REGULATION 13 APPLICATION FOR AN EXTRUSION MANUFACTURING FACILITY JEFFERSON COUNTY, WEST VIRGINIA

Prepared for:

TeMa North America, LLC
395 Steeley Way
Kearneysville, West Virginia 25430

Prepared by:

Potesta & Associates, Inc.
15 South Braddock Street
Winchester, Virginia 22601
Phone: (540) 450-0180 Fax: (540) 450-0182
Email: potesta@potesta.com

Project No. 0103-17-0435-100

July 2018

POTESTA

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Attachments not applicable to, and not included in, this application: Q, R and S

SECTION I - III

GENERAL APPLICANT INFORMATION

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

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

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

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

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

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

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

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

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

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
TeMa North America, LLC

2. Federal Employer ID No. ***(FEIN):***
82-3157701

3. Name of facility *(if different from above):*
Jefferson County Operations

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

5A. Applicant's mailing address:
395 Steeley Way
Kearneysville, WV 25430

5B. Facility's present physical address:
395 Steeley Way
Kearneysville, WV 25430

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

➪ If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**

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

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: TeMa Group

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

➪ If **YES,** please explain: Applicant is leasing the site in the Burr Business Park.

➪ If **NO,** you are not eligible for a permit for this source.

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

10. North American Industry Classification System **(NAICS)** code for the facility:
326199

11A. DAQ Plant ID No. (for existing facilities only):
NA - New Facility

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
NA – New Facility

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

12A.

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

Take Bardane Exit from WV Route 9, turn right onto WV State Route 8, travel approximately 0.3 miles and turn left into the Burr Business Park onto W. Burr Boulevard, turn right onto McGarry Boulevard and then right into the area where the facility will be located on Steeley Way.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
2 Steeley Way, Kearneysville, WV 25430	Kearneysville/Bardane	Jefferson
12.E. UTM Northing (KM): 4,360.27638	12F. UTM Easting (KM): 252.63229	12G. UTM Zone: 18

13. Briefly describe the proposed change(s) at the facility:
Building new manufacturing facility.

14A. Provide the date of anticipated installation or change: 09/15/2018 ➪ If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen:	14B. Date of anticipated Start-Up if a permit is granted: 12/15/2018

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

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

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

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

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

Section II. Additional attachments and supporting documents.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

☐ Other Collectors, specify

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

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

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

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

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

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

☐ **YES** ☒ **NO**

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

Section III. Certification of Information

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

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

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

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

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

Certification of Truth, Accuracy, and Completeness

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

Compliance Certification

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

SIGNATURE _____ *(Please use blue ink)* DATE: July 12, 2018 *(Please use blue ink)*

35B. Printed name of signee: Tonj Ciotti		35C. Title: Chief Executive Officer
35D. E-mail: tonj.ciotti@temanorthamerica.com	36E. Phone: (304) 707-2290	36F. FAX: Use Email
36A. Printed name of contact person (if different from above): Patrick Ward		36B. Title: Engineer
36C. E-mail: peward@potesta.com	36D. Phone: (304) 342-1400	36E. FAX: Use Email

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

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

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

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

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

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

ATTACHMENT A

BUSINESS CERTIFICATE

State of West Virginia

Certificate

I, Mac Warner, Secretary of State of the State of West Virginia, hereby certify that

TEMA NORTH AMERICA, LLC

Control Number: 9AJRJ

has filed its "Articles of Organization" in my office according to the provisions of West Virginia Code §§31B-2-203 and 206. I hereby declare the organization to be registered as a limited liability company from its effective date of September 29, 2017 until the expiration of the term or termination of the company.

Therefore, I hereby issue this

CERTIFICATE OF A LIMITED LIABILITY COMPANY

Given under my hand and the Great Seal of the State of West Virginia on this day of September 29, 2017

Mac Warner

Secretary of State

FILED

SEP 29 2017

IN THE OFFICE OF
SECRETARY OF STATE

9AJRJ

ARTICLES OF ORGANIZATION OF TEMA NORTH AMERICA, LLC

The undersigned, desiring to form a limited liability company pursuant to Chapter 31B of the West Virginia Code, adopts the following Articles of Organization for such limited liability company, FILED IN DUPLICATE:

Article I
Name

The name of the limited liability company shall be "TeMa North America, LLC" referred to in these Articles of Organization as the "Company."

Article II
Purpose

The purposes for which this Company is formed are: (1) to acquire, construct, own, operate and manage a manufacturing facility, (2) to transact any business that is incidental thereto, and (3) to transact any lawful business for which limited liability companies may be organized under the laws of the State of West Virginia as determined by the member or Manager of the Company.

Article III
Principal and Designated Office; Agent for Service of Process; E-mail Address for Notices

The address of the Company's principal office and initial designated office is 1948 Wiltshire Rd., Bldg. 4, Kearneysville, West Virginia 25430. The Company's name and address of the registered agent for service of process is Cogency Global Inc., 1627 Quarrier Street East, Charleston, West Virginia 25311 (Kanawha County). The e-mail address to which informational notices and reminders of annual filings may be sent is: info@temanorthamerica.com.

SECRETARY OF STATE
17 SEP 29 AM 10:42
RECEIVED

Article IV
Organizer/Members Having Authority to Execute Instruments

The Organizer of this Company is Tonj Ciotti, whose address is Via dell'Industria, no. 21, 31209 Vittorio Veneto (TV), Italy. As the Company will be manager-managed, no members will have authority to execute instruments on behalf of the Company.

Article V
Term Company

The Company shall be a "term company." The term of the Company shall expire on or before December 31, 2120.

Article VI
Management by Managers

The Company is to be "manager-managed." The Company's initial Manager is Mr. Tonj Ciotti, whose address is Via dell'Industria, no. 21, 31209 Vittorio Veneto (TV), Italy.

Article VII
West Virginia Code Section 31B-3-303(c)

No Manager or Member shall be liable in his or her capacity as a member for all or any part of the Company's debts, obligations, or liabilities.

IN WITNESS WHEREOF, the undersigned has, for the purpose of forming TeMa North America, LLC, a West Virginia limited liability company, executed these Articles of Organization this 10 day of September, 2017.

TONJ CIOTTI, Organizer

ATTACHMENT B

AREA MAP

POTESTA
Engineers and Environmental Consultants

15 South Braddock Street
Winchester, Virginia 22601
Phone: (540) 450-0180
Fax: (540) 450-0182

Area Map

for

TeMa North America, LLC
395 Steeley Way
Kearneysville, WV 25430
Project No. 0103-17-0435-100

ATTACHMENT C

INSTALLATION AND STARTUP SCHEDULE

ATTACHMENT C

INSTALLATION AND STARTUP SCHEDULE

The equipment installation will start after issuance of the permit and is expected to occur around September 15, 2018. Operations are anticipated to start around December 15, 2018.

ATTACHMENT D

REGULATORY DISCUSSION

ATTACHMENT D

REGULATORY DISCUSSION

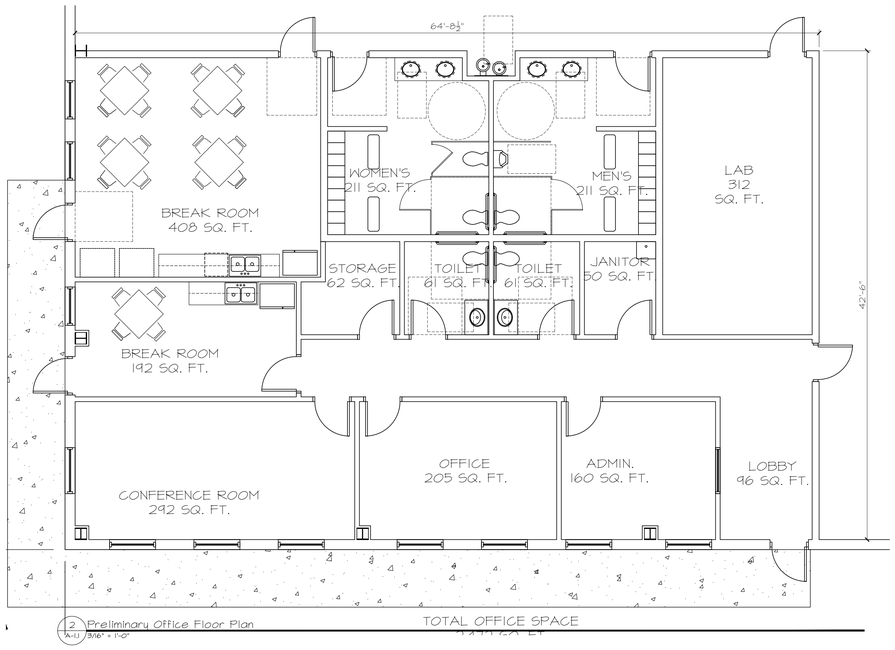
The facility is required to comply with the requirements contained in the applicable provisions of (1) 45CSR7, and (2) 45CSR13.

1. 45CSR7, *To Prevent and Control Particulate Matter Air Pollution from Manufacturing Processes and Associated Operations*, this facility meets the definition of a manufacturing process and is thereby required to meet the standards of the rule. The rule requires the facility to maintain dust control to meet the process rate standards.

2. 45CSR13, *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*, defines a source that is subject to the rule. This definition includes a source that is subject to a substantive requirement (Section 2.24.a.). Regulation 7 is considered a substantive requirement; therefore, the facility is required to obtain a permit and to operate within the limits of the permit and in accordance with the permit application.

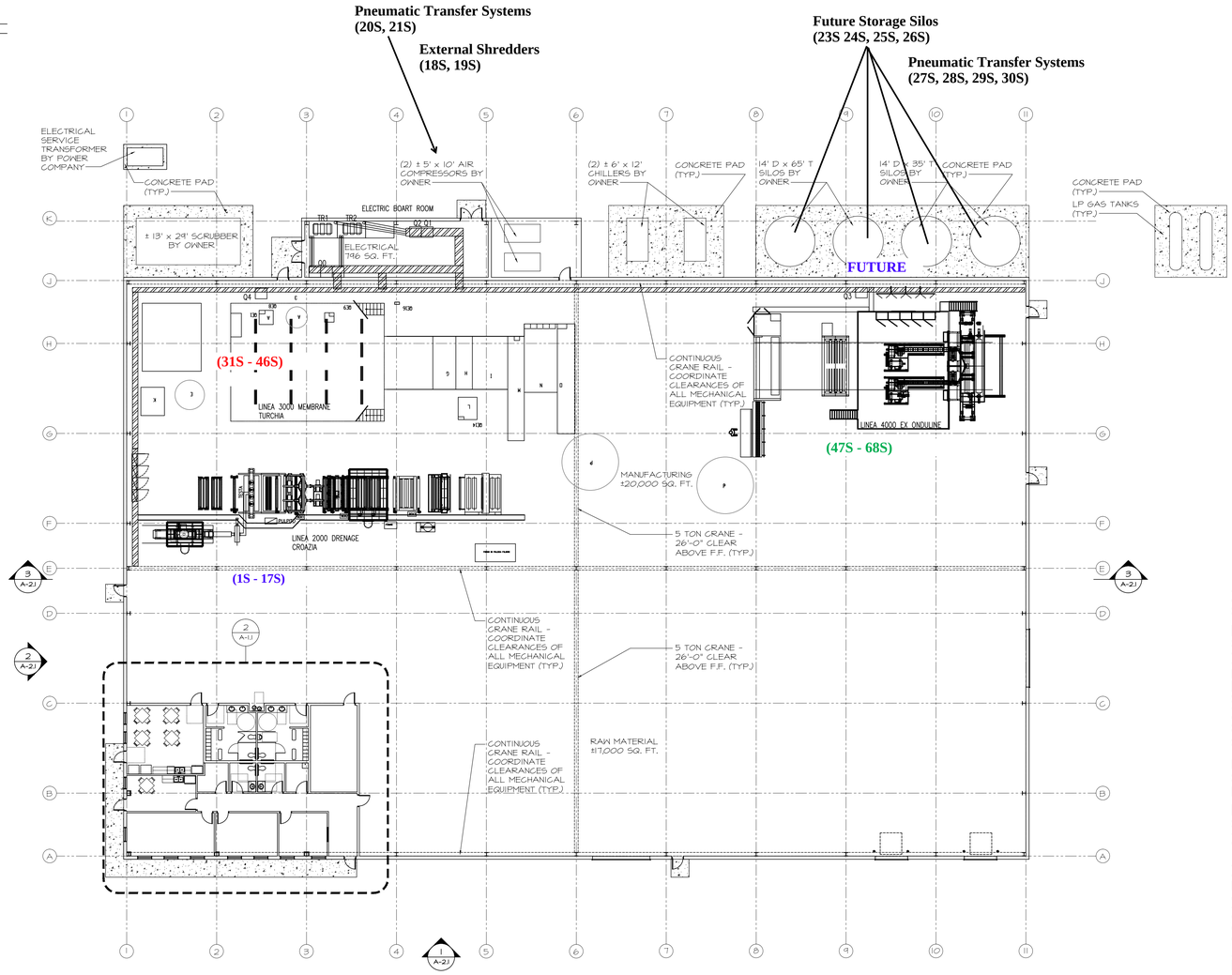
ATTACHMENT E

PLOT PLAN



2 A-1.1 Preliminary Office Floor Plan
3/16" = 1'-0"

TOTAL OFFICE SPACE
4,411 SQ. FT.



1 A-1.1 Preliminary Floor Plan
1/16" = 1'-0"

NOTE: Information in color (blue, red, green) added by POTESTA & ASSOCIATES, INC. for air permitting purposes only.

PRELIMINARY - NOT FOR CONSTRUCTION

TeMa U.S.A.
PROPOSED MANUFACTURING FACILITY
BURR BUSINESS PARK
Jefferson County, West Virginia

DESIGN CONCEPTS
architecture + interiors
129 - 131 South Loudoun Street
Winchester, VA 22601
tel. (540) 722-7247, fax. (540) 722-7248
archdesign@designconcepts.com

JOB # 1717

November 15, 2017

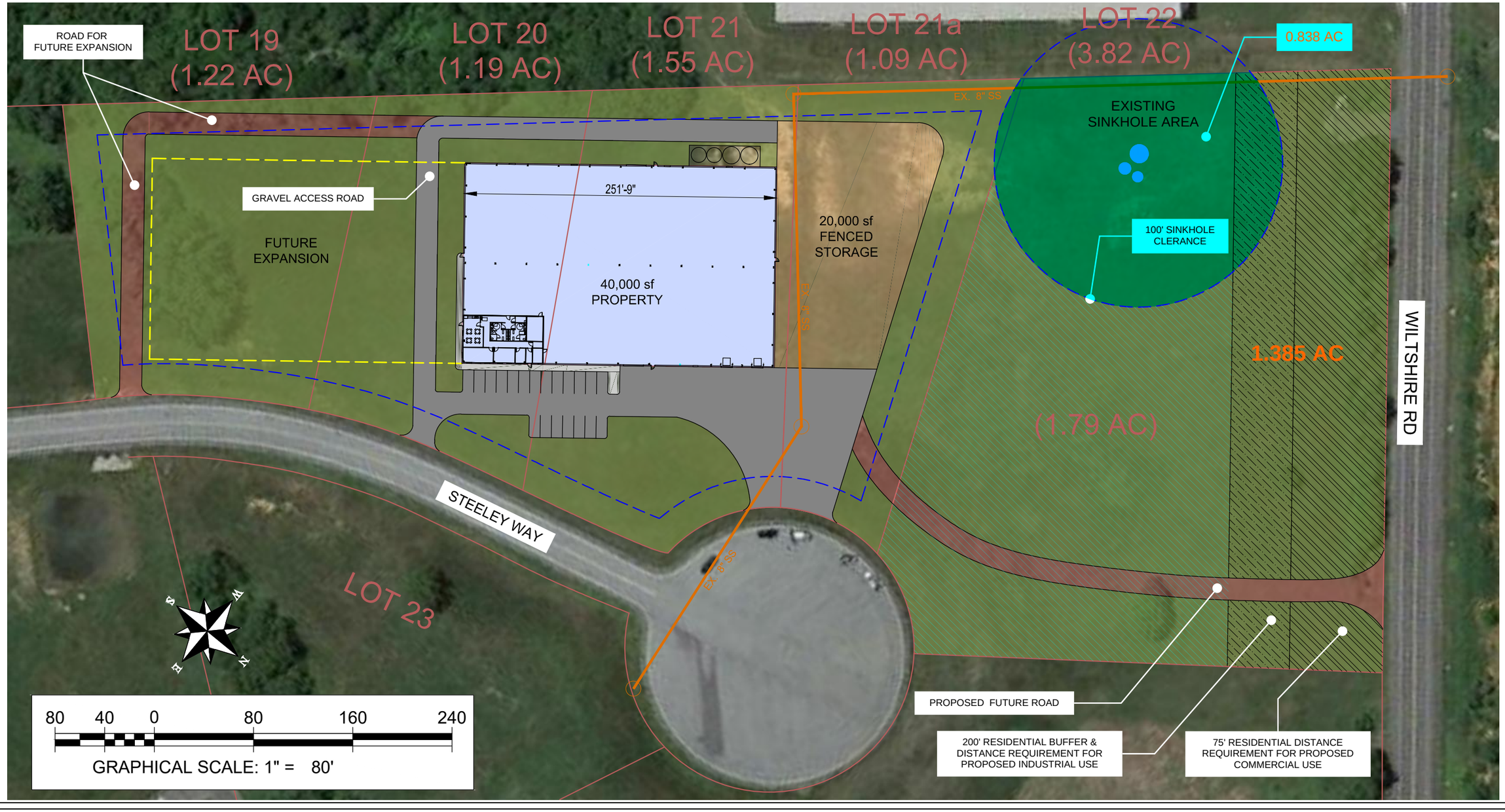
Preliminary Drawings

These Documents- Schematic Drawings, Preliminary Drawings, or Working Drawings, and Specifications are the Property of Architecture Design Concepts,P.C. and may not be used, reproduced, or utilized without the express written consent of Architecture Design Concepts, P.C.

REVISIONS:

PRELIMINARY FLOOR PLANS

A-1.1



HOWARD SHOCKEY & SONS, INC.

LOT 19 - 20 - 21 - 22

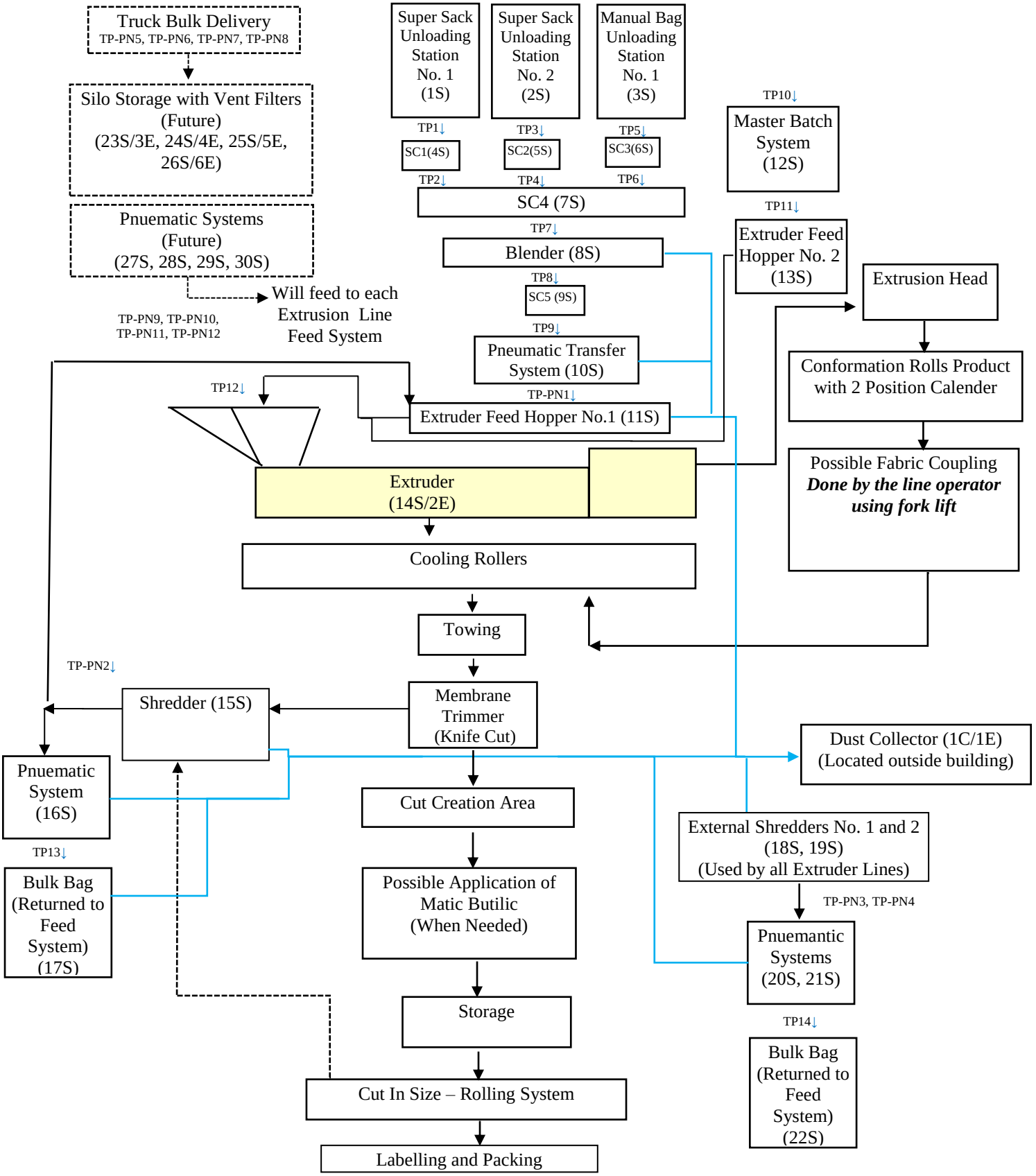
BURR BUSINESS PARK

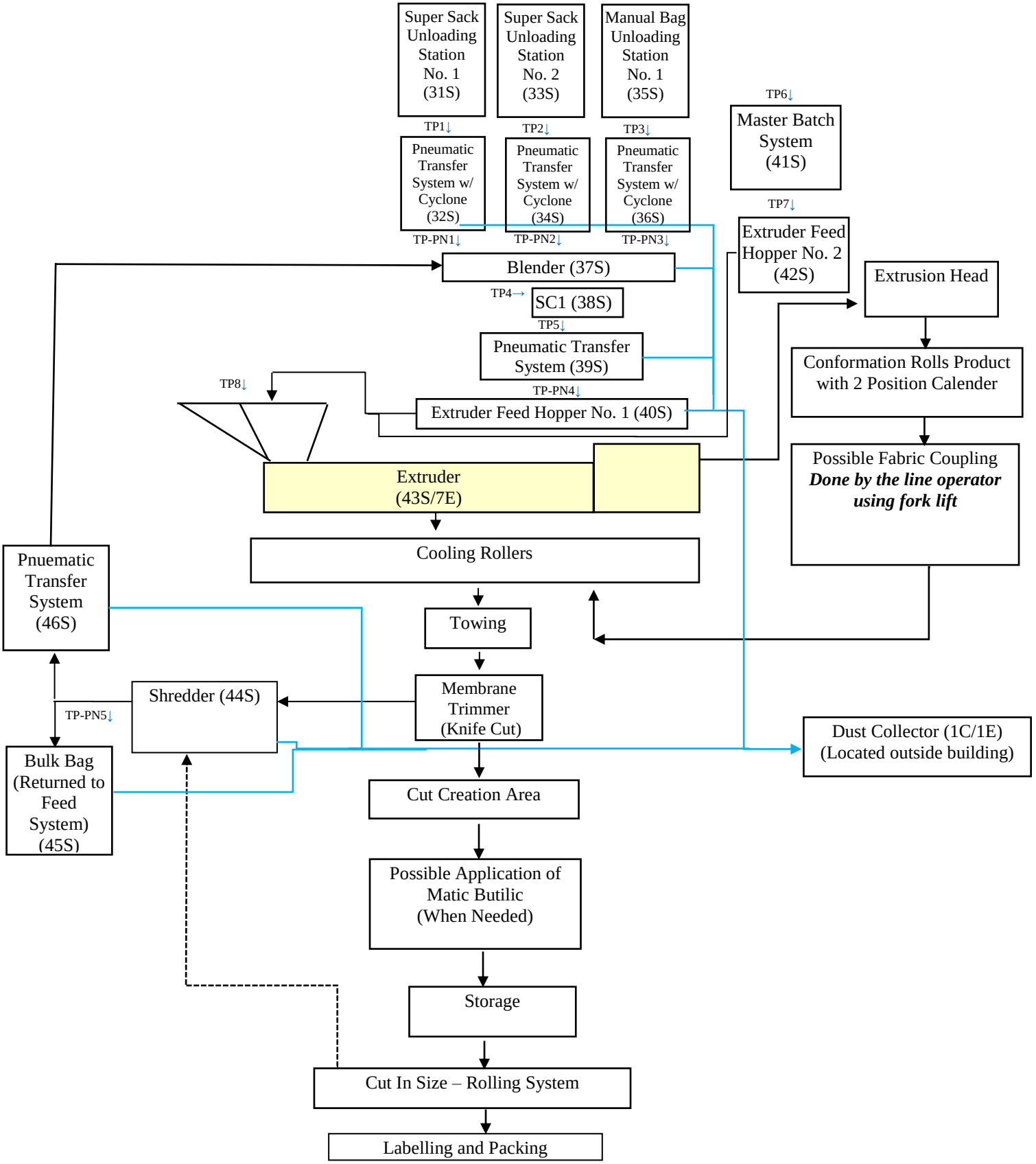
September 27, 2017

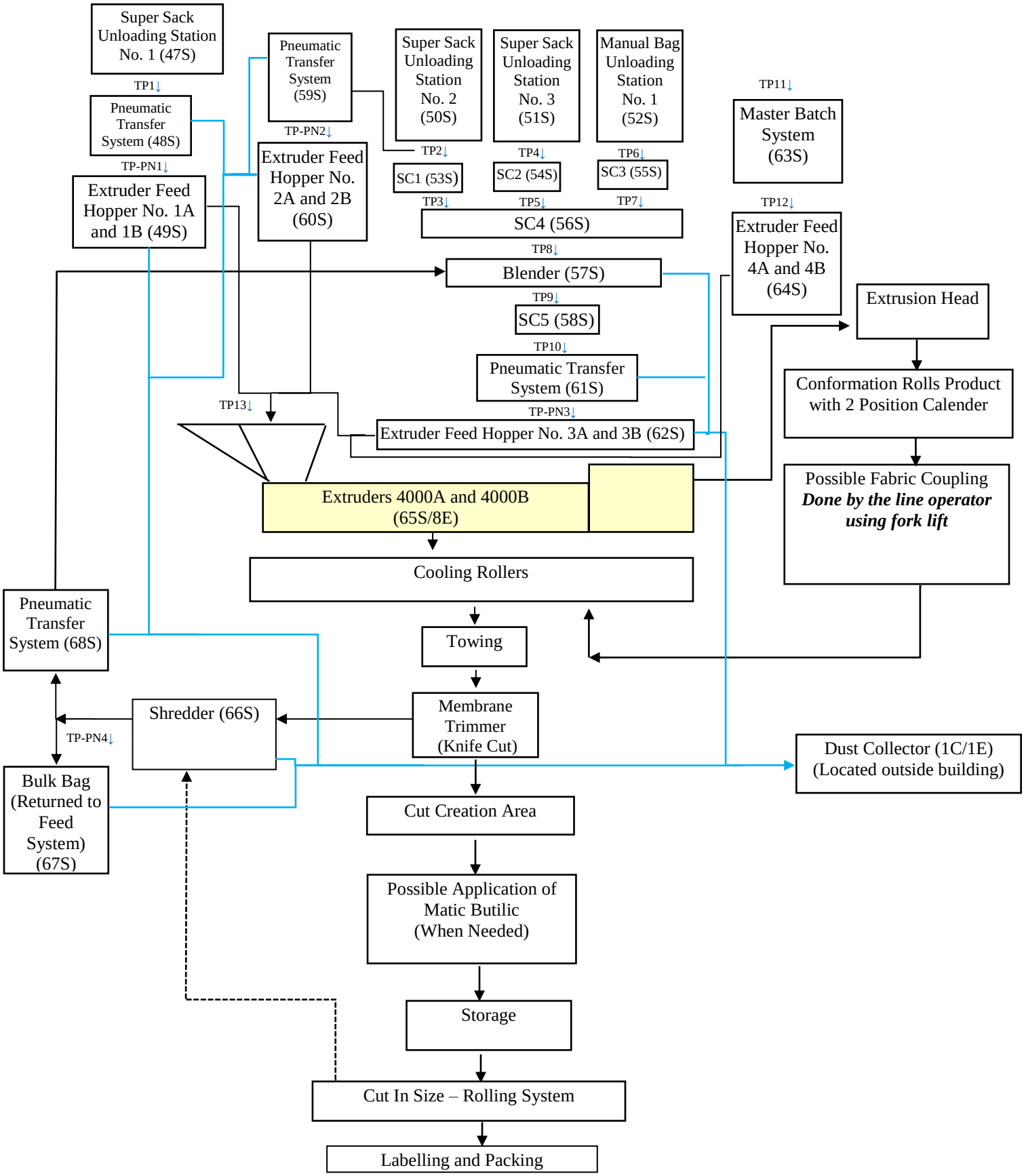
1 / 1

ATTACHMENT F

DETAILED PROCESS FLOW DIAGRAM


Truck Bulk Delivery
TP-PN5, TP-PN6, TP-PN7, TP-PN8
Silo Storage with Vent Filters (Future)
(23S/3E, 24S/4E, 25S/5E, 26S/6E)
Pnuematic Systems (Future)
(27S, 28S, 29S, 30S)
TP-PN9, TP-PN10, TP-PN11, TP-PN12
Will feed to each Extrusion Line Feed System
Super Sack Unloading Station No. 1 (1S)
Super Sack Unloading Station No. 2 (2S)
Manual Bag Unloading Station No. 1 (3S)
TP1↓
TP3↓
TP5↓
SC1(4S)
SC2(5S)
SC3(6S)
TP2↓
TP4↓
TP6↓
SC4 (7S)
TP7↓
Blender (8S)
TP8↓
SC5 (9S)
TP9↓
Pneumatic Transfer System (10S)
TP10↓
Master Batch System (12S)
TP11↓
Extruder Feed Hopper No. 2 (13S)
Extrusion Head
Conformation Rolls Product with 2 Position Calender
Possible Fabric Coupling
Done by the line operator using fork lift
TP12↓
TP-PN1↓
Extruder Feed Hopper No.1 (11S)
Extruder (14S/2E)
Cooling Rollers
Towing
TP-PN2↓
Shredder (15S)
Membrane Trimmer (Knife Cut)
Dust Collector (1C/1E) (Located outside building)
Pnuematic System (16S)
Cut Creation Area
External Shredders No. 1 and 2 (18S, 19S) (Used by all Extruder Lines)
TP13↓
Bulk Bag (Returned to Feed System) (17S)
Possible Application of Matic Butilic (When Needed)
TP-PN3, TP-PN4
Pnuemantic Systems (20S, 21S)
Storage
TP14↓
Bulk Bag (Returned to Feed System) (22S)
Cut In Size – Rolling System
Labelling and Packing


Super Sack Unloading Station No. 1 (31S)
Super Sack Unloading Station No. 2 (33S)
Manual Bag Unloading Station No. 1 (35S)
TP1↓
TP2↓
TP3↓
Pneumatic Transfer System w/ Cyclone (32S)
Pneumatic Transfer System w/ Cyclone (34S)
Pneumatic Transfer System w/ Cyclone (36S)
TP-PN1↓
TP-PN2↓
TP-PN3↓
TP6↓
Master Batch System (41S)
TP7↓
Extruder Feed Hopper No. 2 (42S)
Blender (37S)
TP4→
SC1 (38S)
TP5↓
Pneumatic Transfer System (39S)
Extrusion Head
Conformation Rolls Product with 2 Position Calender
TP8↓
TP-PN4↓
Extruder Feed Hopper No. 1 (40S)
Extruder (43S/7E)
Possible Fabric Coupling Done by the line operator using fork lift
Cooling Rollers
Pnuematic Transfer System (46S)
Towing
Shredder (44S)
Membrane Trimmer (Knife Cut)
TP-PN5↓
Dust Collector (1C/1E) (Located outside building)
Bulk Bag (Returned to Feed System) (45S)
Cut Creation Area
Possible Application of Matic Butilic (When Needed)
Storage
Cut In Size – Rolling System
Labelling and Packing


Super Sack Unloading Station No. 1 (47S)
TP1↓
Pneumatic Transfer System (48S)
TP-PN1↓
Extruder Feed Hopper No. 1A and 1B (49S)
Pneumatic Transfer System (59S)
TP-PN2↓
Extruder Feed Hopper No. 2A and 2B (60S)
Super Sack Unloading Station No. 2 (50S)
TP2↓
SC1 (53S)
TP3↓
Super Sack Unloading Station No. 3 (51S)
TP4↓
SC2 (54S)
TP5↓
Manual Bag Unloading Station No. 1 (52S)
TP6↓
SC3 (55S)
TP7↓
SC4 (56S)
TP11↓
Master Batch System (63S)
TP12↓
Extruder Feed Hopper No. 4A and 4B (64S)
TP8↓
Blender (57S)
TP9↓
SC5 (58S)
TP10↓
Pneumatic Transfer System (61S)
TP13↓
TP-PN3↓
Extruder Feed Hopper No. 3A and 3B (62S)
Extrusion Head
Conformation Rolls Product with 2 Position Calender
Possible Fabric Coupling
Done by the line operator using fork lift
Extruders 4000A and 4000B (65S/8E)
Cooling Rollers
Pneumatic Transfer System (68S)
Towing
Shredder (66S)
Membrane Trimmer (Knife Cut)
TP-PN4↓
Dust Collector (1C/1E) (Located outside building)
Bulk Bag (Returned to Feed System) (67S)
Cut Creation Area
Possible Application of Matic Butilic (When Needed)
Storage
Cut In Size – Rolling System
Labelling and Packing

ATTACHMENT G

PROCESS DESCRIPTION

ATTACHMENT G

PROCESS DESCRIPTION

TeMa North America LLC is a proposing to install an extrusion process in the Burr Business Park in Jefferson County, West Virginia. The facility will utilize polypropylene (PP) and polyethylene (PE), including high density polyethylene (HDPE). The facility will have three extrusion lines identified as Line 2000, Line 3000, and Line 4000 for the extrusion of the following types of products:

- Monofilaments spacer, anticorrosion and anticondensation layer on roofing and wall siding products, acoustic products as sound mat under gypsum concrete.
- Uncoupling products such as dimple membrane to be used in ceramic floors.
- Dampproofing and drainage membrane for foundations and wall protection and drainage.

A more complete listing of the types of material and their uses is provided on the last page of this process description.

Most of the raw material will be found locally in West Virginia (DuPont, DOW and other companies) but can also be sourced in other states or countries. There are several producers of the materials for both virgin and recycled materials that will meet our specification to be used to extrude our products. Additions to the PE, PP, and HDPE include flame retardants, fluidifiers, and colorants. Example safety data sheets from some of our current suppliers in other countries are provided in Attachment H. Although the suppliers may be different, the materials being utilized will be the same.

The three extrusion lines are equipped with electrical resistances heating which can reach the melting temperature of the materials to be extruded (typically in the area of about 250° Centigrade/480° Fahrenheit). The extruders will then extrude the product.

The general arrangement of each line is as follows and as shown on the process flow diagram in Attachment F: Material will be delivered in bulk sacks (super sacks) via trucks which will be unloaded by forklift and placed in storage. The bulk sacks will then be handled again by the forklift to move the super sacks to the unloading stations and then the contents conveyed either pneumatically or via screw conveyors to the blending system. After blending, the materials are transferred to the hoppers that feed to the extruder. The extruder then extrudes the product and it passes over water cooled rollers. The material is towed/pulled to the membrane trimmer which contains knife trimming systems to cut the width of the product and square off the edges. The material can then be cut to the required length. Additionally, if the extruded material is to be laminated with a fabric, then the material is not cooled and the laminate is applied to the extruded product prior to the product cooling. This allows the lamination to occur without the use of any adhesives. The final product (laminated or not) is then placed in storage. Additional cutting occurs to meet the final product dimensions and then the products are labeled and packaged. Pieces of

the material that are cut off for proper sizing of the product are sent to the shredder and placed in a super sack or returned to the process. There are two external Shredders that will also feed back to the process via super sacks.

There are four silos that are proposed for future installation. These silos will be filled pneumatically from trucks and then the material will be pneumatically transferred to the extrusion lines. The silos will have a dust collector for the filling process. The transfer of the material to the inside of the facility will be controlled by the existing line dust collection system. If the silos are used to store the plastics, then most likely we would not be using the bulk sack deliveries. Therefore, the only additional emission point created for the use of the silos is silo filling. We have included the silos in the application as a future addition although the date of installation is not known.

There are several building heaters. These are comfort heaters which will burn propane until natural gas is available at the site.

The emissions estimate is contained in Attachment N. The extrusion emissions are based on a stack test conducted at our facility in Italy. The process rates of the two lines being stack tested are known and the resulting emissions are used to develop an emission factor for the resulting identified emissions. The stack testing was conducted to determine each material being released and included a full review of the United States Environmental Protection Agency list of hazardous air pollutants. The transfer of materials, blending, and shredding are based on emissions factors from similar processes permitted by the Division of Air Quality. The emissions factors used for the sources are identified in the calculations. Natural gas combustion emissions from the heaters are based on AP-42, Chapter 1.4., Natural Gas Combustion. Haul road emissions are based on AP-42, Chapter 13.2.2., Unpaved Roads.

The emission estimate is based on full hourly operations for each line (Line 2000 at 400 kg/hr, Line 3000 at 600 kg/hr, and Line 4000 at 1,000 kg/hr). The yearly emissions are estimated based on operating the source for the entire year of 8,760 hours per year. The resulting potential to emit shows that the process is a minor source with total emissions for each criteria pollutant being less than 100 tons per year, individual hazardous air pollutants at less than 10 tons per year each, and total hazardous air pollutants less than 25 tons per year.

