



**Addivant**  
1000 Morgantown Industrial Park  
Morgantown, WV 26501  
Tel: 304-284-2214

July 21, 2017

Director  
West Virginia Department of Environmental Protection  
Division of Air Quality – Permitting Section  
601 57<sup>th</sup> Street S.E.  
Charleston, WV 25304

**RE: Permit Determination Request – Addivant USA, LLC  
North Plant – W430ZP Trial Process  
DAQ Plant I.D. No.: 061-00061**

Dear Director,

Addivant USA, LLC (“Addivant”) is planning to continue a trial of new product to an existing chemical manufacturing unit at the North Plant facility. Addivant completed a three-batch trial of a new product called Weston 430 Zero Phenol (W430ZP) which is a variation of a current product W430 in June 2017. Addivant plans to continue the trial operation until April 2018 producing no more than eight batches per month. This trial product will utilize existing equipment (i.e. tanks, reactor, receiver, condenser, knock out pot, hot well, waste tote) with the exception of the two portable tanks that will only be used for this trial. The existing facility is true minor source under Federal and State regulations, and will remain a true minor source after the proposed changes.

Enclosed is the permit determination form (PDF) along with the following attachments:

- Attachment A – Map of Facility,
- Attachment B – Process Flow Diagram,
- Attachment C – Process Description,
- Attachment D – Safety Data Sheets, and
- Attachment E - Potential-to-Emit Estimates.

Based on the potential-to-emit calculations for the W430ZP trial process, the continued production will not increase the emission above the permitting thresholds for modification as defined in 45 CSR 13: the reasonably calculated maximum potential emissions are under two (2) lb/hr OR five (5) tons/year of total Hazardous Air Pollutants (HAPs); six (6) lbs/hr and ten (10) tons per year or 144 pounds per calendar day of any regulated pollutant.

As requested for all permitting actions, one hardcopy and two electronic copies are included with this submittal. Should the department have any questions or need clarification on any part of this application package, please contact me via e-mail or at 304-284-2214.

Sincerely,

Julie Szymanek  
Environmental Engineer  
Julie.Szymanek@addivant.com

Attachments: PDF and Attachment A, B, C, D, and E  
Enclosures: 2 electronic copies



WEST VIRGINIA  
 DEPARTMENT OF ENVIRONMENTAL PROTECTION  
 DIVISION OF AIR QUALITY  
 601 57<sup>th</sup> Street, SE  
 Charleston, WV 25304  
 Phone: (304) 926-0475  
 www.dep.wv.gov/daq

**PERMIT DETERMINATION FORM  
(PDF)**

FOR AGENCY USE ONLY: PLANT I.D. # \_\_\_\_\_  
 PDF # \_\_\_\_\_ PERMIT WRITER: \_\_\_\_\_

1. NAME OF APPLICANT (AS REGISTERED WITH THE WV SECRETARY OF STATE'S OFFICE): Addivant USA, LLC		
2. NAME OF FACILITY (IF DIFFERENT FROM ABOVE): Morgantown North Plant		3. NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODE:  <b>325199</b>
4A. MAILING ADDRESS: 1000 Morgantown Industrial Park, Morgantown, WV 26501		4B. PHYSICAL ADDRESS: 1000 Morgantown Industrial Park, Morgantown, WV 26501
5A. DIRECTIONS TO FACILITY (PLEASE PROVIDE <b>MAP AS ATTACHMENT A</b> ): I-79 Exit 152. Proceed on Rt 19 N approximately ¾ miles. Turn right onto DuPont Road and proceed to first stop sign. Cross over County Road 45 and enter Morgantown Industrial Park. Take a left at the first stop sign, and then take the next immediate left.		
5B. NEAREST ROAD: County Road 45	5C. NEAREST CITY OR TOWN: Morgantown	5D. COUNTY: Monongalia
5E. UTM NORTHING (KM): 4384.842	5F. UTM EASTING (KM): 587.954	5G. UTM ZONE: 17
6A. INDIVIDUAL TO CONTACT IF MORE INFORMATION IS REQUIRED: Julie Szymanek		6B. TITLE: Environmental Engineer
6C. TELEPHONE: (304) 284-2214	6D. FAX: (304) 284-2363	6E. E-MAIL: Julie.Szymanek@addivant.com
7A. DAQ PLANT I.D. NO. (FOR AN EXISTING FACILITY ONLY):  <b>061-00061</b>		7B. PLEASE LIST ALL CURRENT 45CSR13, 45CSR14, 45CSR19 AND/OR TITLE V (45CSR30) PERMIT NUMBERS ASSOCIATED WITH THIS PROCESS (FOR AN EXISTING FACILITY ONLY):  None
7C. IS THIS PDF BEING SUBMITTED AS THE RESULT OF AN ENFORCEMENT ACTION? IF YES, PLEASE LIST: NA		
8A. TYPE OF EMISSION SOURCE (CHECK ONE): <input type="checkbox"/> NEW SOURCE <input type="checkbox"/> ADMINISTRATIVE UPDATE <input checked="" type="checkbox"/> MODIFICATION <input type="checkbox"/> OTHER (PLEASE EXPLAIN IN 11B)		8B. IF ADMINISTRATIVE UPDATE, DOES DAQ HAVE THE APPLICANT'S CONSENT TO UPDATE THE EXISTING PERMIT WITH THE INFORMATION CONTAINED HEREIN?  <input type="checkbox"/> YES <input type="checkbox"/> NO
9. IS <i>DEMOLITION</i> OR <i>PHYSICAL RENOVATION</i> AT AN EXISTING FACILITY INVOLVED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
10A. DATE OF ANTICIPATED INSTALLATION OR CHANGE:  <u>08/14/2017</u>		10B. DATE OF ANTICIPATED START-UP:  <u>08/14/2017</u>
11A. PLEASE PROVIDE A <b>DETAILED PROCESS FLOW DIAGRAM</b> SHOWING EACH PROPOSED OR MODIFIED PROCESS EMISSION POINT AS <b>ATTACHMENT B</b> .		
11B. PLEASE PROVIDE A <b>DETAILED PROCESS DESCRIPTION</b> AS <b>ATTACHMENT C</b> .		
12. PLEASE PROVIDE <b>MATERIAL SAFETY DATA SHEETS (MSDS)</b> FOR ALL MATERIALS PROCESSED, USED OR PRODUCED AS <b>ATTACHMENT D</b> . FOR CHEMICAL PROCESSES, PLEASE PROVIDE A MSDS FOR EACH COMPOUND EMITTED TO AIR.		

**13A. REGULATED AIR POLLUTANT EMISSIONS:**

⇒ **FOR A NEW FACILITY**, PLEASE PROVIDE PLANT WIDE EMISSIONS BASED ON THE POTENTIAL TO EMIT (PTE) FOR THE FOLLOWING AIR POLLUTANTS INCLUDING ALL PROCESSES.

⇒ **FOR AN EXISTING FACILITY**, PLEASE PROVIDE THE PROPOSED CHANGE IN EMISSIONS BASED ON THE PTE OF ALL PROCESS CHANGES FOR THE FOLLOWING AIR POLLUTANTS.

PTE FOR A GIVEN POLLUTANT IS TYPICALLY BEFORE AIR POLLUTION CONTROL DEVICES AND IS COLLECTED BASED ON THE MAXIMUM DESIGN CAPACITY OF PROCESS EQUIPMENT.

POLLUTANT	HOURLY PTE (LB/HR)	YEARLY PTE (TON/YR) (HOURLY PTE MULTIPLIED BY 8760 HR/YR) DIVIDED BY 2000 LB/TON
PM		
PM <sub>10</sub>		
VOCs	3.00	1.48
CO		
NO <sub>x</sub>		
SO <sub>2</sub>		
Pb		
HAPs (AGGREGATE AMOUNT)	1.04	0.50
TAPs (INDIVIDUALLY)*		
OTHER - Methanol	1.04	0.50

\* ATTACH ADDITIONAL PAGES AS NEEDED

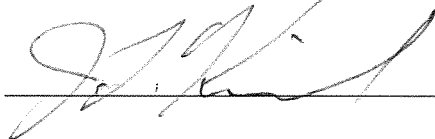
**13B. PLEASE PROVIDE ALL SUPPORTING CALCULATIONS AS ATTACHMENT E.**

CALCULATE AN HOURLY AND YEARLY PTE OF EACH PROCESS EMISSION POINT (SHOWN IN YOUR DETAILED PROCESS FLOW DIAGRAM) FOR ALL AIR POLLUTANTS LISTED ABOVE INCLUDING INDIVIDUAL HAP'S (LISTED IN SECTION 112[b] OF THE 1990 CAAA), TAP'S (LISTED IN 45CSR27), AND OTHER AIR POLLUTANTS (E.G. POLLUTANTS LISTED IN TABLE 45-13A OF 45CSR13, MINERAL ACIDS PER 45CSR7, ETC.).

**14. CERTIFICATION OF DATA**

I, JON KIMMEL, (TYPE NAME) ATTEST THAT ALL THE REPRESENTATIONS CONTAINED IN THIS APPLICATION, OR APPENDED HERETO, ARE TRUE, ACCURATE, AND COMPLETE TO THE BEST OF MY KNOWLEDGE BASED ON INFORMATION AND BELIEF AFTER REASONABLE INQUIRY, AND THAT I AM A **RESPONSIBLE OFFICIAL**\*\* (PRESIDENT, VICE PRESIDENT, SECRETARY OR TREASURER, GENERAL PARTNER OR SOLE PROPRIETOR) OF THE APPLICANT.

SIGNATURE OF RESPONSIBLE OFFICIAL: \_\_\_\_\_



TITLE: SITE DIRECTOR

DATE: 07/21/2017

\*\*THE DEFINITION OF THE PHRASE 'RESPONSIBLE OFFICIAL' CAN BE FOUND AT 45CSR13, SECTION 2.23.

**NOTE: PLEASE CHECK ENCLOSED ATTACHMENTS:**

ATTACHMENT A     ATTACHMENT B     ATTACHMENT C     ATTACHMENT D     ATTACHMENT E

RECORDS ON ALL CHANGES ARE REQUIRED TO BE KEPT AND MAINTAINED ON-SITE FOR TWO (2) YEARS.

THE PERMIT DETERMINATION FORM WITH THE INSTRUCTIONS CAN BE FOUND ON DAQ'S PERMITTING SECTION WEB SITE:

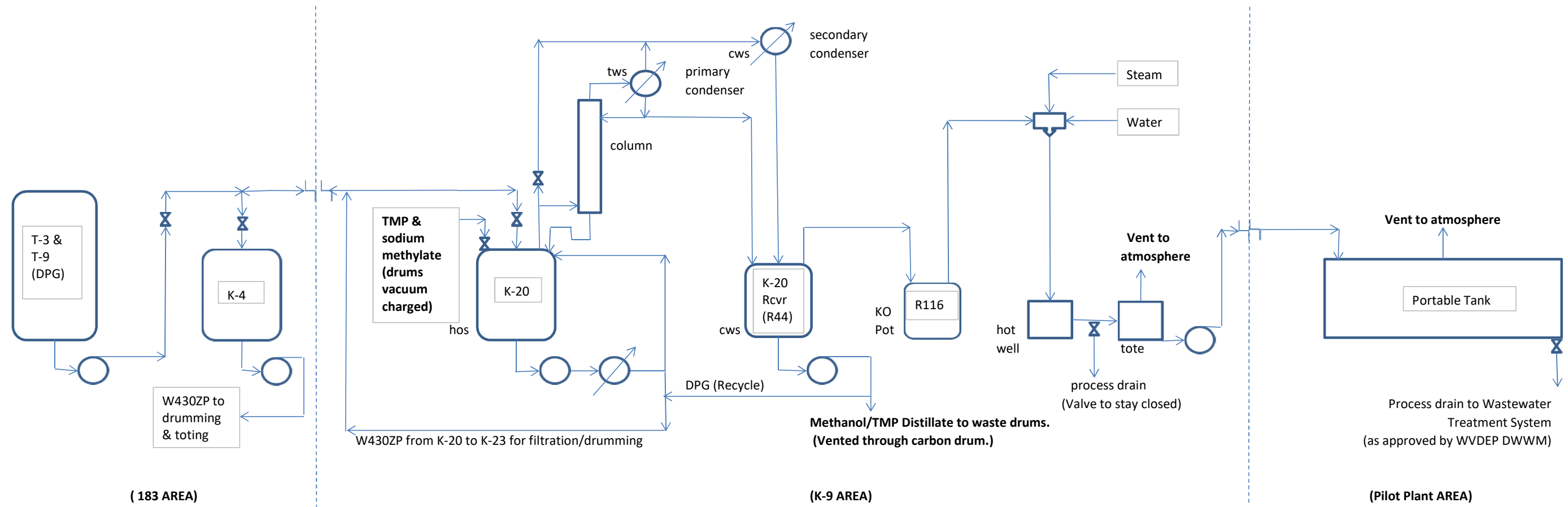
[www.dep.wv.gov/daq](http://www.dep.wv.gov/daq)

# Attachment A – Map of Facility



Attachment B – Process Flow Diagram

W430 (Zero Phenol) Process Flow Diagram for Plant Trial



## Attachment C – Process Description

## **Description of Plant Trial of W430ZP (Zero Phenol)**

Currently, W430 is produced in the plant by reacting Triphenyl Phosphite (TPP) with Di-Propylene Glycol (DPG) in the presence of catalyst (sodium methylate). Phenol and excess DPG are removed from the product, and the product is then cooled down, filtered, and transferred into plastic totes or drums. This operation is all performed at the 183 Production area, using the K-3 reactor and K-23 filtration vessel systems.

