the consideration of penetration times, rates of diffusion and the degradation

· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:**

Tightly sealed goggles

· **Body protection:** *Protective work clothing*

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	*Liquid*
Color:	*Light yellow*
· **Odor:**	*Characteristic*
· **Odour threshold:**	*Not determined.*
· **pH-value:**	*Not determined.*
· **Change in condition**	
Melting point/Melting range:	*Undetermined.*
Boiling point/Boiling range:	*253 °C (487 °F)*
· **Flash point:**	*127 °C (261 °F)*
· **Flammability (solid, gaseous):**	*Not applicable.*
· **Ignition temperature:**	*> 595 °C (> 1103 °F)*
· **Decomposition temperature:**	*Not determined.*
· **Auto igniting:**	*Product is not selfigniting.*
· **Danger of explosion:**	*Product does not present an explosion hazard.*
· **Explosion limits:**	
Lower:	*Not determined.*
Upper:	*Not determined.*
· **Vapor pressure:**	*Not determined.*
· **Density at 25 °C (77 °F):**	*1.21 g/cm³ (10.097 lbs/gal)*
· **Relative density**	*Not determined.*
· **Vapour density**	*Not determined.*
· **Evaporation rate**	*Not determined.*
· **Solubility in / Miscibility with**	
Water:	*Insoluble, Reacts*

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 6)

· **Partition coefficient (n-octanol/water):** Not determined.

· **Viscosity:**
Dynamic at 25 °C (77 °F): 5 mPas
Kinematic: Not determined.

· **Solvent content:**
Organic solvents: 0.0 %

Solids content: 100.0 %
· **Other information** No further relevant information available.

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions**
Exothermic reaction with amines and alcohols
Reacts with water to liberate CO2 gas which may build pressure in closed containers
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:**
By Fire and High Heat: Carbon Monoxide, Carbon Dioxide, Oxides of Nitrogen and traces of HCN.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

26471-62-5 Toluene-diisocyanate (Mixed isomers)

Oral	LD50	Slightly Toxic mg/kg (rat)
Dermal	LD50	Nontoxic mg/kg (rabbit)
Inhalative	LC50/4 h	0.78 mg/l (rat)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitization:**
Sensitization possible through inhalation.
Sensitization possible through skin contact.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful
Irritant
Very toxic

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

26471-62-5	Toluene-diisocyanate (Mixed isomers)	2B

· **NTP (National Toxicology Program)**

26471-62-5	Toluene-diisocyanate (Mixed isomers)	R

(Contd. on page 8)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 7)

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Ecotoxical effects:**
· **Remark:** Harmful to fish
· **Additional ecological information:**
· **General notes:**
This product is not miscible with water. Reacts with water at the interface producing CO2 gas and forming a solid and insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (eg. detergents) or by water-soluble solvents. Previous experience demonstrates that polyurea is inert and non-degradable.
Harmful to aquatic organisms
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:**
Disposal must be made according to official regulations.
Empty containers may only be disposed of after neutralising any product remaining on the walls of the containers with a mixture of isopropanol, ammonia and water and removal of the warning labels. For preparation of decontamination solution, refer to section 6.

14 Transport information

· **UN-Number**	
· **DOT, ADR, IMDG, IATA**	UN2078
· **UN proper shipping name**	
· **DOT**	RQ Toluene diisocyanate
· **ADR**	2078 Toluene diisocyanate
· **IMDG, IATA**	TOLUENE DIISOCYANATE
· **Transport hazard class(es)**	
· **DOT, ADR**	
· **Class**	6.1 Toxic substances.
· **IMDG, IATA**	
· **Class**	Void
· **Packing group**	
· **DOT, ADR**	II
· **IMDG, IATA**	Void
· **Environmental hazards:**	
· **Marine pollutant:**	No

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 8)

· **Special precautions for user**	Warning: Toxic substances
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Hazardous substance:**	100 lbs, 45 kg
· **UN "Model Regulation":**	UN2078, Toluene diisocyanate, 6.1, II

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**
All ingredients are listed.

· **TSCA (Toxic Substances Control Act):**
All ingredients are listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
All ingredients are listed.

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**
None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**
None of the ingredients is listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**
None of the ingredients is listed.

· **TLV (Threshold Limit Value established by ACGIH)**

26471-62-5	Toluene-diisocyanate (Mixed isomers)	(A4)

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
All ingredients are listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients is listed.

· **Product related hazard informations:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Hazard symbols:**

Very toxic

(Contd. on page 10)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 9)

· **Hazard-determining components of labeling:**
Toluene-diisocyanate (Mixed isomers)

· **Risk phrases:**
Very toxic by inhalation.
Irritating to eyes, respiratory system and skin.
Limited evidence of a carcinogenic effect.
May cause sensitisation by inhalation and skin contact.
Danger of serious damage to health by prolonged exposure.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

· **Safety phrases:**
Keep locked up and out of the reach of children.
Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).
After contact with skin, wash immediately with plenty of soap and water.
Do not empty into drains, dispose of this material and its container at hazardous or special waste collection point.
Wear suitable protective clothing, gloves and eye/face protection.
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
In case of accident by inhalation: remove casualty to fresh air and keep at rest.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Product Development Department
· **Contact:** Bryan R. Morris
· **Abbreviations and acronyms:**
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

STOCKMEIER URETHANES

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/26/2014

Reviewed on 05/28/2014

1 Identification

· **Product identifier**

· **Trade name: ISOCYANATE 02**
· **Relevant identified uses of the substance or mixture and uses advised against**
· **Sector of Use** Diisocyanate components used for the production of polyurethanes

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Stockmeier Urethanes USA
20 Columbia Boulevard
Clarksburg, WV 26301-9606
USA
Telephone: (304) 624-7002
Fax: (304) 624-7020

· **Information department:** Product Development Department
· **Emergency telephone number:**
During Normal Business Hours: 1-304-624-7002
For Chemical Emergency
Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night.

Within USA and Canada: (800) 424-9300
Outside USA and Canada: +1 (703) 527-3887 (Collect Calls Not Accepted)

2 Hazard(s) identification

· **Classification of the substance or mixture**

GHS08 Health hazard

Resp. Sens. 1 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

GHS07

Acute Tox. 4 H332 Harmful if inhaled.
Skin Irrit. 2 H315 Causes skin irritation.
Eye Irrit. 2A H319 Causes serious eye irritation.
Skin Sens. 1 H317 May cause an allergic skin reaction.
STOT SE 3 H335 May cause respiratory irritation.

· **Storage:**
Store in a well-ventilated place. Keep container tightly closed. In closed containers, there may be a risk of pressure build up due to water contamination (Liberated CO2 Gas). Store locked up.

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

Harmful

Harmful by inhalation and in contact with skin. Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Irritant

Irritating to eyes, respiratory system and skin. May cause sensitisation by inhalation and skin contact.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/26/2014 Reviewed on 05/28/2014

Trade name: ISOCYANATE 02

(Contd. of page 1)

· **Information concerning particular hazards for human and environment:**
The product has to be labeled due to the calculation procedure of international guidelines.
· **Classification system:**
The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

· **Label elements**

· **Labelling according to EU guidelines:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Code letter and hazard designation of product:**

Harmful

· **Hazard-determining components of labeling:**
Polymeric Diphenylmethane Diisocyanate
4,4'-methylenediphenyl diisocyanate

· **Risk phrases:**
Harmful by inhalation and in contact with skin.
Irritating to eyes, respiratory system and skin.
May cause sensitisation by inhalation and skin contact.
Harmful: danger of serious damage to health by prolonged exposure through inhalation.

· **Safety phrases:**
Keep locked up and out of the reach of children.
Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).
Wear suitable protective clothing and gloves.
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Dispose of this material and its container to hazardous or special waste collection point.
In case of accident by inhalation: remove casualty to fresh air and keep at rest.

· **Special labeling of certain preparations:**
Contains isocyanates. See information supplied by the manufacturer.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 2
Fire = 1
Reactivity = 1

· **HMIS-ratings (scale 0 - 4)**

Health = *2
Fire = 1
Reactivity = 1

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:** Diphenylmethane Diisocyanate (MDI)

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

· **Dangerous components:**		
9016-87-9	Polymeric Diphenylmethane Diisocyanate	50 - 100%
101-68-8	4,4'-methylenediphenyl diisocyanate	25 - 50%

4 First-aid measures

· **Description of first aid measures**
· **General information:**
Symptoms of poisoning may even occur after several hours; therefore, medical observation is required for at least 48 hours after the accident.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of respiratory failure or breathing irregularities, commence resuscitation or administer oxygen.
In case of unconsciousness, place patient stably in side position for transportation.
· **After skin contact:**
Instantly wash with water and soap and rinse thoroughly. Remove any contaminated clothing. If skin irritation persists, seek medical advice.
· **After eye contact:** Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:**
Wash mouth out with water. Do not give anything by mouth to an unconscious person.
Do not induce vomiting; immediately call for medical help.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed**
Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g., fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.

Acute Skin Contact: Causes irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove.

Chronic Skin Contact: Prolonged contact can cause reddening, swelling, rash, and, in some cases, skin sensitization. Animal tests and other research indicate that skin contact with diisocyanates can play a role in causing sensitization and respiratory reaction.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** CO2, extinguishing powder or water spray. Fight larger fires with water spray.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture**
Can be released in case of fire:
Nitrogen Oxides (NOx)
Carbon Monoxide (CO)
Hydrogen Cyanide (HCN)
· **Advice for firefighters**
· **Protective equipment:**
Wear breathing apparatus
Wear full protective suit with self-contained breathing apparatus
See section 8

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **Additional information** Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Mount respiratory protective device.
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow product to reach sewage system or bodies of water.
· **Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Transfer to a waste container. Keep the material damp and exposed to the air in a secure area (CO2-formation!) until completely solidified. The waste can then be disposed of on an approved landfill or a special refuse dump. Ensure adequate ventilation.
In the event of a large spill, treat spill area with decontamination solution. Preparation of decontamination solution: Prepare a mixture of 0.2 - 0.5% liquid detergent and 3 - 8% concentrated ammonium hydroxide in water (5 - 10% sodium carbonate may be substituted for the ammonium hydroxide).
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaust at the workplace.
Keep containers tightly sealed.
Prevent formation of aerosols.
Exhaust ventilation required during spraying or when material is being used at temperatures above 100 degrees F.
· **Information about protection against explosions and fires:** Pay attention to the general rules of internal fire prevention.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Storage Temperature:
Minimum: 64 Degrees Fahrenheit
Maximum: 86 Degrees Fahrenheit
· **Information about storage in one common storage facility:**
Store away from oxidizing agents.
Store away from foodstuffs.
· **Further information about storage conditions:** Keep container tightly sealed.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
101-68-8 4,4'-methylenediphenyl diisocyanate	
PEL	Ceiling limit value: 0.2 mg/m³, 0.02 ppm
REL	Long-term value: 0.05 mg/m³, 0.005 ppm Ceiling limit value: 0.2* mg/m³, 0.02* ppm *10-min
TLV	Long-term value: 0.051 mg/m³, 0.005 ppm

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
Gases fumes and aerosols should not be inhaled.
· **Breathing equipment:**
Aiborne MDI concentrations greater than the ACGIH TLV-TWA (TLV) or OSHA PEL-C (PEL) can occur in inadequately ventilated environments when MDI is sprayed, aerosolized or heated. In such cases, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air-purfying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or (b) a change out schedule, based on the objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL. The recommended APR cartridge is an organic vapor/particulate filter combination cartridge (OV/P100).
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
The following glove types are recommended: neoprene, nitrile rubber, PVC or butyl rubber. Thin, disposable latex gloves should be avoided for repeated or long term handling of the material. Recommended thickness of the glove material: 5 - 6 mil
Selection of the glove material should be based on the consideration of penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:**

Tightly sealed goggles

· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **Information on basic physical and chemical properties**
· **General Information**
· **Appearance:**

Form:	Liquid
Color:	Light to dark amber
· **Odor:**	Characteristic
· **Odour threshold:**	Not determined.

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	Undetermined.
· **Flash point:**	> 110 °C (> 230 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	520 °C (968 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not determined.
· **Density at 25 °C (77 °F):**	1.22 g/cm³ (10.181 lbs/gal)
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Insoluble, Reacts
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic at 25 °C (77 °F):	200 mPas
Kinematic:	Not determined.
· **Solvent content:**	
Organic solvents:	0.0 %
Solids content:	100.0 %
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions**
Exothermic reaction with amines and alcohols
Reacts with water to liberate CO2 gas which may build pressure in closed containers
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:**
By Fire and High Heat: Carbon Monoxide, Carbon Dioxide, Oxides of Nitrogen and traces of HCN.