TeMa North America LLC Product Listing							
PRODUCT FAMILY	**PRODUCTION LINE**	**CORE**	**CORE RAW MATERIALS**	**FABRIC**	**FABRIC NATURE**	**ACCESSORIES**	**PRODUCT USE**
Roofing Products	Monofilaments	Entangled Monofilaments	Polypropylene, Virgin Material and Recycled	Spunbond or Breathable Membrane	Polypropylene or Nylon	Butyl Strip on Edge	Spacer, Anticorrosion and Anti Condensation Layer on Roofing
	Monofilaments	Entangled Monofilaments	Polypropylene, Virgin Material and Recycled	NA	NA	NA	
Siding Products	Monofilaments	Entangled Monofilaments	Polypropylene, Virgin Material and Recycled	Spunbond or Breathable Membrane	Polypropylene or Nylon	Butyl Strip on Edge	Spacer, Anticorrosion and Anti Condensation Layer on Roofing
	Monofilaments	Entangled Monofilaments	Polypropylene, Virgin Material and Recycled	NA	NA	NA	
Acoustic Products	Monofilaments	Entangled Monofilaments	Polypropylene, Virgin Material and Recycled	Spunbond or Breathable Membrane	Polypropylene or Nylon	Butyl Strip on Edge	Sound Mat Under Gypsum Concrete
	Dimple Membrane Line 3000	Dimple Membrane	Polyethylene, Recycled Material	Spunbond or Breathable Membrane	Polypropylene		
Uncoupling Products	Dimple Membrane Line 3000	Dimple Membrane	Polyethylene, Virgin Material	Spunbond	Polypropylene	NA	Uncoupling Membrane in Ceramic Floors
Heating Wire Support Products	Dimple Membrane Line 3000	Dimple Membrane	Polyethylene, Virgin Material	Spunbond	Polypropylene	NA	Uncoupling and Heating Wire Support Membrane for Ceramic Floors
Damp Proofing Membrane for Foundations	Dimple Membrane Line 4000	Dimple Membrane	Polyethylene, Recycled Material	NA	NA	NA	Foundation Wall Protection
Drainage Membrane for Foundations	Dimple Membrane Line 4000	Dimple Membrane	Polyethylene, Recycled Material	Fabric	Polypropylene	NA	Foundation Wall Drainage
Drainage Membrane for Foundations	Dimple Membrane Line 4000	Dimple Membrane	Polyethylene, Recycled Material	Fabric	Polypropylene	NA	Foundation Wall Drainage, Enhanced Compressive Strength

ATTACHMENT H

SAFETY DATA SHEETS (SDS)

List of Safety Data Sheets and Data Sheets of Extrusion and Thermoadhesion Materials

No.	Supplier (1)	File Name	Facility Area of Use
1	KRUSCHITZ	67_KRUSCHITZ_KRUPLENE PP	Extrusion
2	Lyondell Basell	Basell - Hifax CA 60 A - Advanced Polyolefin	Extrusion
3	Lyondell Basell	EP240T	Extrusion
4	VP Italia	GRIMIDB27	Extrusion
5	Borealis	HL708FB DS EN ED01	Extrusion
6	Borealis	HL708FB-PDS-REG_EUROPE-EN-V1-PDS-EUR-49735-10034701	Extrusion
7	ATEX	LOT # 001428	Extrusion
8	Eslatene	MSDS HDPEex-FS02-en	Extrusion
9	Lyondell Basell	MSDS Moplen EP240T	Extrusion
10	Guberti	PP99428B MSDS	Extrusion
11	Guberti	PP99428B TDS	Extrusion
12	Lyondell Basell	Report SDS (Hafax CA 60 A)	Extrusion
13	TEMA S.r.l..	TADRS1MP44_rev3 master nero PP	Extrusion
14	TEMA S.r.l..	TADRS1MP92_bis_master rosso PP 413570	Extrusion
15	TEMA S.r.l..	TADRS1MP94 flame retardantAiPlus	Extrusion
16	ExxonMobil	TDS HYA800 EN	Extrusion
17	ExxonMobil	TDS HYA800	Extrusion
18	Eslatene	TDS-HDPE extrusion black natural green grey	Extrusion
19	Mesgo Iride Colors s.r.l.	MBPPM1684 MSDS Rev02 EN	Extrusion
20	Mesgo Iride Colors s.r.l.	MBPPM1684 TDS Rev01 EN	Extrusion
21	Diap	MSDS EN AIPLUS PP M-1038-X3 NATURAL Rev.2018	Extrusion
22	Diap	Data Sheet AIPLUS PP M-1038-X3 neutral Rev.2018	Extrusion
23	Poliblend Engineered Plastics	Polimid B	Extrusion
24	ExxonMobil	TDS HTA 108 EN	Extrusion
25	DuPont	Typar-SF-datasheets-EU	Thermoadhesion
26	DuPont	Spunbond pdf	Thermoadhesion
27	CE	Non-Woven Geotextile	Thermoadhesion
28	CE	Non-Woven Geotextile doc	Thermoadhesion
29	BWK	Breathable Membrane Top 95	Thermoadhesion
30	ATEX	02_ATEX_POLYPROPYLENE SPUNBOND NONWOVEN	Thermoadhesion

1. Other suppliers may be used for these products.

Material Safety Data Sheet

according 1907/2006EC article 31

Kruplene PP
PP Granulate / compound

Revision: 2
Revision Date: 18.07.2017
Reworked: AK
Date of printing: 18-Jul-17

1. Identification oft he substance/mixture and oft he responsible company

Product Identifier: Krutene -C, Kruplene -H
CAS-No.: 9003-07-0 Polypropylene

Relevant identifizied uses oft he substance or mixture and uses advised against raw material for plastics

Details of supplier:
Kruschitz Plastic GmbH
Mitte 96
9125 Kühnsdorf
Austria
phone: +43 4232 51220 0
e-mail: office@kruschitz-plastic.com

emergency telephone number
phone**:** +43 664 8864 1060
e-mail: a.kaiser@kruschitz-plastic.com

2. Hazards identifcation

Classification oft he substance or the mixture
According Regulation 1272/2008/EC
Not a hazardous substance or mixture according to 1272/2008/EC
According Regulation 67/548/EC or 1999/45/EC: not necessary

Labeling:
Labeling according Regulation 1272/2008/EC: not necessary
Symbol(s): not necessary
Signal word: not necessary

Other hazards:
PBT: not applicable
vPvB: not applicable

3. Composition/information on ingredients

mixture
CAS-No.: 9003-07-0 Polypropylene

EINECS-Number: Polymer

4. First aid measures:

KRUSCHITZ GMBH / WERK 1
Werner-Heisenberg-Straße 5
A-9100 Völkermarkt - Austria
Tel.: +43 (0) 4232-51220-0
Fax: +43 (0) 4232-51220-11
E-Mail: office@kruschitz-plastic.com

NIEDERLASSUNG / WERK 2
Mitte 96
A-9125 Kühnsdorf - Austria
UID-Nr.: ATU 25988009
Firmenbuch: LG Klagenfurt, FN 117586x
Internet: www.kruschitz-plastic.com

Description of first aid measurs:
If inhaled: move to fresh air, if symptoms persist, call a physician.
In case of skin contact: If the molten material gets on skin, quickly cool with water. In case of skin irritation seeek medical attention. Do not try to peel solidified material.
In case of eye contact: In the case of contact with eyes, rinse immediatly with plenty of water, if symptoms persist, call a physician.
If swallowed: Do not induce vomiting without medical advice. If symptoms persist, call a physician.

5. Firefighting measures

Extinguishing media
Suitable extinguishing media:
Water spray (fog), dry, chemical, CO2, Foams.
Unsuitable extinguishing media:
Do no use a water jet
Special hazards arising from the substance or mixture:
Dusts may form explosive dust-air mixtures. Hydrocarbons may be released at elevated temperatures or in a fire.
Advice for fire fighters:
Special protective equipment for fire fighters:
Fire fighters should wear appropriate protective equipment and self contained breathing apparatus with a full face piece operated in positive pressure mode.

6. Accidential release measures

Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Sweep up to prevent slipping hazard, avioid breathing dust.. keep away sources of ignition
Environmental precautions
No special measurs necessary
Methods for cleaning up
Sweeping or vaccum.
Reference to other sections
See disposal instructions 13 and exposure control 8

7. Handling and storage

Handling
Precautions of safe handling
Avoid dust formation. Keep in well-ventilated places.
Advice on protection agains fire and explosion
Actions to avoid electrostatic charge shall be taken.
Keep away sources of ignition, do not smoke.

Storage
Requirements for storage areas and containers:
Keep in dry places. Keep in well-ventilated places
Advice on common storage Do not store together with oxidizing and self-igniting products

8. Exposure controls/personal protection

Control parameters
Ingrediants with exposure limits: none
Additional exposure limits at possible prcessing operations:
Nuisance dust exposure limits of 10 mg/m³

Personal protective equipment
General Protection and Hygiene
Use good housekeeping for safe handling of this product.

KRUSCHITZ GMBH / WERK 1
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E-Mail: office@kruschitz-plastic.com

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A-9125 Kühnsdorf - Austria
UID-Nr.: ATU 25988009
Firmenbuch: LG Klagenfurt, FN 117586x
Internet: www.kruschitz-plastic.com

Respiratiory protection:
No respiratory protection is normally required..
Gloves:
Material of gloves
Recommended Material and thickness approx. 0,7mm; Butyl-rubber
Eye protection: Use safety glasses with side shields.
Skin and body protection: At ambient temperatures use of clean and protective clothing is good industrial practice.rbeitsschutzkleidung

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Apperance:	**Form:**	Pellets, solid
	Color:	opaque, colored, grey or black
	Odor:	no odor
Chemical:	**pH:**	not applicable
Physical:	**Melting point / range:**	140°C – 170°C
	Boiling point / range:	> 300°C
	Flash point:	> 340°C
	Flammablility:	normal
	Autoignition temperature:	> 340°C
	Danger of explosion:	Product has no danger of explosion
	Vapor pressure:	not applicable
	Dichte bei 20°C	880 – 930 kg/m³
Solubility in	**Water**	negliable

10. Stability and reactivity

Reactivity
Material is concidered non-reactive under normal storage and handling conditions
Chemical stability
Material is concidered stable under normal storage and handling conditions
Conditions to avoid
flames, sparks, heat
Possible dangerous reactions: none known
Materials to avoid: Halogens
Thermal decomposition products: Hydrocarbons, alcohols, aldehydes and ketons can be formed.
Other data: avoid strong oxidizing agents

11. Toxicological information

Acute Toxicity:

Acute oral toxicity:	pressumed non toxic
Acute inhalation toxicity:	pressumed non toxic
Acute dermal toxicity:	pressumed non toxic
Skin irritation:	no skin irritation
Eye irritation:	no eye irritation
Sensitization:	did not cause sensitization on laboratory animals

12. Ecological information

Toxicity
Aquatic Toxicity: no further information available
Persisitence and degradability: no further information available
Bio accumalative potential: no further information available
Mobility in soil: no further information available

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E-Mail: office@kruschitz-plastic.com

UID-Nr.: ATU 25988009
Firmenbuch: LG Klagenfurt, FN 117586x
Internet: www.kruschitz-plastic.com

German water classification: hazard class 1, low hazard to water (self assessment)

Results of PBT- und vPvB assessment
PBT: no further information available
PBT: no further information available
Other adverse effects: no further information available

13. Disposal conciderations:

Disposal of Waste
According local regulations
Disposal of uncleaned packaging material:
According local regulations

14. Transport information

ADR/RID-GGVSEB class:		No classification assigned
Sea shipment IMDG/GGVSee	**IMDG/GGVSee-class**	No classification assigned
	ICAO/IATA class	No classification assigned
UN „Modul Regulation“		No classification assigned
Special precaution for user:	not applicable	
Transport/further data:	no hazardous good	

15. Regulatory Information

National Regulation:
Major Accident Hazard Legislation Directive 98/52/EC does not apply-
German water classification: hazard class 1, low hazard to water (self assessment)
Material safety assessment: not available

16. Other information

The information in this Material Safety Data Sheet is correct tot he best of our knowledge, information and belief at the date of publication. The information given is designated only as guidiance for safe handling, storage, transportation, disposal and processing and is not to b e concidered as a warrenty or quality specification of any kind..

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Internet: www.kruschitz-plastic.com

Hifax CA 60 A

Advanced Polyolefin

Product Description

Hifax CA 60 A is a reactor TPO (thermoplastic polyolefin) manufactured using the LyondellBasell' s proprietary *Catalloy* process technology.
It has been developed for industrial applications where a combination of good processability and excellent softness is required. Due to the high fluidity *Hifax* CA 60 A shows high compatibility to fillers and to flame retardant additives as well as to other polyolefins.
The grade is available in natural pellet form.
For regulatory compliance information see *Hifax* CA 60 A Regulatory Affairs Product Stewardship Information/Certification Data Sheet (RAPIDS), which can be found on www.polymers.lyondellbasell.com.

Product Characteristics

Status	Commercial: Active
Test Method used	ISO
Availability	Europe, Asia-Pacific, Australia/NZ, Latin America
Processing Method	Extrusion Coating, Calandering, Injection Molding, Extrusion Pipe Sheet and Semi Finished Products, Extrusion Compounding, Extrusion Flat-die
Features	Ductile, Good Flexibility, High Flow , Low Hardness , High Impact Resistance , Good Processability, Soft
Typical Customer Applications	Panels & Profiles, Exterior Applications, TPO Skins, Polymer modifier, Single Ply Roofing, Industrial

Typical Properties	**Method**	**Value**	**Unit**
Physical			
Density (Method A)	ISO 1183	0.88	g/cm³
Melt flow rate (MFR) (230°C/2.16kg)	ISO 1133	14	g/10 min
Mechanical			
Tensile Stress at Yield	ISO 527-1, -2	6	MPa
Tensile Strain at Break	ISO 527-1, -2	> 500	%
Flexural modulus	ISO 178	80	MPa
Impact			
Notched izod impact strength (- 20 °C, Type 1, Notch A)	ISO 180	80	kJ/m²
Hardness			
Shore hardness (Shore D)	ISO 868	30	
Thermal			
Heat deflection temperature B (0.45 MPa) Unannealed	ISO 75B-1, -2	40	°C
Vicat softening temperature (A50 (50°C/h 10N))	ISO 306	56	°C
Melting temperature	DSC	142	°C
Note: ISO 11357-3			

Notes

Typical properties; not to be construed as specifications.

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LyondellBasell markets this product through the following entities:

- Equistar Chemicals, LP
- Basell Sales & Marketing Company B.V.
- Basell Asia Pacific Limited
- Basell International Trading FZE
- LyondellBasell Australia Pty Ltd

For the contact details of the LyondellBasell company selling this product in your country, please visit http://www.lyondellbasell.com/.

Before using a product sold by a company of the LyondellBasell family of companies, users should make their own independent determination that the product is suitable for the intended use and can be used safely and legally. SELLER MAKES NO WARRANTY; EXPRESS OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY WARRANTY) OTHER THAN AS SEPARATELY AGREED TO BY THE PARTIES IN A CONTRACT.

This product(s) may not be used in:
(i) any U.S. FDA Class I, Health Canada Class I, and/or European Union Class I medical devices, without prior notification to Seller for each specific product and application; or
(ii) the manufacture of any of the following, without prior written approval by Seller for each specific product and application: U.S. FDA Class II medical devices; Health Canada Class II or III medical devices; European Union Class II medical devices; or any equivalent U.S. FDA, Health Canada, or European Union regulations pertaining to medical devices; packaging in direct contact with a pharmaceutical active ingredient and/or dosage form; and tobacco-related products and applications. This product(s) may not be used in the manufacture of any of the following applications: U.S. FDA Class III medical devices; Health Canada Class IV medical devices; European Class III medical devices; applications involving permanent implantation into the body; life-sustaining medical applications; and lead, asbestos or MTBE related applications. All references to the U.S. FDA, Health Canada and European Union regulations include another country's equivalent regulatory classification.

Users should review the applicable Material Safety Data Sheet before handling the product.

Addhere, Adflex, Adstif, Adsyl, Akoafloor, Akoalit, Alathon, Alkylate, Amazing Chemistry, Aquamarine, Aquathene, Arconate, Arcopure, Arcosolv, Arctic Plus, Arctic Shield, Avant, Catalloy, Clyrell, CRP, Crystex, Dexflex, Duopac, Duoprime, Explore & Experiment, Filmex, Flexathene, Glacido, Hifax, Histif, Hostacom, Hostalen, Ideal, Integrate, Koattro, LIPP, Lucalen, Luflexen, Lupolen, Lupolex, Luposim, Lupostress, Lupotech, Metocene, Microthene, Moplen, MPDIOL, Nerolex, Nexprene, Petrothene, Plexar, Polymeg, Pristene, Prodflex, Pro-Fax, Punctilious, Purell, SAA100, SAA101, Sequel, Softell, Spherilene, Spheripol, Spherizone, Starflex, Stretchene, Superflex, TBAc , Tebol, T-Hydro, Toppyl, Trans4m, Tufflo, Ultrathene, Vacido and *Valtec* are trademarks owned or used by the LyondellBasell family of companies.

Adsyl, Akoafloor, Akoalit, Alathon, Aquamarine, Arconate, Arcopure, Arcosolv, Arctic Plus, Arctic Shield, Avant, CRP, Crystex, Dexflex, Duopac, Duoprime, Explore & Experiment, Filmex, Flexathene, Hifax, Hostacom, Hostalen, Ideal, Integrate, Koattro, Lucalen, Lupolen, Microthene, Moplen, MPDIOL, Nexprene, Petrothene, Plexar, Polymeg, Pristene, Pro-Fax, Punctilious, Purell, Sequel, Softell, Spheripol, Spherizone, Starflex, Tebol, T-Hydro, Toppyl, Tufflo and *Ultrathene* are registered in the U.S. Patent and Trademark Office.

Release Date: 16 Dec 2009

Moplen EP240T

Polypropylene, Impact Copolymer

Product Description

Moplen EP240T is a nucleated heterophasic copolymer for injection moulding.
Moplen EP240T has a very high flowability combined with a good impact/stiffness balance.
The main applications of *Moplen* EP240T are thin walled packaging, housewares and housings.
Moplen EP240T is suitable for food contact. It is not intended for medical and pharmaceutical applications.
Moplen EP240T is UL listed under file E31765

Product Characteristics

Status	Commercial: Active
Test Method used	ISO
Availability	Europe, Africa-Middle East
Processing Methods	Injection Molding
Features	Impact Copolymer, Good Flow, Good Impact Resistance , Nucleated, Good Stiffness
Typical Customer Applications	Housewares, Opaque Containers

Typical Properties	Method	Value	Unit
Physical			
Density	ISO 1183	0.900	g/cm³
Melt flow rate (MFR) (230°C/2.16Kg)	ISO 1133	48	g/10 min
Melt volume flow rate (230°C/2.16Kg)	ISO 1133	65	cm³/10min
Mechanical			
Tensile Modulus	ISO 527-1, -2	950	MPa
Tensile Stress at Yield	ISO 527-1, -2	19	MPa
Tensile Strain at Break	ISO 527-1, -2	> 50	%
Tensile Strain at Yield	ISO 527-1, -2	5	%
Impact			
Charpy unnotched impact strength	ISO 179		
(23 °C, Type 1, Edgewise)		No Break	kJ/m²
(0 °C, Type 1, Edgewise)		170	kJ/m²
(-20 °C, Type 1, Edgewise)		150	kJ/m²
Charpy notched impact strength	ISO 179		
(23 °C, Type 1, Edgewise, Notch A)		8	kJ/m²
(0 °C, Type 1, Edgewise, Notch A)		5	kJ/m²
(-20 °C, Type 1, Edgewise, Notch A)		4	kJ/m²
Hardness			
Ball indentation hardness (H 132/30)	ISO 2039-1	44	MPa

Thermal

Heat deflection temperature B (0.45 MPa) Unannealed	ISO 75B-1, -2	78	°C
Vicat softening temperature	ISO 306		
(A50 (50°C/h 10N))		142	°C
(B50 (50°C/h 50N))		56	°C

Additional Properties

Conveying: Conveying equipment should be designed to prevent production and accumulation of fines and dust particles that are contained in polymer resins. These particles can under certain conditions pose an explosion hazard. We recommend the conveying system used is equipped with adequate filters, is operated and maintained that no leak develops and adequate grounding exists at all times.

Health and Safety:
The resin is manufactured to the highest standards but, special requirements apply to certain applications such as food end-use contact and direct medical use. For specific information on regulatory compliance contact your local representative.

Workers should be protected from the possibility of skin or eye contact with molten polymer. Safety glasses are suggested as a minimal precaution to prevent mechanical or thermal injury to the eyes.

Molten polymer may be degraded if it is exposed to air during any of the processing and off-line operations. The products of degradation have an unpleasant odour. In higher concentrations they may cause irritation of the mucus membranes. Fabrication areas should be ventilated to carry away fumes or vapours. Legislation on the control of emissions and pollution prevention must be observed. If the principles of sound manufacturing practice are adhered to and the place of work is well ventilated, no health hazards are involved in processing the resin.

The resin will burn when supplied with excess heat and oxygen. It should be handled and stored away from contact with direct flames and/or ignition sources. In burning the resin contributes high heat and may generate a dense black smoke. Starting fires can be extinguished by water, developped fires should be extinguished by heavy foams forming an aqueous or polymeric film. For further information about safety in handling and processing please refer to the Material Safety Data Sheet.

Storage:
The resin is packed in 25 kg bags or in bulk containers protecting it from contamination. If it is stored under adverse conditions, i. e. if there are large fluctuations in ambient temperature and the atmospheric humidity is high, moisture may condense inside the packaging. Under these circumstances, it is recommended to dry the resin before use. Unfavourable storage conditions may also intensify the resin´s slight characteristic odour.

The resin is subjected to degradation by ultra-violet radiations or by high storage temperatures. Therefore the resin must be protected from direct sunlight, temperatures above 40°C and high atmospheric humidity during storage. The resin can be stored over a period of more than 6 month without significant changes in the specified properties, appropriate storage conditions provided. Higher storage temperatures reduce the storage time.

The information submitted is based on our current knowledge and experience. In view of the many factors that may affect processing and application, these data do not relieve processors of the responsibility of carrying out their own tests and experiments; neither do they imply any legally binding assurance of certain properties or of suitability for a specific purpose. The data do not relieve the customer from his obligation to control the resin upon arrival and to complain about faults. It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed.

Notes

Typical properties; not to be construed as specifications.

© LyondellBasell Industries Holdings, B.V. 2014

LyondellBasell markets this product through the following entities:

- Equistar Chemicals, LP
- Basell Sales & Marketing Company B.V.
- Basell Asia Pacific Limited
- Basell International Trading FZE
- LyondellBasell Australia Pty Ltd

For the contact details of the LyondellBasell company selling this product in your country, please visit http://www.lyb.com/.

Before using a product sold by a company of the LyondellBasell family of companies, users should make their own independent determination that the product is suitable for the intended use and can be used safely and legally.

SELLER MAKES NO WARRANTY; EXPRESS OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY WARRANTY) OTHER THAN AS SEPARATELY AGREED TO BY THE PARTIES IN A CONTRACT.

This product(s) may not be used in:

(i) any U.S. FDA Class I, Health Canada Class I, and/or European Union Class I Medical Devices, without prior notification to Seller for each specific product and application; or

(ii) the manufacture of any of the following, without prior written approval by Seller for each specific product and application: (1) U.S. FDA Class II, Health Canada Class II or Class III, and/or European Union Class II Medical Devices; (2) film, overwrap and/or product packaging that is considered a part or component of one of the aforementioned Medical Devices; (3) packaging in direct contact with a pharmaceutical active ingredient and/or dosage form that is intended for inhalation, injection, intravenous, nasal, ophthalmic (eye), digestive, or topical (skin) administration; (4) tobacco related products and applications; (5) electronic cigarettes and similar devices; and (6) pressure pipe or fittings that are considered a part or component of a nuclear reactor.

(iii) Additionally, the product(s) may not be used in: (1) U.S. FDA Class III, Health Canada Class IV, and/or European Class III Medical Devices; (2) applications involving permanent implantation into the body; (3) life-sustaining medical applications; and (4) lead, asbestos or MTBE related applications.

All references to U.S. FDA, Health Canada, and European Union regulations include another country's equivalent regulatory classification.

Users should review the applicable Material Safety Data Sheet before handling the product.

Addhere, Adflex, Adstif, Adsyl, Akoafloor, Akoalit, Alastian, Alathon, Alkylate, Amazing Chemistry, Aquamarine, Aquathene, Arctic Plus, Arctic Shield, Avant, Catalloy, Clyrell, CRP, Crystex, Dexflex, Duopac, Duoprime, Explore & Experiment, Filmex, Flexathene, Fueling the power to win, Get in touch with, Glacido, Hifax, Histif, Hostacom, Hostalen PP, Hostalen ACP, Ideal, Indure, Integrate, Koattro, LIPP, Lucalen, Luflexen, Lupolen, Lupolex, Luposim, Lupostress, Lupotech, Metocene, Microthene, Moplen, MPDIOL, Nerolex, Nexprene, Petrothene, Plexar, Polymeg, Pristene, Prodflex, Pro-fax, Punctilious, Purell, Refax, SAA100, SAA101, Sequel, Softell, Spherilene, Spheripol, Spherizone, Starflex, Stretchene, Superflex, TBAc , Tebol, T-Hydro, Toppyl, Trans4m, Tufflo, Ultrathene, Vacido and *Valtec*, are trademarks owned and/or used by the LyondellBasell family of companies.

Adsyl, Akoafloor, Akoalit, Alastian, Alathon, Aquamarine, Arctic Plus, Arctic Shield, Avant, CRP, Crystex, Dexflex, Duopac, Duoprime, Explore & Experiment, Filmex, Flexathene, Hifax, Hostacom, Hostalen, Ideal, Integrate, Koattro, Lucalen, Lupolen, Metocene, Microthene, Moplen, MPDIOL, Nexprene, Petrothene, Plexar, Polymeg, Pristene, Pro-fax, Punctilious, Purell, Sequel, Softell, Spheripol, Spherizone, Starflex, Tebol, T-Hydro, Toppyl, Tufflo, Ultrathene are registered in the U.S. Patent and Trademark Office.

Release Date: 06 Jun 2012

GRIMID B 27

PA 6 medium viscosity, general purpose grade

Properties	Test Method	Unit	Typical Value
Physical			
MFI	ISO 292	g/10'	13
Density (23°C)	ISO 1183	g/cm^3	1,13-1,14
Water Absorption (24h/23°C)	ISO 62	%	2
Water Absorption at Saturation	ISO 62	%	9
Mould Shrinkage (Parallel)	ASTM D-955	%	1,1-1,6
Mould Shrinkage (Normal)	ASTM D-955	%	1,1-1,6
Mechanical			
Izod Notched Impact (+23 °C)	ISO 180	J/m	50
Izod Notched Impact Strength(-20 °(	ISO 180	J/m	30
Charpy Notched Impact (+23 °C)	ISO 179	kJ/m^2	3,2
Charpy Unnotched Impact (+23 °C)	ISO 179	kJ/m^2	NB
Charpy Unnotched Impact (-20 °C)	ISO 179	kJ/m^2	>300
Tensile Modulus	ASTM D-638	N/mm^2	2900
Elogation at Break	ASTM D-638	%	100
Tensile Break Strength	ASTM D-638	N/mm^2	64
Tensile Yield Strength	ASTM D-638	N/mm^2	75
Thermal			
Vicat Temperature (1kg)	ASTM D-1525	°C	210
Vicat Temperature (5kg)	ASTM D-1525	°C	200
Heat Deflection Temperature (0,45 N/mm^2)	ASTM D-648	°C	0
Heat Deflection Temperature (1,82 N/mm^2)	ASTM D-648	°C	74
Continuous Service Temperature (20.000 h)	60216/P1 IEC	°C	80 (120h)
Electrical			
Volume Resistivity	ASTM D-257	Ohm cm	5*10EXP(15)
Tracking Resistance (CTI-Method A)	60112 IEC	Volt	>600
Electric Strength (Thickness)	ASTM D-149	kV/mm	18
Flammability			
Flammability Rating	UL 94	-	V2 (1,6 mm)
Glow Wire Test	60695-2-1 IEC	°C	750°@2 mm

The data and informations contained herein are typical average values, based on our current level of knowledge and experience, and do not constitue sales specifications. No liability, warranty or guarantee of product performance is created by this document. It is the buyer's responsability to inspect and test our products in order to determine the suitability for the buyer's application.

Corso Sempione 32/A 20154 Milano (MI) C.F. 05555370963 P.IVA 05555370963 Sede Operativa: Via Veneziana 101/A 24045 Fara Gera d'Adda (BG) Tel. 0363/395929 e-mail commerciale@vpitalia.it

Polypropylene
HL708FB
Polypropylene Homopolymer

Description
HL708FB is a polypropylene homopolymer intended for fibre applications

CAS-No. 9003-07-0

Applications
HL708FB is recommended for:

Micro denier fibres at high spinning speeds
Melt blown applications

Special features
HL708FB is optimised to deliver:

Controlled rheology
Easy processability
Optimal product consistency
Very high flow
Perfect suitable for electrostatic charging

Physical Properties

Property	Typical Value Data should not be used for specification work	Test Method
Melt Flow Rate (230 °C/2,16 kg)	800 g/10min	ISO 1133
Melting temperature (DSC)	158 °C	ISO 11357-3
Molecular weight distribution	Very narrow	

Storage
HL708FB should be stored in dry conditions at temperatures below 50°C and protected from UV-light. Improper storage can initiate degradation, which results in odour generation and colour changes and can have negative effects on the physical properties of this product.

More information on storage is found in our "Safety data sheet" / "Product safety information sheet".

Safety
The product is not classified as dangerous.

Please see our "Safety data sheet" / "Product safety information sheet" for details on various aspects of safety of the product. For more information, contact your Borealis representative.

Borealis AG | Wagramer Strasse 17-19 | 1220 Vienna | Austria
Telephone +43 1 224 00 0 | Fax +43 1 22 400 333
FN 269858a | CCC Commercial Court of Vienna | Website www.borealisgroup.com

Polypropylene
HL708FB

Recycling
The product is suitable for recycling using modern methods of shredding and cleaning.In-house production waste should be kept clean to facilitate direct recycling.

Related Documents
The following related documents are available on request, and represent various aspects on the usability, safety, recovery and disposal of the product.

Statement on chemicals, regulations and standards
"Safety data sheet" / "Product safety information sheet"
Statement on polymer additives and BSE
General statement on compliance to food contact regulations

Disclaimer

The product(s) mentioned herein are not intended to be used for medical, pharmaceutical or healthcare applications and we do not support their use for such applications.

To the best of our knowledge, the information contained herein is accurate and reliable as of the date of publication; however we do not assume any liability whatsoever for the accuracy and completeness of such information.

Borealis makes no warranties which extend beyond the description contained herein. Nothing herein shall constitute any warranty of merchantability or fitness for a particular purpose.

It is the customer's responsibility to inspect and test our products in order to satisfy itself as to the suitability of the products for the customer's particular purpose. The customer is responsible for the appropriate, safe and legal use, processing and handling of our products.

No liability can be accepted in respect of the use of any Borealis product in conjunction with any other products and/or materials. The information contained herein relates exclusively to our products when not used in conjunction with any other material unless as specifically provided for in the test methods stated above.

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BOREALIS

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ATEX, Inc.
Advanced Technological Extrusions
2600 West Park Drive
Gainesville, GA 30504
Tax ID #: 58-2412901
Tel770-536-7272
Fax770-536-7246
Web: www.atex-spun.com

Certificate of Analysis

The specifications of the product ATEX AXAR PP A are guaranteed by control of process parameters and by constant monitoring system of Q.C.laboratory.

CUSTOMER:	TEMA	**LOT#**	001428	**PRODUCT CODE:**	AXAR 1
		PO#	SAMPLE080713	**COLOR:**	WHITE
DATE:	8/7/2013	**PART#**	N/A	**TREATMENT:**	OB

CHARACTERISTICS	UM	AVERAGE VALUE	TARGET	RANGE OF TOLERANCE*
BASIS WEIGHT	Oz/yd²	2.2		±10%
(ASTM D 3776M-09A)	G/m²	75.4	75 G/m²	
TENSILE STRENGTH CARICO DI ROTTURA RESISTANCE A LA RUPTURE HÖCHSTZUG KRAFT	lbf MD lbf CD	30.9 31.3	N/A N/A	N/A N/A
WSP110.4.R4 (12)	N/5cm MD N/5cm CD	137.6 139.2	N/A N/A	N/A N/A
ELONGATION AT PEAK ALLUNGAMENTO AL PICCO ALLONGEMENT A LA POINTE DEHNUNG BEI PEAK	% MD % CD	70.4 75.3	±20% ±20%	±20% ±20%
WSP110.4.R4 (12)				
TEAR STRENGTH	N MD	87.7	N/A	N/A
WSP 100.2.R3 (12)	N CD	79.2	N/A	N/A

QUALITY CONTROL

John White

PRODUCTS
Safety Data
In accord with Directive 2001/58/EC

ESLATENE HD (High Density Polyethylene)

01. Identification of the product and of the company

Identification of the product: ESLATENE HD (Commercial name)
Chemical name: Polyethylene. Family: polymers of ethylene monomer
Chemical formula: $(CH_2)_x$
Identification of the administrator: (ESLAVA PLÁSTICOS S.A. (Name of the company)
Registered address: Calle Rio Vinalopo 31. Tel.: 961 920 212 Fax: 961 920 298

REACH pre-registration: *JS3677170-24*
SM377254-14
EC378573-44

Common use and applications: protections in agriculture, packaging, technical parts, irrigation pipes, film for bags and sheets, extrusion and injection.

02. Identification of hazards

It is insoluble in water. No particular hazards known to man and the environment, except for being a solid fuel with a flashpoint above 350ºC and from 105-115°C melts. In combustion, if the amount of air is sufficient, the main product is generated CO_2. In air gap produces smoke (soot), carbon monoxide and various oligomers and aldehydes, which cause irritation to eyes, skin and respiratory system.

It degrades slightly to long exposures to light and weather, had a fledgling to its composition. If not explicitly additive is not biodegradable. The environmental damage caused by neglect of objects with PE, are mechanical, not biological type.

Generic term for all grades of polyethylene:
HMIS and NFPA Ratings: Health 0, Fire 1, Reactivity 0 (0 = minimal, 1 = mild)
Personal Protection: Safety glasses, gloves, respirator.

The product is a solid which is in the form of granules, non-toxic and minimal odor. Dust contact with eyes may cause mechanical irritation. Contact on the skin can produce mild irritation, although in contact with hot molten material may cause severe burns. In

practice there has been no risk of dermatitis by normal handling. Ingestion of this product is unlikely.

03. Composition / Information on the components

Chemical characteristics: **RECYCLING OF HIGH DENSITY POLYETHYLENE OBTAINED BY SELECTION PROCESS, GRIND,WASHING, DRY AND EXTRUSION to 200 º C. NOT FOR USE COLORED PIGMENTS DYES OR COMPOSED OF HEAVY METALS TO FORM PART, SO MAY RESULT IN CONCENTRATION OVER 100 ppm.**

According to the application that is intended, the polyethylene may be an additive colored mixtures based on Calcium Carbonate and Titanium Dioxide CAS No. 3463-67-7 (white) or Carbon Black CAS No. 1333-86-4 (black).

This material **is not regulated** as hazardous materials or dangerous goods for transport.

04. First aids

In case of contact with skin:
With hot molten product, cool rapidly with cold water, risk of thermal burn. Visiting a doctor.

In case of smoke inhalation in a fire: If the exposure is prolonged or severe, can cause delayed pulmonary edema.

05. Measures for combating fire

Suitable extinguishing media:
Water
Foam
Gas extinguisher
Powder extinguishers
Water spray
Modes of extinction should not be used: none.
To prevent inhalation of airborne contaminants or smoke, should be contained breathing apparatus mask positive pressure mode.

06. Measures to be taken in the event of accidental spillage

Method of cleaning up:
Take up mechanically. The granules are less dense than water, so they get to float in it, accumulating in watery areas.

07. Handling and storage

Handling: safe

Take steps to prevent accumulation of electrostatic charges.
Provide local exhaust / ventilation at processing machines.

Storage

Stability:
Storing the product at temperatures below 40 º C, stability is unlimited. Own care should be taken only in case of fire of solids.

In case of polyethylene dust accumulation over time for its handling, this dust can be irritating and, in case of fire, fire can spread the trickle.

Provide local exhaust / ventilation at processing machines, whose operating temperature often exceed 120 º C.

08. Limitations to exposure and personal protection measures.

Personal protection: No special measures required if handled with good practice.

General protective measures: In the event of use as dust masks.

Hygiene measures:
Do not smoke, eat or drink while working.

Occupational exposure limits: no limits have been established.

Additional security measures: Use safety footwear, given the risk of slipping Avoid overheating, sparks and flames in the vicinity of storage and where dust may have accumulated.

09. Physical and chemical properties

Aspects:

State: physical granular or powder if required.
Color: white or colored.
Odor: Odorless

Significant data security:

Status Change: Melting point of crystallites: LDPE from 106 º C to 130 º C
HDPE from 128 º C to 135 º C

Flash point: Not applicable

Ignition Temperature: Approx. 350 º C
Flammability Classification: Nonflammable

Vapor Pressure: Not applicable.

Mass density: between 0.890 and 0.980 g / cc at 23 º C (water = 1)
Bulk density (transport): between 400 and 600 kg/m3

Sensitivity to water: Not soluble

---

10. Stability and reactivity

Thermal decomposition: Approx. 290ºC

Heat of combustion: min 9500 kcal / kg

Dangerous reactions:
No dangerous reactions known.

Hazardous decomposition products: at temperatures above 400ºC, its decomposition is accelerated, producing hydrocarbons, aldehydes, and CO

Smoke-free nitrogen, chlorine and sulfur.

11. Toxicological information

The polyethylene based materials are considered essentially inert and nontoxic.

Bibliographic data on acute toxicity LD50/LC 50 CAS 9002-88-4: Inhalation lethal concentration of 50% in mouse 12 g/m3 (30 minutes)

Comment:
Based on the experiences of several years and in a proper, there are no known side effects caused by the product, materials used for recycling LDPE were selected from post-consumer materials that have not come into contact with dangerous products.

12. Ecological information

The product is not soluble in water. They are not biodegradable unless expressly additives.
The product is not dangerous for fish and bacteria.
In wastewater treatment plants can be separated by mechanical (flotation).

13. Waste disposal

Recyclable thermoplastic material. The product can be easily recycled, if your application has been considered that their design has been guided in their recovery.