The regular W430 product contains residual phenol, and the customer for this product has now requested a phenol-free version of this product. The W430ZP grade uses Trimethyl Phosphite (TMP) instead of the TPP to react with the DPG. Methanol is generated instead of phenol, and excess DPG is still removed from the product at the end of the reaction. The product would then still need to be cooled down, filtered and transferred into plastic totes or drums.

A 3-batch plant trial was completed in June 2017 to demonstrate the ability to successfully produce the product within the specification determined by the customer. Addivant was successful during this trial. Therefore, Addivant wants to continue the trial process until the scale-up process is completed. The continued trial will be at no more than 8 batches per month.

The reaction is done in the K-20 reactor, located in the K-9 Production Building. DPG would be metered into K-20, and drums of TMP would be vacuum transferred into the reactor. Catalyst would be added last. Methanol would be distilled through an existing, distillation column and condenser and would collect in a receiver. Chilled water would be used on the condenser and receiver jacket to collect the methanol. An existing water/steam jet utility would be used in the distillation process. The effluent from the water/steam jets will be collected into temporary portable holding tanks. Once the methanol is removed from the batch by a combination of atmospheric and vacuum distillation, the methanol from the receiver will be pumped into waste drums. Excess DPG would then be vacuum distilled into the same receiver to complete the distillation process for the batch. The collected DPG in the receiver will be re-used in the next batch of W430ZP produced. The resulting W430ZP product in K-20 would then be cooled down using an external product cooler and transferred to the K-4 filtration vessel, located at the 183 Production Building. The W430ZP will then be filtered in K-4, then transferred into plastic totes or drums after passing QC approval testing.

Any vapors from the DPG & TMP charging operation and the methanol distillation operation will be scrubbed by the water/steam jet utility. Vapors from the methanol drumming operations will be exhausted through an activated carbon drum unit.



No additional plant modifications will be performed for the continued plant trial. Upon a successful trial, a new vacuum system and other equipment would be installed for an improved, plant production process.

## Attachment D – Safety Data Sheets



# WESTON® 430ZP

Version	10
Revision Date	01/18/2017
Print Date	02/07/2017
Country	US
Language:	EN

## SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product code : 400000006372  
Chemical nature : Polymer stabilizer

### Details of the supplier of the safety data sheet

Company: Addivant USA, LLC  
4 Mountainview Terrace  
Suite 200  
Danbury, CT  
United States of America (USA)  
06810  
Telephone : 1-800-962-8641 (US) only

Prepared by msdsrequest@addivant.com

Further information for the safety data sheet :  
msdsrequest@addivant.com

### Emergency telephone number

Emergency telephone number: 866-928-0789  
For additional emergency telephone numbers see section 16 of the Safety Data Sheet.

Disposal considerations : msdsrequest@addivant.com

### Recommended use of the chemical and restrictions on use

Recommended use : Polymer  
Stabilizer

Restrictions on use : For professional and industrial installation and use only.

## SECTION 2. HAZARDS IDENTIFICATION

### Emergency Overview

Appearance	liquid
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Colour	clear, to, yellow
Odour	mild
Hazard Summary	No information available.

### GHS Classification

Skin sensitisation : Category 1

### GHS label elements

Hazard pictograms :



Signal word : Warning

Hazard statements : H317 May cause an allergic skin reaction.

Precautionary statements :

**Prevention:**  
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.  
P272 Contaminated work clothing should not be allowed out of the workplace.  
P280 Wear protective gloves.

**Response:**  
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.  
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.  
P363 Wash contaminated clothing before reuse.

**Disposal:**  
P501 Dispose of contents/ container to an approved waste disposal plant.

### Potential Health Effects

Aggravated Medical Condition : None known.

Symptoms of Overexposure : Sensitisation

### Carcinogenicity:

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Polymer stabilizer

### Hazardous components

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Chemical name	CAS-No.	Concentration (%)
7-[2-(2-hydroxymethylethoxy)methylethoxy]tetramethyl-3,6,8,11-tetraoxa-7-phosphatridecane-1,13-diol	36788-39-3	>= 90 - <= 100

#### SECTION 4. FIRST AID MEASURES

- If inhaled : Move to fresh air in case of accidental inhalation of dust or fumes from overheating or combustion.  
If symptoms persist, call a physician.
- In case of skin contact : Take off contaminated clothing and shoes immediately.  
Wash off with soap and plenty of water.
- In case of eye contact : IF IN EYES: Rinse cautiously with water for several minutes.  
Remove contact lenses, if present and easy to do. Continue rinsing.
- If swallowed : Clean mouth with water and drink afterwards plenty of water.  
Do not give milk or alcoholic beverages.  
Never give anything by mouth to an unconscious person.
- Most important symptoms and effects, both acute and delayed : May cause an allergic skin reaction.  
Sensitisation
- Notes to physician : The first aid procedure should be established in consultation with the doctor responsible for industrial medicine.

#### SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Specific hazards during firefighting : No information available.
- Specific extinguishing methods :
- Further information : Standard procedure for chemical fires.
- Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.

#### SECTION 6. ACCIDENTAL RELEASE MEASURES

- Environmental precautions : No special environmental precautions required.



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Methods and materials for containment and cleaning up : Wipe up with absorbent material (e.g. cloth, fleece).  
Keep in suitable, closed containers for disposal.

## SECTION 7. HANDLING AND STORAGE

Advice on safe handling : For personal protection see section 8.  
No special handling advice required.

Materials to avoid : No special restrictions on storage with other products.

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Hazardous components without workplace control parameters

### Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.

### Hand protection

Remarks : For prolonged or repeated contact use protective gloves.

Eye protection : Safety glasses

Skin and body protection : Protective suit

Hygiene measures : General industrial hygiene practice.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Colour : clear, to, yellow

Odour : mild

Odour Threshold : No data available

pH : No data available

Melting point/range : No data available

Boiling point/boiling range : No data available



# WESTON® 430ZP

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Flash point	: > 200 °C
Vapour pressure	: No data available
Relative density	: No data available
Density	: No data available
Solubility(ies) Water solubility	: No data available
Partition coefficient: n-octanol/water	: No data available
Viscosity Viscosity, kinematic	: Not applicable
Explosive properties	: Not applicable
Oxidizing properties	: No data available
Surface tension	: not determined

## SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Stable under recommended storage conditions.
Chemical stability	: No decomposition if stored and applied as directed.
Possibility of hazardous reactions	: No hazards to be specially mentioned.
Conditions to avoid	: No data available
Incompatible materials	: Water
Hazardous decomposition products	: No hazardous decomposition products are known.

## SECTION 11. TOXICOLOGICAL INFORMATION

### Acute toxicity

#### Product:

Acute oral toxicity	: Remarks: Not classified due to lack of data.
Acute dermal toxicity	: Acute toxicity estimate : 2,778 mg/kg Method: Calculation method

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Language:	EN

**Components:****7-[2-(2-hydroxymethylethoxy)methylethoxy]tetramethyl-3,6,8,11-tetraoxa-7-phosphatridecane-1,13-diol:**

Acute oral toxicity : LD50 (Rat): &gt; 5,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 2 mg/l  
Test atmosphere: dust/mist

Acute dermal toxicity : LD50 (Rabbit): &gt; 2,000 mg/kg

**Skin corrosion/irritation****Product:**

Remarks: Not classified due to lack of data.

**Serious eye damage/eye irritation****Product:**

Remarks: According to the classification criteria of the European Union, the product is not considered as being an eye irritant.

**Respiratory or skin sensitisation****Product:**

Remarks: No data available

**Germ cell mutagenicity****Product:**

Genotoxicity in vitro : Remarks: No data available

**Carcinogenicity****Product:**

Remarks: This information is not available.

**Reproductive toxicity****Product:**

Effects on fertility : Remarks: No data available

Effects on foetal development : Remarks: No data available

**Repeated dose toxicity****Product:**





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Remarks: No data available

**Aspiration toxicity**

**Product:**

No data available

**Further information**

**Product:**

Remarks: No data available

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**SECTION 12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

**Product:**

Toxicity to fish : Remarks: No data is available on the product itself.

Toxicity to algae : Remarks: No data is available on the product itself.

Toxicity to bacteria : Remarks: No data is available on the product itself.

**Persistence and degradability**

**Product:**

Biodegradability : Remarks: No data available

**Bioaccumulative potential**

**Product:**

Bioaccumulation : Remarks: No data available

**Components:**

**7-[2-(2-hydroxymethylethoxy)methylethoxy]tetramethyl-3,6,8,11-tetraoxa-7-phosphatridecane-1,13-diol:**

Partition coefficient: n-octanol/water : log Pow: -1.56 (25 °C)

**Mobility in soil**

No data available

**Other adverse effects**

No data available



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**Product:**

Regulation 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances

Remarks This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Additional ecological information : There is no data available for this product.

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## SECTION 13. DISPOSAL CONSIDERATIONS

**Disposal methods**

Waste from residues : Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging : Empty remaining contents.  
Empty containers should be taken to an approved waste handling site for recycling or disposal.

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## SECTION 14. TRANSPORT INFORMATION

**DOT**

Not dangerous goods

**TDG**

Not dangerous goods

**ADR**

Not dangerous goods

**IATA**

Not dangerous goods

**IMDG**

Not dangerous goods

**RID**

Not dangerous goods



# WESTON® 430ZP

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## SECTION 15. REGULATORY INFORMATION

**TSCA list** : No substances are subject to a Significant New Use Rule.  
 No substances are subject to TSCA 12(b) export notification requirements.

### EPCRA - Emergency Planning and Community Right-to-Know Act

#### CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

#### SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

**SARA 311/312 Hazards** : Acute Health Hazard

**SARA 302** : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

### Clean Air Act

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489):

oxydipropanol	25265-71-8	50 %
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### Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

**California Prop 65** : This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

### The components of this product are reported in the following inventories:

REACH : Not in compliance with the inventory

:  
:

DSL : This product contains the following components listed on the Canadian NDSL. All other components are on the Canadian

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DSL.

AICS	: On the inventory, or in compliance with the inventory
NZIoC	: Not in compliance with the inventory
ENCS	: On the inventory, or in compliance with the inventory
ISHL	: On the inventory, or in compliance with the inventory
KECI	: On the inventory, or in compliance with the inventory
PICCS	: Not in compliance with the inventory
IECSC	: On the inventory, or in compliance with the inventory
TCSI	: Not in compliance with the inventory
TSCA	: On TSCA Inventory

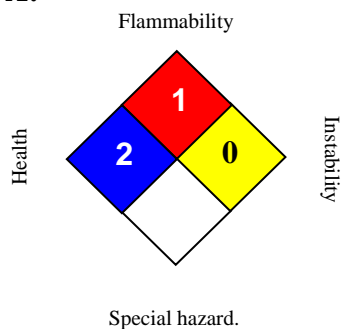
### Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

## SECTION 16. OTHER INFORMATION

### Further information

#### NFPA:



#### HMIS III:

<b>HEALTH</b>	<b>2/</b>
<b>FLAMMABILITY</b>	<b>1</b>
<b>PHYSICAL HAZARD</b>	<b>0</b>

0 = not significant, 1 =Slight,  
2 = Moderate, 3 = High  
4 = Extreme, \* = Chronic



# WESTON® 430ZP

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Language:	EN

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

## Carechem24 International Worldwide Coverage - Addivant

### Emergency Phone Numbers:

<u>Europe:</u>	All European Countries	+44 (0) 1235 239 670
<u>Asia Pacific:</u>	East / South East Asia	Regional Number : +65 3158 1074
	Australia	+61 2801 44558
	New Zealand	+64 9929 1483
	China Taiwan	+86 10 5100 3039
	Japan	+81 345 789 341
	Indonesia	00780 3011 0293
	:Malaysia	+60 3 6207 4347
	Thailand	001800 1 2066 6751
	Korea	+65 3158 1285
	Vietnam	+65 3158 1255
	India	+65 3158 1198
	Pakistan	+65 3158 1329
	Philippines	+65 31581203
	Sri Lanka	+65 3158 1195
	Bangladesh	+65 3158 1200
<u>Middle East / Africa:</u>	Arabic speaking countries	+44 (0) 1235 239 671
	All other countries	+44 (0) 1235 239 670
<u>America</u>	United States / Canada	001866 928 0789
<u>Latin America:</u>	Brazil	+55 113 711 9144
	All other countries	+44 (0) 1235 239 670
	Mexico	+52 555 004 8763

## Safety Data Sheet Dipropylene glycol

Version 1.1

Revision Date: 10/17/2016

### SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

**Product name** : Dipropylene glycol

#### Recommended use of the chemical and restrictions on use

**Recommended use** : Intermediate  
Binding agent  
Release agent

#### Manufacturer or supplier's details

**Company** : Nexeo Solutions, LLC.  
**Address** : 3 Waterway Square Place Suite 1000  
The Woodlands, TX. 77380  
United States of America

#### Emergency telephone number:

Health North America: 1-855-NEXEO4U (1-855-639-3648)  
Health International: 1-855-NEXEO4U (1-855-639-3648)  
Transport North America: CHEMTREC (1-800-424-9300)

**Additional Information:** : Responsible Party: Product Safety Group  
E-Mail: msds@nexeosolutions.com  
SDS Requests: 1-855-429-2661  
SDS Requests Fax: 1-281-500-2370  
Website: www.nexeosolutions.com

### SECTION 2. HAZARDS IDENTIFICATION

#### GHS Classification

Not a hazardous substance or mixture.