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 6)

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· LD/LC50 values that are relevant for classification:		
101-68-8 4,4'-methylenediphenyl diisocyanate		
Oral	LD50	2200 mg/kg (mouse)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitization:**
Sensitization possible through inhalation.
Sensitization possible through skin contact.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful
Irritant

· **Carcinogenic categories**

· IARC (International Agency for Research on Cancer)		
9016-87-9	Polymeric Diphenylmethane Diisocyanate	3
101-68-8	4,4'-methylenediphenyl diisocyanate	3

· NTP (National Toxicology Program)
None of the ingredients is listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
This product is not miscible with water. Reacts with water at the interface producing CO2 gas and forming a solid and insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (eg. detergents) or by water-soluble solvents. Previous experience demonstrates that polyurea is inert and non-degradable.
Water hazard class 1 (self-assessment): slightly hazardous for water.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Can be disposed of with household garbage after solidification following consultation with the waste disposal facility operator and the pertinent authorities and adhering to the necessary technical regulations.

(Contd. on page 8)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 7)

· **Uncleaned packagings:**
· **Recommendation:**
Disposal must be made according to official regulations.
Empty containers may only be disposed of after neutralising any product remaining on the walls of the containers with a mixture of isopropanol, ammonia and water and removal of the warning labels. For preparation of decontamination solution, refer to section 6.

14 Transport information

· **UN-Number**	
· **DOT, ADR, IMDG, IATA**	UN3082
· **ADN**	Void
· **UN proper shipping name**	
· **DOT**	RQ Environmentally hazardous substances, liquid, n.o.s.
· **ADR**	3082 Environmentally hazardous substances, liquid, n.o.s.
· **ADN**	Void
· **IMDG, IATA**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
· **Transport hazard class(es)**	
· **DOT**	
· **Class**	9 Miscellaneous dangerous substances and articles.
· **ADR, ADN, IMDG, IATA**	
· **Class**	Void
· **Packing group**	
· **DOT**	III
· **ADR, IMDG, IATA**	Void
· **Environmental hazards:**	
· **Marine pollutant:**	No
· **Special precautions for user**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Hazardous substance:**	5000 lbs, 2270 kg Single containers less than 5,000 lbs are not regulated. Single containers with 5,000 lbs or more of 4,4' methylenediphenyl diisocyanate are regarded as class 9, NA3082, PG III.
· **UN "Model Regulation":**	UN3082, Environmentally hazardous substances, liquid, n.o.s.

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**
All ingredients are listed.

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 8)

· **TSCA (Toxic Substances Control Act):**
All ingredients are listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**
None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**
None of the ingredients is listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**

9016-87-9	Polymeric Diphenylmethane Diisocyanate	CBD
101-68-8	4,4'-methylenediphenyl diisocyanate	D, CBD

· **TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients is listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients is listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients is listed.

· **Product related hazard informations:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Hazard symbols:**

Harmful

· **Hazard-determining components of labeling:**
Polymeric Diphenylmethane Diisocyanate
4,4'-methylenediphenyl diisocyanate

· **Risk phrases:**
Harmful by inhalation and in contact with skin.
Irritating to eyes, respiratory system and skin.
May cause sensitisation by inhalation and skin contact.
Harmful: danger of serious damage to health by prolonged exposure through inhalation.

· **Safety phrases:**
Keep locked up and out of the reach of children.
Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).
Wear suitable protective clothing and gloves.
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Dispose of this material and its container to hazardous or special waste collection point.
In case of accident by inhalation: remove casualty to fresh air and keep at rest.

· **Special labeling of certain preparations:**
Contains isocyanates. See information supplied by the manufacturer.

(Contd. on page 10)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 9)

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Product Development Department
· **Contact:** Bryan R. Morris
· **Abbreviations and acronyms:**
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

STOCKMEIER URETHANES

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/26/2014

Reviewed on 05/30/2014

1 Identification

· **Product identifier**

· **Trade name: ISOCYANATE 01**
· **Relevant identified uses of the substance or mixture and uses advised against**
· **Sector of Use** Diisocyanate components used for the production of polyurethanes

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Stockmeier Urethanes USA
20 Columbia Boulevard
Clarksburg, WV 26301-9606
USA
Telephone: (304) 624-7002
Fax: (304) 624-7020

· **Information department:** Product Development Department
· **Emergency telephone number:**
During Normal Business Hours: 1-304-624-7002
For Chemical Emergency
Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night.

Within USA and Canada: (800) 424-9300
Outside USA and Canada: +1 (703) 527-3887 (Collect Calls Not Accepted)

2 Hazard(s) identification

· **Classification of the substance or mixture**

GHS08 Health hazard

Resp. Sens. 1 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

GHS07

Skin Irrit. 2 H315 Causes skin irritation.
Eye Irrit. 2A H319 Causes serious eye irritation.
Skin Sens. 1 H317 May cause an allergic skin reaction.
STOT SE 3 H335 May cause respiratory irritation.

· **Storage:**
Store in a well-ventilated place. Keep container tightly closed. In closed containers, there may be a risk of pressure build up due to water contamination (Liberated CO2 Gas). Store locked up.

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

Harmful

Harmful by inhalation. Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Irritant

Irritating to eyes, respiratory system and skin. May cause sensitisation by inhalation and skin contact.
· **Information concerning particular hazards for human and environment:**
The product has to be labeled due to the calculation procedure of international guidelines.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/26/2014 Reviewed on 05/30/2014

Trade name: ISOCYANATE 01

(Contd. of page 1)

· **Classification system:**
The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

· **Label elements**

· **Labelling according to EU guidelines:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Code letter and hazard designation of product:**

Harmful

· **Hazard-determining components of labeling:**
methylenediphenyl diisocyanate (MDI) Mixed Isomers

· **Risk phrases:**
Harmful by inhalation.
Irritating to eyes, respiratory system and skin.
May cause sensitisation by inhalation and skin contact.
Harmful: danger of serious damage to health by prolonged exposure through inhalation.

· **Safety phrases:**
Keep locked up and out of the reach of children.
Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).
Avoid contact with skin and eyes.
Wear suitable gloves.
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Dispose of this material and its container to hazardous or special waste collection point.
In case of accident by inhalation: remove casualty to fresh air and keep at rest.

· **Special labeling of certain preparations:**
Contains isocyanates. See information supplied by the manufacturer.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 2
Fire = 1
Reactivity = 1

· **HMIS-ratings (scale 0 - 4)**

Health = *2
Fire = 1
Reactivity = 1

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
26447-40-5 methylenediphenyl diisocyanate (MDI) Mixed Isomers
· **Identification number(s)**
· **EC number:** 247-714-0

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

· **Index number:** 615-005-00-9
· **Chemical characterization: Mixtures**
· **Description:** Diphenylmethane Diisocyanate (MDI)

· **Dangerous components:**		
26447-40-5	methylenediphenyl diisocyanate (MDI) Mixed Isomers	50 - 100%

· **Additional information:** CAS 101-68-8 is an MDI isomer that is a component of CAS 26447-40-5

4 First-aid measures

· **Description of first aid measures**
· **General information:**
Symptoms of poisoning may even occur after several hours; therefore, medical observation is required for at least 48 hours after the accident.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of respiratory failure or breathing irregularities, commence resuscitation or administer oxygen.
In case of unconsciousness, place patient stably in side position for transportation.
· **After skin contact:**
Instantly wash with water and soap and rinse thoroughly. Remove any contaminated clothing. If skin irritation persists, seek medical advice.
· **After eye contact:** Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:**
Wash mouth out with water. Do not give anything by mouth to an unconscious person.
Do not induce vomiting; immediately call for medical help.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed**
Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g., fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.

Acute Skin Contact: Causes irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove.

Chronic Skin Contact: Prolonged contact can cause reddening, swelling, rash, and, in some cases, skin sensitization. Animal tests and other research indicate that skin contact with diisocyanates can play a role in causing sensitization and respiratory reaction.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** CO2, extinguishing powder or water spray. Fight larger fires with water spray.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture**
Can be released in case of fire:
Nitrogen Oxides (NOx)
Carbon Monoxide (CO)
Hydrogen Cyanide (HCN)

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **Advice for firefighters**
· **Protective equipment:**
Wear breathing apparatus
Wear full protective suit with self-contained breathing apparatus
See section 8
· **Additional information** Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Mount respiratory protective device.
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow product to reach sewage system or bodies of water.
· **Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Transfer to a waste container. Keep the material damp and exposed to the air in a secure area (CO2-formation!) until completely solidified. The waste can then be disposed of on an approved landfill or a special refuse dump. Ensure adequate ventilation.
In the event of a large spill, treat spill area with decontamination solution. Preparation of decontamination solution: Prepare a mixture of 0.2 - 0.5% liquid detergent and 3 - 8% concentrated ammonium hydroxide in water (5 - 10% sodium carbonate may be substituted for the ammonium hydroxide).
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaust at the workplace.
Keep containers tightly sealed.
Prevent formation of aerosols.
Exhaust ventilation required during spraying or when material is being used at temperatures above 100 degrees F.
· **Information about protection against explosions and fires:** Pay attention to the general rules of internal fire prevention.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Storage Temperature:
Minimum: 64 Degrees Fahrenheit
Maximum: 86 Degrees Fahrenheit
· **Information about storage in one common storage facility:**
Store away from oxidizing agents.
Store away from foodstuffs.
· **Further information about storage conditions:** Keep container tightly sealed.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
26447-40-5 methylenediphenyl diisocyanate (MDI) Mixed Isomers	
ACGIH TLV	Short-term value: 0.05 mg/m³

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

NIOSH REL/CEILING	Short-term value: 0.2 mg/m³
NIOSH REL/TWA	Short-term value: 0.05 mg/m³
OSHA PEL	Short-term value: 0.2 mg/m³

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
Gases fumes and aerosols should not be inhaled.
· **Breathing equipment:**
Aiborne MDI concentrations greater than the ACGIH TLV-TWA (TLV) or OSHA PEL-C (PEL) can occur in inadequately ventilated environments when MDI is sprayed, aerosolized or heated. In such cases, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air-purfying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or (b) a change out schedule, based on the objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL. The recommended APR cartridge is an organic vapor/particulate filter combination cartridge (OV/P100).
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
The following glove types are recommended: neoprene, nitrile rubber, PVC or butyl rubber. Thin, disposable latex gloves should be avoided for repeated or long term handling of the material. Recommended thickness of the glove material: 5 - 6 mil
Selection of the glove material should be based on the consideration of penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:**

Tightly sealed goggles

· **Body protection:** Protective work clothing

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Liquid
Color:	Light yellow
· **Odor:**	Characteristic
· **Odour threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	Undetermined.
· **Flash point:**	> 110 °C (> 230 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	
Decomposition temperature:	Not determined.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not determined.
· **Density at 25 °C (77 °F):**	1.22 g/cm³ (10.181 lbs/gal)
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Insoluble, Reacts
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic at 25 °C (77 °F):	13 mPas
Kinematic:	Not determined.
· **Solvent content:**	
Organic solvents:	0.0 %
Solids content:	100.0 %
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions**
Exothermic reaction with amines and alcohols
Reacts with water to liberate CO2 gas which may build pressure in closed containers
· **Conditions to avoid** No further relevant information available.

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 6)

· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:**
By Fire and High Heat: Carbon Monoxide, Carbon Dioxide, Oxides of Nitrogen and traces of HCN.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
26447-40-5 methylenediphenyl diisocyanate (MDI) Mixed Isomers		
Oral	LD50	> 5000 mg/kg (rat)
Dermal	LD50	> 5000 mg/kg (rabbit)
Inhalative	LC50/4 h	2240 mg/l (rat)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitization:**
Sensitization possible through inhalation.
Sensitization possible through skin contact.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful
Irritant

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
None of the ingredients is listed.

· **NTP (National Toxicology Program)**
None of the ingredients is listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
This product is not miscible with water. Reacts with water at the interface producing CO2 gas and forming a solid and insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (eg. detergents) or by water-soluble solvents. Previous experience demonstrates that polyurea is inert and non-degradable.
Water hazard class 1 (self-assessment): slightly hazardous for water.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

(Contd. on page 8)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 7)

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Can be disposed of with household garbage after solidification following consultation with the waste disposal facility operator and the pertinent authorities and adhering to the necessary technical regulations.

· **Uncleaned packagings:**
· **Recommendation:**
Disposal must be made according to official regulations.
Empty containers may only be disposed of after neutralising any product remaining on the walls of the containers with a mixture of isopropanol, ammonia and water and removal of the warning labels. For preparation of decontamination solution, refer to section 6.