The product can be harnessed energy, given its high net heat of combustion. In landfill for non-bacteriological and fermentation is degraded unless it is made specifically for that purpose.

If you have to resort to removal procedures, can be oriented prior to energy recovery in

appropriate facilities, with the final deposition controlled landfill as a last resort destination.

In water treatment plants can be separated mechanically by flotation.

14. Information related to transport

Land transport
ADR (Not classified s hazardous goods)
RID (Not classified as hazardous goods)

Waterway transport
ADNR (Not classified as hazardous goods)

Sea transport
IMDG (Not classified as hazardous goods)

Air transport
ICAO/IATA (Not classified as hazardous goods)

Sending by post: permitted

Nor is subject to risk identification

15. Provisions of legal nature

Should be consulted by areas of application and standardization of products developed.

Additionally, see the Standardization developed (ASTM, ISO, UNE) for characterization, identification and establishment of traceability.

16. Other information

This information is based on the current state of our knowledge. The products are described as regards their safety and this does not constitute a guarantee regarding specific properties due to handling or incorrect prevention measures.

1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name	:	Moplen EP240T
Synonyms	:	Ethylene-Propylene copolymer, 1-Propene-Ethylene-Copolymer
Substance name	:	1-Propene, Polymer with Ethene
Substance No.	:	9010-79-1
Chemical characterization	:	Polypropylene copolymer

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

Identified uses	:	Manufacture of plastic articles by injection molding, extrusion or other conversion process.
Prohibited uses	:	FDA Class III medical devices; European class III medical devices; Health Canada class IV Medical Devices; Applications involving permanent implantation into the body; Life-sustaining medical applications

1.3 Details of the supplier of the safety data sheet

Company	**Registration number**	**Telephone**
Basell Sales & Marketing Company B.V. Delftseplein 27E 3013 AA Rotterdam Netherlands	NA	31 (0) 10 275 55 00

E-mail address : product.safety@lyb.com
Responsible/issuing person

1.4 Emergency telephone number

Basell Sales & Marketing Company B.V. +32 3 575 1235

Poison Center:
National Poisons Information Centre
IE: +353 1 809 2166
24 hours all days

2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Not a hazardous substance or mixture according to Regulation (EC) No 1272/2008.

2.2 Label elements

Labeling (REGULATION (EC) No 1272/2008)

Not a hazardous substance or mixture according to Regulation (EC) No 1272/2008.

2.3 Other hazards

If small particles are generated during further processing, handling or by other means, may form combustible dust concentrations in air.
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB).

3. Composition/information on ingredients

3.2 Mixtures

Ingredients

Chemical name	CAS-No. EC-No.	Classification (REGULATION (EC) No 1272/2008)	Weight %
1-Propene, Polymer with Ethene	9010-79-1	Not Classified	98.0 - 100.0 %

Contains: Additives and stabilizers

4. First aid measures

4.1 Description of first-aid measures

General advice : Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid.

If inhaled : Remove person to fresh air. If signs/symptoms continue, get medical attention.
In case of excessive inhalation of fumes that may be generated during heating of this material, move the person to fresh air.
Obtain medical attention.
Keep person warm, if necessary give Cardio-Pulmonary Resuscitation (CPR)

In case of skin contact : If molten material contacts the skin, immediately flush with large amounts of water to cool the affected tissue and polymer.

Do not attempt to peel polymer from skin as this will remove the skin.
Obtain immediate emergency medical attention if burn is deep or extensive.

In case of eye contact : Flush eyes thoroughly with water for several minutes and seek medical attention if discomfort persists.

: In case of eye contact with molten polymer:
Continuously flush eye(s) with cool running water for at least 15 minutes.
Beyond flushing, DO NOT attempt to remove the material adherent to the eye(s).
Immediately seek medical attention.

If swallowed : Adverse health effects due to ingestion are not anticipated.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Inhalation of process fumes and vapors may cause soreness in the nose and throat and coughing.

Hazards : Dust contact with the eyes can lead to mechanical irritation.
Molten polymer may cause thermal burns.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media : SMALL FIRE:
Use dry chemical, CO2, or water spray.

: LARGE FIRES:
Use water spray hose nozzles from a safe location.

Unsuitable extinguishing media : None known.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire fighting : Keep away from heat and sources of ignition.
In case of fire hazardous decomposition products may be produced such as:
Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

5.3 Advice for firefighters

Special protective equipment for fire-fighters	:	Wear approved positive pressure self-contained breathing apparatus and firefighter protective clothing.
Further information	:	Combustible particulate solid, will decompose under fire conditions. Calorific Value: 8000 - 11000 kcal/kg Fight fire from safe distance with hose lines or monitor nozzles. Heat from fire may melt, decompose polymer, and generate flammable vapors. Move containers from fire area if it can be done without risk. Evacuate immediately in the event of opening of storage container pressure relief devices or discoloration of container. Always stay away from tanks engulfed in fire. Do not attempt to get on top of storage containers involved in fire. Cool storage containers with large volumes of water even after fire is out.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Equip responders with proper protection. Creates dangerous slipping hazard on any hard smooth surface. Equip emergency responders with proper personal protective equipment (PPE) Avoid generating dust. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Potential combustible dust hazard. Polymer particles create slipping hazard on hard smooth surfaces.

6.2 Environmental precautions

Environmental precautions	:	Do not flush into surface water or sanitary sewer system.

6.3 Methods and materials for containment and cleaning up

Methods for containment / Methods for cleaning up	:	On land, sweep/shovel into suitable disposal containers or vacuum using equipment which avoids ignition risk. On water, material is insoluble; collect and contain as any solid. All recovered material should be packaged, labeled, transported and disposed of or reclaimed in conformance with

applicable laws and regulations and in conformance with good engineering practices. Reclaim where possible.

7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling	:	Material is in a pellet form. If converted to small particles during further processing, handling, or by other means, may form combustible dust concentrations in air. Avoid dust accumulation in enclosed space. Avoid generating dust; fine dust suspended in air and in the presence of an ignition source is a potential dust explosion hazard. Static discharge (spark), or other ignition sources, in high dust environments may ignite the dust and result in a dust explosion Electrostatic charge may build during conveying or handling. Equipment handling polymer should be conductive and grounded (earthed) and bonded. Metal containers involved in the transfer of this material should be grounded and bonded. All electrical equipment should conform to applicable electric codes and regulatory requirements for areas handling combustible dusts. After handling, always wash hands thoroughly with soap and water. When bringing the material to processing temperatures vapors may develop may condense in the exhaust ventilation. See section 10.
Fire-fighting class	:	Polymer will burn but does not easily ignite.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Store in a dry location. Use good housekeeping practices during storage, transferring and handling. Process enclosures and adequate ventilation should be used to avoid excessive dust accumulation. Store away from excessive heat and away from strong oxidizing agents. Keep container closed to prevent contamination. Take measures to prevent the build up of electrostatic charge.

7.3 Specific end use(s)

: See Section 1.2.

8. Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Occupational Exposure Limits

Ingredients	CAS-No.	Type	Limit Value	Basis Revision Date	Additional Information
Materials that can be formed when handling this product: Non-specified (inert or nuisance) dust		TWA	10 mg/m3 inhalable	US (ACGIH) 2005	
Materials that can be formed when handling this product: Non-specified (inert or nuisance) dust		TWA	3 mg/m3 respirable	US (ACGIH) 2005	

Consult local authorities for acceptable exposure limits.

8.2 Exposure controls

Engineering measures

Follow the recommendations in international standard NFPA 654 (as amended and adopted) for equipment used to handle this product.
Engineering controls, i.e. enclosed systems, should be used whenever feasible to maintain exposures below acceptable criteria. When such controls are not feasible, or sufficient to achieve full conformance, other engineering controls such as local exhaust ventilation should be used.
Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).

Personal protective equipment

Respiratory protection : Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits.
When workers are facing concentrations above the exposure

limit they must use appropriate certified respirators.
Use appropriate respiratory protection where atmosphere exceeds recommended limits.
Where workers could be exposed to dust concentrations above the exposure limit they must use appropriate certified respirators.

Hand protection	:	Wear gloves that provide thermal protection where there is a potential for contact with heated material.
Eye and face protection	:	Dust service goggles should be worn to prevent mechanical injury or other irritation to eyes due to airborne particles which may result from handling this product.
Skin and body protection	:	Wear suitable protective clothing.
Hygiene measures	:	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 hazards and/or potential hazards that may be encountered during use. Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Take off contaminated clothing and wash before reuse.

Environmental exposure controls

General advice	:	See section 6.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	:	Pellets.
Color	:	Translucent to white
Odor	:	Slight.
Flash point	:	No Data Available.
Lower explosion limit	:	The minimum explosive concentration (MEC) for polymer dust varies according to particle size distribution.
Upper explosion limit	:	Not applicable.

Flammability (solid, gas)	:	Polymer will burn but does not easily ignite.
Oxidizing properties	:	Not considered an oxidizing agent.
Autoignition temperature	:	> 300 °C
Decomposition temperature	:	not determined
Melting point/range	:	50 - 170 °C
Boiling point/boiling range	:	Not applicable.
Vapor pressure	:	Not applicable.
Density	:	< 1 g/cm3
Water solubility	:	Insoluble.
Partition coefficient: n-octanol/water	:	No Data Available.
Viscosity, dynamic	:	Not applicable.
Relative vapor density	:	Not applicable.
Evaporation rate	:	Not applicable.
Explosive properties	:	No Data Available.

9.2 Other information

Other information	:	No additional information available.

10. Stability and reactivity

10.1 Reactivity

No known reactivity hazards.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	Will not occur.

10.4 Conditions to avoid

Conditions to avoid	:	Avoid contact with strong oxidizers, excessive heat, sparks or open flame.

10.5 Incompatible materials

Materials to avoid	:	Material may be softened by some hydrocarbons.

10.6 Hazardous decomposition products

Hazardous decomposition products	:	Not expected to decompose under normal conditions.
Thermal decomposition	:	Note: Carbon monoxide, olefinic and paraffinic compounds, trace amounts of organic acids, ketones, aldehydes and alcohols may be formed.

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity	:	Not classified
Acute inhalation toxicity	:	Not classified
Acute dermal toxicity	:	Not classified
Skin corrosion/irritation	:	Not a skin irritant.
Serious eye damage/eye irritation	:	Not an eye irritant. Mechanical irritation is possible.
Respiratory or skin sensitization	:	Not classified

Chronic toxicity

Carcinogenicity	:	Not classified
Germ cell mutagenicity	:	Not classified

Reproductive toxicity

Effects on fertility /	:	Not classified

Effects on or via lactation
Effects on Development : Not classified

Target Organ Systemic Toxicant - Single exposure

: The substance or mixture is not classified as specific target organ toxicant, single exposure.

Target Organ Systemic Toxicant - Repeated exposure

: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard : Not applicable.

12. Ecological information

12.1 Toxicity

Ecotoxicology Assessment

Acute aquatic toxicity : Not classified

Chronic aquatic toxicity : Not classified

12.2 Persistence and degradability

Biodegradability : Not expected to be biodegradable.

12.3 Bioaccumulative potential

Bioaccumulation : This material is not expected to bioaccumulate.

12.4 Mobility in soil

Additional advice : This material is not volatile and insoluble in water.

Environmental fate and pathways

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB).

12.6 Other adverse effects

Additional ecological : Ecotoxicity is expected to be minimal based on the low water

information	solubility of polymers. No data available on this product. However, birds, fish and other wildlife may eat pellets which may obstruct their intestinal tracts.

13. Disposal considerations

13.1 Waste treatment methods

Product : All recovered material should be packaged, labeled, transported and disposed of or reclaimed in conformance with applicable laws and regulations and in conformance with good engineering practices. Reclaim where possible.
Recycle if possible.

14. Transport information

Not regulated for transport

15. Regulatory information

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

REACh status

If the product has been purchased from any company of the LyondellBasell group of companies registered in the European Union, we confirm that all substances in this preparation have been pre-registered or, where required under REACh, registered, and that we have the intention to proceed with their registration in accordance with the deadlines set forth in REACh. (Regulation (EU) No. 1907/2006)

Other international regulations

Global Inventory Status
The ingredients of this product are compliant with the following chemical inventory requirements or exemptions.

*Additional Explanatory Status Statements follow the table, as necessary.

Country/Region	Inventory	Status Description
Australia	AICS	Compliant
Canada	DSL	Compliant
China	IECSC	Compliant

Europe	REACH	See REACH Compliance Statement
Japan	ENCS	Compliant
Korea	KECI	Compliant
New Zealand	NZIoC	Compliant
Philippines	PICCS	Compliant
United States of America	TSCA	Compliant
Taiwan	TCSCA	Compliant

Contact product.safety@lyb.com for additional global inventory information.

15.2 Chemical safety assessment

No information available.

16. OTHER INFORMATION

Material safety datasheet sections which have been updated:

Revised Section(s): 1 15 16 August 4 2017
Abbreviations and Acronyms

ACGIH - American Conference of Governmental Industrial Hygienists
ACGIH_BEIs - American Conference of Governmental Industrial Hygienists_Biological Exposure Indices
ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road
AICS - Australian Inventory of Chemical Substances
ASTM - American Society for Testing and Materials
BEL - Biological Exposure Limits
BTEX - Benzene, Toluene, Ethylbenzene, Xylenes
CAS - Chemical Abstracts Service
CEFIC - European Chemical Industry Council
CLP - Classification Packaging and Labelling
COC - Cleveland Open-Cup
CS - Consumer Scenario
DIN - Deutsches Institut für Normung
DN(M)EL - Derived No (Minimal) Effect Level
DSL - Canada Domestic Substance List
EC - European Commission
EC50 - Median Effective Concentration
ECETOC - European Center on Ecotoxicology and Toxicology of Chemicals
ECHA - European Chemicals Agency
EL50 - Effective Loading fifty
ELINCS - EHR-Lab Interoperability and Connectivity Specification
ENCS - Japanese Existing and New Chemical Substances Inventory
ERC - Environmental Release Category
EUSES - European Union System for the Evaluation of Substances
EWC - European Waste Code

GHS - Globally Harmonized System of Classification and Labelling of Ch
IARC - International Agency for Research on Cancer
IATA - International Air Transport Association
IC50 - Inhibitory Concentration fifty IL50 = Inhibitory Level fifty
IMDG - International Maritime Dangerous Goods
IECSC - Chinese Chemicals Inventory
IOELV - Indicative Occupational Exposure Limit Values
IP346 - Institute of Petroleum test method N° 346 for the determination of polycyclic aromatics DMSO-extractables
KECI - Korea Existing Chemicals Inventory
Koc - Organic Carbon/Water Partition Coefficient
LC50 - Lethal Concentration fifty
LD50 - Lethal Dose fifty per cent.
LL/EL/IL - Lethal Loading/Effective Loading/Inhibitory Loading
LL50 - Lethal Loading fifty
MAK Commission - Permanent Senate Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area
MARPOL - International Convention for the Prevention of Pollution from Ships
No. - Number
NOEC/NOEL - No Observed Effect Concentration / No Observed Effect Level
NZIoC - New Zealand Inventory of Chemicals
OE_HPV - Occupational Exposure - High Production Volume
OECD - Organization for Economic Co-operation and Development
OEL - Occupational Exposure Limit
PBT - Persistent, Bio accumulative and Toxic
PICCS - Philippine Inventory of Chemicals and Chemical Substances
PNEC - Predicted No Effect Concentration
PPE - Personal Protective Equipment
PROC - Process Category
QSAR - Quantitative Structure–Activity Relationship
REACh - Registration Evaluation and Authorization of Chemicals
RID - Regulations Relating to International Carriage of Dangerous Goods by Rail
SDS - Safety Data Sheet
SKIN_DES - Skin Designation
STEL - Short term exposure limit
STP - Standard Temperature and Pressure
TCSCA - Taiwan inventory of chemicals
TGD - Technical Guidance Document
TRA - Targeted Risk Assessment
TSCA - US Toxic Substances Control Act
TWA - Time-Weighted Average
UN - United Nations
vPvB - very Persistent and very Bioaccumulative
WGK - German Water Endangerment Class

Disclaimer

Multiple legal entities and registration numbers may be displayed in Section 1. The Recipient shall refer to the shipping documents to identify the legal entity that supplied this product.

Disclaimer

This document is generated for the purpose of distributing health, safety, and environmental data.
Information is correct to the best of our knowledge at the date of the SDS publication.
It is not a specification sheet nor should any displayed data be construed as a specification.
Before using a product sold by a company of the LyondellBasell family of companies, users should make their own independent determination that the product is suitable for the intended use and can be used safely and legally.
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This product(s) may not be used in the manufacture of any of the following, without prior written approval by Seller for each specific product and application:
(i) U.S. FDA Class I or II Medical Devices; Health Canada Class I, II or III Medical Devices; European Union Class I or II Medical Devices;
(ii) film, overwrap and/or product packaging that is considered a part or component of one of the aforementioned medical devices;
(iii) packaging in direct contact with a pharmaceutical active ingredient and/or dosage form that is intended for inhalation, injection, intravenous, nasal, ophthalmic (eye), digestive, or topical (skin) administration;
(iv) tobacco related products and applications, electronic cigarettes and similar devices.
(v) safety components in automotive applications, for example: air bags, air bag unit housings and covers, seat belt mechanisms, brake systems, pedals and pedal supports, steering systems.

The product(s) may not be used in:
(i) U.S. FDA Class III Medical Devices; Health Canada Class IV Medical Devices; European Class III Medical Devices;
(ii) applications involving permanent implantation into the body;
(iii) life-sustaining medical applications.

All references to U.S. FDA, Health Canada, and European Union regulations include another country's equivalent regulatory classification.
In addition to the above, LyondellBasell may further prohibit or restrict the use of its products in certain applications. For further information, please contact a LyondellBasell representative.

The presentation of numerical data, such as that used for physical and chemical properties and toxicological values, is expressed using a comma (,) to separate digits into groups of three and a period (.) as the decimal marker. For example, 1,234.56 mg/kg = 1 234,56 mg/kg.
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Language Translations

The information presented in this document has been translated from English by a vendor LyondellBasell believes to be reliable. LyondellBasell and its vendor have made a good-faith effort to verify the accuracy of the translation, but assume no liability or other responsibility for any errors that may have occurred. Please refer to our web site (www.lyondellbasell.com) for the original document written in English.

End of Material Safety Data Sheet

GUBERTI S.P.A.

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Codice Fiscale e Partita IVA IT-01711940260 - R.E.A. e Registro Imprese 01711940260
e-mail:info@guberti.it http://www.guberti.it Capitale Sociale € 600.000,00 Interamente Versato

SAFETY DATA SHEET
IN ACCORDANCE WITH REG. REACH 1907/2006 and Regulation EC No 127/2008-CLP

Product name:	**Black Masterbatch PE**				
		Date:	07.04.2016.	Issue:	VI

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING			
1.1.	**Product identifier**		
	Product name:	Black Masterbatch PE	
	Product code:	**MASTER PP NERO 99428B**	
	Registration number:	Not available	
1.2.	Relevant identified uses of the substance or mixture and uses advised against		
	Relevant identified uses:	Consult the tecnical information	
	Uses advised against:	Consult the tecnical information	
1.3.	Identification of the company / undertaking		
	Manufacturer:	GUBERTI S.P.A.	P.I. 01711940260
	Adfress:	VIA SAN PIO X 58/60	31020 SAN VENDEMIANO -TV-
	Tel.:	0438/411241	
	Fax:	0438/370519	
	Responsible person e-mail:	info@guberti.it	
1.4.	Emergency telephone number		
	Emergency telephone number:	+39 (0)2 66101029 (Centro Antiveleni di Milano)	

2. HAZARDS IDENTIFICATION		
2.1.	Clasification of substance or mixture	
2.1.1.	Classification (Regulation (EC) No. 1272/2008 (CLP))	
	Class of threat and code category:	Precautionary statements:
	Not applicable	Not applicable
2.1.2.	Classification (67/548/EEC, 1999/45/EC)	
	Danger signs:	Precautionary statements:
	Not applicable	The preparation is not classified as dangerous in accordance with the provisions of the Directives 67/548/EEC and 1999/45/EC as amended. However, a Material Safety Data Sheet, containing relevant information, is required.
2.1.3.	Additional information:	
2.2.	Labeling according to EC Directives (1999/45/EC) or (EC) No. 1272/2008 (CLP)	
	Identification of the product:	Not applicable
	Identification number:	Not applicable
	Number of the authorization:	Not applicable

Product name:	Black Masterbatch PE				
		Date:	07.04.2016.	Issue:	VI

	Pictograms:	Not applicable
	Precautionary statements:	Not applicable
	Signal word:	Not applicable
	Hazard statements:	Not applicable
	Suplemental information:	Not available
2.3.	Other hazards	

3. COMPOSITION / INFORMATION ON INGREDIENTS					
Ingredient name	%	REACH No.	EINECS/CAS	Classification according to Regulation 67/548/EEZ	Classification according to Regulation (EC) 1272/2008 (CLP)

4. FIRST AID MEASURES		
4.1.	Description of first aid measures	
	General Information:	No general information
	Inhalation:	When exposed to large amounts of steam and mist, move to fresh air. Take specific treatment if needed.
	Skin:	Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Laundering enough contaminated clothing before reuse.
	Eye:	Do not rub your eyes. Immediately flush eyes with plenty of water for at least 15minutes and call a doctor/physician.
	Ingestion:	No specific measures requested in case of ingestion. If necessary seek medical service.
4.2.	Most important symptoms and effects, both acute and delayed	
	Inhalation:	Dust or gas/vapour released by heat causes irritation of the respiratory tract and may cause dizziness and breathing difficulties.
	Contact skin:	Contact with molten product may cause burns.
	Contact eye:	Dust or gas/vapour released by heat can redden eyes.
	Swallowing:	Not toxic if swallowed
4.3.	Indication of any immediate medical attention and special treatment needed	
	Notify medical personnel of contaminated situations and have them take appropriate protective measures.	

5. FIREFIGHTING MEASURES		
5.1.	Extinguishing media (suitable and unsuitable)	
	Suitable:	Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
	Unsuitable:	Avoid use of water jet for extinguishing

Product name:	**Black Masterbatch PE**				
		Date:	07.04.2016.	Issue:	VI

5.2.	Special hazards arising from the substance or mixture	
	Combustion products:	Complete combustion: CO_2, H_2O, C, $CaCO_3$
5.3.	Advise for fire fighters	
	Keep unauthorized personnel out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. Notify your local fire station and inform the location of the fire and characteristics hazard. Wear appropriate protective equipment. Keep containers cool with water spray. Use fire fighting procedures suitable for surrounding area.	
5.4.	Aditional information	
	N/A	

6. ACCIDENTAL RELEASE MEASURES		
6.1.	Personal precautions, protective equipment and emergency procedures	
6.1.1.	For non-emergency personnel:	
	Personal protection:	Wear proper protective equipment, avoid contact with melted product and inhalation of vapors.
	Procedures in the event of an accident:	Not applicable. If required, notify relevant authorities according to all applicable regulations.
6.1.2.	For emergency responders:	
	Wear proper personal protective apparatus as indicated in Section 8 and avoid skin contact and inhalation. Do not touch spilled material. Stop leak if you can do it without risk. Move container to safe area from the leak area. Remove all sources of ignition.	
6.2.	Environmental precautions:	
	Prevent runoff and contact with waterways, drains or sewers. If large amounts have been spilled, inform the relevant authorities. Avoid dispersal of spilt material and runoff and contact with waterways, drains and sewers. If large spills, advise emergency services.	
6.3.	Methods and material for containment and cleaning up	
6.3.1.	For containment:	Clear area of personnel and move up wind. Prevent, by any means available, spillage from entering drains or watercourse. No smoking, naked lightsor ignition sources. Stop leak if safe to do so.
6.3.2.	For cleaning up:	Large spill : Stay upwind and keep out of low areas. Dike for later disposal.□ Notification to central government, local government. When emissions at least of the standard amount. Dispose of waste in accordance with local regulation.Appropriate container for disposal of spilled material collected. Small liquid state spills: Appropriate container for disposal of spilled material collected.For disposal of spilled material in appropriate containers collected and clear surface.
6.3.3.	Other information:	Slippery when split
6.4.	Reference to other sections	
	See Section 7 for information on safe handling. See Section 8 for information on personal protection. See Section 13 for information on disposal.	

7. HANDLING AND STORAGE	
7.1.	Precautions for safe handling

7.1.1.	General precautions	
	Fire preventions:	Do not smoke while handling product
	Aerosol and dust generation preventions:	Not applicable
	Environmental precautions:	Transport equipment should be properly grounded
7.1.2.	Advice on general occupational hygiene	
	Do not smoke, eat, or drink while handling product. Wear appropriate protective equipment in the areas of handling molten product.	
7.2.	Conditions for safe storage, including any incompatibilities	
	Technical measures and storage conditions:	Save in cool, dry and well ventilated place.
	Packaging materials:	Polyethylene and paper bags.
	Requirements for storage rooms and vessels:	Do not use damaged containers.
7.3.	Specific end use(s)	
	Recommendations:	Not known
	Specific end uses:	See Section 1 for information on 1.2 Relevant identified uses.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

Substance	CAS No.	Exposure limit value (GVI/KGVI)		Biolgical limits value
		ppm	mg/m^3	
DNEL/PNEC-Values				
Worker				

Method of exposure:	Short-term local effects	Short-term systemic effects	Long-term local effects	Long-term systemic effects
Oral	N/A	N/A	N/A	N/A
Inhalative	N/A	N/A	N/A	N/A
Dermal	N/A	N/A	N/A	N/A
The key physical parameters: solubility, combustibility, corrosion				
Consumer				
Method of exposure:	Short-term local effects	Short-term systemic effects	Long-term local effects	Long-term systemic effects
Oral	N/A	N/A	N/A	N/A
Inhalative	N/A	N/A	N/A	N/A
Dermal	N/A	N/A	N/A	N/A

PNEC	
Protected goal in the environment	**PNEC**
Freshwater	N/A
Freshwater sediments	N/A
Marine water	N/A
Marine water sediments	N/A
Food chain	N/A
Microorganisms in the treatment of waste water	N/A
Soil	N/A
Air	N/A

8.2.	Exposure controls	
8.2.1.	Appropriate engineering controls	
	A system of local and/or general exhaust is recommended to keep employee exposures above the Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. The use of local exhaust ventilation is recommended to control emissions near the source.	
8.2.2.	Personal protective equipment (Eye/face protection, Skin protection, Respiratory protection, Thermal hazard)	
8.2.2.1.	Eye protection:	Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield. Provide an emergency eye wash station and quick drench shower in the immediate work area.
8.2.2.2.	Skin protection	
	Hand protection:	Wear appropriate glove.
	Other body parts protection:	Wear appropriate protective clothes and other protection equipment.

8.2.2.3.	Respiratory protection:	In normal condition masks with antidust filters should be available for use when requested.
8.2.2.4.	Thermal hazards:	Not available
8.2.3.	Environmental exposure controls	
	Do not let product enter drains. For ecological information refer to section 12.	

9. PHYSICAL AND CHEMICAL PROPERTIES			
9.1.	Information on basic physical and chemical properties		
		Value	Method
	Appearance:	Solid (pellet)	
	Colour:	Black	
	Odour:	Odourless	
	Odor threshold	N/A	
	pH:	N/A	
	Melting point/freezing point:	110-150 °C	
	Initial boiling point and boiling range:	N/A	
	Flash point:	300 °C	
	Evaporation rate:	N/A	
	Flammability (solid, gas):	N/A	
	Upper/lower flammability or explosive limits:	N/A	
	Vapour pressure:	N/A	
	Vapour density:	N/A	
	Density:	1,0-1,3 g/cm^3	
	Bulk density:	0,7-1,1 g/cm^3	
	Solubility(ies):	Insoluble	
	Partition coefficient: n-octanol/water:	N/A	
	Selfignition temperature:	>350 °C	
	Decomposition temperature:	Decomposition starting from 300 °C	
	Viscosity:	N/A	
	Explosive properties:	N/A	
	Oxidising properties:	N/A	
9.2.	Other information		
	Not available		

10.: STABILITY AND REACTIVITY		
10.1.	Reactivity:	N/A

Product name:	**Black Masterbatch PE**				
		Date:	07.04.2016.	Issue:	VI

10.2.	Chemical stability:	Material is stable under recommended storage and handling conditions.
10.3.	Possibility of hazardous reactions:	Hazardous Polymerization will not occur.
10.4.	Conditions to avoid:	Avoid direct contact with the flames, high temperatures, accumulation of electrostatic charges.
10.5.	Incompatible materials:	N/A
10.6.	Hazardous decomposition products:	May emit flammable vapour if involved in fire.

11. TOXYCOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity:

Input	Method	Organism	Dose LD_{50}/LC_{50} or ATE_{mix}	Time of exposure	Result
Oral:	-	-	-	-	N/A
Dermal:	-	-	-	-	N/A
Inhalation:	-	-	-	-	N/A

Target organ toxicity – single exposure:

	Specific effects	Exposed organ	Remark
Swallowing:	-	-	Not available
Contact skin:	-	-	Not available
Inhalation:	-	-	Not available

Aspiration hazard:	Not available

Irritation of the respiratory system:	Not available

Irritation and corrosion:

	Duration of exposure	Organism	Evaluation	Method	Remark
Skin corrosion / irritation:	-	-	-	-	Not available
Serious damage / eye irritation:	-	-	-	-	Not available

Hypersensitivity

Contact skin:	Not available
Inhalation:	Not available

Product name:	**Black Masterbatch PE**				
		Date:	07.04.2016.	Issue:	VI

	Specific symptoms
Swallowing:	Not available
Contact skin:	Not available
Inhalation:	Not available
Contact eye:	Not available

	Repeated dose toxicity (subacute, subchronic, chronic)					
	Dose	Duration of exposure	Organism	Method	Evaluation	Remark
Subacute oral	-	-	-	-	-	Not available
Subacute skin	-	-	-	-	-	Not available
Subacute inhalation	-	-	-	-	-	Not available
Subchronic oral	-	-	-	-	-	Not available
Subchronic skin	-	-	-	-	-	Not available
Subchronic inhalation	-	-	-	-	-	Not available
Chronic oral	-	-	-	-	-	Not available
Chronic skin	-	-	-	-	-	Not available
Chronic inhalation	-	-	-	-	-	Not available

	Target organ toxicity – repeated exposure:		
	Specific effects	Exposed organ	Remark
Subacute oral	-	-	Not available
Subacute skin	-	-	Not available
Subacute inhalation	-	-	Not available
Subchronic oral	-	-	Not available
Subchronic skin	-	-	Not available

Subchronic inhalation	-	-	Not available
Chronic oral	-	-	Not available
Chronic skin	-	-	Not available
Chronic inhalation	-	-	Not available

	CMR effects (carcinogenicity, mutagenicity, reproductive toxicity)	
	Carcinogenicity:	Not available
	Mutagenicity *in vitro*:	Not available
	Genotoxicity:	Not available
	Mutagenicity *in vivo*:	Not available
	Mutagenicity gametes:	Not available
	Reproductive toxicity:	Not available
	Total evaluation CMR properties:	Not available

11.2.	Practical experience:	
	Observations relevant for classification:	Not available
	Other observations:	Not available
11.3.	General information:	

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity

Acute toxicity	Effect dose	Test duration	Organism	Method	Evaluation	Remark
Fish	LC_{50}	96 h	-	-	-	Not available
Algae/aquatic plants	IC_{50}	72 h	-	-	-	Not available
Crustacea	EC_{50}	48 h	-	-	-	Not available
Other organisms			-	-	-	
Chronic toxicity	**Effect dose**	**Test duration**	**Organism**	**Method**	**Evaluation**	**Remark**
Fish	LC_{50}	96 h	-	-	-	Not available
Algae/aquatic plants	IC_{50}	72 h	-	-	-	Not available
Crustacea	EC_{50}	48 h	-	-	-	Not available

Other organisms			-	-	-	Not available

12.2.	Persistence and degradability
	Abiotic degradation

	$t_{1/2}$	Method	Evaluation	Remark
Marina water	-	-	-	Not available
Freshwater	-	-	-	Not available
Air	-	-	-	Not available
Soil	-	-	-	Not available

	Biodegradation

Degradation rate %	Parameter (days)	Method	Evaluation	Remark
-	-	-	-	Not available
-	-	-	-	Not available
-	-	-	-	Not available

12.3.	Bioaccumulative potential
	Octanol-water partition coefficient (Kow)

Value	Concentration	pH	°C	Method	Evaluation	Remark
-	-	-	-	-	-	Not available
-	-	-	-	-	-	Not available
-	-	-	-	-	-	Not available

	Bioconcentration factor (BCF)

Value	Species	Method	Evaluation	Remark
-	-	-	-	Not available
-	-	-	-	Not available
-	-	-	-	Not available

	Chronic ecotoxicitiy

Value	Dose	Test duration	Species	Met hod	Evaluation	Remark
Chronic fish toxicity	LC_{50}	-	-	-	-	Not available
Chronic crustacea toxicity	EC_{50}	-	-	-	-	Not available

12.4.	Mobility in soil
	known or predicted distribution to environmental:

	Surface tension:				
	Value	°C	Concentration	Method	Remark
	-	-	-	-	Not available
	-	-	-	-	Not available
	-	-	-	-	Not available

	Adsorption/desorption				
Transport	A/D coefficient Henry's const.	log Pow	Volatility	Method	Remark
Soil-water	-	-	-	-	Not available
Water-air	-	-	-	-	Not available
Soil-air	-	-	-	-	Not available

12.5.	Results of PBT and vPvB assessment
	The substance do not meet all the specific criteria detailed in Annex XIII or do not allow a direct comparison with all the criteria in Annex XIII but nevertheless indicate that the substance would not have all these properties and the substance is not considereda PBT/vPvB." □

12.6.	Other adverse effects
	N/A

13. DISPOSAL CONSIDERATION

13.1.	Waste treatment methods
13.1.1.	Information regarding the disposal of the product / packaging:
	Dispose of waste in accordance with all applicable laws and regulations. Dissolve or mix the material with a combustible solvent and burn in a incinerator equipped with fume treatment. Recycle material when possible.

13.1.2.	Waste codes / waste designations according to EWC / AVV:
	N/A

13.1.3.	Recommended waste treatment:
	The user of this product must disposal by oneself or entrust to waste disposer or person who other's waste recycle and dispose, person who establish and operate waste disposal facilities.

13.1.4.	Physical/chemical properties that may affect waste treatment options shall be specified:
	If water separation is possible, pre-process with Water separation process.

14. TRANSPORT INFORMATION

Land transport (ADR)	
UN number:	Not available
UN proper shipping name:	Not available
Packing group:	Not available
Transport hazard class(es):	Not available
Enviromental hazard:	Not applicable
Special precautions for user:	Local transport follows in accordance with Dangerous goods Safety Management Law. Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.
Land transport (RID)	
UN number:	Not available
UN proper shipping name:	Not available
Packing group:	Not available
Transport hazard class(es):	Not available
Enviromental hazard:	Not available
Special precautions for user:	Not available
Inland waterway transport (ADN)	
UN number:	Not available
UN proper shipping name:	Not available
Packing group:	Not available
Transport hazard class(es):	Not available
Enviromental hazard:	Not available
Special precautions for user:	Local transport follows in accordance with Dangerous goods Safety Management Law. Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.
Sea transport (IMDG)	
UN number:	Not available
UN proper shipping name:	Not available
Packing group:	Not available
Transport hazard class(es):	Not available
Enviromental hazard:	Not available
Special precautions for user:	Not available
Transport in bulk in accordance with appendix II of the Marpol agreement 73/78 and the IBC code:	No category assigned for the IBC code.
Air transport (ICAO-TI / IATA-DGR)	
UN number:	Not available
UN proper shipping name:	Not available
Packing group:	Not available

Product name:	**Black Masterbatch PE**				
		Date:	07.04.2016.	Issue:	VI

Transport hazard class(es):	Not available
Special precautions for user:	Stable at room temperature during transport. To avoid spilling, transport in secure, properly sealed containers.
Additional information:	Not available

15. REGULATORY INFORMATION		
15.1.	Safety, health and environmental regulations/legislation specific for the substance or mixture	
	EU regulations	
	Authorisations and/or restrictions on use	
	REACH Restricted substance under REACH	Not applicable
	REACH Substances subject to authorization under REACH	Not applicable
	REACH SVHC	Not applicable
	Europe PBT	Not applicable
	European Union (EU) Transport of Dangerous Goods by Road - Dangerous Goods List	Not applicable
15.2.	Chemical safety assessment	
	A chemical safety assessment has not been carried out.	

16. OTHER INFORMATION		
16.1.	Indication of changes	The Safety Data Sheet has been reviewed and the data therein were revised and laid out according the requirements of the Commission Regulation (EU) No. 453/2010
16.2.	Abbreviations and acronyms:	1272/2008 CLP : Classification, Labelling and Packaging regulation. REACH : Registration, Evaluation and authorisation of chemical substances. DNEL : Derive no effects level PNEC : Predicted no effect concentration
16.3.	Data sources:	This Safety Data Sheet was compiled with data and information from the following sources: ECHA, HZTA, ECOSAR, HSDB, SIDS SIAP, ChemWATCH, CESAR, Chemical DB
16.4.	Classification for mixtures and used evaluation method according to regulation (EC) 1207/2008 [CLP]:	
Classification according to CLP		Classification procedure
16.5.	Relevant R & H-Phrases (number and full text)	
	R:	See Section 2.1 for information on Classification of the mixture.
	H:	See Section 2.1 for information on Classification of the mixture.

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Product name:	**Black Masterbatch PE**				
		Date:	07.04.2016.	Issue:	VI

16.6.	Training advice:	Not applicable
16.7.	Further information	The MSDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered. This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

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MASTER

MASTER PP NERO 99428B

Description: MASTER PP 99428B is a black masterbatch for the colouring of polyolefins, requiring high opacity and very good resistance to UV light due to the fine particles of carbon black. This product is designed for coloration of polyolefine films, sheet extrusion and blow molding. Master PP99428B has a very good dispersion quality and it can be applied to other polyolefine applications as poliolefines pipes and profiles. Master PP99428B also incorporates an antiblock agent that makes rolls of film easier to unwrap. This products is designed for ease of dilution and homogeneous mixing and therefore suitable for direct addition using automatic dosing units or by preblending.

Addition Levels: The amount of masterbatch added depends on the performance requirements of the final application. Typical addition rates for opacifying vary from **1%** to **5%** masterbatch.