#### GHS Label element

Not a hazardous substance or mixture.

#### Other hazards

None known.

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Substance / Mixture** : Substance

#### Hazardous components

No hazardous ingredients

**Molecular formula** : C6-H14-O3

### SECTION 4. FIRST AID MEASURES

**General advice** : Move out of dangerous area.  
Show this safety data sheet to the doctor in attendance.  
Do not leave the victim unattended.

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- |                         |   |   |
|-------------------------|---|---|
| If inhaled              | : | Consult a physician after significant exposure.<br>If unconscious place in recovery position and seek medical advice.   |
| In case of skin contact | : | If skin irritation persists, call a physician.<br>If on skin, rinse well with water.<br>If on clothes, remove clothes.  |
| In case of eye contact  | : | Immediately flush eye(s) with plenty of water.<br>Keep eye wide open while rinsing.<br>If eye irritation persists, consult a specialist.  |
| If swallowed            | : | Clean mouth with water and drink afterwards plenty of water.<br>Keep respiratory tract clear.<br>Never give anything by mouth to an unconscious person.<br>If symptoms persist, call a physician.<br>Do not induce vomiting without medical advice. |

---

**SECTION 5. FIREFIGHTING MEASURES**

- |   |   |   |
|---|---|---|
| Suitable extinguishing media                  | : | Dry chemical<br>Water spray<br>Foam<br>Carbon dioxide (CO <sub>2</sub> )  |
| Unsuitable extinguishing media                | : | High volume water jet   |
| Specific hazards during fire-fighting         | : | Do not allow run-off from fire fighting to enter drains or water courses.   |
| Hazardous combustion products                 | : | Carbon oxides   |
| Specific extinguishing methods                | : | Use a water spray to cool fully closed containers.  |
| Further information                           | : | Standard procedure for chemical fires.<br>Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
| Special protective equipment for firefighters | : | Wear self-contained breathing apparatus for firefighting if necessary.<br>Use personal protective equipment.                                      |

---

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

- |   |   |  |
|---|---|--|
| Personal precautions, protective equipment and emergency procedures | : | Use personal protective equipment.<br>Ensure adequate ventilation. |
|---|---|--|

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- Environmental precautions : Prevent product from entering drains.  
Prevent further leakage or spillage if safe to do so.  
If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods and materials for containment and cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).  
Keep in suitable, closed containers for disposal.

**SECTION 7. HANDLING AND STORAGE**

- Advice on protection against fire and explosion : Normal measures for preventive fire protection.
- Advice on safe handling : Avoid formation of aerosol.  
Do not breathe vapours/dust.  
Avoid contact with skin and eyes.  
For personal protection see section 8.  
Smoking, eating and drinking should be prohibited in the application area.  
Provide sufficient air exchange and/or exhaust in work rooms.  
Dispose of rinse water in accordance with local and national regulations.
- Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.  
Electrical installations / working materials must comply with the technological safety standards.

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Components with workplace control parameters**

Contains no substances with occupational exposure limit values.

**Personal protective equipment**

- Respiratory protection : No personal respiratory protective equipment normally required.  
In the case of vapour formation use a respirator with an approved filter.
- Hand protection
- Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves.
- Eye protection : Eye wash bottle with pure water  
Tightly fitting safety goggles
- Skin and body protection : Impervious clothing  
Choose body protection according to the amount and concentration of the dangerous substance at the work place.



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Hygiene measures : When using do not eat or drink.  
When using do not smoke.  
Wash hands before breaks and at the end of workday.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

Appearance : liquid

Colour : Clear, Colorless

Odour : slight

Odour Threshold : No data available

pH : 6 - 7.4 @ 20 - 25 °C (68 - 77 °F)

Freezing Point (Melting point/freezing point) : < -20 °C (-4 °F)

Boiling Point (Boiling point/boiling range) : 222 - 236 °C (432 - 457 °F)

Flash point : 128 - 132 °C (262 - 270 °F)  
Method: Pensky-Martens closed cup

Evaporation rate : < 0.05  
(Butyl Acetate = 1)

Flammability (solid, gas) : No data available

Upper explosion limit : 12.6 %(V)

Lower explosion limit : 2.2 %(V)

Vapour pressure : 0.0097 - 0.01 mmHg @ 25 °C (77 °F)

Relative vapour density : < 4.63 @ 15 - 20 °C (59 - 68 °F)  
(Air = 1.0)

Relative density : 1.02 - 1.04 @ 20 - 25 °C (68 - 77 °F)  
Reference substance: (water = 1)

Density : 1.02 - 1.03 g/cm<sup>3</sup> @ 20 - 25 °C (68 - 77 °F)

Solubility(ies)  
Water solubility : completely miscible

Solubility in other solvents : No data available

Partition coefficient: n-octanol/water : log Pow: -0.462

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Auto-ignition temperature	: 310 - 337 °C
Thermal decomposition	: No data available
Viscosity	
Viscosity, dynamic	: 75 - 118 mPa.s @ 25 °C (77 °F)
Viscosity, kinematic	: 98 - 118 mm <sup>2</sup> /s @ 20 °C (68 °F)
Surface tension	: 71.4 mN/m, 22 °C

#### SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No dangerous reaction known under conditions of normal use.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: No hazards to be specially mentioned.
Conditions to avoid	: Keep away from heat, flame, sparks and other ignition sources. Exposure to moisture Exposure to sunlight.
Incompatible materials	: Acids Bases Metals Oxidizing agents Reducing agents metal salts isocyanates
Hazardous decomposition products	: Carbon oxides Aldehydes Alcohols ethers Organic acids

#### SECTION 11. TOXICOLOGICAL INFORMATION

<b>Carcinogenicity</b>	
<b>IARC</b>	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
<b>OSHA</b>	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen.

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gen by OSHA.

**NTP**

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

**ACGIH**

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

**Further information**

**Product:**

Remarks: No data available

**SECTION 12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

No data available

**Persistence and degradability**

No data available

**Bioaccumulative potential**

No data available

**Mobility in soil**

No data available

**Other adverse effects**

**Product:**

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances  
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Additional ecological information : No data available

**SECTION 13. DISPOSAL CONSIDERATIONS**

**Disposal methods**

Waste from residues : Dispose of in accordance with all applicable local, state and federal regulations.  
For assistance with your waste management needs - including

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disposal, recycling and waste stream reduction, contact  
NEXEO's Environmental Services Group at 800-637-7922.

Contaminated packaging : Empty remaining contents.  
Dispose of as unused product.  
Do not re-use empty containers.

---

**SECTION 14. TRANSPORT INFORMATION**

**DOT (Department of Transportation):** Not regulated as a dangerous good

**IATA (International Air Transport Association):** Not regulated as a dangerous good

**IMDG-Code:** Not regulated as a dangerous good

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**SECTION 15. REGULATORY INFORMATION**

**WHMIS Classification** : : Not controlled.

**EPCRA - Emergency Planning and Community Right-to-Know Act**

**CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 311/312 Hazards** : Immediate (Acute) Health Hazard  
Chronic (Delayed) Health Hazard  
No SARA Hazards

**SARA 302** : No chemicals in this material are subject to the reporting re-  
quirements of SARA Title III, Section 302.

**SARA 313** : This material does not contain any chemical components with  
known CAS numbers that exceed the threshold (De Minimis)  
reporting levels established by SARA Title III, Section 313.

**Clean Air Act**

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Sec-  
tion 12 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental  
Release Prevention (40 CFR 68.130, Subpart F).

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCMII Intermediate or Final  
VOC's (40 CFR 60.489):

25265-71-8 Dipropylene glycol

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## Dipropylene glycol

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### Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

### US State Regulations

#### Massachusetts Right To Know

No components are subject to the Massachusetts Right to Know Act.

#### Pennsylvania Right To Know

25265-71-8	Dipropylene glycol	90 - 100 %
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#### New Jersey Right To Know

25265-71-8	Dipropylene glycol	90 - 100 %
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#### California Prop 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

### The components of this product are reported in the following inventories:

- TSCA : On TSCA Inventory
- DSL : All components of this product are on the Canadian DSL
- AICS : On the inventory, or in compliance with the inventory
- NZIoC : On the inventory, or in compliance with the inventory
- ENCS : On the inventory, or in compliance with the inventory
- KECI : On the inventory, or in compliance with the inventory
- PICCS : On the inventory, or in compliance with the inventory
- IECSC : On the inventory, or in compliance with the inventory

# Safety Data Sheet

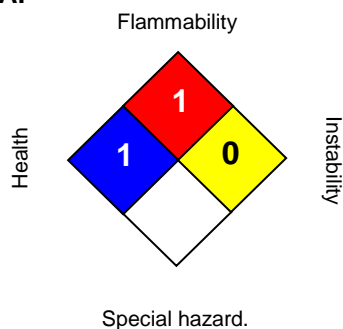
## Dipropylene glycol

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### SECTION 16. OTHER INFORMATION

#### NFPA:



#### HMIS III:

<b>HEALTH</b>	<b>1*</b>
<b>FLAMMABILITY</b>	<b>1</b>
<b>PHYSICAL HAZARD</b>	<b>0</b>

0 = not significant, 1 = Slight,  
2 = Moderate, 3 = High  
4 = Extreme, \* = Chronic

The information accumulated is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made become available subsequently to the date hereof, we do not assume any responsibility for the results of its use. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This MSDS has been prepared by NEXEO™ Solutions EHS Product Safety Department (1-855-429-2661) MSDS@nexeosolutions.com.

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**Legacy SDS:** : R0003556

#### Material number:

16109912, 16067272, 16065272, 16043948, 16039043, 16038958, 16035128, 655451, 634971, 554031, 158626, 70854, 87246, 69107, 86754, 54483, 87845, 153644, 504116, 20337, 20336, 20335, 20334, 20332, 20333

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit

## Safety Data Sheet

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EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier**

- Trade name TRIMETHYL PHOSPHITE HP

**1.2 Relevant identified uses of the substance or mixture and uses advised against**

- no data available

**1.3 Details of the supplier of the safety data sheet****Company**

Solvay USA Inc.,  
NOVECARE  
504 Carnegie Center  
Princeton, NJ, 08540, US  
Telephone Number: 800-973-7873

**1.4 Emergency telephone**

FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT: CHEMTREC 800-424-9300 within the United States and Canada, or 703-527-3887 for international collect calls.

**SECTION 2: Hazards identification**

Although OSHA has not adopted the environmental portion of the GHS regulations, this document may include information on environmental effects.

**2.1 Classification of the substance or mixture****HCS 2012 (29 CFR 1910.1200)**

Flammable liquids, Category 2  
Acute toxicity, Category 4  
Acute toxicity, Category 3  
Eye irritation, Category 2B  
Skin sensitization, Category 1  
Germ cell mutagenicity, Category 1B  
Carcinogenicity, Category 2  
Reproductive toxicity, Category 2  
Specific target organ systemic toxicity - repeated exposure, Category 2

H225: Highly flammable liquid and vapor.  
H302: Harmful if swallowed.  
H311: Toxic in contact with skin.  
H320: Causes eye irritation.  
H317: May cause an allergic skin reaction.  
H340: May cause genetic defects.  
H351: Suspected of causing cancer.  
H361: Suspected of damaging fertility or the unborn child.  
H373: May cause damage to organs through prolonged or repeated exposure if inhaled. (Respiratory Tract, Eyes), Inhalation

**2.2 Label elements****HCS 2012 (29 CFR 1910.1200)****Pictogram****Signal Word**

- Danger

**Hazard Statements**

- H225 Highly flammable liquid and vapor.



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- H302 Harmful if swallowed.
- H311 Toxic in contact with skin.
- H317 May cause an allergic skin reaction.
- H320 Causes eye irritation.
- H340 May cause genetic defects.
- H351 Suspected of causing cancer.
- H361 Suspected of damaging fertility or the unborn child.
- H373 May cause damage to organs (Respiratory Tract, Eyes) through prolonged or repeated exposure if inhaled.

**Precautionary Statements**Prevention

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
- P233 Keep container tightly closed.
- P240 Ground/bond container and receiving equipment.
- P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
- P242 Use only non-sparking tools.
- P243 Take precautionary measures against static discharge.
- P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
- P264 Wash skin thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- P272 Contaminated work clothing must not be allowed out of the workplace.
- P280 Wear protective gloves/ eye protection/ face protection.
- P281 Use personal protective equipment as required.

Response

- P301 + P312 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
- P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P308 + P313 If exposed or concerned: Get medical advice/ attention.
- P330 Rinse mouth.
- P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
- P337 + P313 If eye irritation persists: Get medical advice/ attention.
- P363 Wash contaminated clothing before reuse.
- P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Storage

- P403 + P235 Store in a well-ventilated place. Keep cool.
- P405 Store locked up.

Disposal

- P501 Dispose of contents/ container to an approved waste disposal plant.