14 Transport information

· **UN-Number**	
· **DOT, ADR, IMDG, IATA**	UN3082
· **ADN**	Void
· **UN proper shipping name**	
· **DOT**	RQ Environmentally hazardous substances, liquid, n.o.s.
· **ADR**	3082 Environmentally hazardous substances, liquid, n.o.s.
· **ADN**	Void
· **IMDG, IATA**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
· **Transport hazard class(es)**	
· **DOT**	
· **Class**	9 Miscellaneous dangerous substances and articles.
· **ADR, ADN, IMDG, IATA**	
· **Class**	Void
· **Packing group**	
· **DOT**	III
· **ADR, IMDG, IATA**	Void
· **Environmental hazards:**	
· **Marine pollutant:**	No
· **Special precautions for user**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Hazardous substance:**	5000 lbs, 2270 kg Single containers less than 5,000 lbs are not regulated. Single containers with 5,000 lbs or more of 4,4' methylenediphenyl diisocyanate are regarded as class 9, NA3082, PG III.
· **UN "Model Regulation":**	UN3082, Environmentally hazardous substances, liquid, n.o.s.

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 06/26/2014 Reviewed on 05/30/2014

Trade name: ISOCYANATE 01

(Contd. of page 8)

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**
None of the ingredients is listed.

· **TSCA (Toxic Substances Control Act):**
All ingredients are listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**
None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**
None of the ingredients is listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**
None of the ingredients is listed.

· **TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients is listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients is listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients is listed.

· **Product related hazard informations:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Hazard symbols:**

Harmful

· **Hazard-determining components of labeling:**
methylenediphenyl diisocyanate (MDI) Mixed Isomers

· **Risk phrases:**
Harmful by inhalation.
Irritating to eyes, respiratory system and skin.
May cause sensitisation by inhalation and skin contact.
Harmful: danger of serious damage to health by prolonged exposure through inhalation.

· **Safety phrases:**
Keep locked up and out of the reach of children.
Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).

(Contd. on page 10)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 9)

Avoid contact with skin and eyes.
Wear suitable gloves.
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Dispose of this material and its container to hazardous or special waste collection point.
In case of accident by inhalation: remove casualty to fresh air and keep at rest.

· **Special labeling of certain preparations:**
Contains isocyanates. See information supplied by the manufacturer.
· **Chemical safety assessment:** *A Chemical Safety Assessment has not been carried out.*

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** *Product Development Department*
· **Contact:** *Bryan R. Morris*
· **Abbreviations and acronyms:**
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

Safety Data Sheet
acc. to OSHA HCS

Date of PDF Creation 08/04/2014 Reviewed on 06/30/2014

1 Identification

· **Product identifier**

· **Trade name: AD-PLS-144233**
· **Relevant identified uses of the substance or mixture and uses advised against** No further relevant information available.

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Stockmeier Urethanes USA
20 Columbia Boulevard
Clarksburg, WV 26301-9606
USA
Telephone: (304) 624-7002
Fax: (304) 624-7020

· **Information department:** Product Development Department
· **Emergency telephone number:** During Normal Business Hours: 1-304-624-7002

2 Hazard(s) identification

· **Classification of the substance or mixture**
The substance is not classified according to the Globally Harmonized System (GHS).

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC** Not applicable.
· **Information concerning particular hazards for human and environment:** Not applicable.

· **Label elements**

· **Labelling according to EU guidelines:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 0
Fire = 1
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 0
Fire = 1
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances** Mixture of Non-Hazardous Substances
· **CAS No. Description**
Proprietary

4 First-aid measures

· **Description of first aid measures**
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness, place patient stably in side position for transportation.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 1)

· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:** Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Water fog, carbon dioxide, foam or dry chemical.
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:**
Wear breathing apparatus
Wear full protective suit with self-contained breathing apparatus
See section 8
· **Additional information** Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Environmental precautions:** Do not allow product to reach sewage system or bodies of water.
· **Methods and material for containment and cleaning up:** Dispose of the collected material according to regulations.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling** No special precautions are necessary if used correctly.
· **Information about protection against explosions and fires:** Pay attention to the general rules of internal fire prevention.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Store in a cool, dry area. Keep container closed to maintain product quality.
· **Information about storage in one common storage facility:** Store away from foodstuffs.
· **Further information about storage conditions:** Keep container tightly sealed.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:** Not required.
· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:** The usual precautionary measures for handling chemicals should be followed.
· **Breathing equipment:** Not required.
· **Protection of hands:**
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

The following glove types are recommended: neoprene, nitrile rubber, PVC or butyl rubber. Thin, disposable latex gloves should be avoided for repeated or long term handling of the material. Recommended thickness of the glove material: 5 - 6 mil

Selection of the glove material should be based on the consideration of penetration times, rates of diffusion and the degradation

· **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· **Penetration time of glove material**

The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:** *Goggles recommended during refilling.*

· **Body protection:** *Protective work clothing*

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	*Liquid*
Color:	*Light yellow*
· **Odor:**	*Mild*
· **Odour threshold:**	*Not determined.*
· **pH-value:**	*Not determined.*
· **Change in condition**	
Melting point/Melting range:	*Undetermined.*
Boiling point/Boiling range:	*> 200 °C (> 392 °F)*
· **Flash point:**	*218 °C (424 °F)*
· **Flammability (solid, gaseous):**	*Not applicable.*
· **Ignition temperature:**	
Decomposition temperature:	*Not determined.*
· **Auto igniting:**	*Not determined.*
· **Danger of explosion:**	*Product does not present an explosion hazard.*
· **Explosion limits:**	
Lower:	*Not determined.*
Upper:	*Not determined.*
· **Vapor pressure:**	*Not determined.*
· **Density at 20 °C (68 °F):**	*0.882 g/cm³ (7.36 lbs/gal)*
· **Relative density**	*Not determined.*
· **Vapour density**	*Not determined.*
· **Evaporation rate**	*Not applicable.*
· **Solubility in / Miscibility with**	
Water:	*Insoluble.*
· **Partition coefficient (n-octanol/water):**	*Not determined.*
· **Viscosity:**	
Dynamic:	*Not determined.*

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

Kinematic:	Not determined.
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** By fire and thermal decomposition: Oxides of carbon

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**
· **Primary irritant effect:**
· **on the skin:** Skin irritation may occur with overexposure.
· **on the eye:** Eye irritation may occur with overexposure.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
The substance is not subject to classification.

· **Carcinogenic categories**
· **IARC (International Agency for Research on Cancer)** Substance is not listed.
· **NTP (National Toxicology Program)** Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:** Not known to be hazardous to water.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Smaller quantities can be disposed of with household waste.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	Void
· **UN proper shipping name**	Void

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **Transport hazard class(es)**	Void
· **Packing group**	Void
· **Environmental hazards:** · **Marine pollutant:**	No
· **Special precautions for user**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**
· **Section 355 (extremely hazardous substances):** Substance is not listed.
· **Section 313 (Specific toxic chemical listings):** Substance is not listed.
· **TSCA (Toxic Substances Control Act):** Substance is listed.
· **Proposition 65**
· **Chemicals known to cause cancer:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for females:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for males:** Substance is not listed.
· **Chemicals known to cause developmental toxicity:** Substance is not listed.

· **Cancerogenity categories**
· **EPA (Environmental Protection Agency)** Substance is not listed.
· **TLV (Threshold Limit Value established by ACGIH)** Substance is not listed.
· **NIOSH-Ca (National Institute for Occupational Safety and Health)** Substance is not listed.
· **OSHA-Ca (Occupational Safety & Health Administration)** Substance is not listed.

· **Product related hazard informations:**
Observe the general safety regulations when handling chemicals.
The substance is not subject to classification according to the sources of literature known to us.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Product Development Department
· **Contact:** Bryan R. Morris
· **Abbreviations and acronyms:**
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)

ATTACHMENT I

Emission Units Table

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
S7 (1S)	E1	Polyol Tank	2004	12,000 gal	Modification 2014	C1, C2, C3
S8 (2S)	E1	Polyol Tank	2004	8,000 gal	Modification 2014	C1, C2, C3
S9 (3S)	E1	Polyol Tank	2004	8,000 gal	Modification 2014	C1, C2, C3
S10 (4S)	E1	Polyol Tank	2004	8,000 gal	Modification 2014	C1, C2, C3
S11 (5S)	E1	AD-144233-PLS Tank	2004	8,000 gal	Modification 2014	C1, C2, C3
D1 (5AS)	E2	Dispersion Machine	2004	4000 gal	Modification 2014	C4
D5	E2	Dispersion Machine	2004		Modification 2014	C4
D1VP	E3	D1 Vacuum Pump	2004	NA	Modification 2014	C5
S6	E1	S103/TDI Tank	2004	5,000 gal	Modification 2014	C1, C2, C3
S1 (7S)	E1	Isocyanate Tank	2004	12,000 gal	Modification 2014	C1, C2, C3
S2 (8S)	E1	Isocyanate Tank	2004	8,000 gal	Modification 2014	C1, C2, C3
S3 (9S)	E1	Isocyanate Tank	2004	8,000 gal	Modification 2014	C1, C2, C3
S4 (10S)	E1	Isocyanate Tank	2004	8,000 gal	Modification 2014	C1, C2, C3
S5 (11S)	E1	Isocyanate Tank	2004	8,000 gal	Modification 2014	C1, C2, C3
R1 (12S)	E1	Reactor	2004	3,000 gal	Modification 2014	C1, C2, C3
R2 (13S)	E1	Reactor	2004	3,000 gal	Modification 2014	C1, C2, C3
R3 (14S)	E1	Reactor	2004	1,500 gal	Modification 2014	C1, C2, C3
FS4 (15S)	E2	Polyol/Isocyanate filling station	2004		Modification 2014	None
16S	NA	Isocyanate Blending Vessel	2004	NA	Removal	NA
FS6 (17S)	None	Polyol/Isocyanate filling station	2004		Modification 2014	None
S13	E7	Polyol Tank	2015	6,000 gal	New 2015	None
S12	E6	MDI Tank	2015	6,700 gal	New 2015	C8
R5	E6	Reactor	2015	675 gal	New 2015	C8
R6	E6	Reactor	2015	600 gal	New 2015	C8
R7	E6	Reactor	2015	1,718 gal	New 2015	C8
R8	E6	Reactor	2015	6,250 gal	New 2015	C8

R9	E6	Reactor	2016	6,250 gal	New 2016	C8
R10	E6	Reactor	2015	1,000 gal	New 2015	C8
R11	E5	Reactor	2015	5,000 gal	New 2015	C4
R12	E5	Reactor	2015	5,000 gal	New 2015	C4
R13	E5	Reactor	2015	275 gal	New 2015	C7
R7DV	E5	Reactor 7 Drum Vent	2015	NA	New 2015	C7
EG51	51E	100 kW Emergency Generator	2015	149 hp	New 2015	--
EG52	52E	600 kW Emergency Generator	2016	909 hp	New 2016	--
S14	E14	Polyol Storage Tank	2016	20,000 gal	TBD	--
BFS	E4	Bulk Filling Station	2015		New 2015	C6
TDI DV	E5	Reactor 7 TDI Drum Vent	2015		New 2015	C7

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

ATTACHMENT J

Emission Points Data Summary Sheet

EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Equipment List Form & Plot Plan)*	Source(s) Vented Through This Point *(Must match Equipment List Form & Plot Plan)*		Air Pollution Control Device *(Must match Equipment List Form & Plot Plan)*		Vent Time for Source *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS [2] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [3]		Maximum Potential Controlled Emissions [4]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [5]	Emission Concentration [6] (ppmv or mg/m^3)
	ID No.	Source	ID No.	Device Type	Short Term [1]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
E1	S1-S11, R1-R3	Poly Storage Tanks, Iso Storage Tanks, Reactors 1, 2, 3	C1, C2, C3	Carbon adsorption filter	NA	NA	VOC; 2,4-Toluene diisocyanate / 584859; Methylene dephenyl diisocyanate / 101688			1.0 0.1 0.1	1.0 0.10 0.10	Vapor	EE	
E2	D1, D5, FS4	Dispersion tanks 1 & 5, Fill Station 4	C4	Carbon adsorption filter	NA	NA	VOC; 2,4-Toluene diisocyanate / 584859; Methylene dephenyl diisocyanate / 101688			1.0 0.1 0.1	1.0 0.1 0.1	Vapor	EE	
E3	D1VP	Dispersion Tank 1 Vacuum Pump	C5	Carbon adsorption filter	NA	NA	VOC; 2,4-Toluene diisocyanate / 584859; Methylene dephenyl diisocyanate / 101688			1.0 0.1 0.1	1.0 0.1 0.1	Vapor	EE	
E4	BTFS	Bulk tank trailer filling station	C6	Carbon adsorption filter	NA	NA	VOC			1.0	1.0	Vapor	EE	