Main Properties:

Polymer carrier	**PP**
Color	**BLACK**
Shape	Pellets
c.b. type	Small particle size
Bulk Density (ASTM D 1895)	750 ± 50 g/dm³
Moisture (ASTM D 6980)	Max. 0,40%
Antiblock	**Yes**

- ***multy purpouse black***
- ***low addition rates***
- ***high opacity***

LDPE	HDPE	PP	PS	EVA	SAN	ABS	PVC	PA
✔	✔	✔	✖	✔	✔	✔	✔	✔

Compatibility test is reccomended

✔ **Recommended**
✔ **Potential use**
✖ **Not suitable**

Regulatory: Regulation (EC) No 1907/2006 REACH

Packaging: This products is packed in 25 kg PE bags on pallets.

Storage: Master PP99428B is not particulary sensitive to heat or moisture. At 25 ºC the storage life is 12 months. Storage at higher temperatures may impair quality of the product.

Health and Safety: A Material Safety Data Sheet (MSDS) is available to provide both workers and emergency personnel with the proper producers for handling or working with the Master PP99428B. This MSDS includes information such as physical data, handling and storage recommandation, first aid measures and ecological information.

NOTE:
Above mentioned data and technical characteristics of material are results of laboratory analysing on representative samples and they can be considered as typical average results, but they can not be used as technical specifications of finish (final) product. According above mentioned data and results, Guberti spa is not responsible and has not any kind of obligation for finish (final) product, either Guberti spa does not guarantees for characteristics of finish (final) product. Pellet, cut, size, color, and other properties may vary depending on the manufacturing location. The Quality Management System of Guberti spa has been approved to Quality Management Standards ISO 9001.

1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name	:	Hifax CA 60 A
Synonyms	:	Ethylene-Propylene copolymer, 1-Propene-Ethylene-Copolymer
Substance name	:	1-Propene, Polymer with Ethene
Substance No.	:	9010-79-1
Chemical characterization	:	Polypropylene copolymer

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

Identified uses	:	Manufacture of plastic articles by injection molding, extrusion or other conversion process.
Prohibited uses	:	FDA Class III medical devices; European class III medical devices; Health Canada class IV Medical Devices; Applications involving permanent implantation into the body; Life-sustaining medical applications

1.3 Details of the supplier of the safety data sheet

Company	**Registration number**	**Telephone**
Basell Sales & Marketing Company B.V. Delftseplein 27E 3013 AA Rotterdam Netherlands	NA	31 (0) 10 275 55 00

E-mail address : product.safety@lyb.com
Responsible/issuing person

1.4 Emergency telephone number

Basell Sales & Marketing Company B.V.	+32 3 575 1235

Poison Center:
National Poisons Information Centre
IE: +353 1 809 2166
24 hours all days

2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Not a hazardous substance or mixture according to Regulation (EC) No 1272/2008.

2.2 Label elements

Labeling (REGULATION (EC) No 1272/2008)

Not a hazardous substance or mixture according to Regulation (EC) No 1272/2008.

2.3 Other hazards

If small particles are generated during further processing, handling or by other means, may form combustible dust concentrations in air.
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB).

3. Composition/information on ingredients

3.2 Mixtures

Ingredients

Chemical name	CAS-No. EC-No.	Classification (REGULATION (EC) No 1272/2008)	Weight %
1-Propene, Polymer with Ethene	9010-79-1	Not Classified	98.0 - 100.0 %

Contains: Additives and stabilizers

4. First aid measures

4.1 Description of first-aid measures

General advice : Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid.

If inhaled : Remove person to fresh air. If signs/symptoms continue, get medical attention.
In case of excessive inhalation of fumes that may be generated during heating of this material, move the person to fresh air.
Obtain medical attention.
Keep person warm, if necessary give Cardio-Pulmonary Resuscitation (CPR)

In case of skin contact : If molten material contacts the skin, immediately flush with large amounts of water to cool the affected tissue and polymer.

Do not attempt to peel polymer from skin as this will remove the skin.
Obtain immediate emergency medical attention if burn is deep or extensive.

In case of eye contact : Flush eyes thoroughly with water for several minutes and seek medical attention if discomfort persists.

: In case of eye contact with molten polymer:
Continuously flush eye(s) with cool running water for at least 15 minutes.
Beyond flushing, DO NOT attempt to remove the material adherent to the eye(s).
Immediately seek medical attention.

If swallowed : Adverse health effects due to ingestion are not anticipated.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Inhalation of process fumes and vapors may cause soreness in the nose and throat and coughing.

Hazards : Dust contact with the eyes can lead to mechanical irritation.
Molten polymer may cause thermal burns.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media : SMALL FIRE:
Use dry chemical, CO2, or water spray.

: LARGE FIRES:
Use water spray hose nozzles from a safe location.

Unsuitable extinguishing media : None known.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire fighting : Keep away from heat and sources of ignition.
In case of fire hazardous decomposition products may be produced such as:
Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

5.3 Advice for firefighters

Special protective equipment for fire-fighters	:	Wear approved positive pressure self-contained breathing apparatus and firefighter protective clothing.
Further information	:	Combustible particulate solid, will decompose under fire conditions. Calorific Value: 8000 - 11000 kcal/kg Fight fire from safe distance with hose lines or monitor nozzles. Heat from fire may melt, decompose polymer, and generate flammable vapors. Move containers from fire area if it can be done without risk. Evacuate immediately in the event of opening of storage container pressure relief devices or discoloration of container. Always stay away from tanks engulfed in fire. Do not attempt to get on top of storage containers involved in fire. Cool storage containers with large volumes of water even after fire is out.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Equip responders with proper protection. Creates dangerous slipping hazard on any hard smooth surface. Equip emergency responders with proper personal protective equipment (PPE) Avoid generating dust. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Potential combustible dust hazard. Polymer particles create slipping hazard on hard smooth surfaces.

6.2 Environmental precautions

Environmental precautions	:	Do not flush into surface water or sanitary sewer system.

6.3 Methods and materials for containment and cleaning up

Methods for containment / Methods for cleaning up	:	On land, sweep/shovel into suitable disposal containers or vacuum using equipment which avoids ignition risk. On water, material is insoluble; collect and contain as any solid. All recovered material should be packaged, labeled, transported and disposed of or reclaimed in conformance with

applicable laws and regulations and in conformance with good engineering practices. Reclaim where possible.

7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling	:	Material is in a pellet form. If converted to small particles during further processing, handling, or by other means, may form combustible dust concentrations in air. Avoid dust accumulation in enclosed space. Avoid generating dust; fine dust suspended in air and in the presence of an ignition source is a potential dust explosion hazard. Static discharge (spark), or other ignition sources, in high dust environments may ignite the dust and result in a dust explosion Electrostatic charge may build during conveying or handling. Equipment handling polymer should be conductive and grounded (earthed) and bonded. Metal containers involved in the transfer of this material should be grounded and bonded. All electrical equipment should conform to applicable electric codes and regulatory requirements for areas handling combustible dusts. After handling, always wash hands thoroughly with soap and water. When bringing the material to processing temperatures vapors may develop may condense in the exhaust ventilation. See section 10.
Fire-fighting class	:	Polymer will burn but does not easily ignite.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Store in a dry location. Use good housekeeping practices during storage, transferring and handling. Process enclosures and adequate ventilation should be used to avoid excessive dust accumulation. Store away from excessive heat and away from strong oxidizing agents. Keep container closed to prevent contamination. Take measures to prevent the build up of electrostatic charge.

7.3 Specific end use(s)

: See Section 1.2.

8. Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Occupational Exposure Limits

Ingredients	CAS-No.	Type	Limit Value	Basis Revision Date	Additional Information
Materials that can be formed when handling this product: Non-specified (inert or nuisance) dust		TWA	10 mg/m3 inhalable	US (ACGIH) 2005	
Materials that can be formed when handling this product: Non-specified (inert or nuisance) dust		TWA	3 mg/m3 respirable	US (ACGIH) 2005	

Consult local authorities for acceptable exposure limits.

8.2 Exposure controls

Engineering measures

Follow the recommendations in international standard NFPA 654 (as amended and adopted) for equipment used to handle this product.
Engineering controls, i.e. enclosed systems, should be used whenever feasible to maintain exposures below acceptable criteria. When such controls are not feasible, or sufficient to achieve full conformance, other engineering controls such as local exhaust ventilation should be used.
Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).

Personal protective equipment

Respiratory protection : Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits.
When workers are facing concentrations above the exposure

limit they must use appropriate certified respirators.
Use appropriate respiratory protection where atmosphere exceeds recommended limits.
Where workers could be exposed to dust concentrations above the exposure limit they must use appropriate certified respirators.

Hand protection	:	Wear gloves that provide thermal protection where there is a potential for contact with heated material.
Eye and face protection	:	Dust service goggles should be worn to prevent mechanical injury or other irritation to eyes due to airborne particles which may result from handling this product.
Skin and body protection	:	Wear suitable protective clothing.
Hygiene measures	:	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 hazards and/or potential hazards that may be encountered during use. Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Take off contaminated clothing and wash before reuse.

Environmental exposure controls

General advice	:	See section 6.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	:	Pellets.
Color	:	Translucent to white
Odor	:	Slight.
Flash point	:	No Data Available.
Lower explosion limit	:	The minimum explosive concentration (MEC) for polymer dust varies according to particle size distribution.
Upper explosion limit	:	Not applicable.

Flammability (solid, gas)	:	Polymer will burn but does not easily ignite.
Oxidizing properties	:	Not considered an oxidizing agent.
Autoignition temperature	:	> 300 °C
Decomposition temperature	:	not determined
Melting point/range	:	50 - 170 °C
Boiling point/boiling range	:	Not applicable.
Vapor pressure	:	Not applicable.
Density	:	< 1 g/cm3
Water solubility	:	Insoluble.
Partition coefficient: n-octanol/water	:	No Data Available.
Viscosity, dynamic	:	Not applicable.
Relative vapor density	:	Not applicable.
Evaporation rate	:	Not applicable.
Explosive properties	:	No Data Available.

9.2 Other information

Other information	:	No additional information available.

10. Stability and reactivity

10.1 Reactivity

No known reactivity hazards.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	Will not occur.

10.4 Conditions to avoid

Conditions to avoid	:	Avoid contact with strong oxidizers, excessive heat, sparks or open flame.

10.5 Incompatible materials

Materials to avoid	:	Material may be softened by some hydrocarbons.

10.6 Hazardous decomposition products

Hazardous decomposition products	:	Not expected to decompose under normal conditions.
Thermal decomposition	:	Note: Carbon monoxide, olefinic and paraffinic compounds, trace amounts of organic acids, ketones, aldehydes and alcohols may be formed.

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity	:	Not classified
Acute inhalation toxicity	:	Not classified
Acute dermal toxicity	:	Not classified
Skin corrosion/irritation	:	Not a skin irritant.
Serious eye damage/eye irritation	:	Not an eye irritant. Mechanical irritation is possible.
Respiratory or skin sensitization	:	Not classified

Chronic toxicity

Carcinogenicity	:	Not classified
Germ cell mutagenicity	:	Not classified

Reproductive toxicity

Effects on fertility /	:	Not classified

Effects on or via lactation
Effects on Development : Not classified

Target Organ Systemic Toxicant - Single exposure

: The substance or mixture is not classified as specific target organ toxicant, single exposure.

Target Organ Systemic Toxicant - Repeated exposure

: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard : Not applicable.

12. Ecological information

12.1 Toxicity

Ecotoxicology Assessment

Acute aquatic toxicity : Not classified

Chronic aquatic toxicity : Not classified

12.2 Persistence and degradability

Biodegradability : Not expected to be biodegradable.

12.3 Bioaccumulative potential

Bioaccumulation : This material is not expected to bioaccumulate.

12.4 Mobility in soil

Additional advice : This material is not volatile and insoluble in water.

Environmental fate and pathways

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB).

12.6 Other adverse effects

Additional ecological : Ecotoxicity is expected to be minimal based on the low water

information	solubility of polymers. No data available on this product. However, birds, fish and other wildlife may eat pellets which may obstruct their intestinal tracts.

13. Disposal considerations

13.1 Waste treatment methods

Product : All recovered material should be packaged, labeled, transported and disposed of or reclaimed in conformance with applicable laws and regulations and in conformance with good engineering practices. Reclaim where possible.
Recycle if possible.

14. Transport information

Not regulated for transport

15. Regulatory information

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

REACh status

If the product has been purchased from any company of the LyondellBasell group of companies registered in the European Union, we confirm that all substances in this preparation have been pre-registered or, where required under REACh, registered, and that we have the intention to proceed with their registration in accordance with the deadlines set forth in REACh. (Regulation (EU) No. 1907/2006)

Other international regulations

Global Inventory Status
The ingredients of this product are compliant with the following chemical inventory requirements or exemptions.

*Additional Explanatory Status Statements follow the table, as necessary.

Country/Region	Inventory	Status Description
Australia	AICS	Compliant
Canada	DSL	Compliant
China	IECSC	Compliant

Europe	REACH	See REACH Compliance Statement
Japan	ENCS	Compliant
Korea	KECI	Compliant
New Zealand	NZIoC	Compliant
Philippines	PICCS	Compliant
United States of America	TSCA	Compliant
Taiwan	TCSCA	Compliant

Contact product.safety@lyb.com for additional global inventory information.

15.2 Chemical safety assessment

No information available.

16. OTHER INFORMATION

Material safety datasheet sections which have been updated:

Revised Section(s): 1 15 16 August 4 2017
Abbreviations and Acronyms

ACGIH - American Conference of Governmental Industrial Hygienists
ACGIH_BEIs - American Conference of Governmental Industrial Hygienists_Biological Exposure Indices
ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road
AICS - Australian Inventory of Chemical Substances
ASTM - American Society for Testing and Materials
BEL - Biological Exposure Limits
BTEX - Benzene, Toluene, Ethylbenzene, Xylenes
CAS - Chemical Abstracts Service
CEFIC - European Chemical Industry Council
CLP - Classification Packaging and Labelling
COC - Cleveland Open-Cup
CS - Consumer Scenario
DIN - Deutsches Institut für Normung
DN(M)EL - Derived No (Minimal) Effect Level
DSL - Canada Domestic Substance List
EC - European Commission
EC50 - Median Effective Concentration
ECETOC - European Center on Ecotoxicology and Toxicology of Chemicals
ECHA - European Chemicals Agency
EL50 - Effective Loading fifty
ELINCS - EHR-Lab Interoperability and Connectivity Specification
ENCS - Japanese Existing and New Chemical Substances Inventory
ERC - Environmental Release Category
EUSES - European Union System for the Evaluation of Substances
EWC - European Waste Code

GHS - Globally Harmonized System of Classification and Labelling of Ch
IARC - International Agency for Research on Cancer
IATA - International Air Transport Association
IC50 - Inhibitory Concentration fifty IL50 = Inhibitory Level fifty
IMDG - International Maritime Dangerous Goods
IECSC - Chinese Chemicals Inventory
IOELV - Indicative Occupational Exposure Limit Values
IP346 - Institute of Petroleum test method N° 346 for the determination of polycyclic aromatics DMSO-extractables
KECI - Korea Existing Chemicals Inventory
Koc - Organic Carbon/Water Partition Coefficient
LC50 - Lethal Concentration fifty
LD50 - Lethal Dose fifty per cent.
LL/EL/IL - Lethal Loading/Effective Loading/Inhibitory Loading
LL50 - Lethal Loading fifty
MAK Commission - Permanent Senate Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area
MARPOL - International Convention for the Prevention of Pollution from Ships
No. - Number
NOEC/NOEL - No Observed Effect Concentration / No Observed Effect Level
NZIoC - New Zealand Inventory of Chemicals
OE_HPV - Occupational Exposure - High Production Volume
OECD - Organization for Economic Co-operation and Development
OEL - Occupational Exposure Limit
PBT - Persistent, Bio accumulative and Toxic
PICCS - Philippine Inventory of Chemicals and Chemical Substances
PNEC - Predicted No Effect Concentration
PPE - Personal Protective Equipment
PROC - Process Category
QSAR - Quantitative Structure–Activity Relationship
REACh - Registration Evaluation and Authorization of Chemicals
RID - Regulations Relating to International Carriage of Dangerous Goods by Rail
SDS - Safety Data Sheet
SKIN_DES - Skin Designation
STEL - Short term exposure limit
STP - Standard Temperature and Pressure
TCSCA - Taiwan inventory of chemicals
TGD - Technical Guidance Document
TRA - Targeted Risk Assessment
TSCA - US Toxic Substances Control Act
TWA - Time-Weighted Average
UN - United Nations
vPvB - very Persistent and very Bioaccumulative
WGK - German Water Endangerment Class

Disclaimer

Multiple legal entities and registration numbers may be displayed in Section 1. The Recipient shall refer to the shipping documents to identify the legal entity that supplied this product.

Disclaimer

This document is generated for the purpose of distributing health, safety, and environmental data.
Information is correct to the best of our knowledge at the date of the SDS publication.
It is not a specification sheet nor should any displayed data be construed as a specification.
Before using a product sold by a company of the LyondellBasell family of companies, users should make their own independent determination that the product is suitable for the intended use and can be used safely and legally.
SELLER MAKES NO WARRANTY; EXPRESS OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY WARRANTY) OTHER THAN AS SEPARATELY AGREED TO BY THE PARTIES IN A CONTRACT.
Users should review the applicable Safety Data Sheet before handling the product.
This product(s) may not be used in the manufacture of any of the following, without prior written approval by Seller for each specific product and application:
(i) U.S. FDA Class I or II Medical Devices; Health Canada Class I, II or III Medical Devices; European Union Class I or II Medical Devices;
(ii) film, overwrap and/or product packaging that is considered a part or component of one of the aforementioned medical devices;
(iii) packaging in direct contact with a pharmaceutical active ingredient and/or dosage form that is intended for inhalation, injection, intravenous, nasal, ophthalmic (eye), digestive, or topical (skin) administration;
(iv) tobacco related products and applications, electronic cigarettes and similar devices.
(v) safety components in automotive applications, for example: air bags, air bag unit housings and covers, seat belt mechanisms, brake systems, pedals and pedal supports, steering systems.

The product(s) may not be used in:
(i) U.S. FDA Class III Medical Devices; Health Canada Class IV Medical Devices; European Class III Medical Devices;
(ii) applications involving permanent implantation into the body;
(iii) life-sustaining medical applications.

All references to U.S. FDA, Health Canada, and European Union regulations include another country's equivalent regulatory classification.
In addition to the above, LyondellBasell may further prohibit or restrict the use of its products in certain applications. For further information, please contact a LyondellBasell representative.

The presentation of numerical data, such as that used for physical and chemical properties and toxicological values, is expressed using a comma (,) to separate digits into groups of three and a period (.) as the decimal marker. For example, 1,234.56 mg/kg = 1 234,56 mg/kg.
Adflex, Adstif, Adsyl, Akoafloor, Akoalit, Alastian, Alathon, Aquathene, Avant, Catalloy, Clyrell, Dexflex, Flexathene, Hifax, Hipolyene, Histif, Hostacom, Hostalen, Indure, Integrate, Koattro, Lucalen, Luflexen, Lupolen, Metocene, Microthene, Moplen, Nexprene, Petrothene, Plexar, Pristene, Pro-Fax, Purell, Sequel, SJS, Softell, Starflex, Ultrathene, and Valtec are trademarks owned or used by the LyondellBasell family of companies.

Numerical Data Presentation

The presentation of numerical data, such as that used for physical and chemical properties and toxicological values, is expressed using a comma (,) to separate digits into groups of three and a period (.) as the decimal marker. For example, 1,234.56 mg/kg = 1 234,56 mg/kg.

Language Translations

The information presented in this document has been translated from English by a vendor LyondellBasell believes to be reliable. LyondellBasell and its vendor have made a good-faith effort to verify the accuracy of the translation, but assume no liability or other responsibility for any errors that may have occurred. Please refer to our web site (www.lyondellbasell.com) for the original document written in English.

End of Material Safety Data Sheet

TEMA S.r.l..	Specifiche materie prime	N.Pagina : 1/1
RICERCA E SVILUPPO	Masterbatch nero PP	CODICE: TADRS1MP44

Descrizione prodotto: Masterbatch nero per PP (o VIBATAN99428 or clariant)
Product description: Masterbatch Black for PP **Utilizzo: pigmentante nero per PP**
Use: pigmenting black for PP
Codice articolo: 040102081
Item number: 040102081

PROPRIETA'	MATERIALE	UNITA' MISURA	VALORE NOMINALE	TOLLERANZE
Property	*Reference norm*	*Measuring unit*	*Nominal value*	*Tolerances*
Base *Base*	Polipropilene *polypropylene*	%	50	+/-2
Pigmento *Pigment*	Carbon black	%	50*	+/-2
Stabilità alla luce *Light stability*	-	-	7/8	-
Stabilità al calore *Heat stability*	-	°C	300	-
Colore *Color*	-	-	Nero *Black*	-

**vibatan 99428bor 99428E declares 35%; Clariant 40%*

Note alla consegna:	**Notes at Delivery**
MAG: Verifica del peso. Verifica integrità imballo. Se difformi sospendere il ritiro e contattare ACQ	Warehouse: check weight. Check wrapping conformity and p integrity. In case of non conformity, stop unloading and contact asap purchasing dept.
MAG: Consegnare autocertificazione del fornitore a LAB	Warehouse: send a copy of supplier to LAB
LAB: Eventualmente verificare DSC e segnalare a RS se mfi fuori standard o filo MFI rugoso.	Laboratory: Eventually check DSC , if parameter out of standard report immediately to R&D manager.
MAG/LAB: se fuori standard in seguito ai test, su indicazione di RS, applicare cartello rosso con indicazioni per operatori; se inutilizzabile aprire NC.	Warehouse/Lab: if out of standard after tests, after R&D manager decision, apply red labels on material and open a NOT CONFORMITY procedure.

03	05/02/16	Inserito note alla consegna	Viel	Cais	Cais
02	31/07/12	Traduzione inglese	Viel	Peterle	Peterle
01	29/03/06		Viel	Peterle	Peterle
n. edizione *Revision No.*	data edizione *Date*	DESCRIZIONE *Description*	Redatto *Written*	Verificato *Checked*	Approvato *Approved*

CONSEGNATO A:ACQ PR Lab

TEMA S.r.l..	Specifiche materie prime	N.Pagina : 1/1
RICERCA E SVILUPPO	Masterbatch rosso PP	CODICE: TADRS1MP92bis

Descrizione prodotto: Masterbatch rosso PP (tipo STPM413570)
Product description: Masterbatch red for PP

Utilizzo: pigmentante rosso per PP *Use: pigmenting red for PP*

Codice articolo: 040102093

PROPRIETA'	MATERIALE	UNITA' MISURA	VALORE NOMINALE	TOLLERANZE
Base *Base*	polipropilene	%	-	-
Stabilità alla luce *Light stability*	-	-	7/8	-
Stabilità al calore *Heat stability*	-	°C	300	-
Umidità *Humidity*	-	ppm	<3000	-
Colore *Color*	-	-	rosso	-

Note alla consegna:	**Notes at Delivery**
MAG: Verifica del peso. Verifica integrità imballo. Se difformi sospendere il ritiro e contattare ACQ	Warehouse: check weight. Check wrapping conformity and p integrity. In case of non conformity, stop unloading and contact asap purchasing dept.
MAG: Consegnare autocertificazione del fornitore a LAB	Warehouse: send a copy of supplier to LAB
LAB: Eventualmente verificare DSC e segnalare a RS se mfi fuori standard o filo MFI rugoso.	Laboratory: Eventually check DSC , if parameter out of standard report immediately to R&D manager.
MAG/LAB: se fuori standard in seguito ai test, su indicazione di RS, applicare cartello rosso con indicazioni per operatori; se inutilizzabile aprire NC.	Warehouse/Lab: if out of standard after tests, after R&D manager decision, apply red labels on material and open a NOT CONFORMITY procedure.

03										
02										
01	05/02/16	05/02/16	Inserito nota consegna	Viel	Cais	Cais	05/02/16	Viel	Cais	05/02/16

			e alla consegna		
n. edizione	data edizione	DESCRIZIONE	Redatto	Verificato	Approvato

CONSEGNATO A:ACQ PR Lab

TEMA S.r.l..	Specifiche materie prime	N.Pagina : 1/1
RICERCA E SVILUPPO	Ritardante di fiamma	CODICE: TADRS1MP94

Descrizione prodotto: Ritardante di fiamma Airplus PP (Aiplus M1038X3)
Product description: Flame retardant for PP

Utilizzo: ritardante di fiamma per PP per ottenere classificazione E secondo la EN 13501-1
Use: flame retardant for PPto obtain E class acc to EN 13501-1

Codice articolo: 040102205
Item number: 040102205

PROPRIETA'	MATERIALE	UNITA' MISURA	VALORE NOMINALE	TOLLERANZE
Base /*Base*	polipropilene	%	-	-
MFI *Melt flow rate@* 230°C, 2.16kg	-	g/10'	20	+/-5
Densità *Density*	-	g/cm³	0.93	-
Stabilità al calore *Heat stability*	-	°C	300	-
Esente da metalli pesanti, Bifenili polibromurati (PBB) ed etere di difenile polibromurato (PBDE); *free from PBB PBDE*				

Note alla consegna:	**Notes at Delivery**
MAG: Verifica del peso. Verifica integrità imballo. Se difformi sospendere il ritiro e contattare ACQ	Warehouse: check weight. Check wrapping conformity and p integrity. In case of non conformity, stop unloading and contact asap purchasing dept.
MAG: Consegnare autocertificazione del fornitore a LAB	Warehouse: send a copy of supplier to LAB
LAB: Eventualmente verificare DSC e segnalare a RS se mfi fuori standard o filo MFI rugoso.	Laboratory: Eventually check DSC , if parameter out of standard report immediately to R&D manager.
MAG/LAB: se fuori standard in seguito ai test, su indicazione di RS, applicare cartello rosso con indicazioni per operatori; se inutilizzabile aprire NC.	Warehouse/Lab: if out of standard after tests, after R&D manager decision, apply red labels on material and open a NOT CONFORMITY procedure.

03					
02	09/02/16	Inserito note allo scarico	Cais	Viel	Cais
01	10/06/08		Viel	Peterle	Peterle
n. edizione	data edizione	DESCRIZIONE	Redatto	Verificato	Approvato

CONSEGNATO A:
ACQ PR Lab

Article Information Sheet

DuPont™ Typar® Spunbond Polypropylene

Version 2.2
Revision Date 06.03.2012 Ref. 150000003072

The composition information contained in this document is provided to satisfy the requirements of Article 33 of EC 1907/2006. Other information is provided voluntarily and is not subject to regulatory requirement.

Identification of the article and of the company/undertaking

Product identifier

Product name : DuPont™ Typar® Spunbond Polypropylene

Relevant identified uses of the article and uses advised against

Use of the article various

Details of the supplier of the article information sheet

Company : Du Pont de Nemours (Luxembourg) S.à r.l.
Rue du General Patton / Contern
L-2984 Luxembourg
Luxembourg

Telephone : +352-3666.7400

Telefax : +352-3666.5060

E-mail address : sds-support@che.dupont.com

Emergency telephone number

Emergency telephone number : +44-(0)8456-006.640

Hazards identification

Classification of the substance or mixture

Not relevant for article

Label elements

As an article the product does not need to be labelled in accordance with EC-directives or respective national laws.

Product information

This product has no known adverse effect on human health.

Additives in this product do not present a respiration hazard unless the product is ground to a powder of respirable size and the dust is inhaled. All dusts are potentially injurious to the respiratory tract if respirable particles are generated and inhaled.

Composition/information on ingredients

Article composition

: This product does not contain substances of very high concern (Regulation

(EC) No 1907/2006 (REACH), Article 57).

First aid measures

Description of first aid measures

General advice : No hazards which require special first aid measures.

Most important symptoms and effects, both acute and delayed

Not relevant for article

Indication of any immediate medical attention and special treatment needed

Not relevant for article

Firefighting measures

Extinguishing media

Not relevant for article

Special hazards arising from the article

Specific hazards during firefighting : Burning is accompanied by melting and dripping which may cause the fire to spread.

: Hazardous combustion products Carbon monoxide Carbon dioxide (CO2)

Advice for firefighters

Special protective equipment for firefighters : Wear self-contained breathing apparatus and protective suit.

Further information : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Accidental release measures

Personal precautions, protective equipment and emergency procedures

Not relevant for article

Environmental precautions

Not relevant for article

Methods and materials for containment and cleaning up

Methods for cleaning up : not applicable

Reference to other sections

Not relevant for article

Handling and storage

Precautions for safe handling

Advice on safe handling : Material can create slippery conditions. Take precautionary measures against static discharges.

Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : No special storage conditions required.

Specific end use(s)

Not relevant for article

Exposure controls/personal protection

Control parameters

If sub-section is empty then no values are applicable.

Components with workplace control parameters

Type Form of exposure	Control parameters	Update	Basis	Remarks
Dust (inhalable and respirable fraction)				
TWA Inhalable dust.	10 mg/m3	2007	EH40 WEL	
TWA Respirable dust.	4 mg/m3	2007	EH40 WEL	

Exposure controls

Engineering measures : Provide appropriate exhaust ventilation at places where dust is formed.

Physical and chemical properties

Information on basic physical and chemical properties

Form : sheets, roll

Colour : various

Odour : none

pH : not applicable

Melting point : 168 °C

Boiling point/boiling range : not applicable

Flash point : not applicable

Thermal decomposition	: > 300 °C
Vapour pressure	: not applicable

Other information

Not relevant for article

Stability and reactivity

Reactivity	: Not relevant for article
Chemical stability	: Not relevant for article
Possibility of hazardous reactions	: no data available
Conditions to avoid	: no data available
Incompatible materials	: Not relevant for article
Hazardous decomposition products	: Carbon monoxide Carbon dioxide (CO2)

Toxicological information

Information on toxicological effects

Further information

This product has no known adverse effect on human health.

Ecological information

Toxicity

Persistence and degradability

Not relevant for article

Bioaccumulative potential

Not relevant for article

Mobility in soil

Not relevant for article

Results of PBT and vPvB assessment

Not relevant for article

Other adverse effects

Additional ecological information

This product has no known eco-toxicological effects.

Disposal considerations

Waste treatment methods

Product : Where possible recycling is preferred to disposal or incineration.

Other information

Restrictions on use

Do not use DuPont materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless the material has been provided from DuPont under a written contract that is consistent with DuPont policy regarding medical applications and expressly acknowledges the contemplated use. For further information, please contact your DuPont representative. You may also request a copy of the DuPont POLICY Regarding Medical Applications H-50103-3 and DuPont CAUTION Regarding Medical Applications H-50102-3.

Further information

The DuPont Oval Logo, DuPont™, Typar®, are trademarks of E. I. du Pont de Nemours and Company

Significant change from previous version is denoted with a double bar.

The information provided in this Article Information 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 guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The above information relates only to the specific material(s) designated herein and may not be valid for such material(s) used in combination with any other materials or in any process or if the material is altered or processed, unless specified in the text.

ExxonMobil

ExxonMobil™ HDPE HYA 800

High Density Polyethylene Resin

interpolimeri
Via Cap. Negri, 11—35010 Limena (PD)
Italy
Tel. +39.049.7663811—Fax +39.049.8840410
info@interpolimeri.it

Product Description

HYA 800 is a homopolymer HDPE grade, characterized by high stiffness, high rigidity and high flow.

General

Availability [1]	▪ Africa & Middle East	▪ Asia Pacific	▪ Europe
Additive	▪ Thermal Stabilizer: Yes		
Applications	▪ Drainage Pipes	▪ Food packaging	▪ Liquid Food Containers for Milk, Water and Juices
Revision Date	▪ 01/01/2017		

Resin Properties	Typical Value (English)		Typical Value (SI)		Test Based On
Density	0.961	g/cm³	0.961	g/cm³	ASTM D1505
Melt Index (190°C/2.16 kg)	0.70	g/10 min	0.70	g/10 min	ASTM D1238
High Load Melt Index (190°C/21.6 kg)	46	g/10 min	46	g/10 min	ASTM D1238

Thermal	Typical Value (English)		Typical Value (SI)		Test Based On
Vicat Softening Temperature	261	°F	127	°C	ASTM D1525

Molded Properties	Typical Value (English)		Typical Value (SI)		Test Based On
Tensile Modulus (0.20 in/min (5.0 mm/min))	200000	psi	1400	MPa	ASTM D638
Tensile Stress at 100%					ASTM D638
2.0 in/min (50 mm/min)	2100	psi	14	MPa	
Tensile Strength at Yield					ASTM D638
2.0 in/min (50 mm/min)	3600	psi	25	MPa	
Elongation at Break (2.0 in/min (50 mm/min))	> 100	%	> 100	%	ASTM D638
Environmental Stress-Crack Resistance					ASTM D1693
10% Igepal	< 20	hr	< 20	hr	
100% Igepal	< 20	hr	< 20	hr	
Durometer Hardness (Shore D, 15 sec)	62		62		ASTM D2240

Impact	Typical Value (English)		Typical Value (SI)		Test Based On
Notched Izod Impact Strength	4.5	ft·lb/in²	9.5	kJ/m²	ISO 180/1A

Legal Statement

This product is not intended for use in medical applications and should not be used in any such applications.

Contact your ExxonMobil Chemical Customer Service Representative for potential food contact application compliance (e.g. FDA, EU, HPFB).

Processing Statement

The molded properties have been measured on compression molded sheets, prepared according to ASTM D4703 and ASTM D 638. ASTM D 638: Specimen type T1 / thickness 3 mm (118 mil); tensile modulus : speed of testing 5 mm/min (197 mil/min); tensile strength at yield and elongation at break: speed of testing 50 mm/min (1970 mil/min). ASTM D1693: Conditions B, F50, 10 % Igepal and 100 % Igepal

Notes

Typical properties: these are not to be construed as specifications.

[1] Product may not be available in one or more countries in the identified Availability regions. Please contact your Sales Representative for complete Country Availability.

ExxonMobil™ HDPE HYA 800
High Density Polyethylene Resin

For additional technical, sales and order assistance: www.exxonmobilchemical.com/ContactUs

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exxonmobilchemical.com

ExxonMobil™ HDPE HYA 800

High Density Polyethylene Resin

Product Description
HYA 800 is a homopolymer HDPE grade, characterized by high stiffness, high rigidity and high flow.

General			
Availability [1]	• Africa & Middle East	• Asia Pacific	• Europe
Additive	• Thermal Stabilizer: Yes		
Applications	• Drainage Pipes	• Food packaging	• Liquid Food Containers for Milk, Water and Juices
Revision Date	• March 2010		

Resin Properties	Typical Value	(English)	Typical Value	(SI)	Test Based On
Density	0.961	g/cm³	0.961	g/cm³	ExxonMobil Method
Melt Index (190°C/2.16 kg)	0.70	g/10 min	0.70	g/10 min	ASTM D1238
High Load Melt Index (190°C/21.6 kg)	46	g/10 min	46	g/10 min	ASTM D1238

Thermal	Typical Value	(English)	Typical Value	(SI)	Test Based On
Vicat Softening Temperature	264	°F	129	°C	ASTM D1525

Molded Properties	Typical Value	(English)	Typical Value	(SI)	Test Based On
Tensile Modulus (2.0 in/min (50 mm/min))	170000	psi	1200	MPa	ASTM D638
Tensile Strength at Yield					ASTM D638
2.0 in/min (50 mm/min)	4000	psi	30	MPa	
Elongation at Break (2.0 in/min (50 mm/min))	> 100	%	> 100	%	ASTM D638
Environmental Stress-Crack Resistance					ASTM D1693B
10% Igepal	20	hr	20	hr	
100% Igepal	20	hr	20	hr	
Durometer Hardness (Shore D, 15 sec)	64		64		ASTM D2240

Impact	Typical Value	(English)	Typical Value	(SI)	Test Based On
Unnotched Izod Impact (Area)	5.71	ft·lb/in²	12.0	kJ/m²	ASTM D256

Mechanical	Typical Value	(English)	Typical Value	(SI)	Test Based On
Tensile Stress at 100%					ASTM D412
2.0 in/min (50 mm/min)	> 2000	psi	> 10	MPa	

Legal Statement
Contact your ExxonMobil Chemical Customer Service Representative for potential food contact application compliance (e.g. FDA, EU, HPFB). This product is not intended for use in medical applications and should not be used in any such applications.

Typical properties: these are not to be construed as specifications.

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Processing Statement
The molded properties have been measured on compression molded sheets, prepared according to ASTM D 4703. and ASTM D 638 (1) Specimen type T1 / thickness 3 mm (118 mil); speed of testing 50 mm/min (1970 mil/min). (2) Specimen type T1 / thickness 3 mm (118 mil); speed of testing 5 mm/min (197 mil/min). (3) Conditions B, F50, 10 % Igepal (4) Conditions B, F50, 100 % Igepal

Notes

[1] Product may not be available in one or more countries in the identified Availability regions. Please contact your Sales Representative for complete Country Availability.

For additional technical, sales and order assistance:

Worldwide and the Americas
ExxonMobil Chemical Company
13501 Katy Freeway
Houston, TX 77079-1398
USA
1-281-870-6050

Asia Pacific
ExxonMobil Chemical Singapore Pte. Ltd.
1 HarbourFront Place
#06-00 HarbourFront Tower One
Singapore 098633
86 21 240-75380

Europe, Middle East and Africa
ExxonMobil Chemical Europe
Hermeslaan 2
1831 Machelen, Belgium
420-239-016-274

Typical properties: these are not to be construed as specifications.

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PRODUCTS
Technical Specifications

ESLATENE HD

PRODUCT Recycled high density polyethylene pellets

REFERENCE UNE 53978

DENOMINATION Class IV / Class II

PREFERENTIAL APPLICATION blow moulding / Extrusion

CHARACTERISTICS AND TEST METHODS

MELT INDEX	(0.30 (+0.15 / -0.10)) g/10 min (190ºC 2.160 kg)
MASS DENSITY	(0.955 ± 0.010) g/cc
ASH CONTENT	Maximum 2%
COLOUR	Black / Natural / Green / Grey
CARBON BLACK (black)	1% minimum

The tests are carried out in accordance with the UNE norms on test methods which are cited in norm UNE 53978

PRODUCT CODE NUMBER 2310300 / 2310100 / 2310600 / 2310900

PACKAGING 25 kg plastic bag / big bags

TRANSPORT UNIT 1.250 kg pallets
Alternatively big bags up to 1.000 kg or bulks.

HOMOGENEUS BATCH 25 Tn

Not apt for use in food production.