**2.3 Other hazards which do not result in classification**

- H402: Harmful to aquatic life.
- REACTS WITH WATER TO PRODUCE HEAT, FLAMMABLE METHANOL AND DIMETHYL HYDROGEN PHOSPHITE.

**SECTION 3: Composition/information on ingredients****3.1 Substance**

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**Hazardous Ingredients and Impurities**

Chemical name	Identification number CAS-No.	Concentration [%]
Phosphorous acid, trimethyl ester	121-45-9	> 96
Phosphonic acid, dimethyl ester	868-85-9	< 1
Phosphoric acid, trimethyl ester	512-56-1	< 0.5
Methanol	67-56-1	< 0.5
Pentane	109-66-0	< 0.5
Phosphonic acid, P-methyl-, dimethyl ester	756-79-6	< 0.1

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

**3.2 Mixture**

Not applicable, this product is a substance.

**SECTION 4: First aid measures****4.1 Description of first-aid measures****General advice**

- Show this material safety data sheet to the doctor in attendance.
- First responder needs to protect himself.
- Place affected apparel in a sealed bag for subsequent decontamination.

**In case of inhalation**

- Move to fresh air.
- If breathing is difficult, give oxygen.
- If not breathing, give artificial respiration.
- Consult a physician.

**In case of skin contact**

- Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.
- Seek medical advice.
- Wash contaminated clothing before reuse.

**In case of eye contact**

- Flush eyes with water at least 15 minutes. Get medical attention if eye irritation develops or persists.

**In case of ingestion**

- Do NOT induce vomiting.
- Do not give anything to drink.
- Take victim immediately to hospital.

**4.2 Most important symptoms and effects, both acute and delayed****Effects**

- Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis
- Skin contact may aggravate existing skin disease

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**4.3 Indication of any immediate medical attention and special treatment needed****Notes to physician**

- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.
- Treat symptomatically.
- There is no specific antidote available.

**SECTION 5: Firefighting measures****Flash point**

59 °F (15 °C)  
Seta closed cup

Flammability class: Extremely flammable

**Autoignition temperature**

no data available

**Flammability / Explosive limit**

Lower flammability/explosion limit : not determined  
Upper flammability/explosion limit : not determined

**5.1 Extinguishing media****Suitable extinguishing media**

- Dry chemical
- Water mist
- Water spray
- Carbon dioxide (CO<sub>2</sub>)
- Alcohol-resistant foam

**Unsuitable extinguishing media**

- None known.
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**5.2 Special hazards arising from the substance or mixture**

- Flammable
- Flash back possible over considerable distance.
- Container may explode if heated.
- Highly irritating vapors are released.
- Hazardous decomposition products formed under fire conditions.
- Carbon oxides
- Oxides of phosphorus

**5.3 Advice for firefighters****Special protective equipment for fire-fighters**

- Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing.

**Specific fire fighting methods**

- Fight fire with normal precautions from a reasonable distance.
- Evacuate personnel to safe areas.
- Stay upwind.
- Eliminate all ignition sources if safe to do so.
- Cool closed containers exposed to fire with water spray.
  
- Persons who may have been exposed to contaminated smoke should be immediately examined by a physician and checked for symptoms of poisoning. The symptoms should not be mistaken for heat exhaustion or smoke inhalation.
  
- Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

**SECTION 6: Accidental release measures****6.1 Personal precautions, protective equipment and emergency procedures**

- Ventilate the area.
- Eliminate all ignition sources if safe to do so.
- Evacuate personnel to safe areas.
- Avoid contact with the skin and the eyes.
- Do not breathe vapor.
- Wear suitable protective equipment.
- For personal protection see section 8.
- Remove all incompatible materials as quickly as possible

**6.2 Environmental precautions**

- Do not let product enter drains.
- Do not flush into surface water or sanitary sewer system.
- Spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies

**6.3 Methods and materials for containment and cleaning up****Prohibition**

- Never return spills in original containers for re-use.
- Use only non-sparking tools.

**Recovery**

- Stop leak if safe to do so.
- Dam up with sand or inert earth (do not use combustible materials).
- Cover spill area with foam to reduce vapors
- Pump or collect any free spillage into an appropriate closed container. (see Section 7: Handling and Storage)
- Soak up with inert absorbent material.
- Shovel into suitable container for disposal.

**Decontamination / cleaning**

- Clean contaminated surface thoroughly.
- Decontaminate tools, equipment and personal protective equipment in a segregated area.
- Recover the cleaning water for subsequent disposal.

**Disposal**

- Process the contaminated absorbent material as waste product.

**6.4 Reference to other sections**

- no data available

**SECTION 7: Handling and storage****7.1 Precautions for safe handling**

- Provide adequate ventilation.
- Ensure all equipment is electrically grounded before beginning transfer operations.
- Avoid the formation or spread of mists in the atmosphere.
- Avoid inhalation of vapor or mist.
- Avoid contact with skin and eyes.
- Avoid contact with hot surfaces.
- Prevent the build-up of electrostatic charge.
- Provide adequate ventilation.
- Do not use sparking tools.
- The product must only be handled by specifically trained employees.
- **\*\* HAZARD WARNING:** If this product is used in combination with Trimethylolpropane, Trimethylolpropane derived products or their corresponding Trimethylol alkane homologs, THERE IS A POSSIBILITY that bicyclic phosphates and/or phosphites may be produced as a result of thermal decomposition. Bicyclic phosphates and phosphites have acute neurotoxic properties and may cause convulsive seizures in laboratory test animals. Therefore, this product should not be used in conjunction with Trimethylolpropane or Trimethylolpropane derived products unless tested to determine their decomposition toxicity. Follow all precautionary measures outlined in this Material Safety Data Sheet and/or contact Solvay USA Inc.

**Hygiene measures**

- Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this materials:
- 1) Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
- 2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
- 3) Wash exposed skin promptly to remove accidental splashes or contact with material.

**7.2 Conditions for safe storage, including any incompatibilities****Technical measures/Storage conditions**

- Storage tanks must be:
  - grounded and equipped with an adequate safety valve.
  - Keep in a well-ventilated place.
- Keep in a dry, cool and well-ventilated place.
- Keep container tightly closed.
- Keep under nitrogen.
- Do not allow contact with air.
- Keep away from open flames, hot surfaces and sources of ignition.
- Keep away from incompatible materials to be indicated by the manufacturer
- Keep away from: Oxidizing materials., Avoid all contact with water or humidity.

**Packaging material****Remarks**

- Store in original container.

**7.3 Specific end use(s)**

- no data available

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**SECTION 8: Exposure controls/personal protection**

Introductory Remarks: These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

**8.1 Control parameters****Components with workplace occupational exposure limits**

Ingredients	Value type	Value	Basis
Phosphorous acid, trimethyl ester	TWA	2 ppm 10 mg/m <sup>3</sup>	National Institute for Occupational Safety and Health
Phosphorous acid, trimethyl ester	TWA	2 ppm	American Conference of Governmental Industrial Hygienists
Pentane	TWA	120 ppm 350 mg/m <sup>3</sup>	National Institute for Occupational Safety and Health
Pentane	C	610 ppm 1,800 mg/m <sup>3</sup>	National Institute for Occupational Safety and Health
		15 minute ceiling value	
Pentane	TWA	1,000 ppm 2,950 mg/m <sup>3</sup>	Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants
		The value in mg/m <sup>3</sup> is approximate.	
Pentane	TWA	1,000 ppm	American Conference of Governmental Industrial Hygienists
Methanol	TWA	200 ppm 260 mg/m <sup>3</sup>	National Institute for Occupational Safety and Health
		Potential for dermal absorption	
Methanol	ST	250 ppm 325 mg/m <sup>3</sup>	National Institute for Occupational Safety and Health
		Potential for dermal absorption	
Methanol	TWA	200 ppm	American Conference of Governmental Industrial Hygienists
		Danger of cutaneous absorption	
Methanol	STEL	250 ppm	American Conference of Governmental Industrial Hygienists
		Danger of cutaneous absorption	
Methanol	TWA	200 ppm 260 mg/m <sup>3</sup>	Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants

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The value in mg/m3 is approximate.

**NIOSH IDLH (Immediately Dangerous to Life or Health Concentrations)**

Ingredients	CAS-No.	Concentration
Methanol	67-56-1	6000 ppm
Pentane	109-66-0	1500 ppm

**Biological Exposure Indices**

Ingredients	Value type	Value	Basis
Methanol	BEI	15 mg/l Methanol Urine End of shift (As soon as possible after exposure ceases)	American Conference of Governmental Industrial Hygienists

**8.2 Exposure controls****Control measures****Engineering measures**

- Where engineering controls are indicated by use conditions or a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures :
- Effective exhaust ventilation system
- Used in closed system

**Individual protection measures****Respiratory protection**

- When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.

**Hand protection**

- Impervious gloves
- Where there is a risk of contact with hands, use appropriate gloves
- Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.
- Gloves must be inspected prior to use.
- Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

**Eye protection**

- Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material.
- Eye contact should be prevented through the use of:
  - Tightly fitting safety goggles
  - Safety glasses with side-shields

**Skin and body protection**

- Impervious clothing
- Choose body protection according to the amount and concentration of the dangerous substance at the work place.

**Hygiene measures**

PRCO90020486

Version : 1.03 / US ( Z8 )

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- Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this materials:
- 1) Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
- 2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
- 3) Wash exposed skin promptly to remove accidental splashes or contact with material.

**Protective measures**

- Ensure that eyewash stations and safety showers are close to the workstation location.
- The protective equipment must be selected in accordance with current local standards and in cooperation with the supplier of the protective equipment.
- Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the potential hazards, and/or risks that may occur during use.

**SECTION 9: Physical and chemical properties**

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product information phone number in Section 1 for its exact specifications.

**9.1 Information on basic physical and chemical properties****Appearance**

Form: similar to water  
Physical state: liquid  
Color: clear  
 colorless

**Odor**

strong unpleasant

**Odor Threshold**

no data available

**pH**

Not applicable, reacts with water

**Melting point/freezing point**

Freezing point: -109.5 °F (-78.6 °C)

**Initial boiling point and boiling range**

Boiling point/boiling range: 232 - 234 °F (111 - 112 °C)

**Flash point**

59 °F (15 °C) Seta closed cup

Flammability class: Extremely flammable

**Evaporation rate (Butylacetate = 1)**

no data available

**Flammability (solid, gas)**

no data available

**Flammability (liquids)**

no data available

**Flammability / Explosive limit**

Lower flammability/explosion limit:  
not determined

Upper flammability/explosion limit:

not determined



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<b><u>Autoignition temperature</u></b>	no data available
<b><u>Vapor pressure</u></b>	24 mmHg (32 hPa) ( 68 °F (20 °C))
<b><u>Vapor density</u></b>	no data available
<b><u>Density</u></b>	1.046 g/cm <sup>3</sup> ( 68 °F (20 °C))
<b><u>Relative density</u></b>	no data available
<b><u>Solubility</u></b>	no data available
<b><u>Partition coefficient: n-octanol/water</u></b>	Not applicable; reacts with water and / or octanol.
<b><u>Decomposition temperature</u></b>	no data available
<b><u>Viscosity</u></b>	<u>Viscosity, kinematic</u> : 0.58 mm <sup>2</sup> /s ( 77 °F (25 °C)) 0.52 mm <sup>2</sup> /s ( 100 °F (38 °C))
<b><u>Explosive properties</u></b>	no data available
<b><u>Oxidizing properties</u></b>	Not considered as oxidizing.

**9.2 Other information**

<b><u>Reactions with water / air</u></b>	Reacts violently with water. Flammable gases: Toxic gases: Corrosive gases:
--	--

**SECTION 10: Stability and reactivity****10.1 Reactivity**

- no data available

**10.2 Chemical stability**

- Decomposes upon contact with air.
- Stable under recommended storage conditions.

**10.3 Possibility of hazardous reactions****Polymerization**

- Hazardous polymerization does not occur.

**10.4 Conditions to avoid**

- Keep away from heat and sources of ignition.
- Decomposes on heating.

**10.5 Incompatible materials**

- Air
- Water
- Strong oxidizing agents

- Reacts with:
- Water
- On hydrolysis, forms:
- Phosphorous acid
- Methanol
- Phosphonic acid, dimethyl ester
- with the release of heat.

#### 10.6 Hazardous decomposition products

- On combustion or on thermal decomposition (pyrolysis), releases:
  - Carbon oxides
  - Oxides of phosphorus
- Phosphonic acid, dimethyl ester

### SECTION 11: Toxicological information

#### 11.1 Information on toxicological effects

##### Acute toxicity

<b>Acute oral toxicity</b>	LD50 : 1,350 mg/kg - Rat Harmful if swallowed. Unpublished internal reports
<b>Acute inhalation toxicity</b>	LC50 - 4 h > 45.7 mg/l - Rat Not classified as harmful by inhalation Unpublished internal reports
<b>Acute dermal toxicity</b>	LD50 934 mg/kg - Rabbit Harmful in contact with skin. Unpublished internal reports
<b>Acute toxicity (other routes of administration)</b>	no data available
<b><u>Skin corrosion/irritation</u></b>	Rabbit Mild skin irritation Unpublished internal reports
<b><u>Serious eye damage/eye irritation</u></b>	Rabbit Mild eye irritant Unpublished internal reports
<b><u>Respiratory or skin sensitization</u></b>	Magnusson and Kligman method - Guinea pig May cause sensitization by skin contact. By analogy Unpublished reports

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**Mutagenicity****Genotoxicity in vitro**

Product is considered to be genotoxic

Mutagenicity (Salmonella typhimurium - reverse mutation assay)  
with and without metabolic activation  
negative  
Unpublished internal reports

Mouse lymphoma test / TK  
with and without metabolic activation  
positive  
Unpublished internal reports

**Genotoxicity in vivo**

no data available

**Carcinogenicity**

No information available.