EMISSION POINTS DATA SUMMARY SHEET

E5	R7DV	Reactor 7 TDI Drum Vent	C7	Carbon adsorption filter	NA	NA	2,4-Toluene diisocyanate / 584859			0.1	0.1	Vapor	EE	
E6	R5 – R10, S12	Reactors 5, 6, 7, 8, 9 & 10; MDI storage tank	C8	Carbon adsorption filter	NA	NA	Methylene dephenyl diisocyanate / 101688			0.1	0.1	Vapor	EE	
E7	S13	Polyol storage tank	NA	None	NA	NA	VOC	negligible	negligible			Vapor	EE	
E51	51S	Emergency Generator Engine	NA	None	NA	NA	CO NOx VOC PM SO2	0.30 0.05 0.14 0.014 0.0008	0.074 0.013 0.034 0.0034 0.0002			Vapor	EE	
E52	52S	Emergency Generator Engine	NA	None	NA	NA	CO NOx + NMHC PM SO2	1.20 7.78 0.10 1.69	0.30 1.94 0.025 0.423				EE	

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[2] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, etc. DO NOT LIST CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

[3] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[6] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data

Emission Point ID No. *(Must match Equipment List Form)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
E1	0.5	68			1160	25	4348.122	560.882
E2		68			1160		4348.122	560.882
E3		68			1160		4348.122	560.882
E4		68			1160		4348.122	560.882
E5		68			1160		4348.122	560.882
E6		68			1160		4348.122	560.882
E51		960	888		1160		4348.122	560.882
E52					1160		4348.122	560.882

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

ATTACHMENT K

Fugitive Emissions Data Summary Sheet

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☐ Yes ☒ No ☐ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ☒ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☒ Yes ☐ No ☒ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ☒ Yes ☐ No ☒ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☒ Yes ☐ No ☒ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads						
Unpaved Haul Roads						
Storage Pile Emissions						
Loading/Unloading Operations	VOC; 2,4-TDI 584849; MDI 101688			0.1, 0.1, 0.1	0.1, 0.1, 0.1	EE
Wastewater Treatment Evaporation & Operations						
Equipment Leaks	VOC; 2,4-TDI 584849; MDI 101688	Does not apply	0.1 0.0645 0.0003	Does not apply		
General Clean-up VOC Emissions						
Other	VOC; 2,4-TDI 584849; MDI 101688		0.1 0.2755 0.0132			EE

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, etc. DO NOT LIST CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

ATTACHMENT L

Emissions Unit Data Sheet(s)

Attachment L
EMISSIONS UNIT DATA SHEET
BULK LIQUID TRANSFER OPERATIONS

Furnish the following information for each new or modified bulk liquid transfer area or loading rack, as shown on the *Equipment List Form* and other parts of this application. This form is to be used for bulk liquid transfer operations such as to and from drums, marine vessels, rail tank cars, and tank trucks.

Identification Number (as assigned on *Equipment List Form*): **S7 – S11**
1. Loading Area Name: **Polyol Tank Area**
2. Type of cargo vessels accommodated at this rack or transfer point (check as many as apply): Drums Marine Vessels Rail Tank Cars X Tank Trucks
3. Loading Rack or Transfer Point Data:

Number of pumps	**0**
Number of liquids loaded	**2**
Maximum number of marine vessels, tank trucks, tank cars, and/or drums loading at one time	**1**

4. Does ballasting of marine vessels occur at this loading area? Yes No X Does not apply
5. Describe cleaning location, compounds and procedure for cargo vessels using this transfer point: **Cargo vessels are not cleaned onsite. Upon transfer of materials cargo vessel returns to the supplier for proper cleaning operations and maintenance. Stockmeier will maintain a file of suppliers records of cleaning activities.**
6. Are cargo vessels pressure tested for leaks at this or any other location? Yes X No If YES, describe:
7. Projected Maximum Operating Schedule (for rack or transfer point as a whole):

Maximum	Jan. - Mar.	Apr. - June	July - Sept.	Oct. - Dec.
hours/day	**24**	**24**	**24**	**24**
days/week	**7**	**7**	**7**	**7**
weeks/quarter	**13**	**13**	**13**	**13**

8. Bulk Liquid Data *(add pages as necessary):*							
Pump ID No.		**NA**	**NA**				
Liquid Name		**Polyol**	**Soy Oil**				
Max. daily throughput (1000 gal/day)		**24**	**6**				
Max. annual throughput (1000 gal/yr)		**6,000**	**1,428**				
Loading Method [1]		**SP**	**SP**				
Max. Fill Rate (gal/min)		**44**	**44**				
Average Fill Time (min/loading)		**89**	**89**				
Max. Bulk Liquid Temperature (°F)		**86**	**86**				
True Vapor Pressure [2]		**<0.01**	**<0.01**				
Cargo Vessel Condition [3]		**C**	**C**				
Control Equipment or Method [4]		**VB, CA**	**VB, CA**				
Minimum control efficiency (%)		**99.9**	**99.9**				
Maximum Emission Rate	Loading (lb/hr)	**0.08**	**0.018**				
	Annual (lb/yr)	**45.18**	**11.28**				
Estimation Method [5]		**O**	**O**				

[1] BF = Bottom Fill SP = Splash Fill SUB = Submerged Fill

[2] At maximum bulk liquid temperature

[3] B = Ballasted Vessel, C = Cleaned, U = Uncleaned (dedicated service), O = other (describe)

[4] List as many as apply (complete and submit appropriate *Air Pollution Control Device Sheets*):CA = Carbon Adsorption
LOA = Lean Oil Adsorption
CO = Condensation
SC = Scrubber (Absorption)
CRA = Compressor-Refrigeration-Absorption
TO = Thermal Oxidation or Incineration
CRC = Compression-Refrigeration-Condensation
VB = Dedicated Vapor Balance (closed system)
O = other (descibe)

[5] EPA = EPA Emission Factor as stated in AP-42
MB = Material Balance
TM = Test Measurement based upon test data submittal
O = other (describe)

9. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING **Stockmeier will conduct annual monitoring of the bulk storage transfer operations.**	RECORDKEEPING **Stockmeier will maintain a suitable log specifying time and date of inspections, and shipments. The log will note any corrective actions taken.**
REPORTING **Stockmeier will maintain onsite all records and report to the WVDAQ when directed to do so.**	TESTING **Stockmeier will conduct performance testing when so directed by the WVDAQ.**

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

Attachment L
EMISSIONS UNIT DATA SHEET
BULK LIQUID TRANSFER OPERATIONS

Furnish the following information for each new or modified bulk liquid transfer area or loading rack, as shown on the *Equipment List Form* and other parts of this application. This form is to be used for bulk liquid transfer operations such as to and from drums, marine vessels, rail tank cars, and tank trucks.

Identification Number (as assigned on *Equipment List Form*): **S1 – S5**	
1. Loading Area Name: **Iso Tank Area**	
2. Type of cargo vessels accommodated at this rack or transfer point (check as many as apply): Drums Marine Vessels Rail Tank Cars X Tank Trucks	
3. Loading Rack or Transfer Point Data:	
Number of pumps	**0**
Number of liquids loaded	**2**
Maximum number of marine vessels, tank trucks, tank cars, and/or drums loading at one time	**1**
4. Does ballasting of marine vessels occur at this loading area? Yes No X Does not apply	
5. Describe cleaning location, compounds and procedure for cargo vessels using this transfer point: **Cargo vessels are not cleaned onsite. Upon transfer of materials cargo vessel returns to the supplier for proper cleaning operations and maintenance. Stockmeier will maintain a file of suppliers records of cleaning activities.**	
6. Are cargo vessels pressure tested for leaks at this or any other location? Yes X No If YES, describe:	

7. Projected Maximum Operating Schedule (for rack or transfer point as a whole):

Maximum	Jan. - Mar.	Apr. - June	July - Sept.	Oct. - Dec.
hours/day	**24**	**24**	**24**	**24**
days/week	**7**	**7**	**7**	**7**
weeks/quarter	**13**	**13**	**13**	**13**

8. Bulk Liquid Data *(add pages as necessary):*							
Pump ID No.		**NA**	**NA**				
Liquid Name		**MDI**	**TDI**				
Max. daily throughput (1000 gal/day)		**24**	**6**				
Max. annual throughput (1000 gal/yr)		**6,000**	**824.8**				
Loading Method [1]		**SP**	**SP**				
Max. Fill Rate (gal/min)		**44**	**44**				
Average Fill Time (min/loading)		**89**	**89**				
Max. Bulk Liquid Temperature (°F)		**86**	**86**				
True Vapor Pressure [2]		**<0.01**	**<0.01**				
Cargo Vessel Condition [3]		**C**	**C**				
Control Equipment or Method [4]		**VB, CA**	**VB, CA**				
Minimum control efficiency (%)		**99**	**99**				
Maximum Emission Rate	Loading (lb/hr)	**0.001**	**0.001**				
	Annual (lb/yr)	**0.0017**	**0.0001**				
Estimation Method [5]		**O**	**O**				

[1] BF = Bottom Fill SP = Splash Fill SUB = Submerged Fill

[2] At maximum bulk liquid temperature

[3] B = Ballasted Vessel, C = Cleaned, U = Uncleaned (dedicated service), O = other (describe)

[4] List as many as apply (complete and submit appropriate *Air Pollution Control Device Sheets*):CA = Carbon Adsorption
CO = Condensation
CRA = Compressor-Refrigeration-Absorption
CRC = Compression-Refrigeration-Condensation
O = other (descibe)
LOA = Lean Oil Adsorption
SC = Scrubber (Absorption)
TO = Thermal Oxidation or Incineration
VB = Dedicated Vapor Balance (closed system)

[5] EPA = EPA Emission Factor as stated in AP-42
MB = Material Balance
TM = Test Measurement based upon test data submittal
O = other (describe)

9. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING **Stockmeier will conduct annual monitoring of the bulk storage transfer operations.**	RECORDKEEPING **Stockmeier will maintain a suitable log specifying time and date of inspections, and shipments. The log will note any corrective actions taken.**
REPORTING **Stockmeier will maintain onsite all records and report to the WVDAQ when directed to do so.**	TESTING **Stockmeier will conduct performance testing when so directed by the WVDAQ.**

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

Attachment L
EMISSIONS UNIT DATA SHEET
CHEMICAL PROCESS

For chemical processes please fill out this sheet and all supplementary forms (see below) that apply. Please check all supplementary forms that have been completed.

- ☐ *Emergency Vent Summary Sheet*
- ☐ *Leak Sources Data Sheet*
- ☐ *Toxicology Data Sheet*
- ☒ *Reactor Data Sheet*
- ☐ *Distillation Column Data Sheet*

1. Chemical process area name and equipment ID number (as shown in *Equipment List Form*)
   Reactors R1, R2, R3, R5, R6, R7, R8, R9, R10, R11, R12, R13; Dispersion Machines D1, D5; Filling Stations FS4, FS6

2. Standard Industrial Classification Codes (SICs) for process(es)
   2821

3. List raw materials and ☒ attach MSDSs
   MSDS sheets are included in Attachment H (on CD)

4. List Products and Maximum Production and ☒ attach MSDSs

Description and CAS Number	Maximum Hourly (lb/hr)	Maximum Annual (ton/year)
polyurethanes		121,128

5. Complete the *Emergency Vent Summary Sheet* for all emergency relief devices.

6. Complete the *Leak Source Data Sheet* and describe below or attach to application the leak detection or maintenance program to minimize fugitive emissions. Include detection instruments, calibration gases or methods, planned inspection frequency, and record-keeping, and similar pertinent information. If subject to a rule requirement (e.g. 40CFR60, Subpart VV), please list those here.

   Not Applicable

7. Clearly describe below or attach to application Accident Procedures to be followed in the event of an accidental spill or release.

   Stockmeier will supply absorbent material to capture spills and place into sealed drum for proper disposal. System will be completely shut down in the event of a spill or release. Containment measures meet or exceed the required 110%.

8A. Complete the *Toxicology Data Sheet* or attach to application a toxicology report (an up-to-date material safety data sheets (MSDS) may be used) outlining the currently known acute and chronic health effects of each compound or chemical entity emitted to the air. If these compounds have already been listed in Item 3, then a duplicate MSDS sheet is not required. Include data such as the OSHA time weighted average (TWA) or mutagenicity, teratogenicity, irritation, and other known or suspected effects should be addressed. Indicate where these are unknown, and provide references.

8B. Describe any health effects testing or epidemiological studies on these compounds that are being or may be conducted by the company or required under TSCA, RCRA or other federal regulations. Discuss the persistence in the environment of any emission (e.g. pesticides, etc.).