Information Sheet

According to Annex II to REACH - Regulation 2015/830

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code:	**MBPPM1684**
Product name	**MBPP ROSSO M1684**
Chemical name and synonym	**Pigmentary dispersion**

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

Intended use	**Coloring agent**

1.3. Details of the supplier of the safety data sheet

Name	**Mesgo Iride Colors s.r.l.**
Full address	**Via Borgo San Siro**
District and Country	**27026 Garlasco (PV)** **Italia** **Tel. +390382816611** **Fax +390382810045**
e-mail address of the competent person responsible for the Safety Data Sheet	**f.farina@mesgoiridecolors.it**

1.4. Emergency telephone number

For urgent inquiries refer to	**+39038224444 CAV-CNIT Pavia - Operativo (24/24)**

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is not classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements).

Hazard classification and indication: --

2.2. Label elements

This product is not subject to hazard labeling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

2.3. Other hazards

SECTION 3. Composition/information on ingredients

3.1. Substances

Information not relevant

3.2. Mixtures

The product does not contain substances classified as being hazardous to human health or the environment pursuant to the provisions Regulation (EU) 1272/2008 (CLP) (and subsequent amendments and supplements) in such quantities as to require the statement.

SECTION 4. First aid measures

4.1. Description of first aid measures

Not specifically necessary. Observance of good industrial hygiene is recommended.

SECTION 4. First aid measures ... / >>

4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product are unknown.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT
The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.
UNSUITABLE EXTINGUISHING EQUIPMENT
None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE
Do not breathe combustion products.

5.3. Advice for firefighters

GENERAL INFORMATION
Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.
SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS
Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use breathing equipment if fumes or powders are released into the air. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Confine using earth or inert material. Collect as much material as possible and eliminate the rest using jets of water. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use.

7.2. Conditions for safe storage, including any incompatibilities

Keep the product in clearly labelled containers. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Information not available

8.2. Exposure controls

Comply with the safety measures usually applied when handling chemical substances.
HAND PROTECTION
None required.
SKIN PROTECTION
None required.
EYE PROTECTION
None required.
RESPIRATORY PROTECTION
None required, unless indicated otherwise in the chemical risk assessment.
ENVIRONMENTAL EXPOSURE CONTROLS
The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Granular
Colour	red
Odour	imperceptible
Odour threshold	Not available
pH	Not available
Melting point / freezing point	Not available
Initial boiling point	Not available
Boiling range	Not available
Flash point	Not available
Evaporation Rate	Not available
Flammability of solids and gases	Not available
Lower inflammability limit	Not available
Upper inflammability limit	Not available
Lower explosive limit	Not available
Upper explosive limit	Not available
Vapour pressure	Not available
Vapour density	Not available
Relative density	Not available
Solubility	Not available
Partition coefficient: n-octanol/water	Not available
Auto-ignition temperature	Not available
Decomposition temperature	Not available
Viscosity	Not available
Explosive properties	Not available
Oxidising properties	Not available

9.2. Other information

VOC (Directive 2010/75/EC) :	0
VOC (volatile carbon) :	0

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

SECTION 10. Stability and reactivity ... / >>

10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

10.4. Conditions to avoid

None in particular. However the usual precautions used for chemical products should be respected.

10.5. Incompatible materials

Information not available

10.6. Hazardous decomposition products

Information not available

SECTION 11. Toxicological information

According to currently available data, this product has not yet produced health damages. Anyway, it must be handled according to good industrial practices.

11.1. Information on toxicological effects

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

LC50 (Inhalation) of the mixture:	Not classified (no significant component)
LD50 (Oral) of the mixture:	Not classified (no significant component)
LD50 (Dermal) of the mixture:	Not classified (no significant component)

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

SECTION 11. Toxicological information ... / >>

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

Information not available

12.2. Persistence and degradability

Information not available

12.3. Bioaccumulative potential

Information not available

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Neat product residues should be considered special non-hazardous waste.
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
Solid residues may be suitable for disposal in an authorised landfill site.
CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not applicable

SECTION 14. Transport information ... / >>

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EC: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006
None

Substances in Candidate List (Art. 59 REACH)
On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisarion (Annex XIV REACH)
None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
None

Substances subject to the Rotterdam Convention:
None

Substances subject to the Stockholm Convention:
None

Healthcare controls
Information not available

German regulation on the classification of substances hazardous to water (VwVwS 2005)
WGK 1: Low hazard to waters

15.2. Chemical safety assessment

No chemical safety assessment has been processed for the mixture and the substances it contains.

SECTION 16. Other information

LEGEND:
- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%

SECTION 16. Other information ... / >>

- IMDG: International Maritime Code for dangerous goods- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:
The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.
This document must not be regarded as a guarantee on any specific product property.
The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.
Provide appointed staff with adequate training on how to use chemical products.

Changes to previous review:
The following sections were modified:
01 / 02 / 04 / 06 / 11 / 15.

MESGO Iride Colors compounding solutions

Technical data sheet

Rev.01 03/04/2018

MBPP ROSSO M1684

Description

Pigment masterbatch, red color, PP based.

Process

INJECTION MOLDING	√	EXTRUSION SHEET	√
BLOWN FILM		STRETCH FILM	√
CAST FILM		TEXTILE SPINNING	√

Properties	Value	Unit	Method
Additive content	-	%	INTERNAL
Density	-	g/cm3	ISO 1183
Bulk Density	-	Kg/dm3	ISO 60
Moisture content	-	%	INTERNAL
Heat stability	260	°C	ISO 75
Light fastness	6	blue scale	ISO 4892
Melt flow index 230°C/2160 g	-	g/10 min	ISO 1133

Uses

Masterbatch for coloring plastic materials.

Suggested quantity 2%

Packaging & Storage

20 Kg bags or 1000 Kg octabin

Use within two years from production date

Normatives

Compliant to REACH Regulation n° 1907/2006 -EU

Compliant to RoHS Directive n° 2011/65 - EU

Notes

The data contained in this publication are based on our current knowledge and experience.In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed.

Safety Data Sheet

In accordance with Regulation 453/2010/EC

Last update: Mar 2018

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identification

Chemical classification:	Masterbatch Flame retardant PP
Trade name / (code):	**AIPLUS PP M-1038-X3 EXP NAT.**

1.2 Relevant identified uses of the substance or mixture

Industry sector:	Production of polypropylene articles
Type of use:	Additive flame retardant for polypropylene

1.3 Details of the supplier of the safety data sheet

DIAP srl
Via Vepre sn - 60043 Cerreto D'Esi (AN) Italy
Tel. +39 0732 677213
E-mail: info@diap.it

1.4 **Emergency telephone number**. Telephone: +39 0732 677213

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

The substance/mixture is not classified as dangerous according to EEC directives 1999/45, 67/548 and Regulation 1272/2008 (CLP) and subsequent amendments.

2.2 Label elements

Exempt from labeling in accordance with EC Regulation 1272/2008 (CLP)

2.3 Other hazards

No other hazards, normal precautions required in the workplace to be observed

SECTION 3: Composition/information on ingredients

3.1 Substances

N.A.

3.2 Mixtures

The mixture is essentially composed of Homopolymer polypropylene (<85%), melamine compounds (<12%), 2.3-dimethil-2.3 diphenylbuthane (<2%)

CAS N° 9003-07-01 CAS N° 29305-12-2 CAS N°1889-67-4

SECTION 4: First aid measures

4.1 **Description of first aid measures**

The measures listed below refer to critical situations (fire, incorrect process conditions). The product is non-irritating and does not release hazardous fumes at room temperature.

In case of contact with skin:
After contact with the hot product, wash immediately with cold water.
Do not remove the solidified product from the skin.
Seek medical assistance.

In case of contact with eyes:
Wash with running water for several minutes by keeping the eyelids wide open.

In case of ingestion:
No specific measure is necessary in case of ingestion of the product as it is.
If necessary, call a doctor.

In case of inhalation:
The product is in pellet form and cannot be inhaled.

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

None

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

Treatment: none

SECTION 5: Firefighting measures

5.1 **Extinguishing media**

Suitable extinguishing media: water, foam, CO2, chemical powder.
Extinguishing media not to be used for safety reasons: none in particular.

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

In case of fire, dangerous gases are formed due to combustion (carbon oxides, toxic pyrolysis products, etc.).
Burning produces heavy smoke.

5.3 **Advice for firefighters**

The fire debris and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Use proper personal protective equipment (breathing apparatus, helmet, goggles, overalls, gloves, fireproof boots).

SECTION 6: Accidental release measures

6.1 **Personal precautions, protective equipment and emergency procedures**
For non-emergency personnel no PPE is required.
For emergency responders, in the event of a release, none PPE is required, clean transit areas to prevent slipping.

6.2 **Environmental precautions**
Avoid releasing into the environment.

6.3 **Methods and material for containment and cleaning up**
Collect the product up with mechanical means.
Reuse if possible or dispose in accordance with the current provisions.

SECTION 7: Handling and storage

7.1. **Precautions for safe handling**
Its manipulation at room temperature does not involve specific risks to the health of operators. During the process it is necessary to avoid inhalation of smokes and vapors; therefore, fume extraction and adequate ventilation must be provided.
No smoking; do not use open flames; avoid the presence of static electricity.

7.2. **Conditions for safe storage, including any incompatibilities**
Keep the product away from heat sources and protected from direct sunlight in cool, well-ventilated areas.
Storage is required in order to prevent hazards due to instability or breakage of the packaging units (big bags / bags). In particular, storage of overlapping rows may be dangerous to all persons involved in warehouse operations.

7.3. **Specific end use**
None in particular

SECTION 8: Exposure control/personal protection

8.1 **Exposure limit values**
No information available

8.2 **Exposure control**
Respiratory protection:
If there is a risk of overexposure to dust, vapor or fumes (in case of product processing) it is advisable to install a local exhaust ventilation systems over the processing apparatus (e.g. extraction hood): the work environment will be properly ventilated.

Protection for skin and body:
Resistant gloves agents (EN 374 type). Breakthrough time of building material: see manufacturer's specifications. Standard work clothes.

Protection for eyes:
Use goggles when necessary.

Safety Data Sheet

In accordance with Regulation 453/2010/EC

Last update: Mar 2018

SECTION 9: Physical and chemical properties

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

Colour:	Natural
Appearance:	Cylindrical pellet
Odour:	Odorless
pH:	N.A.
Melting point:	160÷170°C
Ignition temperature:	N.A.
Density:	0.93 g/cm^3
Flammability or explosive limits:	>350°C
Solubility in water:	insoluble

9.2 **Other information**

Conductivity:	N.A.

SECTION 10: Stability and reactivity

10.1 **Reactivity**

In normal conditions of use, there are no risks of reaction with other substances.

10.2 **Chemical stability**

The product is stable and chemically inert at room temperature.

10.3 **Possibility of hazardous reactions**

Under normal conditions of storage and use, there are no predictable hazardous reactions.

10.4 **Conditions to avoid**

Avoid temperatures above thermal stability and electrostatic charges.

10.5 **Incompatible materials**

No information available.

10.6 **Hazardous decomposition products**

In case of fire or thermal decomposition gases and vapors that are potentially dangerous to health can be released.

SECTION 11: Toxicological information

11.1 On the basis of our experience and the information available, the product is not harmful to health and the environment when used properly.

SECTION 12: Ecological information

12.1 **Toxicity**
Adopt good working practices, so that the product is not released into the environment.

12.2 **Persistence and degradability**
N.A.

12.3 **Bioaccumulative potential**
N.A.

12.4 **Mobility in soil**
N.A.

12.5 **Results of PBT and vPvB assessment**
vPvB substances: none - PBT substances: none

12.6 **Other adverse effects**
N.A.

SECTION 13: Disposal considerations

13.1 **Waste treatment methods**

Product:
The material, after appropriate treatments (e.g. washing, re-granulation, etc.) can be used again if suitable, in application fields that allow it, as it is or mixed with virgin material.
Residues are to be considered special hazardous waste and must be carried to a hazardous waste disposal site in accordance with European directives (91/156/EEC, 91/68/EEC, 94/62/EC) evaluating the possible ingredients listed in section 2.

Uncleaned packaging:
Uncleaned packaging materials are to be considered as equivalent to chemical residues, therefore disposed of according to national regulations on waste management.

SECTION 14: Transport information

By road (ADR Directive 94/55/EC)	No limitation in transportation
By rail (RID Directive 96/49/EC)	No limitation in transportation
By sea (IMO-IMDG)	No limitation in transportation
Air transport (ICAO / IATA)	No limitation in transportation

SECTION 15: Regulatory information

15.1 **Specific safety, health and environmental regulations and legislation for the substance or mixture**

It does not contain substances subject to restrictions under Annex XVII
It does not contain REACH substances (SVHC -15/01/2018)
It does not contain any substance listed in Annex XIV of REACH

15.2 **Chemical safety assessment**
No further information available

SECTION 16: Other information

General bibliography:
- Directive 67/548/EEC and subsequent amendments and adjustments
- Directive 199/45/EC and subsequent amendments
- Regulation (EC) 1907/2006 of the European Parliament (REACH)
- Regulation (EC) 1272/2008 of the European Parliament (CLP)

The information provided is based on our knowledge and on data collected by DIAP srl and it is aimed to describe the product only for environmental, health and safety needs. Therefore, it must not be considered as a guarantee of specific qualities of the product.
DIAP srl refuses all responsibility for conducts of buyer companies that do not comply with this information and for uses of the product that are not reasonably foreseeable, incorrect or improper.
The information contained in this document allows the entrepreneur-user to comply with their obligations as an employer under Legislative Decree no. 81/08 and subsequent amendments.

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mar-18

F.R. masterbatch for PP

AIPLUS PP M-1038-X3 neutral

Product Data and Technical Information

Aiplus **PP M-1038-X3 neutral** is a PP flame retardant masterbatch in pellets with an exact percentage of active substance, neutral.

Aiplus **PP M-1038-X3 neutral** is suitable for fibers in PP that require flame retardant resistance in compliance with UL 94-V2 norms.

Properties	Unit	Value	Method
Melt flow rate (MFR)	g/10'	**25±5**	ASTM D 1238L
Density	g/cm^3	**0,93**	ASTM D 1505

A concentration from 3 to 4% of Aiplus PP M-1038-X3 neutral in the final polymer is generally enough, depending on LOI value that you want obtain.

Flame retardant Properties

Polypropylene std with 3% Aiplus PP M-1038-X3 neutral:

		Unit	Value	Norm
UL 94		Class	**V2**	IEC 60695
Glow wire test		°C	**960°C/3,2 mm**	CEI EN 60695 2-12
Glow wire test		°C	**700°C/3,2 mm**	CEI EN 60695 2-13
Oxigen index	LOI	%	**26,5**	ASTM D 2863-2000
Halogens in smokes		%	**Absent**	NF X70-100

The main advantages of **Aiplus PP M-1038-X3 neutral** are:

High thermal stability
Low smoke emissions
No antimony trioxide
No poly-brominated
No corrosion
Poor degradation in re-manufacturing
Low density
High workability
Optimum dispersion
High efficiency

Aiplus PP M-1038-X3 neutral is in compliance with European Directory 2011/65/UE (RoHS) about the absence of polybromine (PBB and PBDE) and heavy metals in the product.
Aiplus PP M-1038-X3 neutral also meets the European norms 2006/122/EC .

poliblend® engineering plastics

			POLIMID A UNFILLED							POLIMID B UNFILLED						POLIMID A REINFORCED			
			SG	SG/5	SG/1	SG LDM	SG HV	SG KW	SG FD	AV	AV/1	AV HF	AV FD	34	40	15 GB	15 GF	30 GB	30 GF
			PA 66 STANDARD VISCOSITY	PA 66 IMPROVED MOULDABILITY	PA 66 ECONOMICAL VERSION	PA 66 FAST CYCLES	PA 66 HIGH VISCOSITY	PA 66 HEAT STABILIZED	PA 66 STANDARD VISCOSITY FDA CERTIFIED	PA 6 STANDARD VISCOSITY	PA 6 ECONOMICAL VERSION	PA 6 LOW VISCOSITY FAST CYCLES	PA 6 STANDARD VISCOSITY FDA CERTIFIED	PA 6 MEDIUM VISCOSITY	PA 6 HIGH VISCOSITY	PA 66 15% GLASS BEAD	PA6 6 15 % GLASS FIBER	PA 66 30% GLASS BEAD	PA 66 30% GLASS FIBER
PHYSICAL AND THERMAL PROPERTIES	**METHOD**	**UNIT**																	
DENSITY	ISO 1183	g/cm³	1,14	1,14	1,14	1,14	1,14	1,14	1,14	1,14	1,14	1,14	1,14	1,14	1,14	1,24	1,24	1,36	1,36
MELTING POINT	DSC	°C	260	260	260	260	260	260	260	222	222	222	222	222	222	260	260	260	260
MOULD SHRINKAGE (average)	ISO 294-4	%	1,4 - 1,8	1,4 - 1,8	1,4 - 1,8	1,4 - 1,8	1,3 - 1,7	1,4 - 1,8	1,4 - 1,8	1,0 - 1,4	1,0 - 1,4	1,0 - 1,4	1,0 - 1,4	1,0 - 1,4	1,0 - 1,4	1,2 - 1,5	0,6-1,0	1-1,2	0,4 - 0,8
MOISTURE ABSORPTION (in water at 23°C) 24h/saturation	ISO 62	%	1,2 - 8,5	1,2 - 8,5	1,2 - 8,5	1,2 - 8,5	1,2 - 8,5	1,2 - 8,5	1,2 - 8,5	1,5-9,0	1,5-9,0	1,5-9,0	1,5-9,0	1,5-9,0	1,5-9,0	1,5-7	1-6,5	1,2-6,5	0,7 - 6,0
VICAT SOFTENING TEMPERATURE B 9.8 N	ISO 306	°C	255	255	250	255	255	255	255	206	206	206	206	208	208	250	255	255	255
HEAT DEFLECTION TEMPERATURE 0.45 MPa	ISO 75-2	°C	220	220	210	220	220	220	220	160	160	165	160	165	165	230	245	235	255
HEAT DEFLECTION TEMPERATURE 1.81 MPa	ISO 75-2	°C	80	80	80	83	85	80	80	70	70	70	70	75	75	100	230	110	240
CONTINUOUS SERVICE TEMPERATURE (without load, 20,000 hours)	IEC 60216	°C	90	90	80	90	90	120	90	80	80	80	80	80	80	110	115	110	115
HEAT RESISTANCE / BALL TEST	IEC 60695-10-2	°C	> 165	>165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	>165	> 165	> 165	>165	> 165	>165	165	> 165
MECHANICAL PROPERTIES	**METHOD**	**UNIT**																	
TENSILE YIELD STRESS	ISO 527	MPa	85	80	75	80	90	85	85	85	85	80	85	85	85	50	–	–	160
TENSILE STRENGTH AT BREAK	ISO 527	MPa	–	–	–	–	–	–	–	–	–	–	–	–	–	50	120	75	160
TENSILE MODULUS	ISO 527	MPa	3100	3100	3000	3300	3200	3000	3100	3000	3000	3000	3000	3200	3100	3800	6000	4500	9000
TENSILE YIELD STRAIN	ISO 527	%	5	5	4	5	4	5	5	4,5	4,5	5	4,5	5	5,5	4	–	3,5	–
TENSILE STRAIN AT BREAK	ISO 527	%	40	40	30	35	40	40	40	40	40	45	40	45	50	5	3	4,5	2,5
NOTCHED IZOD IMPACT STRENGHT	ISO 180/A	KJ/m²	5	4,5	4	4,5	5,5	5	5	5,5	5,5	5,5	5,5	6	6,5	3,5	6	4	9,5
UNNOTCHED IZOD IMPACT STRENGHT	ISO 180/U	KJ/m²	NB	NB	-	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	30	30	–	70
ELECTRICAL PROPERTIES & FLAME RETARDANCY	**METHOD**	**UNIT**																	
COMPARATIVE TRACKING INDEX (CTI)	IEC 60112	V	600	> 600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
VOLUME RESISTIVITY	IEC 60093	Ohm·cm	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14
FLAMMABILITY RATING 0.8 mm / 1.5 mm / 3.0 mm	UL 94	-	V2 (1-1,6mm)	V2/V2/V2	-	V2/V2/V2	V2/V2/V2	V2/V2/V2	V2/V2/V2	V2/V2/V2	V2/V2/V2	V2/V2/V2	V2/V2/V2	V2/V2/V2	V2/V2/V2	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB
GLOW WIRE FLAMMABILITY INDEX (GWFI) / 2 mm	IEC 60695-2-12	°C	960	825	825	825	825	825	825	825	825	825	825	825	825	650	650	650	650
GLOW WIRE IGNITION TEMPERATURE (GWIT) / 2 mm	IEC 60695-2-13	°C	725	725	-	725	725	725	725	750	750	750	750	750	750	–	–	–	–
BURNING RATING 350 X 100 X 1 mm	FMVSS 302 ISO 3795	mm/min	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR<100	BR < 100

Remarks:
NB: no breaking
: UL CERTIFICATION

The information contained in this document is provided in good faith and for indication only.
The values, referred to moulded trials and conditioned 40h - 23°C - 50% U.R., are to be assessed carefully with our Technical Assistance Service depending on the project needs. The products are not suitable for food applications unless otherwise indicated. The contents must not be considered in any case as a contractual commitment or warranty by us, especially in case of incorrect use of our products by third parties. For the moulding conditions see the specific Technical Data Sheets.

poliblend® engineering plastics

POLIMID A REINFORCED

PHYSICAL AND THERMAL PROPERTIES	METHOD	UNIT	30 GF KW PA 66 30% GLASS FIBER HEAT STABILIZED	30 GF KW2 PA 66 30% GLASS FIBER VERY HIGH HEAT STABILIZATION	30 GF HM PA 66 30% GLASS FIBER ECONOMICAL VERSION HIGH MODULE	50 GF PA 66 50% GLASS FIBER	60 GF KW EST PA 66 60% GLASS FIBER HEAT STABILIZED GLOSSY FINISH	15 GF EM1 PA 66 15% GLASS FIBER IMPACT RESISTANCE	30 GF EM1 PA 66 30% GLASS FIBER IMPACT RESISTANCE	15 GF EM2 PA 66 15% GLASS FIBER HIGH IMPACT RESISTANCE	30 GF EM2 PA 66 30% GLASS FIBER HIGH IMPACT RESISTANCE	30 GF FD PA 66 30% GLASS FIBER FDA CERTIFIED	30 GF K1 PA 66 30% GLASS FIBER HEAT AND HYDROLYSIS STABILIZED	30 GF WR PA 66 30% GLASS FIBER WRAS CERTIFIED	30 GF KWG PA 66 30% GLASS FIBER HEAT AND GLYCOL STABILIZED	30 GF HWG PA 66 30% GLASS FIBER GLYCOL AND HYDROLYSIS STABILIZED
DENSITY	ISO 1183	g/cm³	1,36	1,36	1,36	1,57	1,65	1,22	1,33	1,19	1,3	1,36	1,36	1,36	1,36	1,35
MELTING POINT	DSC	°C	260	260	260	260	260	260	260	260	260	260	260	260	260	260
MOULD SHRINKAGE (average)	ISO 294-4	%	0,4 - 0,8	0,4 - 0,8	0,4 - 0,8	0,4 - 0,6	0,3 - 0,5	0,7 - 1,1	0,6 - 0,9	0,8-1,2	0,7-1,1	0,4 - 0,8	0,4 - 0,8	0,4 - 0,8	0,4 - 0,8	0,4 - 0,8
MOISTURE ABSORPTION (in water at 23°C) 24h/saturation	ISO 62	%	0,7 - 6,0	0,7 - 6,0	0,7 - 6,0	0,5 - 4,0	0,3 - 2,00	1,2 - 6,0	0,8 - 4,0	1,4 - 4,5	0,7-6,0	0,7 - 6,0	0,7 - 6,0	0,7 - 6,0	0,7 - 6,0	0,7 - 6,0
VICAT SOFTENING TEMPERATURE B 9.8 N	ISO 306	°C	255	255	255	255	255	24 5	250	240	245	255	255	255	255	255
HEAT DEFLECTION TEMPERATURE 0.45 MPa	ISO 75-2	°C	255	255	255	260	260	240	250	235	250	255	255	255	255	255
HEAT DEFLECTION TEMPERATURE 1.81 MPa	ISO 75-2	°C	240	240	240	255	255	215	245	210	235	240	240	240	240	240
CONTINUOUS SERVICE TEMPERATURE (without load, 20,000 hours)	IEC 60216	°C	120	130	115	130	140	105	110	105	110	115	140	115	140	130
HEAT RESISTANCE / BALL TEST	IEC 60695-10-2	°C	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	>165	> 165	>165	> 165
MECHANICAL PROPERTIES	**METHOD**	**UNIT**														
TENSILE YIELD STRESS	ISO 527	MPa	160	160	150	220	225	110	120	100	110	160	160	160	160	160
TENSILE STRENGTH AT BREAK	ISO 527	MPa	160	160	150	220	225	110	120	100	110	160	160	160	160	160
TENSILE MODULUS	ISO 527	MPa	9000	9000	8000	14500	18500	5000	6500	4500	6000	9000	9000	9000	9000	9200
TENSILE YIELD STRAIN	ISO 527	%	2,5	2,5	2,5	2	1,5	3	3	-	4,5	2,5	3	2,5	3	
TENSILE STRAIN AT BREAK	ISO 527	%	2,5	2,5	2,5	2	2	5	3,5	5,5	5	2,5	3	2,5	3	2,5
NOTCHED IZOD IMPACT STRENGHT	ISO 180/A	KJ/m²	9,5	9,5	8	11,5	12,5	9	11,5	12,5	13,5	9,5	9,5	9,5	9,5	9,5
UNNOTCHED IZOD IMPACT STRENGHT	ISO 180/U	KJ/m²	70	70	60	110	110	50	60	65	75	70	70	70	70	70
ELECTRICAL PROPERTIES & FLAME RETARDANCY	**METHOD**	**UNIT**														
COMPARATIVE TRACKING INDEX (CTI)	IEC 60112	V	600	600	600	600	600	600	600	600	600	600	600	600	600	600
VOLUME RESISTIVITY	IEC 60093	Ohm·cm	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14
FLAMMABILITY RATING 0.8 mm / 1.5 mm / 3.0 mm	UL 94	-	HB/HB/-	-/HB/HB	HB/HB/-	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB
GLOW WIRE FLAMMABILITY INDEX (GWFI) / 2 mm	IEC 60695-2-12	°C	650	650	650	650	650	650	650	650	650	650	650	650	650	650
GLOW WIRE IGNITION TEMPERATURE (GWIT) / 2 mm	IEC 60695-2-13	°C	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BURNING RATING 350 X 100 X 1 mm	FMVSS 302 ISO 3795	mm/min	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100

Remarks:
NB: no breaking
: UL CERTIFICATION

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POLIMID A REINFORCED

POLIMID B REINFORCED

PHYSICAL AND THERMAL PROPERTIES	METHOD	UNIT	25 GF TT/1	30 FC	1515 GFB	EM1	EM4	15 GF	15 GB	30 GF	30 GB	50 GF	15 GF EM1	15 GF EST	30 GF FD	30 GF K1
			PA 66 25% GLASS FIBER THERMAL BREAK	PA 66 30% CARBON FIBER	PA 66 15% GLASS FIBER 15% GLASS BEAD	PA 66 IMPACT RESISTANCE	PA 66 VERY HIGH IMPACT RESISTANCE AT LOW TEMPERATURES	PA 6 15% GLASS FIBER	PA 6 15% GLASS BEAD	PA 6 30% GLASS FIBER	PA 6 30% GLASS BEAD	PA 6 50% GLASS FIBER	PA 6 15% GLASS FIBER IMPACT RESISTANCE	PA 6 15% GLASS FIBER GLOSSY FINISH	PA 6 30% GLASS FIBER FDA CERTIFIED	PA 6 30% GLASS FIBER HEAT AND HYDROLYSIS STABILIZED
DENSITY	ISO 1183	g/cm³	1,32	1,28	1,35	1,11	1,05	1,25	1,25	1,35	1,35	1,57	1,22	1,25	1,35	1,35
MELTING POINT	DSC	°C	260	260	260	260	260	222	222	222	222	222	222	222	222	222
MOULD SHRINKAGE (average)	ISO 294-4	%	0,5-0,9	0,15 - 0,3	1 - 1,4	1,5-1,9	2,0-2,4	0,6 - 1,0	1,2-1,5	0,4 - 0,8	0,9 - 1,3	0,3 - 0,6	0,5 - 0,9	0,6 - 1,0	0,4 - 0,8	0,4 - 0,8
MOISTURE ABSORPTION (in water at 23°C) 24h/saturation	ISO 62	%	0,7 - 6,0	0,8 - 5,0	0,7 - 6,0	0,9 - 7,5	0,8 - 6,0	2,2 - 7,0	1,8 - 7,5	0,9 - 6,5	0,9 - 6,5	0,8 - 5,0	2,0 - 6,0	2,2 - 7,0	0,9 - 6,5	0,9 - 6,5
VICAT SOFTENING TEMPERATURE B 9.8 N	ISO 306	°C	253	258	255	252	248	215	205	220	205	223	210	215	220	220
HEAT DEFLECTION TEMPERATURE 0.45 MPa	ISO 75-2	°C	250	260	235	195	170	205	190	218	195	220	205	205	218	218
HEAT DEFLECTION TEMPERATURE 1.81 MPa	ISO 75-2	°C	235	248	215	75	60	195	90	208	95	215	190	195	208	208
CONTINUOUS SERVICE TEMPERATURE (without load, 20,000 hours)	IEC 60216	°C	110	120	110	85	80	105	100	110	105	120	100	105	110	130
HEAT RESISTANCE / BALL TEST	IEC 60695-10-2	°C	> 165	> 165	> 165	> 165	> 165	> 165	>165	> 165	> 165	> 165	> 165	> 165	> 165	> 165
MECHANICAL PROPERTIES	**METHOD**	**UNIT**														
TENSILE YIELD STRESS	ISO 527	MPa	145	–	90	65	40	115	50	170	70	220	105	115	170	170
TENSILE STRENGTH AT BREAK	ISO 527	MPa	145	210	90	–	–	115	50	170	70	220	105	115	170	170
TENSILE MODULUS	ISO 527	MPa	8000	18500	6000	2400	1800	6500	4500	9000	4200	13500	5000	6500	9000	9000
TENSILE YIELD STRAIN	ISO 527	%	3	–	2,5	6,5	8	4	–	2,5	3,5	2	4,5	4	2,5	2,5
TENSILE STRAIN AT BREAK	ISO 527	%	3	2	4	55	> 100	4	4	2,5	8	2	5,5	4	2,5	2,5
NOTCHED IZOD IMPACT STRENGHT	ISO 180/A	KJ/m²	8	10,5	5,5	12	65	7	3,5	9,5	4,5	13	8	7	9,5	9,5
UNNOTCHED IZOD IMPACT STRENGHT	ISO 180/U	KJ/m²	60	90	55	NB	NB	35	25	70	40	115	45	35	70	70
ELECTRICAL PROPERTIES & FLAME RETARDANCY	**METHOD**	**UNIT**														
COMPARATIVE TRACKING INDEX (CTI)	IEC 60112	V	600	–	600	600	600	600	600	600	600	600	600	600	600	600
VOLUME RESISTIVITY	IEC 60093	Ohm·cm	1E14	1E2	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14
FLAMMABILITY RATING 0.8 mm / 1.5 mm / 3.0 mm	UL 94	-	-/HB/HB	HB (1,6-1,8 mm)	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB
GLOW WIRE FLAMMABILITY INDEX (GWFI) / 2 mm	IEC 60695-2-12	°C	650	–	650	700	700	650	650	650	650	650	650	650	650	650
GLOW WIRE IGNITION TEMPERATURE (GWIT) / 2 mm	IEC 60695-2-13	°C	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BURNING RATING 350 X 100 X 1 mm	FMVSS 302 ISO 3795	mm/min	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100

Remarks:
NB: no breaking
: UL CERTIFICATION

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POLIMID B REINFORCED

PHYSICAL AND THERMAL PROPERTIES	METHOD	UNIT	30 GF KW PA 6 30% GLASS FIBER HEAT STABILIZED	30 GF KW2 PA 6 30% GLASS FIBER VERY HIGH HEAT STABILIZATION	50 GF K1 PA 6 50% GLASS FIBER HEAT AND HYDROLYSIS STABILIZED	30 GF EM2 PA 6 30% GLASS FIBER HIGH IMPACT RESISTANCE	25 30 GF BS EM PA 6 25% GLASS FIBER 30% MINERAL FILLER IMPACT RESISTANCE SOUNDPROOF	30 GB KW PA 6 30% GLASS BEAD HEAT STABILIZED	1515 GFB PA 6 15% GLASS FIBER 15% GLASS BEAD	40 CM KW PA 6 40% MINERAL FILLER HEAT STABILIZED	2525 GFB EST PA 6 25% GLASS FIBER 25% GLASS BEAD GLOSSY FINISH	EM1 PA 6 IMPACT RESISTANCE	EM4 PA 6 VERY HIGH IMPACT RESISTANCE AT LOW TEMPERATURES
DENSITY	ISO 1183	g/cm³	1,35	1,35	1,57	1,30	1,67	1,35	1,35	1,47	1,56	1,11	1,05
MELTING POINT	DSC	°C	222	222	222	222	222	222	222	222	222	222	222
MOULD SHRINKAGE (average)	ISO 294-4	%	0,4 - 0,8	0,4 - 0,8	0,3 - 0,6	0,6-0,9	0,5-0,7	0,9 - 1,3	0,7-0,8	0,6 - 0,8	0,6-0,8	1,1-1,5	1,8-2,2
MOISTURE ABSORPTION (in water at 23°C) 24h/saturation	ISO 62	%	0,9 - 6,5	0,9 - 6,5	0,8 - 5,0	0,8 - 5,5	0,5 - 4,0	0,9 - 8,5	0,9 - 8,5	0,9 - 6,5	0,9 - 8,5	1,5-8	1,2-7,5
VICAT SOFTENING TEMPERATURE B 9.8 N	ISO 306	°C	220	220	223	218	220	205	210	220	220	205	180
HEAT DEFLECTION TEMPERATURE 0.45 MPa	ISO 75-2	°C	218	218	220	208	190	195	210	190	200	175	140
HEAT DEFLECTION TEMPERATURE 1.81 MPa	ISO 75-2	°C	208	208	215	198	170	95	170	170	190	65	55
CONTINUOUS SERVICE TEMPERATURE (without load, 20,000 hours)	IEC 60216	°C	115	125	135	95	100	110	105	100	110	80	75
HEAT RESISTANCE / BALL TEST	IEC 60695-10-2	°C	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	>165	>165
MECHANICAL PROPERTIES	**METHOD**	**UNIT**											
TENSILE YIELD STRESS	ISO 527	MPa	170	170	220	140	120	70	100	70	110	75	50
TENSILE STRENGTH AT BREAK	ISO 527	MPa	170	170	220	140	130	70	100	70	110	–	–
TENSILE MODULUS	ISO 527	MPa	9000	9000	14000	6800	9700	4200	6500	6000	7500	2600	1800
TENSILE YIELD STRAIN	ISO 527	%	2,5	2,5	2	3	2,5	3,5	3,5	2,5	2,5	6	8
TENSILE STRAIN AT BREAK	ISO 527	%	2,5	2,5	2	4	2,5	8	3,5	3	3,5	50	>100
NOTCHED IZOD IMPACT STRENGHT	ISO 180/A	KJ/m²	9,5	9,5	13	16	12	4,5	7	4,5	8,5	10	65
UNNOTCHED IZOD IMPACT STRENGHT	ISO 180/U	KJ/m²	70	70	115	100	65	40	40	45	55	NB	NB
ELECTRICAL PROPERTIES & FLAME RETARDANCY	**METHOD**	**UNIT**											
COMPARATIVE TRACKING INDEX (CTI)	IEC 60112	V	600	600	600	600	600	600	600	600	600	600	600
VOLUME RESISTIVITY	IEC 60093	Ohm·cm	1E14	1E14	1E14	1E14	1E14	1E14	-	1E14	-	1E14	1E14
FLAMMABILITY RATING 0.8 mm / 1.5 mm / 3.0 mm	UL 94	-	- / HB / HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB
GLOW WIRE FLAMMABILITY INDEX (GWFI) / 2 mm	IEC 60695-2-12	°C	650	650	650	650	650	650	650	650	650	650	650
GLOW WIRE IGNITION TEMPERATURE (GWIT) / 2 mm	IEC 60695-2-13	°C	–	–	–	–	–	–	–	–	–	–	–
BURNING RATING 350 X 100 X 1 mm	FMVSS 302 ISO 3795	mm/min	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR<100	BR<100