This product does not contain any ingredient designated as probable or suspected human carcinogens by:

NTP  
IARC  
OSHA  
ACGIH

**Toxicity for reproduction and development****Toxicity to reproduction / fertility**

no data available

**Developmental Toxicity/Teratogenicity**

Rat  
Oral exposure  
NOAEL maternal: 49 mg/kg  
Unpublished internal reports

LOAEL teratogenicity: 49 mg/kg  
Possible risk of harm to the unborn child.  
Unpublished internal reports

**STOT****STOT-single exposure**

no data available

**STOT-repeated exposure**

Phosphorous acid, trimethyl ester

Routes of exposure: Inhalation  
Target Organs: Respiratory Tract, Eyes  
The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2 according to GHS criteria.  
If inhaled 28 Days - Rat  
LOAEL: 0.53 mg/l  
Ocular toxicity effects  
Pulmonary toxicity effects  
Unpublished internal reports

Dermal exposure 21 Days - Rabbit  
LOAEL: 300 mg/kg  
Liver toxicity  
Pulmonary toxicity effects  
Unpublished internal reports

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Oral exposure 90 Days - Rat  
 LOAEL: 80 mg/kg  
 effects on the reproductive system  
 Unpublished internal reports

**Neurological effects**

No neurotoxic effects observed., Acute test for inhibition of the enzymatic activity of cerebral esterases, Acute test for inhibition of the enzymatic activity of blood esterases, Unpublished internal reports

**Aspiration toxicity**

no data available

**SECTION 12: Ecological information****12.1 Toxicity****Aquatic Compartment****Acute toxicity to fish**

LC50 - 96 h : > 100 mg/l - Danio rerio (zebra fish)  
 Hydrolysis products  
 Unpublished reports

**Acute toxicity to daphnia and other aquatic invertebrates.**

EC50 - 48 h : 25 mg/l - Daphnia magna (Water flea)  
 Hydrolysis products  
 Unpublished reports

**Toxicity to aquatic plants**

EC50 - 72 h : > 100 mg/l - Algae  
 Hydrolysis products  
 Unpublished reports

**Toxicity to microorganisms**

no data available

**Chronic toxicity to fish**

no data available

**Chronic toxicity to daphnia and other aquatic invertebrates.**

no data available

**Chronic Toxicity to aquatic plants**

no data available

**12.2 Persistence and degradability****Abiotic degradation**

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**Stability in water** Half-life value: 0.4 h (25 °C)  
pH: 10.0  
Unpublished internal reports,  
Half-life value: < 0.1 h (0 °C)  
pH: 6.0  
Unpublished internal reports,

**Physical- and photo-chemical elimination** no data available

**Biodegradation**

**Biodegradability** Ultimate aerobic biodegradability  
50 % - 28 d  
Unpublished reports

**12.3 Bioaccumulative potential**

**Partition coefficient: n-octanol/water** Not applicable; reacts with water and / or octanol.

**Bioconcentration factor (BCF)** no data available

**12.4 Mobility in soil**

**Adsorption potential (Koc)** no data available

**Known distribution to environmental compartments** Ultimate destination of the product: Water  
Hydrolysis products  
  
Ultimate destination of the product: Soil  
Hydrolysis products

**12.5 Results of PBT and vPvB assessment** no data available

**12.6 Other adverse effects** no data available

**Ecotoxicity assessment**

**Acute aquatic toxicity** Harmful to aquatic organisms.

**SECTION 13: Disposal considerations****13.1 Waste treatment methods****Product Disposal**

- Chemical additions, processing or otherwise altering this material may make the waste management information presented in this SDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material.

**Waste Code**

- RCRA Hazardous Waste (40 CFR 302)
- D001 - Ignitable waste – (I)
- Environmental Protection Agency
- Hazardous Waste – YES

**Advice on cleaning and disposal of packaging**

- Rinse with an appropriate solvent.
- Allow it to drain thoroughly.
- After recovery of solvent dispose of by special waste incineration.
  
- Re-use or recycle following decontamination.
  
- Dispose of in accordance with local regulations.

**Measure for waste avoidance or recovery**

- Do not dispose of together with household waste.

**SECTION 14: Transport information**

Transportation status: IMPORTANT! Statements below provide additional data on listed transport classification. The listed Transportation Classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors.

**DOT**

<b>14.1 UN number</b>	UN 2329
<b>14.2 Proper shipping name</b>	TRIMETHYL PHOSPHITE
<b>14.3 Transport hazard class</b>	3
Label(s)	3
<b>14.4 Packing group</b>	
Packing group	III
ERG No	130
<b>14.5 Environmental hazards</b>	NO
<b>Marine pollutant</b>	

**TDG**

<b>14.1 UN number</b>	UN 2329
<b>14.2 Proper shipping name</b>	TRIMETHYL PHOSPHITE
<b>14.3 Transport hazard class</b>	3
Label(s)	3
<b>14.4 Packing group</b>	

## TRIMETHYL PHOSPHITE HP

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Packing group	III
ERG No	130

<b>14.5 Environmental hazards</b>	NO
<b>Marine pollutant</b>	

**IMDG**

<b>14.1 UN number</b>	UN 2329
<b>14.2 Proper shipping name</b>	TRIMETHYL PHOSPHITE
<b>14.3 Transport hazard class</b>	3
Label(s)	3
<b>14.4 Packing group</b>	
Packing group	III
<b>14.5 Environmental hazards</b>	NO
<b>Marine pollutant</b>	
<b>14.6 Special precautions for user</b>	
EmS	F-E , S-D

For personal protection see section 8.

**IATA**

<b>14.1 UN number</b>	UN 2329
<b>14.2 Proper shipping name</b>	TRIMETHYL PHOSPHITE
<b>14.3 Transport hazard class</b>	3
Label(s):	3
<b>14.4 Packing group</b>	
Packing group	III
Packing instruction (cargo aircraft)	366
Max net qty / pkg	220.00 L
Packing instruction (passenger aircraft)	355
Max net qty / pkg	60.00 L
<b>14.5 Environmental hazards</b>	NO
<b>14.6 Special precautions for user</b>	
For personal protection see section 8.	

Note: The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transportation regulations for hazardous materials, it would be advisable to check their validity with your sales office.

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**SECTION 15: Regulatory information****15.1 Notification status**

Inventory Information	Status
United States TSCA Inventory	- On TSCA Inventory
Canadian Domestic Substances List (DSL)	- All components of this product are on the Canadian DSL
Australia Inventory of Chemical Substances (AICS)	- On the inventory, or in compliance with the inventory
Japan. CSCL - Inventory of Existing and New Chemical Substances	- On the inventory, or in compliance with the inventory
Korea. Korean Existing Chemicals Inventory (KECI)	- On the inventory, or in compliance with the inventory
China. Inventory of Existing Chemical Substances in China (IECSC)	- On the inventory, or in compliance with the inventory

**15.2 Federal Regulations****US. EPA EPCRA SARA Title III****SARA HAZARD DESIGNATION SECTIONS 311/312 (40 CFR 370)**

Fire Hazard	yes
Reactivity Hazard	no
Sudden Release of Pressure Hazard	no
Acute Health Hazard	yes
Chronic Health Hazard	yes

**Section 313 Toxic Chemicals (40 CFR 372.65)**

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**Section 302 Emergency Planning Extremely Hazardous Substance Threshold Planning Quantity (40 CFR 355)**

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**Section 302 Emergency Planning Extremely Hazardous Substance Reportable Quantity (40 CFR 355)**

This material does not contain any components with a SARA 302 RQ.

**Section 304 Emergency Release Notification Reportable Quantity (40 CFR 355)**

This material does not contain any components with a section 304 EHS RQ.

**US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)**

Ingredients	CAS-No.	Reportable quantity
Methanol	67-56-1	5000 lb

**Other regulations****Weapons Precursor Regulations**

- This product is regulated by the U.S. Department of Commerce under the provisions of the Chemical Weapons Convention (15 CFR Parts 730-774).



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**15.3 State Regulations****US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)**

WARNING! This product contains a chemical known in the State of California to cause cancer.

Ingredients	CAS-No.
Phosphoric acid, trimethyl ester	512-56-1

WARNING: This product contains a chemical known in the State of California to cause birth defects or other reproductive harm.

Ingredients	CAS-No.
Methanol	67-56-1

**SECTION 16: Other information****NFPA (National Fire Protection Association) - Classification**

Health	2 moderate
Flammability	3 serious
Instability or Reactivity	1 slight

**HMIS (Hazardous Materials Identification System (Paint & Coating)) - Classification**

Health	2 moderate
Flammability	3 serious
Reactivity	1 slight
PPE	Determined by User; dependent on local conditions

**Further information**

- Product evaluated under the US GHS format.

**Date Prepared:** 07/05/2016**Key or legend to abbreviations and acronyms used in the safety data sheet**

- C Ceiling value not be exceeded at any time.
- ST STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
- STEL Short-term exposure limit
- TWA 8-hour, time-weighted average
- ACGIH American Conference of Governmental Industrial Hygienists
- OSHA Occupational Safety and Health Administration
- NTP National Toxicology Program
- IARC International Agency for Research on Cancer
- NIOSH National Institute for Occupational Safety and Health

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but do not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in any other manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.



# Methanol/TMP Distillate

Version	10
Revision Date	02/06/2017
Print Date	02/06/2017
Country	US
Language:	Z8

## SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Methanol/TMP Distillate

Product code : 400000009267

### Details of the supplier of the safety data sheet

Company: Addivant USA, LLC  
4 Mountainview Terrace  
Suite 200  
Danbury, CT  
United States of America (USA)  
06810  
Telephone : 1-800-962-8641 (US) only

Prepared by msdsrequest@addivant.com

Further information for the material safety data sheet :  
msdsrequest@addivant.com

### Emergency telephone

Emergency telephone: 866-928-0789  
For additional emergency telephone numbers see section 16 of the  
Safety Data Sheet.

Disposal considerations : msdsrequest@addivant.com

### Recommended use of the chemical and restrictions on use

Recommended use : Intermediate

Restrictions on use : For professional and industrial installation and use only.

## SECTION 2. HAZARDS IDENTIFICATION

### Emergency Overview

Appearance	liquid
------------	--------

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Color	clear, to, light yellow
Odor	strong, unpleasant

### GHS Classification

Flammable liquids	: Category 2
Acute toxicity (Oral)	: Category 3
Acute toxicity (Inhalation)	: Category 3
Acute toxicity (Dermal)	: Category 3
Skin irritation	: Category 2
Serious eye damage	: Category 1
Specific target organ systemic toxicity - single exposure	: Category 1

### GHS label elements

Hazard pictograms :



Signal Word : Danger

Hazard Statements : H225 Highly flammable liquid and vapor.  
H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled.  
H315 Causes skin irritation.  
H318 Causes serious eye damage.  
H370 Causes damage to organs.

Precautionary Statements : **Prevention:**  
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.  
P233 Keep container tightly closed.  
P240 Ground/bond container and receiving equipment.  
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.  
P242 Use only non-sparking tools.  
P243 Take precautionary measures against static discharge.  
P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.  
P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P271 Use only outdoors or in a well-ventilated area.  
P280 Wear protective gloves/ eye protection/ face protection.



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**Response:**

P301 + P310 + P330 IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304 + P340 + P311 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor.

P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.

P307 + P311 IF exposed: Call a POISON CENTER or doctor/physician.

P332 + P313 If skin irritation occurs: Get medical advice/attention.

P362 Take off contaminated clothing and wash before reuse.

P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

**Storage:**

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

P403 + P235 Store in a well-ventilated place. Keep cool.

P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

**Potential Health Effects**

- Inhalation : Toxic by inhalation.
- Skin : Toxic in contact with skin.
- Eyes : Causes serious eye damage.
- Ingestion : Toxic if swallowed.
- Aggravated Medical Condition : None known.
- Symptoms of Overexposure : Eye irritation  
Skin irritation  
Shortness of breath  
Gastrointestinal disturbance

**Carcinogenicity:****IARC**

No se identifica ningún componente de este producto, que presente niveles mayores que o igual a 0,1% como agente carcinógeno humano probable, posible o confirmado por la (IARC) Agencia Internacional de Investigaciones sobre Carcinógenos.

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No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**ACGIH** No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

**OSHA** No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

**NTP** No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

#### Hazardous ingredients

Chemical name	CAS-No.	Concentration (%)
Methanol	67-56-1	>= 90 - <= 100
Trimethyl phosphite	121-45-9	>= 1 - < 10

### SECTION 4. FIRST AID MEASURES

- General advice : No hazards which require special first aid measures.
- If inhaled : Move to fresh air in case of accidental inhalation of dust or fumes from overheating or combustion.  
If symptoms persist, call a physician.
- In case of skin contact : Take off contaminated clothing and shoes immediately.  
Wash off with soap and plenty of water.
- In case of eye contact : Flush eyes with water as a precaution.  
Remove contact lenses.  
Protect unharmed eye.  
Keep eye wide open while rinsing.
- If swallowed : Clean mouth with water and drink afterwards plenty of water.