9. **Waste Products** - Waste products status: (If source is subject to RCRA or 45CSR25, please contact the Hazardous Waste Section of WVDEP, OAQ at (304) 926-3647.)

9A. Types and amounts of wastes to be disposed:

9B. Method of disposal and location of waste disposal facilities:

Carrier: **Safety Kleen** Phone:

9C. Check here if approved USEPA/State Hazardous Waste Landfill will be used ☐

10. Maximum and Projected Typical Operating Schedule for process or project as a whole (circle appropriate circle units:

	(hrs/day) (hr/batch)	(days), (batches/day), (batches/week)	(days/yr), (weeks/year)
10A. Maximum	**24 hrs/day**	**7 days/week**	**365 days/yr**
10B. Typical	**8 hrs/day**	**5 days/week**	**240 days/yr**

11. Complete a *Reactor Data Sheet* for each reactor in this chemical process.

12. Complete a *Distillation Column Data Sheet* for each distillation column in this chemical process.

13. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING
NA

RECORDKEEPING
NA

REPORTING
NA

TESTING
NA

MONITORING. Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment operation or air pollution control

RECORDKEEPING. Please describe the proposed recordkeeping that will accompany the monitoring.

REPORTING. Please describe the proposed frequency of reporting of the recordkeeping.

TESTING. Please describe any proposed emissions testing for this process equipment or air pollution control

14. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

INFORMATION REQUIRED FOR CHEMICAL PROCESSES

The notes listed below for chemical processes are intended to help the applicant submit a complete application to the OAQ; these notes are not intended to be all inclusive. The requirements for a complete application for a permit issued under 45CSR13 are designed to provided enough information for a permit reviewer to begin a technical review. Additional information beyond that identified may be required to complete the technical review of any individual application.

Process Description

Please keep these points in mind when completing your process description as part of this permit application.

1. Provide a general process overview. This brief, but complete, process description should include chemical or registered trademark names of chemical products, intermediates, and/or raw materials to be produced or consumed, and the ultimate use(s) of the product(s). A list of the various chemical compounds is helpful.
2. Describe each process step. Include the process chemistry and stoichiometrically balanced reaction equation or material mass balance on all components.
3. Describe the methods and equipment used to receive, store, handle, and charge raw materials.
4. Describe the methods and equipment used to handle, store, or package final products and intermediates.
5. Provide process flow diagrams or equipment layout drawings which clearly show the process flow relationships among all pieces of process and control equipment. Identify all air emission discharge points. Discuss instrumentation and controls for the process.
6. Discuss the possibilities of process upsets, the duration and frequency of upsets, and consequences (including air emissions) of these upsets. Include a description of rupture discs, pressure relief valves, and secondary containment systems.
7. Discuss any fugitive emissions and the methods used to minimize them.
8. Include the following plans for the process if available:
   a. preventative maintenance and malfunction abatement plan (recommended for all control equipment).
   b. continuous emissions (in-stack) monitoring plan
   c. ambient monitoring plan
   d. emergency response plan

Regulatory Discussion

The following state and federal air pollution control regulations may be applicable to your chemical process. You should review these regulations carefully to determine if they apply to your process. Please summarize the results of your review in your permit application along with any other regulations you believe are applicable.

- Title 45 Legislative Rule Division of Environmental Protection, Office of Air Quality contains West Virginia's air pollution control regulations, including the following promulgated rules which may require emissions reductions or control technologies for your chemical process:
  a. 45CSR27 - Best Available Technology (BAT) for Toxic Air Pollutants (TAPs)
  b. 45CSR21 - VOC emissions controls for ozone maintenance in Kanawha, Cabell, Putnam, Wayne, and Wood counties.
  c. 45CSR13 (Table 45-13A) - plantwide emission thresholds for permitting for certain pollutants.
- Federal Guidelines for case-by-case MACT determinations under section 112(g) of the 1990 CAAA for individual and total HAPs greater than 10 and 25 tons per year, respectively.
- There are also subparts of the federal Standards of Performance for New Stationary Sources (NSPS), 40CFR60 60, and the National Emission Standards for Hazardous Air Pollutants (NESHAP) at 40CFR61 and 40CFR63, which apply to various chemical and nonchemical processes. These subparts are too numerous to list here, but these areas of the federal regulations should be consulted carefully to determine applicability to your process.

Emissions Summary and Calculations

Please keep these points in mind when submitting your emissions calculations as part of this permit application.

1. For each pollutant, provide the basis for the emissions estimate and for all emission reduction(s) or control efficiency(ies) claimed.
2. For all batch processes provide the following
   a. Emissions of each pollutant in pound(s) per batch, from each process step
   b. Annual emissions based on number of batches requested per year
   c. The total time for each process step and the duration of the emissions during the process step
   d. Total batch time, total emissions per batch (or per day), and annual emissions based on the number of batches requested per year.

EMERGENCY VENT SUMMARY SHEET

List below all emergency relief devices, rupture disks, safety relief valves, and similar openings that will vent only under abnormal conditions.

Emission Point ID[1]	Equipment to Relief Vent (type, ID if available)[2]	Relief Vents (type) & Set Pressure (psig)	Name of Chemical(s) or Pollutants Controlled	Worst Case Emission per Release Event (lbs)
None	**NA**	**NA**	**NA**	**NA**

All routine vents (non-emergency) should be listed on the *Emission Points Data Summary Sheet.*

[1] Indicate the emission point, if any, to which source equipment normally vents. Do <u>not</u> assign emission point ID numbers to each emergency relief vent or device.

[2] List all emergency relief devices next to the piece of equipment from which they control releases.

LEAK SOURCE DATA SHEET

Source Category	Pollutant	Number of Source Components[1]	Number of Components Monitored by Frequency[2]	Average Time to Repair (days)[3]	Estimated Annual Emission Rate (lb/yr)[4]
Pumps[5]	light liquid VOC[6,7]	NA			
	heavy liquid VOC[8]				
	Non-VOC[9]				
Valves[10]	Gas VOC				
	Light Liquid VOC				
	Heavy Liquid VOC				
	Non-VOC				
Safety Relief Valves[11]	Gas VOC				
	Non VOC				
Open-ended Lines[12]	VOC				
	Non-VOC				
Sampling Connections[13]	VOC				
	Non-VOC				
Compressors	VOC				
	Non-VOC				
Flanges	VOC				
	Non-VOC				
Other	VOC				
	Non-VOC				

[1 - 13] See notes on the following page.

Notes for Leak Source Data Sheet

1. For VOC sources include components on streams and equipment that contain greater than 10% w/w VOC, including feed streams, reaction/separation facilities, and product/by-product delivery lines. Do not include certain leakless equipment as defined below by category.

2. By monitoring frequency, give the number of sources routinely monitored for leaks, using a portable detection device that measures concentration in ppm. Do not include monitoring by visual or soap-bubble leak detection methods. "M/Q(M)/Q/SA/A/O" means the time period between inspections as follows:

   Monthly/Quarterly, with Monthly follow-up of repaired leakers/Quarterly/Semi-annual/Annually/Other (specify time period)

   If source category is not monitored, a single zero in the space will suffice. For example, if 50 gas-service valves are monitored quarterly, with monthly follow-up of those repaired, 75 are monitored semi-annually, and 50 are checked bimonthly (alternate months), with non checked at any other frequency, you would put in the category "valves, gas service:" 0/50/0/75/0/50 (bimonthly).

3. Give the average number of days, after a leak is discovered, that an attempt will be made to repair the leak.

4. Note the method used: MB - material balance; EE - engineering estimate; EPA - emission factors established by EPA (cite document used); O - other method, such as in-house emission factor (specify).

5. Do not include in the equipment count sealless pumps (canned motor or diaphragm) or those with enclosed venting to a control device. (Emissions from vented equipment should be included in the estimates given in the Emission Points Data Sheet.)

6. Volatile organic compounds (VOC) means the term as defined in 40 CFR □51.100 (s).

7. A light liquid is defined as a fluid with vapor pressure equal to or greater than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if 20% w/w or more of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a light liquid.

8. A heavy liquid is defined as a fluid with a vapor pressure less than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if less than 20% w/w of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a heavy liquid.

9. LIST CO, H_2S, mineral acids, NO, NO_2, SO_3, etc. DO NOT LIST CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

10. Include all process valves whether in-line or on an open-ended line such as sample, drain and purge valves. Do not include safety-relief valves, or leakless valves such as check, diaphragm, and bellows seal valves.

11. Do not include a safety-relief valve if there is a rupture disk in place upstream of the valve, or if the valve vents to a control device.

12 Open-ended lines include purge, drain and vent lines. Do not include sampling connections, or lines sealed by plugs, caps, blinds or second valves.

13. Do not include closed-purge sampling connections.

TOXICOLOGY DATA SHEET[1]

Descriptor Name/CAS Number	OSHA Limits[2]		Acute[3] TC_{LO} - Animal LC_{LO} - Animal LC_{50} - Animal	Chronic[4]	Irritation[5]	References
	TWA	CL				
Polyether Polyol	NA	NA	NA	NA	NA	MSDS
MDI 101-68-8	0.005 ppm	0.02 ppm	LC50/rat >2.24 mg/l / 1h	C	Dermal irritation - low	MSDS
2,4-TDI 584-84-9	0.005 ppm	0.02 ppm	LC50/rat <= 0.78 mg/l / 1h	C	Eye irritation - low	MSDS

[1] Indicate by "ND" where no data exists, in company's knowledge.
[2] Time Weighted Average, Ceiling Limit, or other, with units.
[3] If inhalation data is not available, provide other data as available.
[4] Relying on animal or human studies, indicate if any data suggests: C = carcinogenicity, M = mutagenicity, T = teratogenecity, O = oncogenicity.
[5] Indicate if there are dermal or eye irritation effects and whether they are considered to be low, moderate, or severe.

REACTOR DATA SHEET

Provide the following information for each piece of equipment that is a potential or actual source of emissions as shown on the *Equipment List Form* and other parts of application.

Identification Number (as shown on *Equipment List Form*): **12s, 13s, 14s, 15s, 16s, 17s**

1. Name and type of equipment (e.g. CSTR, plug flow, batch, etc.)
   Batch reactors, filling stations, and blending vessel

2. Type of operation ☒ Batch ☐ Continuous ☐ Semi-batch

3. Projected Actual Equipment Operating Schedule (complete appropriate lines):

   9 hrs/day **5** days/week **48** weeks/year

   5 hrs/batch **1.8** batches/day (Circle one) **240** days/yr (Circle one)

4. Feed Data Flow In = **2398** gal/hr, or gal/batch

Material Name & CAS No.	Phase[a]	Specific Gravity	Vapor Pressure[b]	Charge Rate			Fill Time (min/batch, run)[c]
				Normal	Max	Units	
Polyol (no CAS#)	L	~1.02	<1				
2,4-TDI 584-84-9	L	Not provided	0.025 mmHg				
MDI 101-68-8	L	1.22	<0.00001 mmHg				

a. S = Solid, L = Liquid, G = gas or vapor
b. At feed conditions
c. Total time that equipment is filling per batch or run (start-up), for tank or vessel-type equipment.

5. Provide all **chemical reactions** that will be involved (if applicable), including the residence time and any side reactions that may occur as well as gases that may be generated during these reactions. Indicate if the reaction(s) are exothermic or endothermic.

6. Maximum Temperature	7A. Maximum Pressure 7B. Max. Set Pressure for venting
°C	mmHg mmHg
°F	psig psig

8. Output Data Flow Out = gal/hr or gal/batch

Material Name and CAS No.	Phase	Specific Gravity	Vapor Pressure	Hourly or Batch Output Rate		
				Normal	Maximum	Units
polyurethane	**L**					

9. Complete the following emission data for equipment connected to a header exhaust system, giving emissions levels before entering header system (i.e. before control equipment).

☒ Check here if not applicable

Emission Point ID (exhaust point of header system):

Material Name and CAS No.	Maximum Potential Emission Rate (lb/hr)	Method **

** MB - material balance: EE - Engineering Estimate: TM - Test Measurement (submit test data): O - other (Explain)

10. Provide the following information pertaining to each condenser that may be attached to this reactor. Attach additional pages as necessary if more than one condenser is used for this reactor. Complete the Condenser Air Pollution Control Device Sheet if necessary.