Remarks:
NB: no breaking
: UL CERTIFICATION

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POLIMID A
FLAME RETARDANT

PHYSICAL AND THERMAL PROPERTIES	METHOD	UNIT	25 GF V0F K PA 66 25% GLASS FIBER, FLAME RETARDANT WITH RED PHOSPHORUS VERY GOOD ELECTRICAL PROPERTIES	25 GF V0A TR1 PA 66 25% GLASS FIBER FLAME RETARDANT WITH HALOGENS (PBB/PBDE FREE)	25 GF V0F PA 66 25% GLASS FIBER FLAME RETARDANT WITH RED PHOSPHORUS STANDARD	25 GF V0FK KW PA 66 25% GLASS FIBER FLAME RETARDANT WITH RED PHOSPHORUS VERY GOOD ELECTRICAL PROPERTIES HEAT STABILIZED	25 GF V0 HFR KW PA 66 25% GLASS FIBER, FLAME RETARDANT, HALOGENS AND RED PHOSPHORUS FREE, VERY GOOD HEAT STABILIZATION	30 GF V0 HFR KW PA 66 30% GLASS FIBER, FLAME RETARDANT, HALOGENS AND RED PHOSPHORUS FREE, VERY GOOD HEAT STABILIZATION	30 GF V0A PA 66 30% GLASS FIBER, FLAME RETARDANT WITH HALOGENS	35 GF V0F K PA 66 35% GLASS FIBER FLAME RETARDANT WITH RED PHOSPHORUS VERY GOOD ELECTRICAL PROPERTIES	50 GF V0FK KW PA 66 50% GLASS FIBER, FLAME RETARDANT, WITH RED PHOSPHORUS, VERY GOOD ELECTRICAL PROPERTIES, HEAT STABILIZED	SG EM1 V0M PA 66 FLAME RETARDANT, HALOGENS AND RED PHOSPHORUS FREE, IMPACT RESISTANCE	SG V0A XP KW2 PA 66 FLAME RETARDANT, WITH HALOGENS, IMPACT RESISTANCE VERY GOOD HEAT STABILIZATION	SG V0A PA 66 FLAME RETARDANT WITH HALOGENS	SG V0M PA 66 FLAME RETARDANT HALOGENS AND RED PHOSPHORUS FREE
DENSITY	ISO 1183	g/cm³	1,36	1,56	1,38	1,36	1,40	1,43	1,60	1,44	1,57	1,16	1,32	1,38	1,18
MELTING POINT	DSC	°C	260	260	260	260	260	260	260	260	260	260	260	260	260
MOULD SHRINKAGE (average)	ISO 294-4	%	0,4 - 0,8	0,4 - 0,6	0,4 - 0,8	0,4 - 0,8	0,4 - 0,6	0,4 - 0,6	0,4 - 0,6	0,3 - 0,6	0,3 - 0,5	1,6 - 2,0	1,4 - 2,2	1,4 - 1,8	1,1 - 1,8
MOISTURE ABSORPTION (in water at 23°C) 24h/saturation	ISO 62	%	0,7 - 6,0	0,5 - 4,0	0,8 - 6,5	0,7 - 6,0	0,5 - 4,0	0,6 - 4,0	0,5 - 4,0	0,5 - 5	0,5 - 5,0	0,9-5,5	0,9-5,5	0,9-5,5	0,9-5,5
VICAT SOFTENING TEMPERATURE B 9.8 N	ISO 306	°C	253	253	255	253	250	255	255	255	255	235	175	250	240
HEAT DEFLECTION TEMPERATURE 0.45 MPa	ISO 75-2	°C	255	258	255	255	255	255	256	260	260	220	160	200	230
HEAT DEFLECTION TEMPERATURE 1.81 MPa	ISO 75-2	°C	232	243	240	232	240	240	245	248	255	88	90	80	95
CONTINUOUS SERVICE TEMPERATURE (without load, 20,000 hours)	IEC 60216	°C	120	125	110	120	120	120	110	120	130	85	100	110	90
HEAT RESISTANCE / BALL TEST	IEC 60695-10-2	°C	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165
MECHANICAL PROPERTIES	**METHOD**	**UNIT**													
TENSILE YIELD STRESS	ISO 527	MPa	135	125	120	135	135	–	120	150	180	60	40	28	68
TENSILE STRENGTH AT BREAK	ISO 527	MPa	135	125	120	135	135	150	120	150	180	–	–	35	–
TENSILE MODULUS	ISO 527	MPa	8000	9000	7500	8000	8500	9800	8500	9500	13000	2900	2400	3200	3750
TENSILE YIELD STRAIN	ISO 527	%	2,5	2,5	2,5	2,5	2,5	2,5	2	2	–	4,5	3,5	2,5	3,5
TENSILE STRAIN AT BREAK	ISO 527	%	2,5	2,5	2,5	2,5	2,5	2,5	2	2	2	30	25	5,5	10
NOTCHED IZOD IMPACT STRENGHT	ISO 180/A	KJ/m²	8,5	6,5	7	8,5	8	10,5	6,5	10,5	11,5	7,5	10	5,5	4
UNNOTCHED IZOD IMPACT STRENGHT	ISO 180/U	KJ/m²	70	45	55	70	60	80	35	90	110	NB	85	40	NB
ELECTRICAL PROPERTIES & FLAME RETARDANCY	**METHOD**	**UNIT**													
COMPARATIVE TRACKING INDEX (CTI)	IEC 60112	V	525	400	350	500	575	600	350	550	600	600	275	300	600
VOLUME RESISTIVITY	IEC 60093	Ohm·cm	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14
FLAMMABILITY RATING 0.8 mm / 1.5 mm / 3.0 mm	UL 94	-	V0 / V0 / V0	V0/V0/V0	V0 / V0 / V0	V0 / V0 / V0	V0/V0/V0	V0/V0/V0	V0/V0/V0	V0/V0/V0	V0/V0/V0	V0/V0/V0	V0/V0/V0	V0/V0/V0	V0/V0/V0
GLOW WIRE FLAMMABILITY INDEX (GWFI) / 2 mm	IEC 60695-2-12	°C	960	960	960	960	960	960	960	960	960	850	960	960	960
GLOW WIRE IGNITION TEMPERATURE (GWIT) / 2 mm	IEC 60695-2-13	°C	750	850	750	775	800	825 (3mm)	775	775	775	750	775	725	825
BURNING RATING 350 X 100 X 1 mm	FMVSS 302 ISO 3795	mm/min	-	-	-	-	-	-	-	-	-	-	-	-	-

Remarks:
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			POLIMID B FLAME RETARDANT									POLIMID C FLAME RETARDANT
PHYSICAL AND THERMAL PROPERTIES	**METHOD**	**UNIT**	**20 GF V2M HF KW** PA 6 20% GLASS FIBER FLAME RETARDANT, HALOGENS AND RED PHOSPHORUS FREE HIGH FLUIDITY HEAT STABILIZED	**25 GF V0A TR1** PA 6 25% GLASS FIBER, FLAME RETARDANT WITH HALOGENS (PBB/PBDE FREE)	**25 GF V0HFR KW** PA 6 PA 6 25% GLASS FIBER, FLAME RETARDANT, HALOGENS AND RED PHOSPHORUS FREE HEAT STABILIZED	**30 GF V0HFR KW** PA 6 30% GLASS FIBER FLAME RETARDANT, HALOGENS AND RED PHOSPHORUS FREE HEAT STABILIZED	**30 GF V2M HF KW** PA 6 30% GLASS FIBER FLAME RETARDANT HALOGENS AND RED PHOSPHORUS FREE HIGH FLUIDITY HEAT STABILIZED	**30 GF V2M KW** PA 6 30% GLASS FIBER FLAME RETARDANT HALOGENS AND RED PHOSPHORUS FREE HEAT STABILIZED	**30 GF V0A** PA 6 30% GLASS FIBER FLAME RETARDANT WITH HALOGENS	**AV V0A** PA 6 FLAME RETARDANT WITH HALOGENS	**AV V0M** PA 6 FLAME RETARDANT HALOGENS AND RED PHOSPHORUS FREE	**POLIMID C V0M** PA COPOLYMER FLAME RETARDANT HALOGENS AND RED PHOSPHORUS FREE
DENSITY	ISO 1183	g/cm³	1,32	1,56	1,36	1,39	1,39	1,39	1,6	1,36	1,18	1,17
MELTING POINT	DSC	°C	222	222	222	222	222	222	222	222	222	245
MOULD SHRINKAGE (average)	ISO 294-4	%	0,5 - 0,7	0,4 - 0,6	0,4 - 0,7	0,5 - 0,7	0,4 - 0,6	0,4 - 0,6	0,4 - 0,6	1,0 - 1,4	1,0 - 1,4	0,9 - 1,15
MOISTURE ABSORPTION (in water at 23°C) 24h/saturation	ISO 62	%	0,8 - 4,5	1,0 - 5,5	0,6 - 4,5	0,8 - 4,5	0,8 - 4,5	0,8 - 4,5	1,0 - 5,5	2,0 - 8,0	1,8 - 9,0	1,5 - 8,0
VICAT SOFTENING TEMPERATURE B 9.8 N	ISO 306	°C	205	218	210	210	205	205	220	195	206	230
HEAT DEFLECTION TEMPERATURE 0.45 MPa	ISO 75-2	°C	190	203	205	205	190	190	205	175	195	210
HEAT DEFLECTION TEMPERATURE 1.81 MPa	ISO 75-2	°C	165	198	200	175	175	175	200	75	70	75
CONTINUOUS SERVICE TEMPERATURE (without load, 20,000 hours)	IEC 60216	°C	110	115	120	120	110	110	100	80	80	90
HEAT RESISTANCE / BALL TEST	IEC 60695-10-2	°C	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165
MECHANICAL PROPERTIES	**METHOD**	**UNIT**										
TENSILE YIELD STRESS	ISO 527	MPa	–	120	125	–	–	–	115	80	85	70
TENSILE STRENGTH AT BREAK	ISO 527	MPa	80	120	95	120	95	95	115	75	85	–
TENSILE MODULUS	ISO 527	MPa	5500	8500	7000	7500	7000	7000	8000	3100	2900	3600
TENSILE YIELD STRAIN	ISO 527	%	2,5	2,5	3	2,5	2,5	2,5	2,5	2,5	3	3
TENSILE STRAIN AT BREAK	ISO 527	%	2,5	2,5	3	2,5	2,5	2,5	2,5	8	10	8,5
NOTCHED IZOD IMPACT STRENGHT	ISO 180/A	KJ/m²	3,5	6,5	6,5	7	6,5	6,5	7	5,5	4	4
UNNOTCHED IZOD IMPACT STRENGHT	ISO 180/U	KJ/m²	30	45	45	50	45	45	40	60	NB	65
ELECTRICAL PROPERTIES & FLAME RETARDANCY	**METHOD**	**UNIT**										
COMPARATIVE TRACKING INDEX (CTI)	IEC 60112	V	550	400	550	550	550	550	300	300	> 600	550
VOLUME RESISTIVITY	IEC 60093	Ohm·cm	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14
FLAMMABILITY RATING 0.8 mm / 1.5 mm / 3.0 mm	UL 94	-	V2/V2/V2	V0/V0/V0	V0/V0/V0	V2/V2/V2	V2/V2/V2	V2/V2/V2	V0/V0/V0	V0/V0/V0	V0/V0/V0	V0/V0/V0
GLOW WIRE FLAMMABILITY INDEX (GWFI) / 2 mm	IEC 60695-2-12	°C	960	960	960	850	850	850	960	960	960	960
GLOW WIRE IGNITION TEMPERATURE (GWIT) / 2 mm	IEC 60695-2-13	°C	725	800	775	-	-	-	775	-	800	750
BURNING RATING 350 X 100 X 1 mm	FMVSS 302 ISO 3795	mm/min	-	-	-	-	-	-	-	-	-	-

Remarks:
NB: no breaking
: UL CERTIFICATION

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POLIMID LUB A

PHYSICAL AND THERMAL PROPERTIES	METHOD	UNIT	3020 GFTF PA 66 30% GLASS FIBER PTFE LUBRICATED	30 GF Y10 PA 66 30% GLASS FIBER MOLYBDENUM DISULPHIDE LUBRICATED	3015 GFTF V0A PA 66 30% GLASS FIBER PTFE LUBRICATED FLAME RETARDANT WITH HALOGENS	50 GF KW Y10 PA 66 50% GLASS FIBER MOLYBDENUM DISULPHIDE LUBRICATED HEAT STABILIZED	1515 GFM Y10 KW PA 66 15% GLASS FIBER 15% MINERAL FILLER MOLYBDENUM DISULPHIDE LUBRICATED HEAT STABILIZED	SG Y10 PA 66 STANDARD VISCOSITY MOLYBDENUM DISULPHIDE LUBRICATED	SG Y30 PA 66 INCREASED LUBRICATION WITH MOLYBDENUM DISULPHIDE	3015 FCTF PA 66 30% CARBON FIBER PTFE LUBRICATED	3020 GBTF PA 66 30% GLASS BEAD PTFE LUBRICATED	TF4 SI KW2 PA 66 PTFE AND SILICON LUBRICATED VERY GOOD HEAT STABILIZATION	SG TF4 PA 66 PTFE LUBRICATED
DENSITY	ISO 1183	g/cm³	1,48	1,38	1,68	1,59	1,37	1,14	1,14	1,38	1,48	1,3	1,25
MELTING POINT	DSC	°C	260	260	260	260	260	260	260	260	260	260	260
MOULD SHRINKAGE (average)	ISO 294-4	%	0,5 - 0,7	0,45 - 0,6	0,3 - 0,5	0,3 - 0,6	0,6 - 0,8	1,4 - 1,8	1,4 - 1,8	0,3 - 0,5	0,5 - 0,7	1,0 - 1,2	1,2 - 1,5
MOISTURE ABSORPTION (in water at 23°C) 24h/saturation	ISO 62	%	0,8 - 1,0	1,2 - 1,0	0,5 - 4,0	0,5 - 3,5	1,2 - 4	1,2 - 7,0	1,2 - 7,0	0,7 - 4,5	0,8 - 4,5	1,2 - 4,5	1,2 - 4,5
VICAT SOFTENING TEMPERATURE B 9.8 N	ISO 306	°C	250	260	255	265	250	235	235	255	250	240	245
HEAT DEFLECTION TEMPERATURE 0.45 MPa	ISO 75-2	°C	265	260	256	260	230	230	230	260	265	200	250
HEAT DEFLECTION TEMPERATURE 1.81 MPa	ISO 75-2	°C	250	255	245	255	205	85	85	250	250	100	100
CONTINUOUS SERVICE TEMPERATURE (without load, 20,000 hours)	IEC 60216	°C	100	105	110	120	90	90	90	120	100	110	110
HEAT RESISTANCE / BALL TEST	IEC 60695-10-2	°C	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165
MECHANICAL PROPERTIES	**METHOD**	**UNIT**											
TENSILE YIELD STRESS	ISO 527	MPa	–	–	–	–	–	–	–	–	–	–	–
TENSILE STRENGTH AT BREAK	ISO 527	MPa	135	150	120	195	90	75	65	170	70	65	70
TENSILE MODULUS	ISO 527	MPa	7000	9000	8000	13000	6800	3300	3000	18000	4500	2600	2900
TENSILE YIELD STRAIN	ISO 527	%	–	–	–	–	–	–	–	–	–	–	–
TENSILE STRAIN AT BREAK	ISO 527	%	2	2	2	2	3	2	2	2	2	2	2
NOTCHED IZOD IMPACT STRENGHT	ISO 180/A	KJ/m²	8,5	8	6	11	6,5	4,5	3,5	9,5	6,5	3	3
UNNOTCHED IZOD IMPACT STRENGHT	ISO 180/U	KJ/m²	45	–	25	90	45	–	–	40	30	40	45
ELECTRICAL PROPERTIES & FLAME RETARDANCY	**METHOD**	**UNIT**											
STATIC FRICTION COEFFICIENT	ASTM D 3702		0,32	0,42	0,29	0,46	0.56	0,29	0,29	0,26	0,29	0,27	0,26
DINAMIC FRICTION COEFFICIENT	ASTM D 3702		0,25	0,36	0,27	0,39	0,45	0,26	0,26	0,2	0,22	0,22	0,22
WEAR FACTOR	ASTM D 3702		7	30	5	21	36	70	70	15	6,5	6,2	6,2
VOLUME RESISTIVITY	IEC 60093	Ohm*cm	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14
GLOW WIRE IGNITION TEST (GWT) GWIT / 2 MM	IEC 60695-2-13	°C	650	650	650	650	650	650	650	650	650	650	650
BURNING RATING 350 X 100 X 1 MM	FMVSS 302 ISO 3795	mm/min	BR<100	BR<100	BR<100	BR<100	BR<100	BR<100	BR<100	BR<100	BR<100	BR<100	BR<100

Remarks:
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			POLIMID LUB B						POLIPOM LUB				POLITER LUB B	
			30 GF Y20	30 GF V2M Y10	3015 GFTF	30 GF Y10	AV / 1 Y5	AV Y10	C 100 TF2	C 100 Y10	C 100 3015 GFTF	C 150 1510 KFTF	SI	TF4
			PA 6 30% GLASS FIBER MOLYBDENUM DISULPHIDE LUBRICATED	PA 6 30% GLASS FIBER FLAME RETARDANT FREE OF HALOGENS AND RED PHOSPHOROUS FREE DISULPHIDE LUBRICATED	PA 6 30% GLASS FIBER PTFE LUBRICATED	PA 6 30% GLASS FIBER MOLYBDENUM DISULPHIDE LUBRICATED	PA 6 ECONOMICAL VERSION MOLYBDENUM DISULPHIDE LUBRICATED	PA 6 STANDARD VISCOSITY MOLYBDENUM DISULPHIDE LUBRICATED	POM COPOLYMER MFI 10 PTFE LUBRICATED	POM COPOLYMER MFI 10 MOLYBDENUM DISULPHIDE LUBRICATED	POM COPOLYMER MFI 10 30% GLASS FIBER PTFE LUBRICATED	POM COPOLYMER MFI 13 ARAMIDIC FIBER AND PTFE LUBRICATED	PBT SILICON LUBRICATED	PBT PTFE LUBRICATED
PHYSICAL AND THERMAL PROPERTIES	**METHOD**	**UNIT**												
DENSITY	ISO 1183	g/cm³	1,38	1,39	1,49	1,37	1,14	1,14	1,48	1,44	1,62	1,46	1,32	1,41
MELTING POINT	DSC	°C	222	222	222	222	222	222	175	175	175	175	225	225
MOULD SHRINKAGE (average)	ISO 294-4	%	0,4 - 0,6	0,4 - 0,6	0,45 - 0,65	0,4-0,6	1,5 - 1,8	1,45 - 1,9	1,8 - 2,2	1,8 - 2,2	1,2-1,6	1,6 - 2	1,4 - 1,9	2,3 - 2,45
MOISTURE ABSORPTION (in water at 23°C) 24h/saturation	ISO 62	%	0,7 - 6,0	0,7 - 6,0	0,9 - 5,5	0,7-6,0	2,2 - 8,0	2,3 - 8,0	0,2 - 0,8	0,5 - 0,9	0,5 - 0,7	0,5 - 0,7	0,1 - 0,7	0,1 - 0,7
VICAT SOFTENING TEMPERATURE B 9.8 N	ISO 306	°C	220	220	220	220	206	213	155	130	155	150	190	180
HEAT DEFLECTION TEMPERATURE 0.45 MPa	ISO 75-2	°C	220	220	218	220	180	175	150	140	150	120	180	160
HEAT DEFLECTION TEMPERATURE 1.81 MPa	ISO 75-2	°C	200	200	208	200	80	75	100	95	145	85	60	70
CONTINUOUS SERVICE TEMPERATURE (without load, 20,000 hours)	IEC 60216	°C	110	110	100	110	80	90	80	80	80	80	120	120
HEAT RESISTANCE / BALL TEST	IEC 60695-10-2	°C	> 165	> 165	> 165	> 165	> 165	> 165	> 125	> 125	>125	>125	> 165	> 165
MECHANICAL PROPERTIES	**METHOD**	**UNIT**												
TENSILE YIELD STRESS	ISO 527	MPa	–	–	–	–	78	80	60	70	–	–	50	–
TENSILE STRENGTH AT BREAK	ISO 527	MPa	150	140	145	155	80	85	–	–	65	55	–	40
TENSILE MODULUS	ISO 527	MPa	8000	7500	8000	8500	3300	3400	3100	3200	4800	3200	2400	2300
TENSILE YIELD STRAIN	ISO 527	%	–	–	–	–	5	5	5	6	–	4,5	4	4
TENSILE STRAIN AT BREAK	ISO 527	%	3	2,5	2	3,5	11	12	15	15	4	6,5	40	8
NOTCHED IZOD IMPACT STRENGHT	ISO 180/A	KJ/m²	7	6,5	7,5	7,5	4	5	6	5,5	7,5	5	4	3,5
UNNOTCHED IZOD IMPACT STRENGHT	ISO 180/U	KJ/m²	45	35	–	–	NB	NB	–	–	45	35	NB	–
ELECTRICAL PROPERTIES & FLAME RETARDANCY	**METHOD**	**UNIT**												
STATIC FRICTION COEFFICIENT	ASTM D 3702		–	–	0,3	0,39	0,31	0,29	0,2	0,16	0,31	0,18	0,26	0,14
DINAMIC FRICTION COEFFICIENT	ASTM D 3702		–	–	0,25	0,36	0,28	0,26	0,1	0,13	0,29	0,12	0,21	0,11
WEAR FACTOR	ASTM D 3702		–	–	19	34	75	–	2,5	1,1	–	–	28	5
VOLUME RESISTIVITY	IEC 60093	Ohm*cm	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14
GLOW WIRE IGNITION TEST (GWT) GWIT / 2 MM	IEC 60695-2-13	°C	650	650	650	650	650	650	650	650	650	650	650	650
BURNING RATING 350 X 100 X 1 MM	FMVSS 302 ISO 3795	mm/min	BR<100	BR<100	BR<100	BR<100	BR<100	BR<100	–	–	–	–	BR<100	BR<100

Remarks:
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			POLIMID STAT A ANTISTATIC & CONDUCTIVE					POLIMID STAT B			POLIMID STAT C	SECOMID A		SECOMID B				
			20 FC	30 FC	40 FC	2015 FCGF	1010 GFC	20 FC	30 FC	40 FC	15 FC	30 GF	FL KW	FL	30 GF MX	FL HF	EM1	30 GF
			PA 66 20% CARBON FIBER	PA 66 30% CARBON FIBER	PA 66 40% CARBON FIBER	PA 66 20% CARBON FIBER 15% GLASS FIBER	PA 66 10% CARBON FIBER 10% GLASS FIBER	PA 6 20%CARBON FIBER	PA 6 30% CARBON FIBER	PA 6 40% CARBON FIBER	PA COPOLYMER 15% CARBON FIBER	PA 66 30% GLASS FIBER	PA 66 FROM TEXTILE RECYCLING HEAT STABILIZED	PA 6 FROM TEXTILE RECYCLING	PA 6 30% GLASS FIBER ECONOMICAL VERSION	PA 6 FROM TEXTILE RECYCLING HIGH FLUIDITY	PA 6 IMPACT RESISTANCE	PA 6 30% GLASS FIBER ECONOMICAL VERSION
PHYSICAL AND THERMAL PROPERTIES	**METHOD**	**UNIT**																
DENSITY	ISO 1183	g/cm³	1,22	1,28	1,31	1,39	1,25	1,22	1,28	1,30	1,19	1,36	1,14	1,14	1,36	1,14	1,11	1,35
MELTING POINT	DSC	°C	260	260	260	260	260	225	225	225	225	260	260	222	222	222	222	222
MOULD SHRINKAGE (average)	ISO 294-4	%	0,2 - 0,4	0,15 - 0,3	0,2 - 0,4	0,2 - 0,45	0,35 - 0,4	0,2 - 0,4	0,3 - 0,5	0,2 - 0,4	0,3 - 0,5	0,4 - 0,8	1,0 - 1,4	1,0 - 1,4	0,4 - 0,8	1,0 - 1,4	1,1 - 1,5	0,4 - 0,8
MOISTURE ABSORPTION (in water at 23°C) 24h/saturation	ISO 62	%	0,6 - 4,5	0,6 - 4,0	0,6 - 4,0	0,6 - 4,0	0,6 - 4,0	1,5 - 5,0	1,5 - 5	0,6	0,3	0,7 - 6,0	2,0 - 8,0	1,5 - 9,0	0,8	1,5-9,0	1,5 - 8	0,9 - 6,5
VICAT SOFTENING TEMPERATURE B 9.8 N	ISO 306	°C	253	258	258	258	256	220	230	225	258	255	250	206	225	205	205	220
HEAT DEFLECTION TEMPERATURE 0.45 MPa	ISO 75-2	°C	255	260	255	260	258	220	225	220	260	250	205	180	220	165	175	218
HEAT DEFLECTION TEMPERATURE 1.81 MPa	ISO 75-2	°C	245	248	250	250	248	215	220	225	250	235	85	80	205	65	65	208
CONTINUOUS SERVICE TEMPERATURE (without load, 20,000 hours)	IEC 60216	°C	110	120	120	110	110	105	110	110	110	100	80	60	110	80	80	100
HEAT RESISTANCE / BALL TEST	IEC 60695-10-2	°C	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165
MECHANICAL PROPERTIES	**METHOD**	**UNIT**																
TENSILE YIELD STRESS	ISO 527	MPa	170	210	230	140	120	165	190	225	155	135	85	85	140	80	70	150
TENSILE STRENGTH AT BREAK	ISO 527	MPa	170	210	230	140	120	165	190	225	155	135	–	–	140	–	–	150
TENSILE MODULUS	ISO 527	MPa	14000	18500	23000	11000	9000	13000	16000	21000	10500	7500	2950	2850	8500	2750	2500	7500
TENSILE YIELD STRAIN	ISO 527	%	2	–	–	2	–	1,5	1,5	1,5	1,5	2,5	5	4,5	2	4,5	4,5	3
TENSILE STRAIN AT BREAK	ISO 527	%	2	2	1	2	2	1,5	1,5	1,5	1,5	2,5	30	40	3	25	55	3
NOTCHED IZOD IMPACT STRENGHT	ISO 180/A	KJ/m²	5,5	7	8	6,5	6	6,5	7	8	5	7	4	5	8,5	5,5	7,5	7,5
UNNOTCHED IZOD IMPACT STRENGHT	ISO 180/U	KJ/m²	45	55	55	40	35	40	55	55	35	50	NB	NB	60	NB	–	55
ELECTRICAL PROPERTIES & FLAME RETARDANCY	**METHOD**	**UNIT**																
COMPARATIVE TRACKING INDEX (CTI)	IEC 60112	V	–	–	–	–	–	–	–	-	-	600	600	600	600	600	600	600
VOLUME RESISTIVITY	IEC 60093	Ohm·cm	1E3	1E2	1E1	1E4	1E3	1E3	1E3	1E1	1E4	1E14	1E14	1E14	1E14	1E14	1E14	1E14
FLAMMABILITY RATING 0.8 mm / 1.5 mm / 3.0 mm	UL 94	-	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	-/HB/HB	V2/V2/V2	V2/V2/V2	-/HB/HB	V2/V2/V2	-/HB/HB	-/HB/HB
GLOW WIRE FLAMMABILITY INDEX (GWFI) / 2 mm	IEC 60695-2-12	°C	–	–	–	–	–	–	–	–	–	650	825	825	650	825	650	850
GLOW WIRE IGNITION TEMPERATURE (GWIT) / 2 mm	IEC 60695-2-13	°C	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BURNING RATING 350 X 100 X 1 mm	FMVSS 302 ISO 3795	mm/min	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100

Remarks:
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POLIPOM

POLITER B

PHYSICAL AND THERMAL PROPERTIES	METHOD	UNIT	100 D	20 D	C WR	C 20	C 100	C 250	C 100 25GF	C 100 30GF	NAT	20 GB	30 GB	30 GF	30 GF EM1	30 GF EM2 LS	50 GF	V0 M	EM1	EM4	POLITER B 30 GF V0A
			POM HOMOPOLYMER MFI 10	POM HOMOPOLYMER MFI 2	POM COPOLYMER WRAS CERTIFIED	POM COPOLYMER MFI 2	POM COPOLYMER MFI 10	POM COPOLYMER MFI 25	POM COPOLYMER MFI 10 25% GLASS FIBER	POM COPOLYMER MFI 10 30% GLASS FIBER	PBT NATURAL	PBT 20% GLASS BEAD	PBT 30% GLASS BEAD	PBT 30% GLASS FIBER	PBT 30% GLASS FIBER IMPACT RESISTANCE	PBT 30% GLASS FIBER HIGH IMPACT RESISTANCE LASER MARKING	PBT 50% GLASS FIBER	PBT FLAME RETARDANT HALOGENS FREE	PBT IMPACT RESISTANCE	PBT VERY HIGH IMPACT RESISTANCE	PBT 30% GLASS FIBER HALOGENATED FLAME RETARDANT (PBB/PBDE FREE)
DENSITY	ISO 1183	g/cm³	1,42	1,42	1,42	1,42	1,42	1,42	1,56	1,59	1,31	1,45	1,53	1,53	1,44	1,39	1,7	1,35	1,28	1,21	1,59
MELTING POINT	DSC	°C	175	175	175	175	175	175	175	175	225	225	225	225	225	225	225	225	225	225	225
MOULD SHRINKAGE (average)	ISO 294-4	%	1,6 - 1,9	1,8 - 2,2	1,8 - 2,2	1,8 - 2,2	1,8 - 2,2	1,8 - 2,2	0,8 - 1	0,6 - 0,9	1,6 - 2,0	1,1 - 1,3	0,8 - 1,0	0,4 - 0,8	0,5 - 0,9	0,7-1,1	0,3 - 0,6	1,6 - 2,0	1,7 - 2,2	2,0 - 2,4	0,4 - 0,8
MOISTURE ABSORPTION (in water at 23°C) 24h/saturation	ISO 62	%	0,2 - 0,8	0,2 - 0,8	0,2 - 0,8	0,2 - 0,8	0,2 - 0,8	0,2 - 0,8	0,3 - 0,6	0,2 - 0,5	0,08 - 0,5	0,06 - 0,4	0,05 - 0,4	0,05 - 0,4	0,04 - 0,4	0,15 - 0,17	0,03 - 0,3	0,07 - 0,09	0,08 - 0,5	0,08 - 0,5	0,03 - 0,3
VICAT SOFTENING TEMPERATURE B 9.8 N	ISO 306	°C	165	165	165	165	165	165	165	165	190	194	195	220	220	205	222	170	180	170	215
HEAT DEFLECTION TEMPERATURE 0.45 MPa	ISO 75-2	°C	165	165	165	165	165	165	165	165	180	185	195	225	215	205	225	165	170	115	220
HEAT DEFLECTION TEMPERATURE 1.81 MPa	ISO 75-2	°C	115	110	105	108	105	105	160	160	60	75	90	210	195	185	215	50	55	50	205
CONTINUOUS SERVICE TEMPERATURE (without load, 20,000 hours)	IEC 60216	°C	80	80	80	80	80	80	85	85	120	130	130	130	130	130	130	110	110	100	125
HEAT RESISTANCE / BALL TEST	IEC 60695-10-2	°C	> 125	> 125	> 125	> 125	> 125	> 125	> 125	> 125	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165	> 165
MECHANICAL PROPERTIES	**METHOD**	**UNIT**																			
TENSILE YIELD STRESS	ISO 527	MPa	55	60	55	60	55	55	90	95	55	60	75	125	120	110	165	45	50	40	105
TENSILE STRENGTH AT BREAK	ISO 527	MPa	50	55	50	55	50	45	80	95	–	65	80	125	115	105	165	40	45	35	105
TENSILE MODULUS	ISO 527	MPa	3000	3000	2900	2900	2900	2900	6500	7200	2500	3500	4500	9000	7000	5900	14000	2800	2000	1850	10000
TENSILE YIELD STRAIN	ISO 527	%	8	10	11	12	11	10	3	2,5	4	3,5	3,5	2	2,5	3	1,5	4	5	6	2
TENSILE STRAIN AT BREAK	ISO 527	%	45	60	45	50	45	35	3	2,5	60	4	3,5	2	3	4	1,5	15	65	100	2
NOTCHED IZOD IMPACT STRENGHT	ISO 180/A	KJ/m²	5,5	6	6	6,5	6	4,5	6,5	7,5	4,5	3,5	4	8	10,5	13	10,5	4	6,5	8	6,5
UNNOTCHED IZOD IMPACT STRENGHT	ISO 180/U	KJ/m²	NB	NB	NB	NB	NB	NB	25	30	NB	25	30	65	90	100	115	35	NB	NB	40
ELECTRICAL PROPERTIES & FLAME RETARDANCY	**METHOD**	**UNIT**																			
COMPARATIVE TRACKING INDEX (CTI)	IEC 60112	V	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	250
VOLUME RESISTIVITY	IEC 60093	Ohm·cm	-	-	-	-	-	-	-	-	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E14	1E13	1E13	1E14
FLAMMABILITY RATING 0.8 mm / 1.5 mm / 3.0 mm	UL 94	-	HB/HB/HB	HB/HB/HB	HB/HB/HB	HB/HB/HB	HB/HB/HB	HB/HB/HB	HB/HB/HB	HB/HB/HB	HB/HB/HB	HB/HB/HB	HB/HB/HB	HB/HB/HB	HB/HB/HB	HB/HB/HB	HB/HB/HB	V0/V0/V0	HB/HB/HB	HB/HB/HB	V0/V0/V0
GLOW WIRE FLAMMABILITY INDEX (GWFI) / 2 mm	IEC 60695-2-12	°C	650	650	650	650	650	650	650	650	800	650	650	650	650	650	650	960	650	650	960
GLOW WIRE IGNITION TEMPERATURE (GWIT) / 2 mm	IEC 60695-2-13	°C	–	–	–	–	–	–	–	–	-	-	-	-	-	-	-	-	-	-	-
BURNING RATING 350 X 100 X 1 mm	FMVSS 302 ISO 3795	mm/min	-	-	-	-	-	-	-	-	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100	BR < 100

Remarks:
NB: no breaking
: UL CERTIFICATION

The information contained in this document is provided in good faith and for indication only.
The values, referred to moulded trials and conditioned 40h - 23°C - 50% U.R., are to be assessed carefully with our Technical Assistance Service depending on the project needs. The products are not suitable for food applications unless otherwise indicated. The contents must not be considered in any case as a contractual commitment or warranty by us, especially in case of incorrect use of our products by third parties. For the moulding conditions see the specific Technical Data Sheets.

ExxonMobil™ HDPE HTA 108

High Density Polyethylene Resin

Product Description

HTA 108 is a homopolymer HDPE film grade designed to improve stiffness and barrier in coextrusion or in PE blends. When blended with LLDPE or metallocene LLDPE, HTA 108 improves their processability.

General

Availability [1]	▪ Africa & Middle East	▪ Asia Pacific	▪ Europe
Additive	▪ Antiblock: No	▪ Slip: No	▪ Thermal Stabilizer: Yes
Applications	▪ Blown Film ▪ Bread Bags ▪ Collation Shrink ▪ Food packaging ▪ Form Fill And Seal Packaging ▪ Freezer Film	▪ General Packaging ▪ Industrial Packaging ▪ Label Film ▪ Lamination Film ▪ Multilayer Packaging Film ▪ Overwrap Film	▪ Packaging Films ▪ Shoppers ▪ Shrink Film ▪ Stand Up Pouches
Revision Date	▪ 03/01/2014		

Resin Properties	Typical Value (English)		Typical Value (SI)		Test Based On
Density	0.961	g/cm³	0.961	g/cm³	ExxonMobil Method
Melt Index (190°C/2.16 kg)	0.70	g/10 min	0.70	g/10 min	ASTM D1238
Melt Mass-Flow Rate (MFR)	46	g/10 min	46	g/10 min	ASTM D1238

Thermal	Typical Value (English)		Typical Value (SI)		Test Based On
Vicat Softening Temperature	261	°F	127	°C	ASTM D1525

Film Properties	Typical Value (English)		Typical Value (SI)		Test Based On
Tensile Strength at Break MD	8700	psi	60	MPa	ASTM D882
Tensile Strength at Break TD					ASTM D882
20 in/min (500 mm/min)	4500	psi	31	MPa	
Elongation at Break MD					ASTM D882
20 in/min (500 mm/min)	510	%	510	%	
Elongation at Break TD					ASTM D882
20 in/min (500 mm/min)	2	%	2	%	
Secant Modulus MD - 1% Secant	170000	psi	1200	MPa	ASTM D882
Secant Modulus TD - 1% Secant	250000	psi	1700	MPa	ASTM D882
Dart Drop Impact	< 30	g	< 30	g	ASTM D1709A
Elmendorf Tear Strength MD	10	g	10	g	ASTM D1922
Elmendorf Tear Strength TD	200	g	200	g	ASTM D1922

Additional Information

Monolayer Film:
HTA108 can be added to LDPE, LLDPE or mLLDPE films to increase stiffness when high transparency is not mandatory.

Legal Statement

This product is not intended for use in medical applications and should not be used in any such applications.

Contact your ExxonMobil Chemical Customer Service Representative for potential food contact application compliance (e.g. FDA, EU, HPFB).

Processing Statement

The test specimens for Vicat Softening Point were prepared using ASTM D 4703. All film properties have been measured on 25 µm (0.98 mil) thick films (BUR of 2.5 : 1, pocket extrusion at 200°C / 392°F). Properties of coextruded films and blends can be found in the HTA108 Fact Sheet.

Notes

Typical properties: these are not to be construed as specifications.

[1] Product may not be available in one or more countries in the identified Availability regions. Please contact your Sales Representative for complete Country Availability.

For additional technical, sales and order assistance: www.exxonmobilchemical.com/ContactUs

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DuPont™ Typar® SF Geotextile

Technical Data Sheet Europe

Property	Standard	Unit	SF20	SF24	SF27	SF32	SF33	SF37	SF40	SF44	SF45	SF49	SF56	SF65	SF70	SF77	SF85	SF94	SF111
Descriptive properties																			
Area Weight	EN ISO 9864	g/m²	68	80	90	110	110	125	136	150	150	165	190	220	240	260	290	320	375
Thickness under 2kN/m²	EN ISO 9863-1	mm	0,35	0,38	0,39	0,43	0,45	0,45	0,47	0,48	0,50	0,49	0,57	0,59	0,65	0,65	0,73	0,74	0,83
Thickness under 200kN/m²	EN ISO 9863-1	mm	0,28	0,29	0,31	0,35	0,36	0,37	0,39	0,40	0,40	0,40	0,48	0,53	0,59	0,59	0,69	0,69	0,79
Mechanical properties																			
Energy Absorption	EN ISO 10319	kJ/m²	1,0	2,0	1,8	3,0	3,2	3,6	3,7	4,5	4,8	5,8	5,8	7,4	8,2	8,6	9,8	11,4	13,0
Tensile Strength	EN ISO 10319	kN/m	3,4	5,0	5,0	7,0	8,0	8,5	9,0	10,3	12,0	12,6	13,1	16,5	16,7	20,0	21,3	25,0	30,0
Elongation	EN ISO 10319	%	35	40	40	45	42	52	52	52	50	52	52	55	55	55	55	55	55
Tensile Strength at 5%	EN ISO 10319	kN/m	1,8	2,3	2,6	3,3	3,0	3,8	4,0	4,5	4,4	5,2	5,7	6,8	7,2	8,2	8,8	10,0	11,5
Puncture CBR	EN ISO 12236	N	500	700	750	1000	1100	1200	1250	1575	1600	1800	1850	2350	2400	2900	3150	3500	4250
Dynamic Cone Puncture	EN ISO 13433	mm	50	45	45	35	35	33	29	27	30	30	22	25	23	22	16	17	14
Grab Strength	ASTM D4632	N	300	420	450	625	650	725	750	900	940	1050	1100	1400	1450	1680	1750	2050	2350
Tear Strength	ASTM D4533	N	160	215	220	290	260	320	370	385	320	335	460	440	570	450	610	570	600
Hydraulic properties																			
Opening Size O_{90}	EN ISO 12956	µm	225	210	175	140	200	130	120	100	130	90	80	80	75	75	70	70	65
Permeability V_{iH50}	EN ISO 11058	10^{-3}m/s	180	110	100	70	65	50	50	40	33	25	35	18	20	12	15	5	5
Flow Rate at 10cm WH	BS 6906-3	l/(m².s)	240	190	175	110	113	80	75	70	68	50	60	35	40	23	30	15	15
Permeability at 20kN/m²	DIN 60500-4	10^{-4}m/s	5,2	4,9	4,7	4,6	3,5	3,2	2,8	2,6	2,6	1,7	1,9	1,6	1,8	1,4	1,6	1,1	1,0
Permeability at 200kN/m²	DIN 60500-4	10^{-4}m/s	3,2	3,1	3,1	2,9	2,3	1,8	2,0	1,8	1,7	1,2	1,4	1,2	1,3	1,0	1,2	0,8	0,7

Durability

Predicted to be durable for a minimum of 100 years in all natural soils	
Natural UV light	**Good resistance up to several months in direct sunlight, but prolonged exposure, particularly in tropical sunlight, can cause strength losses. Product should be covered after 2 weeks of installation.**
Moisture	Does not absorb moisture
Rot, Mildew	Unaffected
Natural occurring acids and alkali	Unaffected
Oxydation Resistance EN ISO 13438	100% retained strength
Chemical Resistance EN 14030	100% retained strength
Microbiological Resistance EN 12225	100% retained strength

Product Description

• Polymer	100% Polypropylene, UV stabilized
• Specific gravity	0.91
• Melting point	165°C
• Type of fibre	continuous filament
• Fibre diameter	40/60 µm
• Fibre bonding	Thermal bonding
• Color	Grey

The values correspond to average results obtained in our laboratories and outside institutes and are indicative.
The right is reserved to make changes at any time without notice.