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Do not give milk or alcoholic beverages.  
Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed : Eye irritation  
Skin irritation  
Shortness of breath  
Gastrointestinal disturbance  
Toxic if swallowed, in contact with skin or if inhaled.  
Causes skin irritation.  
Causes serious eye damage.  
Causes damage to organs.

Notes to physician : The first aid procedure should be established in consultation with the doctor responsible for industrial medicine.

## SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Specific extinguishing methods : Standard procedure for chemical fires.

Further information : Standard procedure for chemical fires.

Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

Environmental precautions : No special environmental precautions required.

Methods and materials for containment and cleaning up : Wipe up with absorbent material (e.g. cloth, fleece).  
Keep in suitable, closed containers for disposal.

## SECTION 7. HANDLING AND STORAGE

Advice on safe handling : For personal protection see section 8.  
No special handling advice required.

Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.

Materials to avoid : No special restrictions on storage with other products.

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Ingredients with workplace control parameters



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Ingredients	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Methanol	67-56-1	TWA	200 ppm	ACGIH
		STEL	250 ppm	ACGIH
		TWA	200 ppm 260 mg/m3	OSHA Z-1
		TWA	200 ppm 260 mg/m3	OSHA P0
		STEL	250 ppm 325 mg/m3	OSHA P0
		TWA	200 ppm 260 mg/m3	NIOSH REL
		ST	250 ppm 325 mg/m3	NIOSH REL
		TWA	200 ppm	ACGIH
		STEL	250 ppm	ACGIH
		TWA	200 ppm 260 mg/m3	OSHA Z-1
		TWA	200 ppm 260 mg/m3	OSHA P0
		STEL	250 ppm 325 mg/m3	OSHA P0
		TWA	200 ppm 260 mg/m3	NIOSH REL
		ST	250 ppm 325 mg/m3	NIOSH REL
		TWA	200 ppm	ACGIH
		STEL	250 ppm	ACGIH
		TWA	200 ppm 260 mg/m3	OSHA Z-1
		TWA	200 ppm 260 mg/m3	OSHA P0
		STEL	250 ppm 325 mg/m3	OSHA P0
		TWA	200 ppm 260 mg/m3	NIOSH REL
ST	250 ppm 325 mg/m3	NIOSH REL		
Trimethyl phosphite	121-45-9	TWA	2 ppm	ACGIH
		TWA	2 ppm 10 mg/m3	NIOSH REL
		TWA	2 ppm 10 mg/m3	OSHA P0
		TWA	2 ppm	ACGIH
		TWA	2 ppm 10 mg/m3	NIOSH REL
		TWA	2 ppm 10 mg/m3	OSHA P0
		TWA	2 ppm	ACGIH



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		TWA	2 ppm 10 mg/m3	NIOSH REL
		TWA	2 ppm 10 mg/m3	OSHA P0

**Biological occupational exposure limits**

Ingredients	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
	67-56-1	Methanol	Urine	End of shift (As soon as possible after exposure ceases)	15 mg/l	ACGIH BEI

**Personal protective equipment**

Respiratory protection : No personal respiratory protective equipment normally required.  
Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection  
Remarks : Gloves Gloves must be inspected prior to use.

Eye protection : Tightly fitting safety goggles

Skin and body protection : Protective suit

Hygiene measures : General industrial hygiene practice.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

Appearance : liquid  
Color : clear, to, light yellow  
Odor : strong, unpleasant





# Methanol/TMP Distillate

Version	10
Revision Date	02/06/2017
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Language:	Z8

Odor Threshold	: No data available
pH	: Not applicable
Melting point/range	: No data available
Boiling point/boiling range	: 65 °C
Flash point	: No data available
Evaporation rate	: No data available
Upper explosion limit	: No data available
Lower explosion limit	: No data available
Vapor pressure	: No data available
Relative vapor density	: No data available
Relative density	: ca. 1.1
Density	: No data available
Solubility(ies)	
Water solubility	: partly soluble
Solubility in other solvents	: No data available
Partition coefficient: n-octanol/water	: No data available
Autoignition temperature	: No data available
Thermal decomposition	: No data available
Viscosity	
Viscosity, kinematic	: No data available
Surface tension	: not determined
Oxidizing potential	: No information available.

## SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Stable under recommended storage conditions.
Chemical stability	: No decomposition if stored and applied as directed.
Possibility of hazardous	: No hazards to be specially mentioned.



# Methanol/TMP Distillate

Version	10
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Country	US
Language:	Z8

reactions

Conditions to avoid : No data available

## SECTION 11. TOXICOLOGICAL INFORMATION

### Acute toxicity

#### Product:

Acute oral toxicity : Acute toxicity estimate : 108.7 mg/kg  
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate : 3.33 mg/l  
Exposure time: 4 h  
Test atmosphere: vapor  
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate : 333.33 mg/kg  
Method: Calculation method

### Skin corrosion/irritation

#### Product:

Remarks: No data available

### Serious eye damage/eye irritation

#### Product:

Remarks: No data available

### Respiratory or skin sensitization

#### Product:

Remarks: No data available

### Germ cell mutagenicity

#### Product:

Genotoxicity in vitro : Remarks: No data available

Genotoxicity in vivo : Remarks: No data available

### Carcinogenicity

#### Product:



# Methanol/TMP Distillate

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Remarks: This information is not available.

## Reproductive toxicity

### Product:

Effects on fertility : Remarks: No data available

Effects on fetal development : Remarks: No data available

## Aspiration toxicity

### Product:

No aspiration toxicity classification

## Further information

### Product:

Remarks: No data available

## SECTION 12. ECOLOGICAL INFORMATION

### Ecotoxicity

No data available

### Persistence and degradability

#### Product:

Biodegradability : Remarks: No data available

### Bioaccumulative potential

#### Product:

Bioaccumulation : Remarks: No data available

### Ingredients:

#### Methanol:

Partition coefficient: n-octanol/water : log Pow: -0.7

### Mobility in soil

No data available

### Other adverse effects

No data available



# Methanol/TMP Distillate

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**Product:**

Regulation : 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances

Remarks : This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Additional ecological information : There is no data available for this product.

---

## SECTION 13. DISPOSAL CONSIDERATIONS

**Disposal methods**

Waste from residues : Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging : Empty remaining contents.  
Empty containers should be taken to an approved waste handling site for recycling or disposal.

---

## SECTION 14. TRANSPORT INFORMATION

**DOT**

UN number : 1992  
Description of the goods : Flammable liquids, toxic, n.o.s.  
(Methanol, )  
Class : 3  
Packing group : II  
Labels : 3 (6.1)  
Emergency Response : 131  
Guidebook Number :  
Environmentally hazardous : yes

**IATA**

UN number : 1992  
Description of the goods : FLAMMABLE LIQUID, TOXIC, N.O.S.  
(Methanol, )



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Class : 3  
Packing group : II  
Labels : 3 (6.1)  
Packing instruction (cargo aircraft) : 307  
Packing instruction (passenger aircraft) : 305  
Packing instruction (passenger aircraft) : Y305  
Marine pollutant : no

**IMDG**

UN number : 1992  
Description of the goods : FLAMMABLE LIQUID, TOXIC, N.O.S. (Methanol, )  
Class : 3  
Packing group : II  
Labels : 3 (6.1)  
EmS Number 1 : F-E  
EmS Number 2 : S-D  
Marine pollutant : no

Not regulated by DOT and TDG if shipped or transported in packaging less than 450 liters by road and/or rail.

**SECTION 15. REGULATORY INFORMATION**

**TSCA list** : No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

**EPCRA - Emergency Planning and Community Right-to-Know****CERCLA Reportable Quantity**

Ingredients	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
	67-56-1	5000	5000

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 311/312 Hazards** : Fire Hazard  
Acute Health Hazard  
Chronic Health Hazard



# Methanol/TMP Distillate

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**SARA 302** : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313** : The following components are subject to reporting levels established by SARA Title III, Section 313:

Methanol 67-56-1 100 %

### Clean Air Act

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):

Methanol 67-56-1 100 %

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489):

Methanol 67-56-1 100 %

### Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

**California Prop 65** : This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

### The ingredients of this product are reported in the following inventories:

DSL : All components of this product are on the Canadian DSL

AICS : On the inventory, or in compliance with the inventory

NZIoC : On the inventory, or in compliance with the inventory

ENCS : On the inventory, or in compliance with the inventory

ISHL : On the inventory, or in compliance with the inventory

KECI : On the inventory, or in compliance with the inventory

PICCS : On the inventory, or in compliance with the inventory

IECSC : On the inventory, or in compliance with the inventory

TCSI : Not in compliance with the inventory

:  
:  
:  
:

TSCA : On TSCA Inventory



# Methanol/TMP Distillate

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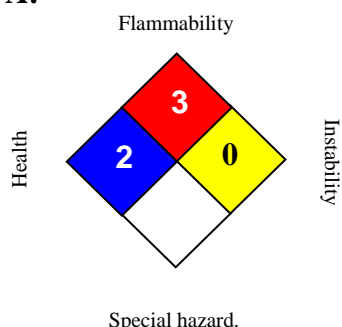
## Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

## SECTION 16. OTHER INFORMATION

### Further information

#### NFPA:



#### HMIS III:

<b>HEALTH</b>	<b>2*</b>
<b>FLAMMABILITY</b>	<b>3</b>
<b>PHYSICAL HAZARD</b>	<b>0</b>

0 = not significant, 1 = Slight,  
2 = Moderate, 3 = High  
4 = Extreme, \* = Chronic

The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

### Carechem24 International Worldwide Coverage - Addivant

#### Emergency Phone Numbers:

<u>Europe:</u>	All European Countries	+44 (0) 1235 239 670
<u>Asia Pacific:</u>	East / South East Asia	Regional Number : +65 3158 1074
	Australia	+61 2801 44558
	New Zealand	+64 9929 1483
	China Taiwan	+86 10 5100 3039
	Japan	+81 345 789 341
	Indonesia	00780 3011 0293
	:Malaysia	+60 3 6207 4347
	Thailand	001800 1 2066 6751
	Korea	+65 3158 1285
	Vietnam	+65 3158 1255
	India	+65 3158 1198
	Pakistan	+65 3158 1329



# Methanol/TMP Distillate

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	Philippines	+65 31581203
	Sri Lanka	+65 3158 1195
	Bangladesh	+65 3158 1200
<u>Middle East / Africa:</u>	Arabic speaking countries	+44 (0) 1235 239 671
	All other countries	+44 (0) 1235 239 670
<u>America</u>	United States / Canada	001866 928 0789
<u>Latin America:</u>	Brazil	+55 113 711 9144
	All other countries	+44 (0) 1235 239 670
	Mexico	+52 555 004 8763



## Attachment E - Potential-to-Emit Estimates

**Addivants; W430ZP Trial Process Update**  
**W430ZP Trial Process Emission Summary Table**

Emission Source	W430ZP Process Emission Levels					
	VOCs		HAPs		Methanol	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
T-3 & T-9 Storage Tanks	<0.01	<0.01	--	--	--	--
K-20 Reactor	0.46	0.26	--	--	--	--
K-4	<0.01	<0.01	--	--	--	--
Methanol Loading	0.04	0.02	0.04	0.02	0.04	0.02
W430ZP Loading	0.05	0.03	--	--	--	--
Hot Well	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Wastewater Tote	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Wastewater Portable Tank	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
W430ZP Process Equipment Leaks	2.44	1.17	0.99	0.47	0.99	0.47
W430ZP Process Totals	3.00	1.48	1.04	0.50	1.04	0.50
<b>Permit Thresholds</b>	<b>6.00</b>	<b>10.00</b>	<b>2.00</b>	<b>5.00</b>	<b>2.00</b>	<b>5.00</b>

**Addivant; W430ZP Trial Process**  
**T-3 & T-9 Dipropylene glycol (DPG) Working and Breathing Emissions Detail Sheet**

Pollutant	Losses (lbs/yr) <sup>1</sup>			Losses (lb/hr)			Losses (tpy)		
	Working Loss	Breathing Loss	Total Emissions	Working Loss	Breathing Loss	Total Emissions	Working Loss	Breathing Loss	Total Emissions
VOC	0.1100	0.0000	0.1100	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001

**Note:**

<sup>1</sup>Losses from EPA TANKs Report - T-3 and T-9

<sup>2</sup>EPA TANKs Report - T-3 and T-9 uses Theoretical Yield of Dipropylene Glycol (DPG) from W430 in K-20 Process Description dated 11/9/16 to estimate tank throughput in gallons/year - (1500 gal/batch) x (80 batches) = 120,000 gal/yr

**Addivant; W430ZP Trial Process**  
**W430ZP Process Emissions - Reactor K-20**

**Emission Points**

W430ZP Initial Preparation using DPG  
W430ZP - Normal Operations

**Note:**

Reactor K-20 Area (A), Volumetric Flowrate (V), Gas Velocity over Liquid (U), and Equivalent Tank Diameter (Deq) assumed to be equal to Reactor K-20 specifications in OS PTE Calcs\_120212 workbook provided by Addivant.