☒ Check here if not applicable

10A. Cooling material

10B. Minimum and Maximum flowrate of cooling material (gal/hr)

10C. Inlet temperature of cooling material (°F)

10D. Outlet temperature of cooling material (°F)

10E. Pressure drop of gas to be condensed from inlet to outlet (psig)

10F. Inlet temperature of gas stream (°F)

10G. Outlet temperature of gas stream (°F)

10H. Number of passes

10I. Cooling surface area

11. Provide the following pertaining to auxiliary equipment that burns fuel (heaters, dryers, etc.):

☒ Check here if not applicable

11A. Type of fuel and maximum fuel burn rate, per hour:

11B. Provide maximum percent sulfur (S), ash content of fuel, and the energy content using appropriate units:

%S % Ash BTU/lb, std. ft^3/day, gal

(circle one)

11C. Theoretical combustion air requirement in SCFD per unit of fuel (circle appropriate unit) @ 70°F and 14.7 PSIA:

SCFD/lb, SCFD, gal (circle one)

11D. Percent excess air: %

11E. Type, amount, and BTU rating of burners and all other firing equipment that are planned to be used:

11F. Total maximum design heat input: $\times 10^6$ BTU/hr.

12. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
REPORTING	TESTING

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION OR AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT OR AIR POLLUTION CONTROL DEVICE.

13. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

NOTE: An *AIR POLLUTION CONTROL DEVICE SHEET* must be completed for any air pollution device(s) (except emergency relief devices) used to control emissions from this reactor.

DISTILLATION COLUMN DATA SHEET

Identification Number (as assigned on *Equipment List Form*): **NA**

1. Name and type of equipment

#. Projected actual equipment operating schedule (complete appropriate lines):

hrs/day	days/week	weeks/year
hrs/batch	batches/day, batches/week	days/yr, weeks/yr

2. Number of stages (plates), excluding condenser

3. Number of feed plates and stage location

4. Specify details of any reheating, recycling, or stage conditioning along with the stage locations

5. Specify reflux ratio, R (where R is defined as the ratio of the reflux to the overhead product, given symbolically as R=L/D, where L = liquid down column, D = distillation product)

6. Specify the fraction of feed which is vaporized, f (where f is the molal fraction of the feed that leaves the feed plate continuously as vapor).

7A. Type of condenser used: ☐ total ☐ partial ☐ multiple ☐ other

7B. For each condenser provide process operating details including all inlet and outlet temperatures, pressures, and compositions.

8. Feed Characteristics
   - A. Molar composition
   - B. Individual vapor pressure of each component
   - C. Total feed stage pressure
   - D. Total feed stage temperature
   - E. Total mass flow rate of each stream into the system

9. Overhead Product
   - A. Molar composition of components
   - B. Vapor pressure of components
   - C. Total mass flow rate of all streams leaving the system as overhead products

10. Bottom Product
   - A. Molar composition of all components
   - B. Total mass flow rate of all steams leaving the system as bottom products

11. General Information
    A. Distillation column diameter
    B. Distillation column height
    C. Type of plates
    D. Plate spacing
    E. Murphree plate efficiency
    F. Any other information necessary of describe the operation of this distillation column.

12. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
    Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
REPORTING	TESTING

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION OR AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT OR AIR POLLUTION CONTROL DEVICE.

13. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

NOTE: An *AIR POLLUTION CONTROL DEVICE SHEET* must be completed for any air pollution device(s) (except emergency relief devices) used to control emissions from this distillation column.

EMERGENCY GENERATOR ENGINE DATA SHEET

Source Identification Number[1]		EG51		EG52			
Engine Manufacturer and Model		Generac QT100		Generac 2806C			
Manufacturer's Rated bhp/rpm		9,097					
Source Status[2]		NS		NS			
Date Installed/Modified/Removed[3]		2015		2016			
Engine Manufactured/Reconstruction Date[4]		2014		2015			
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart IIII? (Yes or No)[5]		No		Yes			
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No)[6]		Yes		No			
Engine, Fuel and Combustion Data	Engine Type[7]	RB4S					
	APCD Type[8]	NSCR					
	Fuel Type[9]	PQ		2FO			
	H_2S (gr/100 scf)						
	Operating bhp/rpm	149 / 2,300		909 / 1,800			
	BSFC (Btu/bhp-hr)	9,097		6417			
	Fuel throughput (ft^3/hr)	1,355 cf/hr		41.4 gal/hr			
	Fuel throughput ($MMft^3$/yr)	0.678		20,700 gal/yr			
	Operation (hrs/yr)	500		500			
Reference[10]	Potential Emissions[11]	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
MD	NO_X	0.05	0.013	7.78	1.94		
MD	CO	0.30	0.074	1.20	0.30		
MD	VOC	0.14	0.034	Incl w/NOx	Incl w/NOx		
AP	SO_2	0.0008	0.0002	1.69	0.423		
AP	PM_{10}	0.014	0.0034	0.10	0.025		
AP	Formaldehyde	0.04	0.011	0.0069	0.0017		

1. Enter the appropriate Source Identification Number for each emergency generator. Generator engines should be designated EG-1, EG-2, EG-3 etc. If more than three (3) engines exist, please use additional sheets.

2. Enter the Source Status using the following codes:

NS	Construction of New Source (installation)	ES	Existing Source
MS	Modification of Existing Source	RS	Removal of Source

3. Enter the date (or anticipated date) of the engine's installation (construction of source), modification or removal.

4. Enter the date that the engine was manufactured, modified or reconstructed.

5. Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart IIII. If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance according to 40CFR§60.4210 as appropriate.

   Provide a manufacturer's data sheet for all engines being registered.

6. Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart JJJJ. If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance according to 40CFR§60.4243a(2)(i) through (iii), as appropriate.

   Provide a manufacturer's data sheet for all engines being registered.

7. Enter the Engine Type designation(s) using the following codes:

LB2S	Lean Burn Two Stroke	RB4S	Rich Burn Four Stroke
LB4S	Lean Burn Four Stroke		

8. Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes:

A/F	Air/Fuel Ratio	IR	Ignition Retard
HEIS	High Energy Ignition System	SIPC	Screw-in Precombustion Chambers
PSC	Prestratified Charge	LEC	Low Emission Combustion
NSCR	Rich Burn & Non-Selective Catalytic Reduction	SCR	Lean Burn & Selective Catalytic Reduction

9. Enter the Fuel Type using the following codes:

PQ	Pipeline Quality Natural Gas	RG	Raw Natural Gas
2FO	#2 Fuel Oil	LPG	Liquid Propane Gas

10. Enter the Potential Emissions Data Reference designation using the following codes. Attach all referenced data to this *Compressor/Generator Data Sheet(s)*.

MD	Manufacturer's Data	AP	AP-42	
GR	GRI-HAPCalc™	OT	Other _____	(please list)

11. Enter each engine's Potential to Emit (PTE) for the listed regulated pollutants in pounds per hour and tons per year. PTE shall be calculated at manufacturer's rated brake horsepower and may reflect reduction efficiencies of listed Air Pollution Control Devices. Emergency generator engines may use 500 hours of operation when calculating PTE. PTE data from this data sheet shall be incorporated in the *Emissions Summary Sheet*.

ATTACHMENT M

Air Pollution Control Device Sheet(s)

Attachment M
Air Pollution Control Device Sheet
(ADSORPTION SYSTEM)

Control Device ID No. (must match Emission Units Table): C1- C8

Equipment Information

1. Name of Control Device: **Vapor Phase Adsorber**
2. Manufacturer: Chem-Trade International, Inc. Model No. DV200
3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

Gas Stream Characteristics

4. Gas Flow Rate into the Collector:
   ACFM 100 @ 86 °F
   Relative Humidity PSIA
5. Emission Rate of each Pollutant (Specify) into and out of Collector:

Pollutant	IN lb/hr	IN grains/acf	IN ppm (volume)	OUT lb/hr	OUT grains/acf	OUT ppm (volume)
A MDI	1.0			0.1		
B 2,4-TDI	1.0			0.1		
C VOC	10.0			1.0		
D						
E						

6. LEL (lower explosive limit) for most volatile pollutant: Pollutant PPM
7. List vapor pressure (mmHg) at the operating temperature for each pollutant in inlet stream:

	Pollutant	Temp	MmHg
A	MDI	86	5.3E-9
B	2,4-TDI	86	<0.01
C	VOC	86	
D			
E			

Adsorbent Characteristics

8. Adsorbent: Type: **Granular Carbon**
   Manufacturer: **Chem-Trade Int.**
   Grade No.: **CT410**
   Specifications:
9. Maximum adsorbate loading: lb pollutant/lb of adsorbent
10. Pressure drop across unit: (in inches of water)
11. Number of beds per unit: **1**
12. Weight of adsorbent material per bed: **200** lb
13. Adsorbent media average particle size: **See attached spec sheet** microns
14. Adsorber geometry:
    Length: **3.5** ft
    Diameter: **2.5** ft
    Bed Depth: **3.5** ft
    Bed Surface Area: ft^2
    Bed Volume: 7 ft^3
15. Temperature Range Adsorption:
    Min. Temp. **32** °F
    Max. Temp. **140** °F
    Average Temp. **62** °F
16. Cycle time for adsorption: hr
17. Frequency of adsorbent replacement: **Once per year** yr
18. Cycle time for drying before adsorbing: **0** hr
19. Saturation Capacity of Pollutant on adsorbent (supply units): **99%**
20. Length of mass transfer zone: **34** in

Regenerative Systems

21. Type of regeneration: ☒ Replacement ☐ Stream ☐ Other, specify:

22. Method of Regeneration:
☒ Alternate use of **1** entire units ☐ Source shut down
☐ Alternate use of beds in a single unit ☐ Other (describe):

23. Cycle time for regeneration: **1** hr

24. Emission steam velocity through bed: ft/min

25. Steam flow rate: lb/min
Steam temp.: **86** °F
Steam pressure: PSIA

26. Disposition of vapors during regeneration:

Divert to second activated carbon canister unit

27. Guaranteed minimum efficiency per pollutant captured:

	Captured Pollutant	Minimum Efficiency
A	**Isocyanates (MDI, 2,4-TDI)**	**99** %
B	**Polyols (VOCs)**	**99** %
C		%
D		%

28. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):

None

29. Describe the collection material disposal system:

Granular activated carbon is sent to US Waste for disposal.

30. Have you included ***Adsorption Control Device*** in the Emissions Points Data Summary Sheet? **Yes**

31. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
Stockmeier will conduct daily monitoring of the system.	**Stockmeier will maintain a suitable log specifying time and date of inspections. The log will note any corrective actions taken.**
REPORTING:	TESTING:
Stockmeier will maintain onsite all records and report to the WVDAQ when directed to do so.	**Stockmeier will conduct performance testing when so directed by the WVDAQ.**

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

32. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.

33. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

34. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

CT410 GRANULAR ACTIVATED CARBON

CT410 is a high quality granular activated carbon, produced under closely controlled operating conditions. Quality and screen sizes are designed to provide high performance levels in the removal of VOC compounds, odors and irritants from various gas streams.

Product Specifications

CCl_4 Activity (wt. %), ---------- 60 min.
Iodine Number. mg/g ---------- 950 min.
Butane Activity, % ---------- 21.6 min.
Hardness Number (ASTM) ---------- 95 min.
Moisture, % as packed ---------- 2 max.

Mesh Size (U.S. Sieve Series)

Greater than 4 mesh, % ---------- 5 max.
Less than 10 mesh, % ---------- 5 max.