Further product information is available upon request. This information corresponds to our current knowledge on the subject. It is offered solely to provide possible suggestions for your own testing. It is not intended, however, to substitute for any testing you may need to conduct to determine for yourself the suitability of our products for your particular purposes. This information may be subject to revision as new knowledge and experience becomes available. Since we cannot anticipate all variations in actual end-use conditions DuPont makes no warranties and assumes no liability in connection with any use of this information. Nothing in this publication is to be considered as a license to operate under or a recommendation to infringe any patent right.

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DUPONT

Typar.

Style	Width (m)	Length (m)	Area (m²)	Roll diameter (cm)	Roll weight (kg)	Maximum number of rolls per full truck (13.6 loading meters)
SF20	2.25	250	563	32	44	175
	4.50	200	900	28	72	144
	5.20	400	2080	38	154	48
SF24	2.10	200	420	29	34	288
	4.50	200	900	29	72	144
	5.20	200	1040	29	83	96
SF27	2.10	200	420	29	43	288
	4.50	200	900	29	92	144
	5.20	200	1040	29	107	96
SF32	2.00	200	400	30	49	210
	4.50	200	900	30	110	105
	5.20	200	1040	30	127	70
SF33	2.10	150	315	29	35	288
	3.00	150	450	29	50	192
	4.50	150	675	29	74	144
	5.20	150	780	29	86	96
SF37	2.10	150	315	29	45	288
	4.50	150	675	29	96	144
	5.20	150	780	29	111	96
SF40	2.10	150	315	30	48	288
	4.50	150	675	30	103	144
	5.20	150	780	30	119	96
SF44	4.50	150	675	31	113	105
	5.20	150	780	31	130	70
SF45	4.50	100	450	27	68	189
	5.20	100	520	27	78	126
SF49	4.50	100	450	26	86	162
	5.20	100	520	26	99	108
SF56	4.50	100	450	29	97	144
	5.20	100	520	29	112	96
SF65	4.50	100	450	30	110	144
	5.20	100	520	30	127	96
SF70	4.50	100	450	31	119	105
	5.20	100	520	31	138	70
SF77	4.50	100	450	32	128	105
	5.20	100	520	32	148	70
SF85	4.50	100	450	33	142	105
	5.20	100	520	33	164	70
SF94	4.50	100	450	35	155	105
	5.20	100	520	35	179	70
SF111	4.50	100	450	37	180	105
	5.20	100	520	37	208	70

ISO 14001

Accredited by the Dutch Council for Accreditation

EC ECO MANAGEMENT AND AUDIT SCHEME

This site has an environmental management system and its environmental performance is reported on to the public in accordance with the Community eco-management and audit scheme.

(Registration No. LX-S-0001)

responsible care

CE

Further product information is available upon request. This information corresponds to our current knowledge on the subject. It is offered solely to provide possible suggestions for your own testing. It is not intended, however, to substitute for any testing you may need to conduct to determine for yourself the suitability of our products for your particular purposes. This information may be subject to revision as new knowledge and experience becomes avail able. Since we cannot anticipate all variations in actual end-use conditions DuPont makes no warranties and assumes no liability in connection with any use of this information. Nothing in this publication is to be considered as a license to operate under or a recommendation to infringe any patent right.

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DATA SHEET

No. 1003/CE Revision 04 dated 18/5/2009

Mod. 03 PGQ 5.4_01 Rev. 01 del 03.09.2007

certifying body: tBU Institut für textile Bau- und Umwelttechnik

0799-CPD

GEO PP TC 100

Geo&tex 2000 S.p.A., Via XXV Aprile 3, I-36020 San Nazario (VI) - ITALY

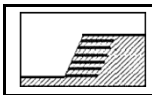
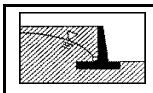
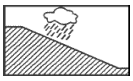
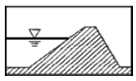
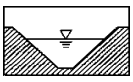
Produced in factories 16166 - A and 16166 - B

11

0799 - CPD - 15

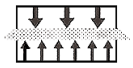
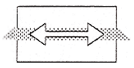
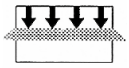
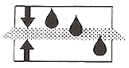
Non woven Geotextile manufactured from UV-stabilised polypropylene staple fiber, needlepunched and thermocalendered

suitable for the following applications:

☑	 **EN 13249:2000+A1:2005 :** Characteristics required for use in the construction of roads and other trafficked areas	☑	 **EN 13250:2000+A1:2005 :** Characteristics required for use in the construction of railways
☑	 **EN 13251:2000+A1:2005 :** Characteristics required for use in earthworks, foundations and retaining structures	☑	 **EN 13252:2000+A1:2005 :** Characteristics required for use in drainage systems
☑	 **EN 13253:2000+A1:2005 :** Characteristics required for use in erosion control works (coastal protection, bank revetments)	☑	 **EN 13254:2000+A1:2005 :** Characteristics required for use in the construction of reservoirs and dams
☑	 **EN 13255:2000+A1:2005 :** Characteristics required for use in the construction of canals	☐	 **EN 13256:2000+A1:2005 :** Characteristics required for use in the construction of tunnels and underground structures
☑	 **EN 13257:2000+A1:2005 :** Characteristics required for use in solid waste disposal	☑	 **EN 13265:2000+A1:2005 :** Characteristics required for use in liquid waste containment projects

Functions:

F - D - R - F+D - F+S+D - F+R+S - F+S - R+S - F+R

☑  ☑  ☐  ☑  ☑ 

Characteristic	Test Method	Unit		Nominal Value	Tolerance
Mass per unit area	EN ISO 9864	g/m^2		100	± 10%
Thickness	EN ISO 9863-1	mm	2 kPa	0,65	± 20%
Wide-Width Tensile Strength	EN ISO 10319	kN/m	MD	6,00	-0,60
			CMD	6,00	-0,60
Elongation	EN ISO 10319	%	MD	50	± 15
			CMD	60	± 20
Static Puncture Resistance	EN ISO 12236	N		1100	-105
Dynamic Perforation Test	EN ISO 13433	mm		33,00	+ 6,60
Characteristic Opening Size	EN ISO 12956	µm		90	± 30
Permeability normal to the Plane	EN ISO 11058	m/s		0,086	-0,026
Long Term Protection Efficiency	EN 13719	%	300 kPa	NR	NR
			600 kPa	NR	NR
			1200 kPa	NR	NR
Water Flow Capacity in the Plane	EN ISO 12958	m^2/s	20 kPa - i=1	4,50E-07	-1,40E-07
			100 kPa - i=1	1,50E-07	-4,50E-08
			200 kPa - i=1	1,00E-07	-3,00E-08
Durability Prediction	To be covered within 1 month after installation.Predicted to be durable for more than 25 years in natural soils with 4<ph<9 and soil temperature < 25 ℃				
Oxidation Resistance	EN ISO 13438	Residual Strength		MD	>90%
				CMD	>90%
Chemical Resistance	EN 14030	Residual Strength		MD	>90%
				CMD	>90%
Microbiological Resistance	EN 12225	Residual Strength		MD	100%
				CMD	100%

MD : Machine Direction - CMD : Cross Machine Direction - NR : Not Required for application

TOLERANCE ON ROLL WIDTH: ± 3 cm. TOLERANCE ON ROLL LENGTH: ± 2% IF LENGTH ≤ 200 m, ± 1% IF LENGTH > 200 m.
STANDARD CORES: PAPER, DIAMETER INNER 81mm / OUTER 89mm ± 5%. TOLERANCE ON GROSS/NET WEIGHT ± 5%.
TECHNICAL DATA BASED ON STATISTIC ANALYSIS ON 95% CONFIDENCE LIMIT. PRESENT DATA SHEET CAN BE MODIFIED WITHOUT PRIOR NOTICE

Issued		Verified		Approved	
Date	COM	Date	RCQ	Date	RSGQ
18/5/2009		18/5/2009		18/5/2009	

Geo&tex 2000 S.p.A., Via XXV Aprile 3, I-36020 San Nazario (VI)- ITALY
Tel. +39 (0)424 98330 - Fax. +39 (0)424 98593
www.geotex2000.com - info@geotex2000.com

GEO®

Geo &tex2000SPA	***SAFETY DATA SHEET***	
	TEX PP TC HT	Rev. 00 Del 05/06/2000

1. PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME:	TEX PP TC HT
APPLICATIONS:	Non woven for industrial applications
DESCRIPTION:	Needle-punched and thermocalandered, non resin-coated polyprop.
COMPANY NAME:	GEO&TEX 2000 S.p.A. Via XXV Aprile, 3 36020 SAN NAZARIO (VI)

TELEPHONE NUMBER IN CASE OF EMERGENCY:

TEL 0039 (0)424/98330

FAX 0039 (0)424/98593

2. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredients, eventually dangerous to health according to law 67/548/CEE and updating, or subject to limited exposure:

NO DANGEROUS INGREDIENTS ARE INCLUDED, ACCORDING TO LAW DTD 29/05/1974 N. 256 AND FOLLOWING UPDATINGS (DM 28/01/1992 ANNEX III POINT 2), IN CONCENTRATION HIGHER THAN 0.1% AS REGARDS TOXIC SUBSTANCES AND 1% AS REGARDS HARMFUL, CORROSIVE OR IRRITATING SUBSTANCES.

3. INDICATION OF HAZARDS

NOT APPLICABLE

4. FIRST AID MEASURES

SKIN OR EYES CONTACT:

No significant risks have been found in case of contact with skin.
Particles of fibres can cause a slight inconvenience to eyes, similar to dust.
N.B.: In case of exposure to drops of melted product, rinse the affected area with cold water.
Immediate medical assistance is required.

INGESTION:

The product is an inert solid difficult to be ingested. No real risk is specified.

INHALATION:

No significant irritations due to inhalation of particles and fibres have been found.
In case of excessive inhalation of smoke produced by fire, bring the affected person to fresh air and require medical assistance.

NOTES FOR THE DOCTOR:

Medical assistance is suggested in case of heavy allergic reaction.

5. FIRE REGULATIONS

RACCOMMENDED ESTINGUISHING MEDIA:
Water, carbon dioxide, dry chemicals, Foam.

FORBIDDEN ESTINGUISHING MEDIA:
None

RISKS DURING FIRE:
Toxic smokes can be developed during fire, in particular carbon monoxide and irritating smokes.

PROTECTION EQUIPMENT:
Respiratory tools or masks with filters and suitable clothes.

6. MEASURES IN CASE OF ACCIDENTAL EMISSION

CLEANING METHOD:
Clean with vacuum cleaner or broom avoiding development of dust.

7. HANDLING AND STORAGE

HANDLING:
No special care under normal conditions.

STORAGE:
Avoid stocking large quantities in the vicinity of flames or chemical products (as. example: concentrated acid).

SUITABLE STOCK AREA:
Any.

8. EXPOSURE CONTROL / INDIVIDUAL PROTECTION

PROTECTION CAUTIONS:
None in particular for personal protection.

RESPIRATORY PROTECTION:
In case of dust caused by handling of large quantities of fibres, a cloth mask is suggested.

PROTECTION OF HANDS:
None in particular.

PROTECTION OF EYES:
None in particular.

PROTECTION OF SKIN:
None in particular.

LIMIT OF EXPOSURE TO CONTAINED SUBSTANCES:
Total dust TLV-TWA 10 mg/m^3 Inhaled dust TLW-TVA 3 mg/m^3

9. PHYSICAL AND CHEMICAL DATA

ASPECT:	Non woven cloth in rolls
COLOUR:	Usually white
ODOUR:	Odourless
pH:	Non applicable
VISCOSITY:	Non applicable
WEIGHT	90 ÷ 2000 g/m^2
FUMES DENSITY (AIR = 1):	Non applicable
FUMES TENSION:	Non applicable
MELTING POINT:	170 ÷ 175 °C
BOILING POINT:	Non applicable
FLAMMABILITY POINT:	> 300°C
SELF-FLAMMABILITY:	Not determined
BURST POINT:	Not explosive
SUPPORTER OF BURNING:	Not supporting
SOLUBILITY IN WATER:	Insoluble
PARTITION COEFFICIENT:	
RATIO OCTANE/WATER:	Not applicable

10. STABILITY AND REACTIVITY DATA

CONDITIONS TO BE AVOIDED:
Stable at normal usage conditions, avoid flames

SUBSTANCES TO BE AVOIDED:
Avoid contact with concentrated acids, alkali and oxidating substances.

DECOMPOSITION:
Does not putrefy

11. TOXICITY

LD50 oral (rat):	No test performed.
LD50 skin (rabbit):	No test performed.
LC50 inhalation 4 hours, fumes exposure, rat:	Not applicable

12. ECOLOGICAL DATA

No test performed. The material is made from pure PP fibres; no resins or glues are used. The material is manufactured with mechanical punching only. The material is unaffected by bacteria, fungi, rats or termites. The material is not biodegradable. The material is permeable to water and microbs of the soil.

To be used according to good work practices. Do not dispose the material in the environment; the material is recyclable.

13. WASTE DISPOSAL

The product is not contaminated. It can be considered as urban waste and disposed as such.

14. TRANSPORT DATA

ADR/RID	Not subjected
IMO/IMDG	Not subjected
ICAO/IATA	Not subjected

15. REGULATIONS

It is not classified as dangerous, according to law 256/74 DM 28-01-1992 and EEC law 67/548, 88/478 and updating.

16. OTHER INFORMATION

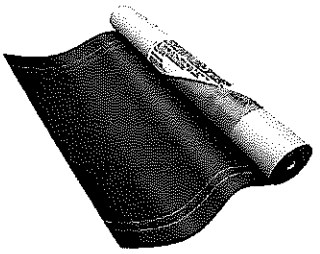
The information contained in these sheets has been taken from SAX (dangerous properties of industrial materials) and from safety data sheets of the raw materials used in the production of our material.

The information contained in these sheets corresponds to our present knowledge and may be subject to variations. The product must be stocked and used according to normal norms of hygiene, safety and good practice, according to technical instructions of the manufacturer and to law regulations.

This safety sheet is written by:

ECORICERCHE SICUREZZA s.r.l. Via Col di Grado, 15/B Bassano del Grappa (VI)

Tel 0424/ 502684 Fax 0424/504163



REWASI TOP 95 UV Plus

Technical information

Description / Application

Highly breathable 3-layer underlay composed of a special Linopore functional membrane between two layers extremely water-repellent polypropylene nonwoven. It can be laid directly onto timber boarding or insulation material. Also available with self-adhesive strips (2xSK).

Technical data:

Properties	Test	Unit	Value
Application:			Underlay for pitched roofs
Functional layer:			Linopore UV-Plus Special-Functional-Membrane
Carrier material:			Polypropylene Spunbond
Weight:	EN 1849-2	g/m²	95
Thickness:	EN 1849-2	mm	0,4
Reaction to fire:	EN 13501-1	Class	E
Resistance to penetration of water:	EN 1928	Class	W 1
After artificial ageing:	EN 1297/1296	Class	W 1
Tensile properties MD:	EN 12311-1	N/ 50 mm	220
Tensile properties CD:	EN 12311-1	N/ 50 mm	210
Elongation MD:	EN 12311-1	%	60
Elongation CD:	EN 12311-1	%	40
Resistance to tearing (Nail shank) MD:	EN 12310-1	N/200 mm	85
Resistance to tearing (Nail shank) CD:	EN 12310-1	N/200 mm	90
Values after artificial ageing:	EN 1297/1296		>75 % of it original value
Increased requirements – artificial ageing:	EN 1297/1296	°C	+100
Flexibility at low temperature:	EN 1109	°C	-30
Water vapor transmission (s_d -Value):	EN ISO 12572	s_d-Wert-m	0,02
Resistance to penetration of air:	EN 12114	m³/(m²/h/50Pa)	< 0,1
Resistance to temperature:	EN13859-1	°C	-30 bis +100
UV-Stability:	-	-	>3 months
Size accuracy:	EN 1107-2	%	<1%
Resistance to driving rain:	TU-Berlin	-	Passed
Suitable as temporary roof sealing:	-	-	Not suitable
Roll width:	EN 1848-2	m	2,55
Roll length:	EN 1848-2	m	1300 - 1400
Roll weight:		kg	-
Packing:			1 Jumbo roll on pallett

Die Werte unterliegen Toleranzen. Ohne Angabe gilt die branchenübliche Toleranz gemäß Norm, Material und Eigenschaft.

Insatllation

REWASI-TOP is a highly-breathable and water repellent underlay for pitched roofs and can be laid directly onto timber boarding or insulation. The lapping area can be glued or is left loose depending on the application. **REWASI-TOP** is usually laid directly onto the timber boarding in parallel direction with the gutter, starting from the bottom and with an overlap of approx. 10 cm. The installation has to be done without any stresses and without slacks between the rafters. The fastening of the underlay is done step by step by means of a tacker and the counter-battening. An additional sealing between the counter-battening and **Rewasi-Top**, by means of butyl sticky tape for example, is recommended. The fastening in the overlapping area has to be done in concealed manner.

Reparations of small damages and connection of overlap joints has to be done by means of special sticky tapes which are part of our product range also. Larger damages should be repaired using pieces of the original underlay and suitable tapes or glues.

To guarantee its correct function the whole installation has to be done according to current national regulations of installing, the manufacturers technical advice as well as the descriptions of the Zentralverband des Deutschen Dachdeckerhandwerks e.v. Cologne.

Storage:

Rewasi-Top has to be protected against direct sunlight and weather while its storage. Stacking of pallets may lead to damages and is not recommended.

System accesories*:

Application for:	Lapping area		Damages	Penetrations	Abutments
	MD	*CD*			
SK-Self-adhesive strips*	X				
Thermo - Tape*		O	X		
Thermo - Nageldichtband*				X	O
Thermo - Kleb +Dicht*	O	X	X		X
Thermo – Flex*				X	
Thermo Butyl*				X	X
X = Standard application O = Optional application					

USB/UDB Klasse A ZVDH - FDB

Information:

All information is given according to our best knowledge, based on practical experiences and tests, but the information is still not binding and is no guarantee of any characteristics according to BGH-dispensation of justice. We recommend a test of suitability of the product using original materials before every application, before releasing the product for use. In addition to this, we refer to our general terms of sale and delivery. Stand: 20170111

CE

NB 0761 - CPR
BWK-Dachzubehör GmbH
Birkichstraße 1
D – 74549 Wolpertshausen
07 / LE-Dop 64756476 – MPF 6251
DIN EN 13859-1:2014, DIN EN 13859-2:2014

Entspricht EN 13859-1/ -2
ZVDH-Produktdatenblatt Klasse: UDB-A / USB-A,
Werte/Leistungen zu den wesentlichen Eigenschaften gemäß EN siehe Technische Daten*

ATEX, Inc.
Advanced Technological Extrusions
2600 West Park Drive
Gainesville, GA 30504
Phone: 770-536-7272
Fax: 770-536-7246

MATERIAL SAFETY DATA SHEET

September 10, 2009

SECTION 1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

1.1 Identification of the Substance or Preparation

Product Name	AXAR
Chemical Name	Polypropylene Spunbond Nonwoven
Formula	Homopolymer

1.2 Company Identification

ATEX, Inc.
2600 West Park Drive
Gainesville, Georgia USA
Ph: 770-536-7272
Fax: 770-536-7246

1.3 Emergency Telephone Number 770-536-7272

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

2.1 Composition

Polypropylene Between 94 - 98% (varies with pigment)
Color Pigment Between 2% - 6% (varies with color)

All colored products are produced by dispersing a pigment in the melt flow prior to spinning. As a result, these pigments are totally encapsulated in polymer, and under normal circumstances, there is no skin contact during use. The information given applies to all weights and colored products.

SECTION 3 HAZARDOUS IDENTIFICATION

3.1 Specific Hazards None

As colored pigment is totally encapsulated in polymer, the potential hazards detailed herein for polypropylene apply.

SECTION 4 FIRST AID MEASURES

4.1	Skin Contact	No emergency care is necessary in normal conditions.
4.2	Eye Contact	No emergency care is necessary in normal conditions.
4.3	Swallowing	Consult a physician.
4.4	Inhalation	No emergency care is necessary in normal conditions.

SECTION 5 FIRE FIGHTING MEASURES

5.1	Suitable Extinguishing Media	Carbon Dioxide ($C0_2$), All Purpose Type Foams, Dry Chemical
5.2	Extinguishing Media to be Avoided	None
5.3	Special Fire Fighting Procedures	None
5.4	Specific Hazard	Fire may produce carbon monoxide and dioxide.
5.5	Special Protective Equipment	None

SECTION 6 ACCIDENTAL RELEASE MEASURES

6.1	Personal Precautions	None
6.2	Environmental Precautions	Do not disperse in environment.
6.3	Methods for Clean Up	Not necessary.

SECTION 7 HANDLING AND STORAGE

7.1	General Handling Precautions Technical Measures/	None
7.2	Storage Conditions	No special measures are required.
7.3	Storage	Not sun exposed.

SECTION 8 EXPOSURE CONTROLS AND PERSONAL PERTECTION

8.1	Personal Protective Equipment	Not necessary.
8.2	Respiratory Protection	Not necessary.
8.3	Hand Protection	Not necessary.
8.4	Eye Protection	Not necessary.
8.5	Skin Protection	Not necessary.
8.6	Exposure Limits	None

SECTION 9 PHYSICAL DATA

9.1	Aspect	Nonwoven Web
9.2	Color	White or Color
9.3	Odor	None
9.4	Melting Point (°C)	160°C
9.5	Ignition Temperature	Not available.
9.6	Auto Ignition Temperature	Not available.

SECTION 10 STABILITY AND REACTIVITY

10.1	Stability	Stable in normal conditions.
10.2	Conditions to Avoid	None known.
10.3	Incompatible Materials	Strong and concentrated acids.
10.4	Hazardous Decomposition Products	Fire may produce carbon monoxide.

SECTION 11 TOXICOLOGICAL INFORMATION

11.1	General Information	The product is stable to chemical agents. If correctly used, it does not generate any damage.
11.2	Skin Contact	Harmless
11.3	Eye Contact	Harmless
11.4	Swallowing	Toxicological information not available.
11.5	Inhalation	Harmless

SECTION 12 ECOLOGICAL INFORMATION

The product is insoluble in water and not biodegradable. Do not disperse in environment.

SECTION 13 DISPOSAL CONSIDERATIONS

Where possible, recycling is preferred to disposal or incineration. The product can be incinerated when in compliance with local regulations.

SECTION 14 TRANSPORT INFORMATION

Not classified as dangerous in the meaning of transport regulations.

SECTION 15 REGULATORY INFORMATION

The labeling of dangerous products is not applicable. If this product is spilled, it is not subject to any special reporting. Contact local authorities to determine if there may be local reporting requirements.

SECTION 16 OTHER INFORMATION

The information contained herein is furnished without warranty of any kind. The information describes exclusively the safety requirements for the product and is based on the present level of our knowledge. It does not constitute a guarantee for the characteristics of the described product.

Users should consider data only as supplement to other information gathered by them and must take independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of materials and the safety and health of employees and customers and the protection of the environment.

ATTACHMENT I

EMISSION UNITS TABLE

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Line 2000

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
1S	Transfer Points (TPS)	Super Sack Unloading Station No. 1	2018	400 kg/hr	New	N
2S	TPS	Super Sack Unloading Station No. 2	2018	400 kg/hr	New	N
3S	TPS	Manual Bag Unloading Station No. 1	2018	400 kg/hr	New	N
4S	TPS	Screw Conveyor No. 1	2018	400 kg/hr	New	FE
5S	TPS	Screw Conveyor No. 2	2018	400 kg/hr	New	FE
6S	TPS	Screw Conveyor No. 3	2018	400 kg/hr	New	FE
7S	TPS	Screw Conveyor No. 4	2018	400 kg/hr	New	FE
8S	1E	Blender	2018	400 kg/hr	New	DC (1C)
9S	TPS	Screw Conveyor No. 5	2018	400 kg/hr	New	FE
10S	1E	Pneumatic Transfer System	2018	400 kg/hr	New	DC (1C)
11S	1E	Extruder Feed Hopper No. 1	2018	400 kg/hr	New	DC (1C)
12S	TPS	Master Batch System	2018	400 kg/hr	New	N
13S	TPS	Extruder Feed Hopper No. 2	2018	400 kg/hr	New	N
14S	2E	Extruder	2018	400 kg/hr	New	N
15S	1E	Shredder	2018	400 kg/hr	New	DC (1C)
16S	1E	Pneumatic System	2018	400 kg/hr	New	DC (1C)
17S	1E	Bulk Bag Loading Station	2018	400 kg/hr	New	DC (1C)

[1] For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S, or other appropriate designation.
[2] For Emission Points use the following numbering system: 1E, 2E, 3E, or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C, or other appropriate designation.

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

External Shredders and Future Silo Storage

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
18S	1E	External Shredder No. 1	2018	1,000 kg/hr	New	DC (1C)
19S	1E	External Shredder No. 2	2018	1,000 kg/hr	New	DC (1C)
20S	1E	Pneumatic Transfer System	2018	1,000 kg/hr	New	DC (1C)
21S	1E	Pneumatic Transfer System	2018	1,000 kg/hr	New	DC (1C)
22S	1E	Bulk Bag Loading Station	2018	1,000 kg/hr	New	DC (1C)
23S	3E	Silo No. 1 Storage (Future)	2018	1,000 kg/hr	New	VF (2C)
24S	4E	Silo No. 2 Storage (Future)	2018	1,000 kg/hr	New	VF (3C)
25S	5E	Silo No. 3 Storage (Future)	2018	1,000 kg/hr	New	VF (4C)
26S	6E	Silo No. 4 Storage (Future)	2018	1,000 kg/hr	New	VF (5C)
27S	1E	Pneumatic Transfer System	2018	1,000 kg/hr	New	DC (1C)
28S	1E	Pneumatic Transfer System	2018	1,000 kg/hr	New	DC (1C)
29S	1E	Pneumatic Transfer System	2018	1,000 kg/hr	New	DC (1C)
30S	1E	Pneumatic Transfer System	2018	1,000 kg/hr	New	DC (1C)

[1] For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S, or other appropriate designation.
[2] For Emission Points use the following numbering system: 1E, 2E, 3E, or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C, or other appropriate designation.

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Line 3000

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
31S	TPS	Super Sack Unloading Station No. 1	2018	600 kg/hr	New	N
32S	1E	Pneumatic Transfer System	2018	600 kg/hr	New	DC (1C)
33S	TPS	Super Sack Unloading Station No. 2	2018	600 kg/hr	New	N
34S	1E	Pneumatic Transfer System	2018	600 kg/hr	New	DC (1C)
35S	TPS	Manual Bag Unloading System No. 1	2018	600 kg/hr	New	N
36S	1E	Pneumatic Transfer System	2018	600 kg/hr	New	DC (1C)
37S	1E	Blender	2018	600 kg/hr	New	DC (1C)
38S	TPS	Screw Conveyor No. 1	2018	600 kg/hr	New	N
39S	1E	Pneumatic Transfer System	2018	600 kg/hr	New	DC (1C)
40S	1E	Extruder Feed Hopper No. 1	2018	600 kg/hr	New	DC (1C)
41S	TPS	Master Batch System	2018	600 kg/hr	New	N
42S	TPS	Extruder Feed Hopper No. 2	2018	600 kg/hr	New	N
43S	7E	Extruder	2018	600 kg/hr	New	N
44S	1E	Shredder	2018	600 kg/hr	New	DC (1C)
45S	1E	Bulk Bag Loading	2018	600 kg/hr	New	DC (1C)
46S	1E	Pneumatic Transfer System	2018	600 kg/hr	New	DC (1C)

[1] For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S, or other appropriate designation.
[2] For Emission Points use the following numbering system: 1E, 2E, 3E, or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C, or other appropriate designation.

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Line 4000

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
47S	TPS	Super Sack Unloading Station No. 1	2018	1,000 kg/hr	New	N
48S	1E	Pneumatic Transfer System	2018	1,000 kg/hr	New	DC(1C)
49S	1E	Extruder Feed Hopper No. 1A and 1B	2018	1,000 kg/hr	New	DC(1C)
50S	TPS	Super Sack Unloading Station No. 2	2018	1,000 kg/hr	New	N
51S	TPS	Super Sack Unloading Station No. 3	2018	1,000 kg/hr	New	N
52S	TPS	Manual Bag Unloading Station No. 1	2018	1,000 kg/hr	New	N
53S	TPS	Screw Conveyor No. 1	2018	1,000 kg/hr	New	N
54S	TPS	Screw Conveyor No. 2	2018	1,000 kg/hr	New	N
55S	TPS	Screw Conveyor No. 3	2018	1,000 kg/hr	New	N
56S	TPS	Screw Conveyor No. 4	2018	1,000 kg/hr	New	N
57S	1E	Blender	2018	1,000 kg/hr	New	DC(1C)
58S	TPS	Screw Conveyor No. 5	2018	1,000 kg/hr	New	N
59S	1E	Pneumatic Transfer System	2018	1,000 kg/hr	New	DC(1C)
60S	1E	Extruder Feed Hopper No. 2A and 2B	2018	1,000 kg/hr	New	DC(1C)
61S	1E	Pneumatic Transfer System	2018	1,000 kg/hr	New	DC(1C)

[1] For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S, or other appropriate designation.
[2] For Emission Points use the following numbering system: 1E, 2E, 3E, or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C, or other appropriate designation.

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Line 4000

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
62S	1E	Extruder Feed Hopper No. 3A and 3B	2018	1,000 kg/hr	New	DC(1C)
63S	TPS	Master Batch System	2018	1,000 kg/hr	New	N
64S	TPS	Extruder Feed Hopper No. 4A and 4B	2018	1,000 kg/hr	New	N
65S	8E	Extruder	2018	1,000 kg/hr	New	N
66S	1E	Shredder	2018	1,000 kg/hr	New	DC(1C)
67S	1E	Bulk Bag Loading	2018	1,000 kg/hr	New	DC(1C)
68S	1E	Pneumatic Transfer System	2018	1,000 kg/hr	New	DC(1C)
69S	9E	Natural Gas/Propane Fueled Building Heaters (All Heaters Grouped Together)	2018	2.22 MMBtu/hr	New	N

[1] For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S, or other appropriate designation.
[2] For Emission Points use the following numbering system: 1E, 2E, 3E, or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C, or other appropriate designation.

ATTACHMENT J

EMISSION POINTS DATA SUMMARY SHEET

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/ Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
Extruder 2000 System															
1E	Vertical	Various (See Attachment I)		NA	NA	NA	NA	PM/PM10/PM2.5	6.79	29.75	0.14	0.59	Solid	EF	NA
2E	Vertical	14S	Extruder 2000	NA	NA	NA	NA	PM/PM10/PM2.5 VOC Total HAPS	0.07 0.25 0.20	0.32 1.11 0.88	0.07 0.25 0.20	0.32 1.11 0.88	Solid Vapor Vapor	EF	NA
3E	Vertical	23S	Silo Storage	NA	NA	NA	NA	PM/PM10/PM2.5	0.89	3.89	0.02	0.08	Solid	EF	NA
4E	Vertical	24S	Silo Storage	NA	NA	NA	NA	PM/PM10/PM2.5	0.89	3.89	0.02	0.08	Solid	EF	NA
5E	Vertical	25S	Silo Storage	NA	NA	NA	NA	PM/PM10/PM2.5	0.89	3.89	0.02	0.08	Solid	EF	NA
6E	Vertical	26S	Silo Storage	NA	NA	NA	NA	PM/PM10/PM2.5	0.89	3.89	0.02	0.08	Solid	EF	NA
TPS	TPS	TPS	Transfer Points	NA	NA	NA	NA	PM/PM10/PM2.5	10.03	43.94	0.91	4.00	Solid	EF	NA

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J Continued
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
Extruder 3000 System															
1E	Vertical	Various (See Attachment I)		NA	NA	NA	NA	PM/PM10/PM2.5	3.75	16.43	0.07	0.33	Solid	EF	NA
7E	Vertical	43S	Extruder 3000	NA	NA	NA	NA	PM/PM10/PM2.5 VOC Total HAPS	0.11 0.38 0.30	0.48 1.65 1.30	0.11 0.38 0.30	0.48 1.65 1.30	Solid Vapor Vapor	EF	NA
TPS	TPS	TPS	Transfer Points	NA	NA	NA	NA	PM/PM10/PM2.5	3.75	16.43	0.75	3.29	Solid	FE	NA

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J Continued
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
Extruder 4000 System															
1E	Vertical	Various (See Attachment I)		NA	NA	NA	NA	PM/PM10/PM2.5	6.22	27.23	0.12	0.54	Solid	EF	NA
8E	Vertical	65S	Extruder 4000 A and B	NA	NA	NA	NA	PM/PM10/PM2.5 VOC Total HAPS	0.18 0.62 0.49	0.79 2.72 2.16	0.18 0.62 0.49	0.79 2.72 2.16	Solid Vapor Vapor	EF	NA
TPS	TPS	TPS	Transfer Points	NA	NA	NA	NA	PM/PM10/PM2.5	10.66	46.67	2.13	9.33	Solid	EF	NA

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J Continued
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
9E	Vertical	69S	Building Heater	NA	NA	NA	NA	PM/PM10/PM2.5 CO NO_x SO_2 VOC Total HAPS	0.02 0.18 0.22 0.01 0.01 0.000001	0.07 0.80 0.95 0.01 0.05 0.000005	0.02 0.18 0.22 0.01 0.01 0.000001	0.07 0.80 0.95 0.01 0.05 0.000005	Solid Gas Gas Gas Vapor PM/Vap.	EE	NA

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data								
Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
Not Available								

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.
*See design details in the Appendix.

ATTACHMENT K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☒ Yes ☐ No ☐ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ☒ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☐ Yes ☒ No ☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ☐ Yes ☒ No ☐ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads						
Unpaved Haul Roads	PM PM10 PM2.5	27.49 8.10 0.80	14.49 4.27 0.42	27.49 8.10 0.80	14.49 4.27 0.42	AP-42
Storage Pile Emissions						
Loading/Unloading Operations						
Wastewater Treatment Evaporation & Operations						
Equipment Leaks		Does Not Apply		Does Not Apply		
General Clean-up VOC Emissions						
Other						

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, etc. DO NOT LIST CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

ATTACHMENT L

EMISSIONS UNIT DATA SHEETS

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 1S-30S

1. Name or type and model of proposed affected source:

   Extruder 2000 and associated feed systems, transfers of material (pneumatic or other transfers), super sack unloading stations, manual unloading stations, to include all equipment listed in Attachment I under Line 2000 and including the future storage and transfer of bulk material into and out of silos. The extruder and all equipment that is used to extrude HDPE and PP into products through the typical thermos extrusion process. The extrusion line includes the ancillary sources to feed and remove the product.

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   Extruder 2000 – 400 kg/hr

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   Feed rate and production rate are the same.

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   NA

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): Electric Heat - NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel): NA

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used: Per Booth

@ °F and psia

a.	NO_X	NA	lb/hr	NA	grains/ACF
b.	SO_2	NA	lb/hr	NA	grains/ACF
c.	CO	NA	lb/hr	NA	grains/ACF
d.	PM_{10}	14.38	lb/hr	NA	grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA	grains/ACF
f.	VOCs	0.25	lb/hr	NA	grains/ACF
g.	Pb	NA	lb/hr	NA	grains/ACF
h.	Specify other(s) Total HAPS Individual HAPS listed in Attachment N	0.20	lb/hr	NA	grains/ACF
			lb/hr		grains/ACF
			lb/hr		grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
Feed rate to the extruder in tons per month.	Feed rate to the extruder in tons per month.
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

None

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 31S-46S

1. Name or type and model of proposed affected source:

   Extruder 3000 and associated feed systems, transfers of material (pneumatic or other transfers), super sack unloading stations, manual unloading stations, to include all equipment listed in Attachment I under Line 3000 and including the future storage and transfer of bulk material into and out of silos. The extruder and all equipment that is used to extrude HDPE and PP into products through the typical thermos extrusion process. The extrusion line includes the ancillary sources to feed and remove the product.

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   Extruder 3000 – 600 kg/hr

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   Feed rate and production rate are the same.

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   NA

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): Electric Heat - NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel): NA

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used: Per Booth

@ °F and psia

a.	NO_X	NA	lb/hr	NA	grains/ACF
b.	SO_2	NA	lb/hr	NA	grains/ACF
c.	CO	NA	lb/hr	NA	grains/ACF
d.	PM_{10}	7.61	lb/hr	NA	grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA	grains/ACF
f.	VOCs	0.25	lb/hr	NA	grains/ACF
g.	Pb	NA	lb/hr	NA	grains/ACF
h.	Specify other(s) Total HAPS Individual HAPS listed in Attachment N	0.30	lb/hr	NA	grains/ACF
			lb/hr		grains/ACF
			lb/hr		grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
Feed rate to the extruder in tons per month.	Feed rate to the extruder in tons per month.
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

None

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 47S-68S

1. Name or type and model of proposed affected source:

   Extruder 4000 and associated feed systems, transfers of material (pneumatic or other transfers), super sack unloading stations, manual unloading stations, to include all equipment listed in Attachment I under Line 4000 and including the future storage and transfer of bulk material into and out of silos. The extruder and all equipment that is used to extrude HDPE and PP into products through the typical thermos extrusion process. The extrusion line includes the ancillary sources to feed and remove the product.