**References:**

US EPA Guideline Series: Control of Volatile Organic Compound Emissions from Batch Processes, 1993.

**W430ZP Initial Preparation using DPG**

K-20 Vacuum System			
Variable	Definition	Value	Basis
u	Gas Viscosity (g/cm-s)	0.65	Viscosity of air from Perry's Chemical Engineers' Handbook
p	Gas Density (g/cm <sup>3</sup> )	1	Density of air from Perry's Chemical Engineers' Handbook
Dv	Gas Diffusivity (cm <sup>2</sup> /s)	0.05	VOC diffusivity in air
Nsc	Schmidt Number	13	Nsc = u/(p*Dv)
A	Cross-sectional Area of Liquid Surface (ft <sup>2</sup> )	33.18	Tank Area provided by Addivant based on 2,000-gallon reactor
V	Volumetric Flowrate of Gas (ft <sup>3</sup> /min)	440	Volumetric Flowrate provided by Addivant
U	Gas Velocity over Liquid (m/hr)	243	U = Q/A U = V ft <sup>3</sup> /min x 60 min/hr x 1/15 ft <sup>2</sup> x 0.3048 m/ft
Deq	Equivalent Tank Diameter (m)	2.5	Deq = 4 x cross-sectional area/perimeter Deq = 4 x 15 ft <sup>2</sup> /16 ft x 0.3048 m/ft
k	Mass Transfer Coefficient (ft/hr)	1.1	k = 0.0958 * U <sup>0.78</sup> * Deq <sup>-0.11</sup> * Nsc <sup>-0.67</sup>
MW	Molecular Weight (lb/lb-mol)	134.113	Molecular weight of DPG
P	Vapor Pressure (atm)	2.10E-05	DPG vapor pressure = 0.016 mmHg * (1 atm/760 mm Hg)
H	Emission Hours (hr/batch)	1.00	Assume each trial preparation takes 1 hr
R	Universal Gas Constant (atm-ft <sup>3</sup> /lbmol-R)	0.7302	Engineering constant
T	Temperature (R)	527.67	Assume Temperature = 20°C (ambient conditions)
E	Emission Rate (lb per batch)	2.73E-04	E = (MW * k * P * A * H)/(R * T), US EPA open top tank equation
	Emission Rate (lb/hr)	2.73E-04	lb/batch ÷ hours/batch
n	Efficiency of control equipment	0%	Assumed 0% control efficiency for potential to emit calculations
	Estimated Potential Emissions (ton per batch)	1.36E-07	Emissions (lb/yr) * 1 ton/2,000 lb * (1-n)
	Batches per year	20	8 Batches/month, July 2017 - April 2018
	Estimated Potential Emissions (tpy)	2.73E-06	Emissions (lb/yr) * 1 ton/2,000 lb * (1-n)

## K-20 Vacuum System

Variable	Definition	Value	Basis
u	Gas Viscosity (g/cm-s)	0.65	Viscosity of air from Perry's Chemical Engineers' Handbook
p	Gas Density (g/cm <sup>3</sup> )	1	Density of air from Perry's Chemical Engineers' Handbook
Dv	Gas Diffusivity (cm <sup>2</sup> /s)	0.05	VOC diffusivity in air
Nsc	Schmidt Number	13	$Nsc = u/(p \cdot Dv)$
A	Cross-sectional Area of Liquid Surface (ft <sup>2</sup> )	33.18	Tank Area provided by Addivant based on 2,000-gallon reactor
V	Volumetric Flowrate of Gas (ft <sup>3</sup> /min)	440	Volumetric Flowrate provided by Addivant
U	Gas Velocity over Liquid (m/hr)	243	$U = Q/A$ $U = V \text{ ft}^3/\text{min} \times 60 \text{ min/hr} \times 1/15 \text{ ft}^2 \times 0.3048 \text{ m/ft}$
Deq	Equivalent Tank Diameter (m)	2.5	$Deq = 4 \times \text{cross-sectional area/perimeter}$ $Deq = 4 \times 15 \text{ ft}^2/16 \text{ ft} \times 0.3048 \text{ m/ft}$
k	Mass Transfer Coefficient (ft/hr)	1.1	$k = 0.0958 \cdot U^{0.78} \cdot Deq^{-0.11} \cdot Nsc^{-0.67}$
MW	Molecular Weight (lb/lb-mol)	430.47	Molecular weight of W430 from TMP Mass Balance
P	Vapor Pressure (atm)	0.0132	Vapor Pressure of W430 = 10 mmHg * (1 atm/760 mmHg)
H	Emission Hours (hrs/batch)	14.00	Assume 14 hr run time per batch
R	Universal Gas Constant (atm-ft <sup>3</sup> /lbmol-R)	0.7302	Engineering constant
T	Temperature (R)	631.67	Temperature = 140°C from WESTON 430 in K-20 Procedure
E	Emission Rate (lb per batch)	6.41	$E = (MW \cdot k \cdot P \cdot A \cdot H)/(R \cdot T)$ , US EPA open top tank equation
	Emission Rate (lb/hr)	0.46	lb/batch ÷ hours/batch
n	Efficiency of control equipment	0%	Assumed 0% control efficiency for potential to emit calculations
	Estimated Potential Emissions (ton per batch)	3.21E-03	Emissions (lb/yr) * 1 ton/2,000 lb * (1-n)
	Batches per year	80	8 Batches/month, July 2017 - April 2018
	Estimated Potential Emissions (tpy)	2.56E-01	Emissions (lb/yr) * 1 ton/2,000 lb * (1-n)

**Addivant; W430ZP Trial Process**  
**K-4 (W430ZP Product) Tank Working and Breathing Emissions Detail Sheet**

Pollutant	Losses (lbs/yr) <sup>1</sup>			Losses (lb/hr)			Losses (tpy)		
	Working Loss	Breathing Loss	Total Emissions	Working Loss	Breathing Loss	Total Emissions	Working Loss	Breathing Loss	Total Emissions
VOC	7.52	0.00	7.52	0.001	0.000	0.001	0.004	0.00	0.00

**Note:**

<sup>1</sup>Losses from EPA TANKs Report - K-4 W430ZP Product

<sup>2</sup>EPA TANKs Report - K-4 W430ZP Product uses weighted average of Dipropylene glycol and Trimethyl phosphite inputs as a conservative representative of W430ZP Product so that EPA TANKs run could be completed

<sup>3</sup>EPA TANKs Report - K-4 W430ZP Product uses W430ZP density from Chemical/Physical Data for W430ZP and Theoretical Yield of W430 Product from W430ZP in K-20 Process Description dated 11/9/2016 to estimate tank throughput in gallons/year - (1225 gal/batch) x (80 batches) = 98,000 gal/yr

**Addivant; W430ZP Trial Process  
Methanol Loading Losses**

**Methanol Loading Losses**

Compound	Molecular Weight (lb/lbmol)	True Vapor Pressure of Liquid (psia)	Saturation Factor	Temperature (°R)	Loading Loss Rate (lb/10 <sup>3</sup> gal)	Methanol Recovery Rate (gal/batch)	Number of W430 Trial Runs (batches)	Methanol Recovery (gal/yr)	Annual Loading Losses (tpy)	Annual Loading Losses (lb/hr)
Methanol	32.04	1.16	1.45	513.27	1.31	403.00	80.00	32240.00	2.11E-02	4.40E-02

**Note:**

<sup>1</sup>Emission calculation from AP 42 5.2-4 Equation (1) - Loading Loss (lb/10<sup>3</sup> gal) of liquid loaded

<sup>2</sup>Methanol Recovery Rate from W430ZP Production Theoretical Yields in W430ZP in K-20 Process Description dated 11/9/16

<sup>3</sup>Methanol Receiver (R44) chilled to 12°C (53.6°F). According to the Clausius–Clapeyron equation, vapor pressure of methanol at 12°C is 60.54 mmHg (1.161 psia).

Saturated Vapor Pressure for Methanol	
Temp (°F)	Pressure (psia)
53.6	1.161

**Addivant; W430ZP Trial Process**  
**W430ZP Drumming and Toting Losses**

**W430ZP Loading Losses**

Compound	Molecular Weight (lb/lbmol)	True Vapor Pressure of Liquid (psia)	Saturation Factor	Temperature (°R)	Loading Loss Rate (lb/10 <sup>3</sup> gal)	W430 Production Rate (gal/batch)	Number of W430 Trial Runs (batches)	W430 Production (gal/yr)	Annual Loading Losses (tpy)	Annual Loading Losses (lb/hr)
W430ZP	430.47	0.04	1.45	599.67	0.52	1225.00	80.00	98000.00	2.54E-02	5.30E-02

**Note:**

<sup>1</sup>Emission calculation from AP 42 5.2-4 Equation (1) - Loading Loss (lb/10<sup>3</sup> gal) of liquid loaded

<sup>2</sup> Using the temperature provided by Addivant for the drumming, Vapor pressure and W430ZP production rate based off of values calculated or used in EPA TANKs Report - K-4 W430ZP Product

<sup>3</sup>The temperature of the W430ZP during drumming/toting is approximately 60 deg C or (140 deg F) based on vapor pressure of DPG.

Saturated Vapor Pressure for W430ZP	
Temp (°F)	Pressure (psia)
140	0.040



**Addivant; W430ZP Trial Process**  
**Hot Well Loading Losses - Wastewater**

**Hot Well Flashing Losses**

Compound	Molecular Weight (lb/lbmol)	True Vapor Pressure of Liquid (psia)	Saturation Factor	Temperature (°R)	Loading Loss Rate (lb/10 <sup>3</sup> gal)	Wastewater Recovery Rate (gal/trial)	Number of W430 Trial Runs (trials)	Methanol Recovery (gal/yr)	Annual Loading Losses (tpy)	Annual Loading Losses (lb/hr)
Methanol	32.04	12.27	1.45	599.67	11.84	12000.00	80.00	576.00	3.41E-03	7.11E-03

**Note:**

<sup>1</sup>Emission calculation methodology from AP 42 5.2-4 Equation (1) - Loading Loss (lb/10<sup>3</sup> gal) of liquid loaded

<sup>2</sup>Methanol is assumed to be a maximum of 0.06% of the wastewater recovered. (4.21 lb MeOH/1000 lbs W430) x (11211 lbs W430/trial) x (1 gal Methanol/6.564 lb Methanol) = 7.2 gal MeOH/trial

<sup>3</sup>Percent Methanol in Wastewater = (7.2 gal MeOH/batch) ÷ (12,000 gal wastewater/batch) x 100 = 0.06%

Saturated Vapor Pressure for Methanol	
Temp (°F)	Pressure (psia)
140	12.269

**Addivant; W430ZP Trial Process**  
**Wastewater Tote Working and Breathing Emissions Detail Sheet**

Pollutant	Losses (lbs/yr) <sup>1</sup>			Losses (lb/hr)			Losses (tpy)		
	Working Loss	Breathing Loss	Total Emissions	Working Loss	Breathing Loss	Total Emissions	Working Loss	Breathing Loss	Total Emissions
VOC	0.53	0.000	0.53	0.000	0.000	0.000	0.000	0.000	0.000
Methanol	0.53	0.000	0.53	0.000	0.000	0.000	0.000	0.000	0.000

**Note:**

<sup>1</sup>Losses from EPA TANKs Report - W430ZP Wastewater Tote

<sup>2</sup>Wastewater is an estimated 0.06% methanol and 99.94% water and is based of a throughput of 960,000 gal wastewater/yr (12,000 gal wastewater/batch x 80 batches)

**Addivant; W430ZP Trial Process**  
**Wastewater Portable Tank Working and Breathing Emissions Detail Sheet**

Pollutant	Losses (lbs/yr) <sup>1</sup>			Losses (lb/hr)			Losses (tpy)		
	Working Loss	Breathing Loss	Total Emissions	Working Loss	Breathing Loss	Total Emissions	Working Loss	Breathing Loss	Total Emissions
VOC	0.71	1.18	1.89	0.000	0.000	0.000	0.000	0.001	0.001
Methanol	0.71	1.18	1.89	0.000	0.000	0.000	0.000	0.001	0.001

**Note:**

<sup>1</sup>Losses from EPA TANKs Report - W430ZP Wastewater Portable Tank

<sup>2</sup>Wastewater is an estimated 0.06% methanol and 99.94% water and is based of a throughput of 960,000 gal wastewater/yr (12,000 gal wastewater/batch x 80 batches)

**Addivant; W430ZP Trial Process  
W430ZP (VOC) Equipment Leaks**

**Calculation Methodology**

Emission factors are SOCMF factors - US EPA. Emissions are calculated using the number of components and the maximum hours in a year.

**Input Data**

	Value	Basis
Heavy Liquid Valves EF:	0.00023 kg/hr 0.00051 lbs VOC/valve/hr	SOCMI Factors - US EPA. Protocol for Equipment Leak Emission Estimates, (EPA-453/R-95-017)
Gas Valves EF:	0.00597 kg/hr 0.01316 lbs VOC/valve/hr	
Heavy Liquid Flanges EF <sup>(1)</sup> :	0.00183 kg/hr 0.00403 lbs VOC/flange/hr	November 1995, Table 2-1.
Gas Flanges EF <sup>(1)</sup> :	0.00183 kg/hr 0.00403 lbs VOC/flange/hr	
Heavy Liquid Pump Seals EF:	0.00862 kg/hr 0.019 lbs VOC/pump seal/hr	
Sampling Connections EF:	0.015 kg/hr 0.033 lbs VOC/sampling connection/hr	
Gas Pressure Relief Valves EF <sup>(2)</sup> :	0.104 kg/hr 0.2293 lbs VOC/relief valve/hr	

Hours: 960 Maximum hours in a year.