Typical Properties

Apparent Density, g/ml ---------- 0.48
Domestic freight classification: NMFC #40560
Import/Export Classification: 3802.10.0000 (HS tariff Classification)

Packaging

55-pound bags, 1000 lb. bulk sacks or bulk trailer

CHEM-TRADE INTERNATIONAL, INC.
325 MEADOWLANDS BLVD., SUITE 1
WASHINGTON, PA. 15301
Telephone 724-745-1405
Fax 724-745-0995

ATTACHMENT N

Supporting Emissions Calculations

ATTACHMENT N - AIR EMISSIONS CALCULATIONS

Stockmeier Urethanes

Emissions Summary

Pollutant	Emissions (tpy)		
	Current Permitted	Proposed	Net Change
CO	0	0.375	0.375
NOx	0	0.013	0.013
PM	0	0.028	0.028
SO_2	0	0.423	0.423
VOC	1.48	6.034	4.554
NOx + NMHC	0	1.944	1.944
Total HAPs	0.95	1.212	0.262
Speciated HAPS	**Current Permitted**	**Proposed**	**Net Change**
2,4-TDI	0.2	0.6	0.4
MDI	0.2	0.6	0.4
Xylene	0.45	0	-0.45
Ethylbenzene	0.1	0	-0.1
Formaldehyde	0	0.012	0.012

ATTACHMENT N - AIR EMISSIONS CALCULATIONS

Stockmeier Urethanes

new ID numbers in parantheses

Tanks Equipment ID No.	Volume (gal)	Chemical	Permitted Throughput (gal/yr)	Proposed Throughput (gal/yr)
1S (S7)	12000	Polyol	685,284	3,105,545
2S (S8)	8000	Polyol	571,070	1,107,137
3S (S9)	8000	Polyol	571,070	571,070
4S (S10)	8000	Polyol	571,070	1,107,137
5S (S11)	8000	Soy Oil	571,070	291,838
S6	5000	S103/TDI		
7S (S1)	12000	MDI	972,000	963,496
8S (2S)	8000	MDI	648,000	82,482
9S (3S)	8000	MDI	648,000	332,818
10S (4S)	8000	MDI	648,000	584,825
11S (5S)	8000	TDI	262,440	262,440
S12	6,700	MDI		804,702
S13	6,000	Polyol		
S14	20000	Polyol		
			6,148,004	**9,213,490**

2,969,564 gal/yr polyol total existing
6,182,727 gal/yr polyol total proposed

3,178,440 gal/yr MDI total existing
3,030,763 gal/yr MDI proposed

Process Equipment ID No.	Reactors	Pemitted Throughput (gal/yr)	Proposed Throughput (gal/yr)
R1	3,000 gal Reactor	357,142	1,071,426
R2	3,000 gal Reactor	950,000	2,850,000
R3	1,500 gal Reactor	1,190,476	3,571,428
R5	675 gal Reactor	NA	3,942,000
R6	600 gal Reactor	NA	3,504,000
R7	1,718 gal Reactor	NA	10,033,120
R8	6,250 gal Reactor	NA	36,500,000
R9	6,250 gal Reactor	NA	36,500,000
R10	1,000 gal Reactor	NA	5,840,000
R11	5,000 gal Reactor	NA	29,200,000
R12	5,000 gal Reactor	NA	29,200,000
R13	275 gal Reactor	NA	1,606,000
Total Throughput		**2,497,618**	**163,817,974**

ATTACHMENT N - AIR EMISSIONS CALCULATIONS

Emission Point ID No.	Sources Vented	Control Device	Permitted Emissions									
			VOC		2,4-TDI		MDI		Xylene		Ethylbenzene	
			lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
1E	6S, 15S, 17S	1C	1.08	1.2	0.1	0.1	0.1	0.1	0.43	0.45	0.1	0.1
2E	1S, 2S, 3S, 4S, 5S, 5AS	2C	0.1	0.28								
3E	7S, 8S, 9S, 10S, 11S	3C			0.1	0.1	0.1	0.1				
Total			**1.18**	**1.48**	**0.2**	**0.2**	**0.2**	**0.2**	**0.43**	**0.45**	**0.1**	**0.1**

Emission Point ID No.	Sources Vented	Control Device	Proposed Emissions									
			VOC		2,4-TDI		MDI		Xylene		Ethylbenzene	
			lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
E1	S1-S11, R1-R3	C1, C2, C3	1	1	0.1	0.1	0.1	0.1	Xylene and Ethylbenzene are not used at this facility. These chemicals need to be removed from the permit.			
E2	D1, D5, FS4	C4	1	1	0.1	0.1	0.1	0.1				
E3	D1 Vacuum Pump	C5	1	1	0.1	0.1	0.1	0.1				
E4	Bulk Tank Filling Station	C6	1	1	0.1	0.1	0.1	0.1				
E5	R11-R13, R7 TDI Drum Vent	C7	1	1	0.1	0.1	0.1	0.1				
E6	R5-R10, S12	C8	1	1	0.1	0.1	0.1	0.1				
E7	S13	None	negligible	negligible								
Total			**6**	**6.00**	**0.60**	**0.60**	**0.60**	**0.60**	**0**	**0**	**0**	**0**

MDI Calculator Results (attached) = 6.83672 lb/yr 0.0034184 ton/yr MDI
TDI Calculator Results (attached) = 267 lb/yr 0.1335 ton/yr TDI

MDI Calculator predicts emissions from tank working and breathing losses, fugitives, equipment leaks, and filling-blending operations
TDI Calculator predicts emissions from fugitive and equipment leaks

Stockmeier Urethanes USA, Inc.

Natural Gas Fired Emergency Generator Engine 100 kW

EPA Certification # EGNXB06.82C1-029

Pollutant	Generac QT100 w/catalyst		
	E.F.	Emissions	
	g/bhp-hr	(lb/hr)	(tpy)
CO	0.9	0.30	0.074
NOx	0.16	0.05	0.013
THC (= VOC)	0.42	0.14	0.034

	lb/mmBtu		
PM	0.0099871	0.014	0.0034
SO2	0.000588	0.0008	0.0002
Formaldehyde	0.03168	0.04	0.011
Methane	1.25	1.69	0.42
CO2	110	149.09	37

Brake Horsepower	149
Fuel Consumption (lb/hr)	56.24
mmBtu/hr (input)	1.36
Annual Hours	500

56.24 lb/hr fuel flow
24,100 Btu/lb
1,355,384 Btu/hr

56.24 lb/hr x 24,100 Btu/lb = 1,355,384 btu/hr
1355384 Btu/hr x scf/1000 Btu = 1,355 scf/hr

1,355 scf/hr x 500 hr/yr = 677692 scf/yr
0.678 mmcf/yr

CO, NOx, and THC emission factors are manufacturer's data
CO2, PM, SO_2, and Methane emission factors are from AP-42, Chapter 3, Table 3.2-2.
Formaldehyde emission factor is AP-42 Table 3.2-2 with 40% reduction from APCD.

Diesel Fired Emergency Generator Engine 600 kW

EPA Certification # FCPXL18.1NYS-010

Pollutant	Generac Engine Model 2806C-E18TAG3		
	E.F.	Emissions	
	g/bhp-hr	(lb/hr)	(tpy)
CO	0.6	1.20	0.30
NOx +NMHC	3.88	7.78	1.94
PM	0.05	0.10	0.025

	lb/mmBtu		
SO2	0.29	1.69	0.423
Formaldehyde	0.00118	0.0069	0.00172
CO2	164	956.59	239.15

Brake Horsepower	909		
Fuel Consumption (gal/hr)	41.4	7.3	lb/gal
mmBtu/hr (input)	5.83	19,300	Btu/lb per AP-42
Annual Hours	500	5,832,846	Btu/hr

41.4 gal/hr x 7.3 lb/gal x 19,300 Btu/lb = 5,832,846 btu/hr

CO, NOx + THC, and PM emission factors are manufacturer's data
CO_2 and SO_2 emission factors are from AP-42, Chapter 3, Table 3.3-1.
Formaldehyde emission factor is AP-42 Table 3.3-2.

To: A1 Overview

M1 Tank

Show / Hide Guidance

Show / Hide Calculation Details

Tank Calculations

Tank Filling and Storage emissions estimate for working and storage losses

Clear Values

WORKING LOSSES

Term	Quantity	Unit	Comment
Throughput Volume	2,768,323	gal/year	Annual throughput per year. Enter value and select units.
Q_w	370,097	ft^3/year	Annual throughput of MDI pumped to the tank in ft^3 per year
T_{amb} Storage Temperature	68.0	F	Enter temperature and select units: F, K, or C.
T_{amb} Storage Temperature	20.0	C	Storage temperature in C
VP_{amb}	5.42E-06	mmHg	MDI vapor pressure based on temperature
M_w	250.26	g/mole	Molecular weight of MDI
Percentage MDI	100	percent	Percent MDI in the MDI/PMDI mixtures. Enter value.
K_{MDI}	1.00		Adjustment factor based on temperature and percentage MDI
L_w	**1.72E-03**	**lb/yr**	Calculated emissions of diisocyanates from working losses

Clear Values

BREATHING LOSSES

Term	Quantity	Unit	Comment
Volume of Tank	8,000	gal	Enter value and select units.
V_T	8,000	gal	Volume of tank in gallons
L_T	90	percent	Percentage of tank that is liquid-filled
V_V	800	gal	Calculated volume of vapor space
Temperature Fluctuation Range	20.0	F	Enter value and select units.
T_R	11.1	C	Average day-night temperature fluctuation in C
T_{amb} Ambient Temperature	68.0	F	Enter temperature and select units: F, K, or C.
T_{amb} Ambient Temperature	20.0	C	Ambient temperature in C
K_E	0.038		Vapor expansion factor
M_{air}	0.0105	lb-mole/day	Total air displaced
VP_{amb}	5.42E-06	mmHg	MDI vapor pressure based on temperature
M_w	250.26	g/mole	Molecular weight of MDI
K_{MDI}	0.92		Adjustment factor based on temperature and percentage MDI
L_b	**6.31E-06**	**lb/yr**	Calculated emissions of diisocyanates from breathing losses

Total Emissions	**1.72E-03**	**lb/yr**	**Calculated emissions of diisocyanates (combined)**

To A1 Overview

M7 Filling-Blending Operation

Show/Hide Guidance

Show/Hide Calculation Details

Filling and Blending Operation

Calculation of emissions from filling/blending operations

Calculating Emissions from Mixing/Blending/Filling Process

Calculating Stack Emissions

Estimating emissions from a mixing/blending operation will correspond to the total volume of air displaced from the containers at the filling temperature. The reasonable worst case scenario will be to assume that the volume of air displaced from the container is saturated with MDI/PMDI. Loses will be experienced when the reactor or blend tank is filled with the MDI/PMDI mixture and when the reactor/blend tank is emptied into containers. Loses will be based upon the volume of MDI/PMDI charged to the reactor/blend tank and the volume of containers filled with the blend.

The filling losses can be estimated from the following equation:

$$L_{fill} = V_{air} * (1 / 359) * (273.15 / T_{fill}) * (VP_{MDI} / 760) * M_w * K_{MDI} * C_{blnd}$$

Where:

L_{fill} = the emissions from the filling operation in lbs/year

V_{air} = the annual volume of displaced air in ft^3/year

T_{fill} = the temperature the material is charged or filled at in K

VP_{MDI} = the vapor pressure of MDI in mm Hg at the charging/filling temperature.

M_w = the molecular weight of MDI (250.26)

K_{MDI} = the adjustment factor to the vapor pressure

C_{blnd} = the proportion of MDI/PMDI in the blend. If only MDI/PMDI is filled then C_{blnd} is 1.

How many sets of data do you have?	1	Select

Clear Values

Term	Quantity	Unit	Comment	Data Set #
% MDI in MDI/PMDI	91	percent	Enter percentage of MDI in MDI/PMDI, 1-100.	1
C_{blnd}	100	percent	Enter percentage of MDI/PMDI in the blend, 1-100.	1
Volume of Container	28,018.0	gal	Enter volume of displaced air in each container	1
Number of Containers	4,366	1/yr	Enter number of containers per year	1
V_{air}	16,353,821.93	ft^3/yr	Annual volume of displaced air	1
T_{fill}	86.0	F	Enter temperature and select units: F, K, or C.	1
T_{fill}	30.0	C	Charging/filling temperature, in C	1
VP_{MDI}	1.89E-05	mmHg	MDI vapor pressure based on temperature	1
M_W	250.26	g/mole	Molecular weight of MDI	1
K_{MDI}	0.93		Adjustment factor to the vapor pressure	1
				1
L_{fil}	**2.37E-01**	**lb/yr**	Calculated emissions of diisocyanates	1

L_{fil}	**2.37E-01**	**lb/yr**	Calculated emissions of diisocyanates	GRAND TOTAL

To: A1 Overview

M2 Fugitive-Monitoring Data

Show/Hide Guidance

Show/Hide Calculation Details

Fugitive Emissions - From Monitoring Data

Fugitive emissions calculated from monitoring data

Fugitive Emissions - using monitoring data in a building

Fugitive emissions are air releases of volatile chemicals that typically occur due to leaks from fittings and seals in chemical process equipment, transfer operations or storage systems. Direct measurement or monitoring data can be used to estimate fugitive emissions. In the absence of direct measurement or monitoring data, industrial hygiene data on MDI concentrations in the workplace can be used to estimate MDI or MDI/PMDI fugitive emissions. This technique can only be used if the industrial hygiene data are representative of average concentrations throughout the year and throughout the building.

The fugitive emissions can be estimated from the following expression:

$$L_{fg} = C_{mdi}/1{,}000{,}000 * (V_B / 359) * N_{year} * (273.15 / T_{amb}) * M_w * K_f$$

Where:
L_{fg} = the fugitive emissions in lb/year.
C_{mdi} = the average MDI concentration, in ppmv, in the air within the building.
V_B = the volume of the workspace building in ft^3.
N_{year} = the number of air exchanges per year.
T_{amb} = the ambient temperature in K.
M_w = the molecular weight of MDI (250.26).
K_f = the adjustment factor to the MDI concentration in the building air. API uses a value of 1.10

How many sets of monitoring data do you have?	1	Select

Clear Values

Term	Quantity	Unit	Comment	Data Set #
C_{mdi}	0.150	ppbv	Average MDI concentration in the air within the building. Enter value and select input units.	1
V_B	10,944,000	ft^3	Enter value. Volume of the workspace building in ft^3.	1
N_{year}	22,500	1/year	Number of air exchanges per year. Enter value.	1
T_{amb} Ambient Temperature	68.0	F	Enter temperature and select units: F, K, or C.	1
				1
L_{fg}	**2.639E+01**	**lb/yr**	Calculated emissions of diisocyanates	1

L_{fg}	**2.639E+01**	**lb/yr**	Calculated emissions of diisocyanates	GRAND TOTAL

To A1 Overview

M3 Fugitive-Equipment Leaks

Show / Hide Guidance

Show / Hide Calculation Details

Fugitive Emissions - From Equipment Leaks

Fugitive emissions calculated from equipment leaks

The MDI emissions from equipment leaks using the Modified Correlation Approach can be determined using the following equations:

$$S_V = [1{,}315.8 \times 10[(10.902 - 4634.09/(266.15 + t)]\,]$$

Where:
S_V = Screening Value in ppmv and t = Temperature in °C.

The calculated screening value is then inserted into the Leak Rate/Screening Value Correlation Formula for the appropriate equipment type and the leakage rate is determined:

$$K_{gas} = 2.205 * 1.87 \times 10^{-6} * (S_V)^{0.873}$$
$$K_{liq} = 2.205 * 6.41 \times 10^{-6} * (S_V)^{0.787}$$
$$K_{pump} = 2.205 * 1.90 \times 10^{-5} * (S_V)^{0.824}$$
$$K_{con} = 2.205 * 3.05 \times 10^{-6} * (S_V)^{0.885}$$

Where:
K_{gas} = the emission factor for gas valves in lb/year-item.
K_{liq} = the emission factor for liquid valves in lb/year-item.
K_{pump} = the emission factor for liquid pumps in lb/year-item.
K_{con} = the emission factor for connectors in lb/year-item.

Emissions for each screening type can then be estimated from the following equations:

$L_{...} = K_{...} * n_{...} * K_{...} * t$

$L_{gas} = K_{gas} * n_{gas} * K_{mdi} * t_{pr}$

$L_{liq} = K_{liq} * n_{liq} * K_{mdi} * t_{pr}$

$L_{pump} = K_{pump} * n_{pump} * K_{mdi} * t_{pr}$

$L_{con} = K_{con} * n_{con} * K_{mdi} * t_{pr}$

Where:

L_{gas} = the annual losses from gas valves in lb/yr.

n_{gas} = the number of gas valves.

L_{liq} = the annual losses from liquid valves in lb/yr.

n_{liq} = the number of liquid valves.

L_{pump} = the annual losses from liquid pumps in lb/yr.

n_{pump} = the number of liquid pumps.

L_{con} = the annual losses from connectors in lb/yr.

n_{con} = the number of connectors.

K_{mdi} = the adjustment factor to the vapor pressure.

t_{pr} = the total time in hours/year that the process is operating.

Total Emissions can then be estimated from the following expression:

$E_{tot} = L_{gas} + L_{liq} + L_{pump} + L_{con}$

How many sets of data do you have?	1	Select

Clear Values

Term	Quantity	Unit	Comment	Data Set #
Input Temperature	68.0	F	Enter temperature and select units: F, K, or C.	1
T	20.0	C	temperature in C used in calculation	1
S_V	0.007	ppmv	Screening Value in ppmv as function of temperature t	1
K_{gas}	5.22E-08	lb/hour-item	Emission factor for gas valves in lb/year-item	1
K_{liq}	2.75E-07	lb/year-item	Emission factor for liquid valves in lb/year-item	1
K_{pump}	6.78E-07	lb/year-item	Emission factor for liquid pumps in lb/year-item	1
K_{con}	8.02E-08	lb/year-item	Emission factor for connectors in lb/year-item	1
% MDI in MDI/PMDI	100.0	percent	Percentage of MDI/PMDI in feedstock	1
K_{MDI}	1.0000		Adjustment factor to the vapor pressure	1
Valves in Gas Service	0	items	Items in service	1
Valves in Liquid Service	236	items	Enter items in service	1
Pumps/Agitators	4	items	Enter items in service	1
Connectors (e.g., Quick Connects)	4	items	Enter items in service	1
Emissions from valves in gas service	0.00E+00	lb/hr	Emissions quantity	1
Emissions from valves in liquid service	6.50E-05	lb/hr	Emissions quantity	1
Emissions from pumps	2.71E-06	lb/hr	Emissions quantity	1
Emissions from Connectors	3.21E-07	lb/hr	Emissions quantity	1
t_{pr}	8,760	hrs/yr	Enter total time that the process or equipment is operating (i.e., in contact with MDI/PMDI)	1
L_{gas}	0.00E+00	lb/yr	Diisocyanate emissions from valves in gas service	1
L_{liq}	5.69E-01	lb/yr	Diisocyanate emissions from valves in liquid service	1
L_{pump}	2.38E-02	lb/yr	Diisocyanate emissions from pumps	1
L_{con}	2.81E-03	lb/yr	Diisocyanate emissions from Connectors	1
				1
E_{tot}	**5.96E-01**	**lb/yr**	Calculated emissions of diisocyanates	1

E_{tot}	**5.96E-01**	**lb/yr**	Calculated emissions of diisocyanates	GRAND TOTAL

To: A1 Overview

M1 Fugitive-Monitoring Data

Fugitive Emissions - From Monitoring Data

Show/Hide Calculation Details

Fugitive Emissions - using monitoring data in a building

Fugitive emissions are air releases of volatile chemicals that typically occur due to leaks from fittings and seals in chemical process equipment, transfer operations or storage systems. Direct measurement or monitoring data can be used to estimate fugitive emissions. In the absence of direct measurement or monitoring data, industrial hygiene data on TDI concentrations in the workplace can be used to estimate TDI fugitive emissions. This technique can only be used if the industrial hygiene data are representative of average concentrations throughout the year and throughout the building.

The fugitive emissions can be estimated from the following expression:

$$L_{fs} = C_{vbi}/1{,}000{,}000 * (V_B / 359) * N_{year} * (273.15 / T_{amb}) * M_w * K_f$$

Where:

L_{fs} = the fugitive emissions in lb/year.
C_{vbi} = the average TDI concentration, in ppbv or ppmv, in the air within the building.
V_B = the volume of the workspace building in ft^3.
N_{year} = the number of air exchanges per year.
T_{amb} = the ambient temperature in K.
M_w = the molecular weight of TDI (174.15).
K_f = the adjustment factor to the TDI concentration in the building air. API uses a value of 1.10

How many sets of monitoring data do you have?	1	Select

Clear Values

Term	Quantity	Unit	Comment	Item #
C_{tdi}	4.500	ppbv	Average TDI concentration in the air within the building. Enter value and select input units.	1
V_B	10,944,000	ft^3	Enter value. Volume of the workspace building in ft^3.	1
N_{year}	22,500	1/year	Number of air exchanges per year. Enter value.	1
T_{amb} Ambient Temperature	68.0	F	Enter value and select input units.	1
T_{amb} Ambient Temperature	20.0	C	Ambient Temperature in C	1
M_w	174.15	g/mole	Molecular weight of TDI	1
K_f	1.10		Adjustment factor to the TDI concentration in the building air	1
				1
L_{fg}	**5.51E+02**	**lb/yr**	Calculated emissions of diisocyanates	1

L_{fg}	**5.51E+02**	**lb/yr**	Calculated emissions of diisocyanates	GRAND TOTAL

To A1 Overview

M2 Fugitive-Equipment Leaks

Fugitive Emissions - From Equipment Leaks

Show / Hide Calculations

Do not use this method for components that do not leak, such as sealless pumps and welded fittings.

The TDI emissions from equipment leaks using the Modified Correlation Approach can be determined using the following equations:

$$S_v = 10[(11.763 - 3096.326/(t + 273.15))]$$

Where:
S_v = Screening Value in ppmv and t = Temperature in °C.

The calculated screening value is then inserted into the Leak Rate/Screening Value Correlation Formula for the appropriate equipment type and the leakage rate is determined:

$$K_{gas} = 2.205 * 1.87 \times 10^{-6} * (S_v)^{0.873}$$
$$K_{liq} = 2.205 * 6.41 \times 10^{-6} * (S_v)^{0.787}$$
$$K_{pump} = 2.205 * 1.90 \times 10^{-5} * (S_v)^{0.824}$$
$$K_{con} = 2.205 * 3.05 \times 10^{-6} * (S_v)^{0.885}$$

Where:
K_{gas} = the emission factor for gas valves in lb/year-item.
K_{liq} = the emission factor for liquid valves in lb/year-item.
K_{pump} = the emission factor for liquid pumps in lb/year-item.
K_{con} = the emission factor for connectors in lb/year-item.

Emissions for each screening type can then be estimated from the following equations:

$$L_{gas} = K_{gas} * n_{gas} * K_{mdi} * t_{pr}$$
$$L_{liq} = K_{liq} * n_{liq} * K_{mdi} * t_{pr}$$

$L_{pump} = K_{pump} * n_{pump} * K_{mdi} * t_{pr}$
$L_{con} = K_{con} * n_{con} * K_{mdi} * t_{pr}$

Where:
L_{gas} = the annual losses from gas valves in lb/yr.
n_{gas} = the number of gas valves.
L_{liq} = the annual losses from liquid valves in lb/yr.
n_{liq} = the number of liquid valves.
L_{pump} = the annual losses from liquid pumps in lb/yr.
n_{pump} = the number of liquid pumps.
L_{con} = the annual losses from connectors in lb/yr.
n_{con} = the number of connectors.
K_{mdi} = the adjustment factor to the vapor pressure.
t_{pr} = the total time in hours/year that the process is operating.

Total Emissions can then be estimated from the following expression:

$E_{tot} = L_{gas} + L_{liq} + L_{pump} + L_{con}$

Clear Values

Term	Quantity	Unit	Comment
Input Temperature	68.0	F	Enter temperature and select units.
T	20.0	C	temperature in C used in calculation
S_V	15.876	ppmv	Screening Value in ppmv as function of temperature t
K_{gas}	4.61E-05	lb/hour-item	Emission factor for gas valves in lb/year-item
K_{liq}	1.25E-04	lb/hour-item	Emission factor for liquid valves in lb/year-item
K_{pump}	4.09E-04	lb/hour-item	Emission factor for liquid pumps in lb/year-item
K_{con}	7.77E-05	lb/hour-item	Emission factor for connectors in lb/year-item
Valves in Gas Service	0	items	Items in service
Valves in Liquid Service	118	items	Enter items in service
Pumps/Agitators	0	items	Enter items in service
Connectors (e.g., Quick Connects)	0	items	Enter items in service
Emissions from valves in gas service	0.00E+00	lb/hr	Emissions quantity
Emissions from valves in liquid service	1.47E-02	lb/hr	Emissions quantity
Emissions from pumps	0.00E+00	lb/hr	Emissions quantity
Emissions from Connectors	0.00E+00	lb/hr	Emissions quantity
t_{pr}	8,760	hrs/yr	Enter total time that the process or equipment is operating (i.e., in contact with TDI)
L_{gas}	0.00E+00	lb/yr	Diisocyanate emissions from valves in gas service
L_{liq}	1.29E+02	lb/yr	Diisocyanate emissions from valves in liquid service
L_{pump}	0.00E+00	lb/yr	Diisocyanate emissions from pumps
L_{con}	0.00E+00	lb/yr	Diisocyanate emissions from Connectors
E_{tot}	**1.29E+02**	**lb/yr**	Calculated emissions of diisocyanates

ATTACHMENT P

Public Notice

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Stockmeier Urethanes, Inc., has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Modification Permit to increase production limits at its facility located at 20 Columbia Boulevard, Clarksburg, in Harrison County, West Virginia. The latitude and longitude coordinates are: 39.28193 degrees North and 80.29410 degrees West.

The applicant estimates a net change in potential to discharge the following Regulated Air Pollutants will be:

Carbon Monoxide (CO): 0.375 tons per year
Oxides of Nitrogen (NOx): 0.013 tons per year
Particulate Matter (PM): 0.028 tons per year
Sulfur Dioxide (SO_2): 0.423
Volatile Organic Compounds (VOC): 4.554 tons per year
Total Hazardous Air Pollutants (HAPs): 0.262 tons per year

Modification of the operation began during the first quarter of 2015. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.

Dated this the 10th day of May, 2016.

By: Stockmeier Urethanes, Inc.
Bryan R. Morris
VP TS&D and EHS
P.O. Box 1456
Clarksburg, WV 26302-1456