**Description of Streams and Number of Equipment Components**

Stream ID	Vapor/ Liquid Service?	Number of Equipment Components not in Vacuum Service						
		Liquid Service Valves	Liquid Service Flanges	Vapor Service Valves	Vapor Service Flanges	Pump Seals	Sampling Connections	Safety Relief Valves
T-3 & T-9 to K-20 Reactor - DPG	Liquid	31	60			4		2
K-20 Reactor to K-4	Liquid	18	35			2	3	1
K-20 Reactor to column	Vapor			5	11		1	
Primary condensor to K-20 Receiver (R44)	Liquid	3	7					1
Primary condensor to secondary condensor	Vapor				2			
Secondary condensor to K-20 Receiver (R44)	Vapor			3	6			
K-20 Receiver (R44) to K-20 Charge Meter - DPG	Liquid	8	17			2	1	
K-20 Charge Metering Manifold at K-20 - DPG	Liquid	5	8					
K-20 Receiver (R44) to Methanol drumming	Liquid	4	8				2	
K-20 Receiver (R44) to KO Pot R116	Vapor			1	4			
KO Pot R116 to Water Jet	Vapor			5	12			1
Water Jet to hot well	Liquid							
Hot Well to Wastewater Tote	Liquid	2	4					
Wastewater Tote to Frac Tank	Liquid	9	18					
<b>Totals:</b>		<b>80</b>	<b>157</b>	<b>14</b>	<b>35</b>	<b>8</b>	<b>7</b>	<b>5</b>

Calculation

Streams	Emissions from Leaking Components not in Vacuum Service							
	Percent VOC in Stream	Valves Liquid (lbs/yr)	Valves Gas (lbs/yr)	Flanges Liquid (lbs/yr)	Flanges Gas (lbs/yr)	Pump Seals (lbs/yr)	Sampling Connections (lbs/yr)	Pressure Relief Valves (lbs/yr)
T-3 & T-9 to K-20 Reactor - DPG	100%	15.09	0.00	232.39	0.00	72.98	0.00	440.22
K-20 Reactor to K-4	100%	8.76	0.00	135.56	0.00	36.49	95.24	220.11
K-20 Reactor to column	100%	0.00	63.18	0.00	42.60	0.00	31.75	0.00
Primary condensor to K-20 Receiver (R44)	100%	1.46	0.00	27.11	0.00	0.00	0.00	220.11
Primary condensor to secondary condensor	100%	0.00	0.00	0.00	7.75	0.00	0.00	0.00
Secondary condensor to K-20 Receiver (R44)	100%	0.00	37.91	0.00	23.24	0.00	0.00	0.00
K-20 Receiver (R44) to K-20 Charge Meter - DPG	100%	3.89	0.00	65.84	0.00	36.49	31.75	0.00
K-20 Charge Metering Manifold at K-20 - DPG	100%	2.43	0.00	30.98	0.00	0.00	0.00	0.00
K-20 Receiver (R44) to Methanol drumming	100%	1.95	0.00	30.98	0.00	0.00	63.49	0.00
K-20 Receiver (R44) to KO Pot R116	100%	0.00	12.64	0.00	15.49	0.00	0.00	0.00
KO Pot R116 to Water Jet	100%	0.00	63.18	0.00	46.48	0.00	0.00	220.11
Water Jet to hot well	1%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hot Well to Wastewater Tote	1%	0.01	0.00	0.15	0.00	0.00	0.00	0.00
Wastewater Tote to Frac Tank	1%	0.04	0.00	0.70	0.00	0.00	0.00	0.00
<b>Total</b>		33.64	176.89	523.72	135.56	145.95	222.23	1,100.55

**Total VOC Emissions from Equipment Leaks**  
**2,339 lbs/yr**  
**1.17 tpy**

Streams	Emissions from Leaking Components not in Vacuum Service							
	Percent VOC in Stream	Valves Liquid (lbs/hr)	Valves Gas (lbs/hr)	Flanges Liquid (lbs/hr)	Flanges Gas (lbs/hr)	Pump Seals (lbs/hr)	Sampling Connections (lbs/hr)	Pressure Relief Valves (lbs/hr)
T-3 & T-9 to K-20 Reactor - DPG	100%	1.57E-02	0.00E+00	2.42E-01	0.00E+00	0.08	0.00E+00	4.59E-01
K-20 Reactor to K-4	100%	9.13E-03	0.00E+00	1.41E-01	0.00E+00	0.04	9.92E-02	2.29E-01
K-20 Reactor to column	100%	0.00E+00	6.58E-02	0.00E+00	4.44E-02	0.00	3.31E-02	0.00E+00
Primary condensor to K-20 Receiver (R44)	100%	1.52E-03	0.00E+00	2.82E-02	0.00E+00	0.00	0.00E+00	2.29E-01
Primary condensor to secondary condensor	100%	0.00E+00	0.00E+00	0.00E+00	8.07E-03	0.00	0.00E+00	0.00E+00
Secondary condensor to K-20 Receiver (R44)	100%	0.00E+00	3.95E-02	0.00E+00	2.42E-02	0.00	0.00E+00	0.00E+00
K-20 Receiver (R44) to K-20 Charge Meter - DPG	100%	4.06E-03	0.00E+00	6.86E-02	0.00E+00	0.04	3.31E-02	0.00E+00
K-20 Charge Metering Manifold at K-20 - DPG	100%	2.54E-03	0.00E+00	3.23E-02	0.00E+00	0.00	0.00E+00	0.00E+00
K-20 Receiver (R44) to Methanol drumming	100%	2.03E-03	0.00E+00	3.23E-02	0.00E+00	0.00	6.61E-02	0.00E+00
K-20 Receiver (R44) to KO Pot R116	100%	0.00E+00	1.32E-02	0.00E+00	1.61E-02	0.00	0.00E+00	0.00E+00
KO Pot R116 to Water Jet	100%	0.00E+00	6.58E-02	0.00E+00	4.84E-02	0.00	0.00E+00	2.29E-01
Water Jet to hot well	1%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00
Hot Well to Wastewater Tote	1%	1.01E-05	0.00E+00	1.61E-04	0.00E+00	0.00	0.00E+00	0.00E+00
Wastewater Tote to Frac Tank	1%	4.56E-05	0.00E+00	7.26E-04	0.00E+00	0.00	0.00E+00	0.00E+00
<b>Total</b>		3.50E-02	1.84E-01	5.46E-01	1.41E-01	0.15	2.31E-01	1.15E+00

**Total VOC Emissions from Equipment Leaks**  
**2.44 lbs/hr**

**Addivant; W430ZP Trial Process  
Methanol (HAP) Equipment Leaks**

**Calculation Methodology**

Emission factors are SOCMF factors - US EPA. Emissions are calculated using the number of components and the maximum hours in a year.

**Input Data**

	<b>Value</b>	<b>Basis</b>
Heavy Liquid Valves EF:	0.00023 kg/hr 0.00051 lbs VOC/valve/hr	SOCMI Factors - US EPA. Protocol for Equipment Leak Emission Estimates, (EPA-453/R-95-017) November 1995, Table 2-1.
Gas Valves EF:	0.00597 kg/hr 0.01316 lbs VOC/valve/hr	
Heavy Liquid Flanges EF <sup>(1)</sup> :	0.00183 kg/hr 0.00403 lbs VOC/flange/hr	
Gas Flanges EF <sup>(1)</sup> :	0.00183 kg/hr 0.00403 lbs VOC/flange/hr	
Heavy Liquid Pump Seals EF:	0.00862 kg/hr 0.019 lbs VOC/pump seal/hr	
Sampling Connections EF:	0.015 kg/hr 0.033 lbs VOC/sampling connection/hr	
Gas Pressure Relief Valves EF <sup>(2)</sup> :	0.104 kg/hr 0.2293 lbs VOC/relief valve/hr	

Hours: 960 Maximum hours in a year.

**Description of Streams and Number of Equipment Components**

Stream ID	Vapor/ Liquid Service?	Number of Equipment Components not in Vacuum Service						
		Liquid Service Valves	Liquid Service Flanges	Vapor Service Valves	Vapor Service Flanges	Pump Seals	Sampling Connections	Safety Relief Valves
K-20 Reactor to column	Vapor			5	11		1	
Primary condensor to K-20 Receiver (R44)	Liquid	3	7					1
Primary condensor to secondary condensor	Vapor				2			
Secondary condensor to K-20 Receiver (R44)	Vapor			3	6			
K-20 Receiver (R44) to Methanol drumming	Liquid	4	8			2	2	
K-20 Receiver (R44) to KO Pot R116	Vapor			1	4			
KO Pot R116 to Water Jet	Vapor			5	12			1
Water Jet to hot well	Liquid							
Hot Well to Wastewater Tote	Liquid	2	4					
Wastewater Tote to Frac Tank	Liquid	9	18					
<b>Totals:</b>		<b>18</b>	<b>37</b>	<b>14</b>	<b>35</b>	<b>2</b>	<b>3</b>	<b>2</b>

Calculation

Streams	Emissions from Leaking Components not in Vacuum Service							
	Percent VOC in Stream	Valves Liquid (lbs/yr)	Valves Gas (lbs/yr)	Flanges Liquid (lbs/yr)	Flanges Gas (lbs/yr)	Pump Seals (lbs/yr)	Sampling Connections (lbs/yr)	Pressure Relief Valves (lbs/yr)
K-20 Reactor to column	100%	0.00	63.18	0.00	42.60	0.00	31.75	0.00
Primary condensor to K-20 Receiver (R44)	100%	1.46	0.00	27.11	0.00	0.00	0.00	220.11
Primary condensor to secondary condensor	100%	0.00	0.00	0.00	7.75	0.00	0.00	0.00
Secondary condensor to K-20 Receiver (R44)	100%	0.00	37.91	0.00	23.24	0.00	0.00	0.00
K-20 Receiver (R44) to Methanol drumming	100%	1.95	0.00	30.98	0.00	36.49	63.49	0.00
K-20 Receiver (R44) to KO Pot R116	100%	0.00	12.64	0.00	15.49	0.00	0.00	0.00
KO Pot R116 to Water Jet	100%	0.00	63.18	0.00	46.48	0.00	0.00	220.11
Water Jet to hot well	1%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hot Well to Wastewater Tote	1%	0.01	0.00	0.15	0.00	0.00	0.00	0.00
Wastewater Tote to Frac Tank	1%	0.04	0.00	0.70	0.00	0.00	0.00	0.00
<b>Total</b>		<b>3.46</b>	<b>176.89</b>	<b>58.95</b>	<b>135.56</b>	<b>36.49</b>	<b>95.24</b>	<b>440.22</b>

**Total VOC Emissions from Equipment Leaks**  
**947 lbs/yr**  
**0.47 tpy**

Streams	Emissions from Leaking Components not in Vacuum Service							
	Percent VOC in Stream	Valves Liquid (lbs/hr)	Valves Gas (lbs/hr)	Flanges Liquid (lbs/hr)	Flanges Gas (lbs/hr)	Pump Seals (lbs/hr)	Sampling Connections (lbs/hr)	Pressure Relief Valves (lbs/hr)
K-20 Reactor to column	100%	0.00E+00	6.58E-02	0.00E+00	4.44E-02	0.00	3.31E-02	0.00E+00
Primary condensor to K-20 Receiver (R44)	100%	1.52E-03	0.00E+00	2.82E-02	0.00E+00	0.00	0.00E+00	2.29E-01
Primary condensor to secondary condensor	100%	0.00E+00	0.00E+00	0.00E+00	8.07E-03	0.00	0.00E+00	0.00E+00
Secondary condensor to K-20 Receiver (R44)	100%	0.00E+00	3.95E-02	0.00E+00	2.42E-02	0.00	0.00E+00	0.00E+00
K-20 Receiver (R44) to Methanol drumming	100%	2.03E-03	0.00E+00	3.23E-02	0.00E+00	0.04	6.61E-02	0.00E+00
K-20 Receiver (R44) to KO Pot R116	100%	0.00E+00	1.32E-02	0.00E+00	1.61E-02	0.00	0.00E+00	0.00E+00
KO Pot R116 to Water Jet	100%	0.00E+00	6.58E-02	0.00E+00	4.84E-02	0.00	0.00E+00	2.29E-01
Water Jet to hot well	1%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00
Hot Well to Wastewater Tote	1%	1.01E-05	0.00E+00	1.61E-04	0.00E+00	0.00	0.00E+00	0.00E+00
Wastewater Tote to Frac Tank	1%	4.56E-05	0.00E+00	7.26E-04	0.00E+00	0.00	0.00E+00	0.00E+00
<b>Total</b>		<b>3.61E-03</b>	<b>1.84E-01</b>	<b>6.14E-02</b>	<b>1.41E-01</b>	<b>0.04</b>	<b>9.92E-02</b>	<b>4.59E-01</b>

**Total VOC Emissions from Equipment Leaks**  
**0.99 lbs/hr**