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   Extruder 4000 – 1,000 kg/hr

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   Feed rate and production rate are the same.

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   NA

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): Electric Heat - NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel): NA

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used: Per Booth

@ °F and psia

a.	NO_X	NA	lb/hr	NA	grains/ACF
b.	SO_2	NA	lb/hr	NA	grains/ACF
c.	CO	NA	lb/hr	NA	grains/ACF
d.	PM_{10}	17.05	lb/hr	NA	grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA	grains/ACF
f.	VOCs	0.62	lb/hr	NA	grains/ACF
g.	Pb	NA	lb/hr	NA	grains/ACF
h.	Specify other(s) Total HAPS Individual HAPS listed in Attachment N	0.49		NA	grains/ACF
			lb/hr		grains/ACF
			lb/hr		grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
Feed rate to the extruder in tons per month.	Feed rate to the extruder in tons per month.
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

None

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 69S (9E)

1. Name or type and model of proposed affected source:

   Building Heaters (multiple heaters).

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   The emission unit is for the propane or natural gas fired building heaters with a total heat input of 2.22 MMBtu/hr.

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   None

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   NA

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

Propane or natural gas at a total of 2.22 MMBtu/hr.

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Propane or Pipeline Quality Natural Gas

(c) Theoretical combustion air requirement (ACF/unit of fuel): NA

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

Various

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

NA

(g) Proposed maximum design heat input: 2.22 × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used: Per Booth

@ °F and psia

a.	NO_X	0.22	lb/hr	NA	grains/ACF
b.	SO_2	0.01	lb/hr	NA	grains/ACF
c.	CO	0.18	lb/hr	NA	grains/ACF
d.	PM_{10}	0.02	lb/hr	NA	grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA	grains/ACF
f.	VOCs	0.01	lb/hr	NA	grains/ACF
g.	Pb	NA	lb/hr	NA	grains/ACF
h.	Specify other(s)				
	HAPS*	0.000001		NA	grains/ACF
	*Speciated HAPS shown in Attachment N		lb/hr		grains/ACF
			lb/hr		grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	TESTING
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

None

Attachment L
FUGITIVE EMISSIONS FROM UNPAVED HAULROADS

UNPAVED HAULROADS (including all equipment traffic involved in process, haul trucks, endloaders, etc.)

		PM	PM-10
k =	Particle size multiplier	10	10
s =	Silt content of road surface material (%)	148	148
p =	Number of days per year with precipitation >0.01 in.		

Item Number	Description	Number of Wheels	Mean Vehicle Weight (tons)	Mean Vehicle Speed (mph)	Miles per Trip	Maximum Trips per Hour	Maximum Trips per Year	Control Device ID Number	Control Efficiency (%)
1	Delivery Road	10-18	30	10	0.38	10	10,540	NA	0
2									
3									
4									
5									
6									
7									
8									

Source: *AP-42 Fifth Edition – 13.2.2 Unpaved Roads*

$E = k \times 5.9 \times (s \div 12) \times (W \div 3)^{0.7} \times ((365 - p) \div 365) =$ lb/Vehicle Mile Traveled (VMT)

Where:

		PM	PM-10
k =	Particle size multiplier	0.49	1.5
s =	Silt content of road surface material (%)	10	10
S =	Mean vehicle speed (mph)	10	10
W =	Mean vehicle weight (tons)	30	30
w =	Mean number of wheels per vehicle	10-18	10-18
p =	Number of days per year with precipitation >0.01 in.	148	148

For lb/hr: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] = lb/hr

For TPY: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] × [Ton ÷ 2000 lb] = Tons/year

SUMMARY OF UNPAVED HAULROAD EMISSIONS

Item No.	PM				PM-10/PM2.5			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
1	27.49	14.49	27.49	14.49	8.10/0.80	4.27/0.42	8.10/0.80	4.27/0.42
2								
3								
4								
5								
6								
TOTALS	27.49	14.49	27.49	14.49	8.10/0.80	4.27/0.42	8.10/0.80	4.27/0.42

ATTACHMENT M

AIR POLLUTION CONTROL DEVICE SHEETS

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC1 and VF1, VF2, VF3 & VF4)

Equipment Information and Filter Characteristics

1. Manufacturer: Manufacturer Not Selected Yet Model No. The units will be a dust collector or vacuum filters with a control efficiency of 98% or greater.	2. Total number of compartments: 1 3. Number of compartment online for normal operation: 1
4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.	
5. Baghouse Configuration: (check one) ☐ Open Pressure ☐ Closed Pressure ☐ Closed Suction ☐ Electrostatically Enhanced Fabric ☐ Other, Specify	
6. Filter Fabric Bag Material: ☐ Nomex nylon ☐ Wool ☐ Polyester ☐ Polypropylene ☐ Acrylics ☐ Ceramics ☐ Fiber Glass ☐ Cotton Weight oz./sq.yd ☐ Teflon Thickness in ☐ Others, specify	7. Bag Dimension: Diameter in. Length ft. 8. Total cloth area: ft^2 9. Number of bags: 10. Operating air to cloth ratio: ft/min
11. Baghouse Operation: ☐ Continuous ☐ Automatic ☐ Intermittent	
12. Method used to clean bags: ☐ Mechanical Shaker ☐ Sonic Cleaning ☐ Reverse Air Jet ☐ Pneumatic Shaker ☐ Reverse Air Flow ☐ Other: ☐ Bag Collapse ☐ Pulse Jet ☐ Manual Cleaning ☐ Reverse Jet	
13. Cleaning initiated by: ☐ Timer ☐ Frequency if timer actuated ☐ Expected pressure drop range in. of water ☐ Other	
14. Operation Hours: Max. per day: Max. per yr:	15. Collection efficiency: Rating: % Guaranteed minimum: %

Gas Stream Characteristics

16. Gas flow rate into the collector: ACFM at °F and PSIA ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA	
17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air	
18. Gas Stream Temperature: °F	19. Fan Requirements: hp OR ft^3/min
20. Stabilized static pressure loss across baghouse. Pressure Drop: High in. H_2O Low in. H_2O	
21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf	

22. Type of Pollutant(s) to be collected (if particulate give specific type):
Plastic Particulate

23. Is there any SO_3 in the emission stream? ☐ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant: PM/PM10/PM2.5	**IN**		**OUT**	
	lb/hr	**grains/acf**	**lb/hr**	**grains/acf**
1E (Line 2000/Line 3000/Line 4000)	6.79/3.75/6.22	NA	0.14/0.07/0.12	NA
3E-6E (Silo Vent Filters) - Each	0.89	NA	0.02	NA

25. Complete the table:

Particulate Size Range (microns)	**Particle Size Distribution at Inlet to Collector** **Weight % for Size Range**	**Fraction Efficiency of Collector** **Weight % for Size Range**
0 – 2	NA	98%
2 – 4		
4 – 6		
6 – 8		
8 – 10		
10 – 12		
12 – 16		
16 – 20		
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator Not Selected Yet
- ☐ Visual opacity readings, Frequency:
- ☐ Other, specify:

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Return to system.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
Not Selected Yet

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
98% Estimated

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
Not Selected Yet

ATTACHMENT N

SUPPORTING EMISSIONS CALCULATIONS

TeMa
Jefferson County Operation

POTESTA & ASSOCIATES, INC.
Project No. 0103-17-0435-100

By: PEW
Date: 7/15/2018

Checked By: LKB
Date: 7/16/2018

Facility PTE
Point Sources

	Uncontrolled		Controlled	
Parameter	lb/hr	tpy	lb/hr	tpy
PM/PM10/PM2.5	39.06	171.08	4.46	19.54
NOx	0.22	0.95	0.22	0.95
CO	0.18	0.80	0.18	0.80
SO2	0.01	0.01	0.01	0.01
Alkaline Dust (NaOH)	0.0135	0.0590	0.0135	0.0590
Total Organic Carbon (TOC)	0.9575	4.1940	0.9575	4.1940
Sec-Butanol (Secondary Butanol)	0.0269	0.1181	0.0269	0.1181
Iso-propanol	0.0269	0.1181	0.0269	0.1181
Toluene	0.0540	0.2363	0.0540	0.2363
Acetone	0.0809	0.3544	0.0809	0.3544
Ethyl acetate	0.0675	0.2953	0.0675	0.2953
n-Pentane	0.0269	0.1181	0.0269	0.1181
n-Hexane Solvents	0.8497	3.7215	0.8497	3.7215
Acetaldehyde	0.0675	0.2953	0.0675	0.2953
2-Propanal (Acrolein)	0.0014	0.0059	0.0014	0.0059
Formaldehyde	0.0135	0.0590	0.0135	0.0590
Crotonaldehyde (2-Butenal)	0.0026	0.0118	0.0026	0.0118
Butirraldehyde (Butyraldehyde)	0.0054	0.0237	0.0054	0.0237
Propionaldehyde	0.0054	0.0237	0.0054	0.0237
Glutaraldehyde	0.0026	0.0118	0.0026	0.0118
Valeraldehyde (Pentaldehyde)	0.0040	0.0177	0.0040	0.0177
Isovaleraldehyde (Isopentanal)	0.0040	0.0177	0.0040	0.0177
Benzaldehyde	0.0026	0.0118	0.0026	0.0118
2,5-Dimethylbenzaldehyde	0.0014	0.0059	0.0014	0.0059
Hexaldehyde	0.0026	0.0118	0.0026	0.0118
o-Tolualdehyde	0.0014	0.0059	0.0014	0.0059
m-Tolualdehyde	0.0014	0.0059	0.0014	0.0059
p-Tolualdehyde	0.0014	0.0059	0.0014	0.0059
Total VOC (VOC/HAPS and VOCs)	1.1369	4.9857	1.1369	4.9857
Total HAPS (1)	0.9956	4.3597	0.9956	4.3597

Fugitive

PM	27.49	14.49	27.49	14.49
PM10	8.10	4.27	8.10	4.27
PM2.5	0.80	0.42	0.80	0.42

Total PM

PM	66.55	185.57	31.95	34.03
PM10	47.16	175.35	12.56	23.81
PM2.5	39.86	171.50	5.26	19.96

1. Total HAPS includes natural gas combustion HAPS. The other identified HAPS on this page do not include the natural gas combustion HAPS, only the extrusion HAPS.

By: PEW
Date: 7/15/2018

Checked By: LKB
Date: 7/16/2018

Line 2000 PTE

	Uncontrolled		Controlled	
Parameter	lb/hr	tpy	lb/hr	tpy
PM/PM10/PM2.5	14.38	62.97	1.07	4.70
Alkaline Dust (NaOH)	0.0027	0.0119	0.0027	0.0119
Total Organic Carbon (TOC)	0.1932	0.8463	0.1932	0.8463
Sec-Butanol (Secondary Butanol)	0.0054	0.0238	0.0054	0.0238
Iso-propanol	0.0054	0.0238	0.0054	0.0238
Toluene	0.0109	0.0477	0.0109	0.0477
Acetone	0.0163	0.0715	0.0163	0.0715
Ethyl acetate	0.0136	0.0596	0.0136	0.0596
n-Pentane	0.0054	0.0238	0.0054	0.0238
n-Hexane Solvents	0.1715	0.7510	0.1715	0.7510
Acetaldehyde	0.0136	0.0596	0.0136	0.0596
2-Propanal (Acrolein)	0.0003	0.0012	0.0003	0.0012
Formaldehyde	0.0027	0.0119	0.0027	0.0119
Crotonaldehyde (2-Butenal)	0.0005	0.0024	0.0005	0.0024
Butirraldehyde (Butyraldehyde)	0.0011	0.0048	0.0011	0.0048
Propionaldehyde	0.0011	0.0048	0.0011	0.0048
Glutaraldehyde	0.0005	0.0024	0.0005	0.0024
Valeraldehyde (Pentaldehyde)	0.0008	0.0036	0.0008	0.0036
Isovaleraldehyde (Isopentanal)	0.0008	0.0036	0.0008	0.0036
Benzaldehyde	0.0005	0.0024	0.0005	0.0024
2,5-Dimethylbenzaldehyde	0.0003	0.0012	0.0003	0.0012
Hexaldehyde	0.0005	0.0024	0.0005	0.0024
o-Tolualdehyde	0.0003	0.0012	0.0003	0.0012
m-Tolualdehyde	0.0003	0.0012	0.0003	0.0012
p-Tolualdehyde	0.0003	0.0012	0.0003	0.0012
Total VOC (VOC/HAPS and VOCs)	0.2523	1.1050	0.2523	1.1050
Total HAPS	0.2001	0.8762	0.2001	0.8762

TeMa
Jefferson County Operation

POTESTA & ASSOCIATES, INC.
Project No. 0103-17-0435-100

By: PEW
Date: 7/15/2018

Checked By: LKB
Date: 7/16/2018

Line 2000

Process Rate

400 kg/hr
881.85 lb/hr
0.45 ton/hr
3,942 ton/yr (based on 8,760 hrs/yr)

Emission Factors

Transfer Points = 0.80 lb/ton Source: Flying W Plastics Permit Application, Plant I.D. 021-00007, Dated May 2017.
Blending = 0.80 lb/ton Source: Flying W Plastics Permit Application, Plant I.D. 021-00007, Dated May 2017.

ID	Transfer Capacities		e	Control Device		Emissions Uncontrolled		Emissions Controlled	
	tph	tpy	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
TP1	0.45	3,942	0.80	FE	80	0.36	1.58	0.07	0.32
TP2	0.45	3,942	0.80	FE	80	0.36	1.58	0.07	0.32
TP3	0.45	3,942	0.80	FE	80	0.36	1.58	0.07	0.32
TP4	0.45	3,942	0.80	FE	80	0.36	1.58	0.07	0.32
TP5	0.45	3,942	0.80	FE	80	0.36	1.58	0.07	0.32
TP6	0.45	3,942	0.80	FE	80	0.36	1.58	0.07	0.32
TP7	0.45	3,942	0.80	DC	98	0.36	1.58	0.01	0.03
TP8	0.45	3,942	0.80	FE	80	0.36	1.58	0.07	0.32
TP9	0.45	3,942	0.80	FE	80	0.36	1.58	0.07	0.32
TP10	0.45	3,942	0.80	FE	80	0.36	1.58	0.07	0.32
TP11	0.45	3,942	0.80	FE	80	0.36	1.58	0.07	0.32
TP12	0.45	3,942	0.80	FE	80	0.36	1.58	0.07	0.32
TP13	0.45	3,942	0.80	DC	98	0.36	1.58	0.01	0.03
TP14	0.45	3,942	0.80	DC	98	0.36	1.58	0.01	0.03
TP-PN1	0.45	3,942	0.80	DC	98	0.36	1.58	0.01	0.03
TP-PN2	0.45	3,942	0.80	DC	98	0.36	1.58	0.01	0.03
TP-PN3	0.45	3,942	0.80	DC	98	0.36	1.58	0.01	0.03
TP-PN4	0.45	3,942	0.80	DC	98	0.36	1.58	0.01	0.03
TP-PN5	1.11	9,724	0.80	VF (3E)	98	0.89	3.89	0.02	0.08
TP-PN6	1.11	9,724	0.80	VF (4E)	98	0.89	3.89	0.02	0.08
TP-PN7	1.11	9,724	0.80	VF (5E)	98	0.89	3.89	0.02	0.08
TP-PN8	1.11	9,724	0.80	VF (6E)	98	0.89	3.89	0.02	0.08
TP-PN9	1.11	9,724	0.80	DC	98	0.89	3.89	0.02	0.08
TP-PN10	1.11	9,724	0.80	DC	98	0.89	3.89	0.02	0.08
TP-PN11	1.11	9,724	0.80	DC	98	0.89	3.89	0.02	0.08
TP-PN12	1.11	9,724	0.80	DC	98	0.89	3.89	0.02	0.08
					PM/PM10/PM2.5 =	13.58	59.50	0.98	4.31

ID	Transfer Capacities		e	Control Device		Emissions Uncontrolled		Emissions Controlled	
	tph	tpy	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Blender	0.45	3,942	0.80	DC	98	0.36	1.58	0.01	0.03
Shredder	0.45	3,942	0.80	DC	98	0.36	1.58	0.01	0.03

1E	**6.79**	**29.75**	**0.14**	**0.59**
3E-6E	0.89	3.89	0.02	0.08
TPS	10.03	43.94	0.91	4.00

Notes:

1. The pneumatic transfer system vents thought a dust collector or vacuum system. The emissions for the source are based on the emissions of transferring the material from the receiver to the Storage Bin (5-Compartment Bin) and vented through the dust collector or vacuum system.

2. The shredder is not a grinding system; therefore, we have estimated emissions from shredding as an additional transfer of the material with 0.80 lb/ton of material transferred.

TeMa
Jefferson County Operation

POTESTA & ASSOCIATES, INC.
Project No. 0103-17-0435-100

By: PEW
Date: 7/15/2018

Checked By: LKB
Date: 7/16/2018

Extruder 2000 (2E)

Process Rate = 0.45 ton/hr
3,942 ton/yr

Extruder 2000 Emissions (Based on Stack Testing Emission Factor See Page N14)		
Parameter	**lb/hr**	**tpy**
PM/PM10/PM2.5	0.0735	0.3218
Alkaline Dust (NaOH)	0.0027	0.0119
Total Organic Carbon (TOC)	0.1932	0.8463
Sec-Butanol (Secondary Butanol)	0.0054	0.0238
Iso-propanol	0.0054	0.0238
Toluene	0.0109	0.0477
Acetone	0.0163	0.0715
Ethyl acetate	0.0136	0.0596
n-Pentane	0.0054	0.0238
n-Hexane Solvents	0.1715	0.7510
Acetaldehyde	0.0136	0.0596
2-Propanal (Acrolein)	0.0003	0.0012
Formaldehyde	0.0027	0.0119
Crotonaldehyde (2-Butenal)	0.0005	0.0024
Butirraldehyde (Butyraldehyde)	0.0011	0.0048
Propionaldehyde	0.0011	0.0048
Glutaraldehyde	0.0005	0.0024
Valeraldehyde (Pentaldehyde)	0.0008	0.0036
Isovaleraldehyde (Isopentanal)	0.0008	0.0036
Benzaldehyde	0.0005	0.0024
2,5-Dimethylbenzaldehyde	0.0003	0.0012
Hexaldehyde	0.0005	0.0024
o-Tolualdehyde	0.0003	0.0012
m-Tolualdehyde	0.0003	0.0012
p-Tolualdehyde	0.0003	0.0012
Total VOC (VOC/HAPS and VOCs)	0.2523	1.1050
Total HAPS	0.2001	0.8762

VOC/HAPs
VOCs ONLY

By: PEW
Date: 7/15/2018

Checked By: LKB
Date: 7/16/2018

Line 3000 PTE

	Uncontrolled		Controlled	
Parameter	lb/hr	tpy	lb/hr	tpy
PM/PM10/PM2.5	7.61	33.35	0.93	4.09
Alkaline Dust (NaOH)	0.0041	0.0177	0.0041	0.0177
Total Organic Carbon (TOC)	0.2877	1.2601	0.2877	1.2601
Sec-Butanol (Secondary Butanol)	0.0081	0.0355	0.0081	0.0355
Iso-propanol	0.0081	0.0355	0.0081	0.0355
Toluene	0.0162	0.0710	0.0162	0.0710
Acetone	0.0243	0.1065	0.0243	0.1065
Ethyl acetate	0.0203	0.0887	0.0203	0.0887
n-Pentane	0.0081	0.0355	0.0081	0.0355
n-Hexane Solvents	0.2553	1.1181	0.2553	1.1181
Acetaldehyde	0.0203	0.0887	0.0203	0.0887
2-Propanal (Acrolein)	0.0004	0.0018	0.0004	0.0018
Formaldehyde	0.0041	0.0177	0.0041	0.0177
Crotonaldehyde (2-Butenal)	0.0008	0.0035	0.0008	0.0035
Butirraldehyde (Butyraldehyde)	0.0016	0.0071	0.0016	0.0071
Propionaldehyde	0.0016	0.0071	0.0016	0.0071
Glutaraldehyde	0.0008	0.0035	0.0008	0.0035
Valeraldehyde (Pentaldehyde)	0.0012	0.0053	0.0012	0.0053
Isovaleraldehyde (Isopentanal)	0.0012	0.0053	0.0012	0.0053
Benzaldehyde	0.0008	0.0035	0.0008	0.0035
2,5-Dimethylbenzaldehyde	0.0004	0.0018	0.0004	0.0018
Hexaldehyde	0.0008	0.0035	0.0008	0.0035
o-Tolualdehyde	0.0004	0.0018	0.0004	0.0018
m-Tolualdehyde	0.0004	0.0018	0.0004	0.0018
p-Tolualdehyde	0.0004	0.0018	0.0004	0.0018
Total VOC (VOC/HAPS and VOCs)	0.2523	1.1050	0.2523	1.1050
Total HAPS	0.2979	1.3044	0.2979	1.3044

TeMa
Jefferson County Operation

POTESTA & ASSOCIATES, INC.
Project No. 0103-17-0435-100

By: PEW
Date: 7/15/2018

Checked By: LKB
Date: 7/16/2018

Line 3000

Process Rate

600 kg/hr
1,322.77 lb/hr
0.67 ton/hr
5,869 ton/yr (based on 8,760 hrs/yr)

Emission Factors

Transfer Points = 0.80 lb/ton Source: Flying W Plastics Permit Application, Plant I.D. 021-00007, Dated May 2017.
Blending = 0.80 lb/ton Source: Flying W Plastics Permit Application, Plant I.D. 021-00007, Dated May 2017.

ID	Transfer Capacities		e	Control Device		Emissions Uncontrolled		Emissions Controlled	
	tph	tpy	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
TP1	0.67	5,869	0.80	FE	80	0.54	2.35	0.11	0.47
TP2	0.67	5,869	0.80	FE	80	0.54	2.35	0.11	0.47
TP3	0.67	5,869	0.80	FE	80	0.54	2.35	0.11	0.47
TP4	0.67	5,869	0.80	FE	80	0.54	2.35	0.11	0.47
TP5	0.67	5,869	0.80	FE	80	0.54	2.35	0.11	0.47
TP6	0.67	5,869	0.80	FE	80	0.54	2.35	0.11	0.47
TP7	0.67	5,869	0.80	FE	80	0.54	2.35	0.11	0.47
TP-PN1	0.67	5,869	0.80	DC	98	0.54	2.35	0.01	0.05
TP-PN2	0.67	5,869	0.80	DC	98	0.54	2.35	0.01	0.05
TP-PN3	0.67	5,869	0.80	DC	98	0.54	2.35	0.01	0.05
TP-PN4	0.67	5,869	0.80	DC	98	0.54	2.35	0.01	0.05
TP-PN5	0.67	5,869	0.80	DC	98	0.54	2.35	0.01	0.05
					PM/PM10/PM2.5 =	6.43	28.17	0.80	3.52

ID	Transfer Capacities		e	Control Device		Emissions Uncontrolled		Emissions Controlled	
	tph	tpy	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Blender	0.67	5,869	0.80	DC	98	0.54	2.35	0.01	0.05
Shredder	0.67	5,869	0.80	DC	98	0.54	2.35	0.01	0.05

1E	3.75	16.43	0.07	0.33
TPS	3.75	16.43	0.75	3.29

Notes:

1. The pneumatic transfer system vents thought a dust collector or vacuum system. The emissions for the source are based on the emissions of transferring the material from the receiver to the Storage Bin (5-Compartment Bin) and vented through the dust collector or vacuum system.

2. The shredder is not a grinding system; therefore, we have estimated emissions from shredding as an additional transfer of the material with 0.80 lb/ton of material transferred.

TeMa
Jefferson County Operation

POTESTA & ASSOCIATES, INC.
Project No. 0103-17-0435-100

By: PEW
Date: 7/15/2018

Checked By: LKB
Date: 7/16/2018

Extruder 3000 (7E)

Process Rate = 0.67 ton/hr
5,869 ton/yr

Extruder 3000 Emissions (Based on Stack Testing Emission Factor See Page N14)		
Parameter	**lb/hr**	**tpy**
PM/PM10/PM2.5	0.1094	0.4792
Alkaline Dust (NaOH)	0.0041	0.0177
Total Organic Carbon (TOC)	0.2877	1.2601
Sec-Butanol (Secondary Butanol)	0.0081	0.0355
Iso-propanol	0.0081	0.0355
Toluene	0.0162	0.0710
Acetone	0.0243	0.1065
Ethyl acetate	0.0203	0.0887
n-Pentane	0.0081	0.0355
n-Hexane Solvents	0.2553	1.1181
Acetaldehyde	0.0203	0.0887
2-Propanal (Acrolein)	0.0004	0.0018
Formaldehyde	0.0041	0.0177
Crotonaldehyde (2-Butenal)	0.0008	0.0035
Butirraldehyde (Butyraldehyde)	0.0016	0.0071
Propionaldehyde	0.0016	0.0071
Glutaraldehyde	0.0008	0.0035
Valeraldehyde (Pentaldehyde)	0.0012	0.0053
Isovaleraldehyde (Isopentanal)	0.0012	0.0053
Benzaldehyde	0.0008	0.0035
2,5-Dimethylbenzaldehyde	0.0004	0.0018
Hexaldehyde	0.0008	0.0035
o-Tolualdehyde	0.0004	0.0018
m-Tolualdehyde	0.0004	0.0018
p-Tolualdehyde	0.0004	0.0018
Total VOC (VOC/HAPS and VOCs)	0.3756	1.6452
Total HAPS	0.2979	1.3044

VOC/HAPs
VOCs ONLY

Line 4000 PTE

	Uncontrolled		Controlled	
Parameter	lb/hr	tpy	lb/hr	tpy
PM/PM10/PM2.5	17.05	74.69	2.44	10.67
Alkaline Dust (NaOH)	0.0067	0.0294	0.0067	0.0294
Total Organic Carbon (TOC)	0.4766	2.0876	0.4766	2.0876
Sec-Butanol (Secondary Butanol)	0.0134	0.0588	0.0134	0.0588
Iso-propanol	0.0134	0.0588	0.0134	0.0588
Toluene	0.0269	0.1176	0.0269	0.1176
Acetone	0.0403	0.1764	0.0403	0.1764
Ethyl acetate	0.0336	0.1470	0.0336	0.1470
n-Pentane	0.0134	0.0588	0.0134	0.0588
n-Hexane Solvents	0.4229	1.8524	0.4229	1.8524
Acetaldehyde	0.0336	0.1470	0.0336	0.1470
2-Propanal (Acrolein)	0.0007	0.0029	0.0007	0.0029
Formaldehyde	0.0067	0.0294	0.0067	0.0294
Crotonaldehyde (2-Butenal)	0.0013	0.0059	0.0013	0.0059
Butirraldehyde (Butyraldehyde)	0.0027	0.0118	0.0027	0.0118
Propionaldehyde	0.0027	0.0118	0.0027	0.0118
Glutaraldehyde	0.0013	0.0059	0.0013	0.0059
Valeraldehyde (Pentaldehyde)	0.0020	0.0088	0.0020	0.0088
Isovaleraldehyde (Isopentanal)	0.0020	0.0088	0.0020	0.0088
Benzaldehyde	0.0013	0.0059	0.0013	0.0059
2,5-Dimethylbenzaldehyde	0.0007	0.0029	0.0007	0.0029
Hexaldehyde	0.0013	0.0059	0.0013	0.0059
o-Tolualdehyde	0.0007	0.0029	0.0007	0.0029
m-Tolualdehyde	0.0007	0.0029	0.0007	0.0029
p-Tolualdehyde	0.0007	0.0029	0.0007	0.0029
Total VOC (VOC/HAPS and VOCs)	0.6223	2.7257	0.6223	2.7257
Total HAPS	0.4935	2.1611	0.4935	2.1611

TeMa
Jefferson County Operation

POTESTA & ASSOCIATES, INC.
Project No. 0103-17-0435-100

By: PEW
Date: 7/15/2018

Checked By: LKB
Date: 7/16/2018

Line 4000

Process Rate

1,000 kg/hr
2,204.62 lb/hr
1.11 ton/hr
9,724 ton/yr (based on 8,760 hrs/yr)

Emission Factors

Transfer Points = 0.80 lb/ton Source: Flying W Plastics Permit Application, Plant I.D. 021-00007, Dated May 2017.
Blending = 0.80 lb/ton Source: Flying W Plastics Permit Application, Plant I.D. 021-00007, Dated May 2017.

ID	Transfer Capacities		e	Control Device		Emissions			
						Uncontrolled		Controlled	
	tph	tpy	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
TP1	1.11	9,724	0.80	FE	80	0.89	3.89	0.18	0.78
TP2	1.11	9,724	0.80	FE	80	0.89	3.89	0.18	0.78
TP3	1.11	9,724	0.80	FE	80	0.89	3.89	0.18	0.78
TP4	1.11	9,724	0.80	FE	80	0.89	3.89	0.18	0.78
TP5	1.11	9,724	0.80	FE	80	0.89	3.89	0.18	0.78
TP6	1.11	9,724	0.80	FE	80	0.89	3.89	0.18	0.78
TP7	1.11	9,724	0.80	FE	80	0.89	3.89	0.18	0.78
TP8	1.11	9,724	0.80	DC	98	0.89	3.89	0.02	0.08
TP9	1.11	9,724	0.80	FE	80	0.89	3.89	0.18	0.78
TP10	1.11	9,724	0.80	FE	80	0.89	3.89	0.18	0.78
TP11	1.11	9,724	0.80	FE	80	0.89	3.89	0.18	0.78
TP12	1.11	9,724	0.80	FE	80	0.89	3.89	0.18	0.78
TP13	1.11	9,724	0.80	FE	80	0.89	3.89	0.18	0.78
TP-PN1	1.11	9,724	0.80	DC	98	0.89	3.89	0.02	0.08
TP-PN2	1.11	9,724	0.80	DC	98	0.89	3.89	0.02	0.08
TP-PN3	1.11	9,724	0.80	DC	98	0.89	3.89	0.02	0.08
TP-PN4	1.11	9,724	0.80	DC	98	0.89	3.89	0.02	0.08
					PM/PM10/PM2.5 =	15.10	66.12	2.22	9.72

ID	Transfer Capacities		e	Control Device		Emissions			
						Uncontrolled		Controlled	
	tph	tpy	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Blender	1.11	9,724	0.80	DC	98	0.89	3.89	0.02	0.08
Shredder	1.11	9,724	0.80	DC	98	0.89	3.89	0.02	0.08

1E	6.22	27.23	0.12	0.54
TPS	10.66	46.67	2.13	9.33

Notes:
1. The pneumatic transfer system vents thought a dust collector or vacuum system. The emissions for the source are based on the emissions of transferring the material from the receiver to the Storage Bin (5-Compartment Bin) and vented through the dust collector or vacuum system.

2. The shredder is not a grinding system; therefore, we have estimated emissions from shredding as an additional transfer of the material with 0.80 lb/ton of material transferred.

TeMa
Jefferson County Operation

POTESTA & ASSOCIATES, INC.
Project No. 0103-17-0435-100

By: PEW
Date: 7/15/2018

Checked By: LKB
Date: 7/16/2018

Extruder 4000

Process Rate = 1.11 ton/hr
9,724 ton/yr

Extruder 4000 Emissions (Based on Stack Testing Emission Factor See Page N14)		
Parameter	**lb/hr**	**tpy**
PM/PM10/PM2.5	0.1813	0.7939
Alkaline Dust (NaOH)	0.0067	0.0294
Total Organic Carbon (TOC)	0.4766	2.0876
Sec-Butanol (Secondary Butanol)	0.0134	0.0588
Iso-propanol	0.0134	0.0588
Toluene	0.0269	0.1176
Acetone	0.0403	0.1764
Ethyl acetate	0.0336	0.1470
n-Pentane	0.0134	0.0588
n-Hexane Solvents	0.4229	1.8524
Acetaldehyde	0.0336	0.1470
2-Propanal (Acrolein)	0.0007	0.0029
Formaldehyde	0.0067	0.0294
Crotonaldehyde (2-Butenal)	0.0013	0.0059
Butirraldehyde (Butyraldehyde)	0.0027	0.0118
Propionaldehyde	0.0027	0.0118
Glutaraldehyde	0.0013	0.0059
Valeraldehyde (Pentaldehyde)	0.0020	0.0088
Isovaleraldehyde (Isopentanal)	0.0020	0.0088
Benzaldehyde	0.0013	0.0059
2,5-Dimethylbenzaldehyde	0.0007	0.0029
Hexaldehyde	0.0013	0.0059
o-Tolualdehyde	0.0007	0.0029
m-Tolualdehyde	0.0007	0.0029
p-Tolualdehyde	0.0007	0.0029
Total VOC (VOC/HAPS and VOCs)	0.6223	2.7257
Total HAPS	0.4935	2.1611

VOC/HAPs
VOCs ONLY

By: PEW
Date: 7/15/2018

Checked By: LKB
Date: 7/16/2018

Building Heaters

Building heaters will be initially fueled by propane. They will be switched to natural gas when natural gas is available in the area. There is currently no natural gas supply in the area but future plans call for natural gas to be made available to the site but the date is unknown. The emissions estimate is based on natural gas. There will be ten building heaters (eight (8) at 250 MBtu/hr and two (2) at 110 MBtu/hr) with a total of 2,220,000 MMBtu/hr.

Total Heat Rating =	2,220,000	Btu/hr
	2.22	MMBtu/hr
Operating Hours =	8,760	hrs/yr

Emission Type	EF (1)		Emissions	
	lb/10^6 scf	lb/MMBtu (3)	lb/hr	tons/year
CO	84	0.08235	0.18	0.80
NOx	100	0.09804	0.22	0.95
PM	7.6	0.00745	0.02	0.07
PM10 (2)	7.6	0.00745	0.02	0.07
PM2.5 (2)	7.6	0.00745	0.02	0.07
SO2	0.6	0.00059	0.01	0.01
VOC/TOC	5.5	0.00539	0.01	0.05
Lead	0.0005	4.90E-07	0.000001	0.000005
Rounding to =	2			

Note:
1. Emission factors from AP-42, 1.4, Natural Gas Combustion, 7/98.
2. It is assumed that PM10 and PM2.5 are equal to PM.
3. Conversion from lb/10^6 scf to lb/MMBtu (divide by) = 1,020

By: PEW
Date: 7/15/2018

Checked By: LKB
Date: 7/16/2018

Building Heaters HAPs

Total Heat Rating =	2.22	MMBtu/hr
Operating Hours =	8,760	hrs/yr

CAS No.	Hazardous Air Pollutants	EF (1)		Emissions	
		lb/10^6 scf	lb/MMBtu (2)	lb/hr	tons/year
91-57-6	2-Methylnaphthalene	2.40E-05	2.35E-08	5.22E-08	2.29E-07
56-49-5	3-Methylchloranthrene	1.80E-06	1.76E-09	3.92E-09	1.72E-08
57-97-6	7,12-Dimethylbenz(a)anthracene	1.60E-05	1.57E-08	3.48E-08	1.53E-07
83-32-9	Acenaphthene	1.80E-06	1.76E-09	3.92E-09	1.72E-08
203-96-8	Acenaphthylene	1.80E-06	1.76E-09	3.92E-09	1.72E-08
120-12-7	Anthracene	2.40E-06	2.35E-09	5.22E-09	2.29E-08
56-55-3	Benz(a)anthracene	1.80E-06	1.76E-09	3.92E-09	1.72E-08
71-43-2	Benzene	2.10E-03	2.06E-06	4.57E-06	2.00E-05
50-32-8	Benzo(a)pyrene	1.20E-06	1.18E-09	2.61E-09	1.14E-08
205-99-2	Benzo(b)fluoranthene	1.80E-06	1.76E-09	3.92E-09	1.72E-08
191-24-2	Benzo(g,h,i)perylene	1.20E-06	1.18E-09	2.61E-09	1.14E-08
205-82-3	Benzo(k)fluoranthene	1.80E-06	1.76E-09	3.92E-09	1.72E-08
218-01-9	Chrysene	1.80E-06	1.76E-09	3.92E-09	1.72E-08
53-70-3	Dibenzo(a,h)anthracene	1.20E-06	1.18E-09	2.61E-09	1.14E-08
25321-22-6	Dichlorobenzene	1.20E-03	1.18E-06	2.61E-06	1.14E-05
206-44-0	Fluoranthene	3.00E-06	2.94E-09	6.53E-09	2.86E-08
86-73-7	Fluorene	2.80E-06	2.75E-09	6.09E-09	2.67E-08
50-00-0	Formaldehyde	7.20E-02	7.06E-05	1.57E-04	6.86E-04
110-54-3	Hexane	1.80E+00	1.76E-03	3.92E-03	1.72E-02
193-39-5	Indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09	3.92E-09	1.72E-08
91-20-3	Naphthalene	6.10E-04	5.98E-07	1.33E-06	5.82E-06
85-01-8	Phenanathrene	1.70E-05	1.67E-08	3.70E-08	1.62E-07
129-00-0	Pyrene	5.00E-06	4.90E-09	1.09E-08	4.77E-08
108-88-3	Toluene	3.40E-03	3.33E-06	7.40E-06	3.24E-05
7440-38-2	Arsenic	2.00E-04	1.96E-07	4.35E-07	1.91E-06
7440-41-7	Beryllium	1.20E-05	1.18E-08	2.61E-08	1.14E-07
7440-43-9	Cadmium	1.10E-03	1.08E-06	2.39E-06	1.05E-05
7440-47-3	Chromium	1.40E-03	1.37E-06	3.05E-06	1.33E-05
7440-48-4	Cobalt	8.40E-05	8.24E-08	1.83E-07	8.01E-07
7439-96-5	Manganese	3.80E-04	3.73E-07	8.27E-07	3.62E-06
7439-97-6	Mercury	2.60E-04	2.55E-07	5.66E-07	2.48E-06
7440-02-0	Nickel	2.10E-03	2.06E-06	4.57E-06	2.00E-05
7782-49-2	Selenium	2.40E-05	2.35E-08	5.22E-08	2.29E-07
			VOC HAPs Subtotal	4.09E-03	1.79E-02
			Metal HAPs Subtotal	1.21E-05	5.30E-05
			Total HAPs	4.10E-03	1.80E-02

References:
1. AP42 Table 1.4-3 and Table 1.4-4, 7/98.
2. Conversion from lb/10^6 scf to lb/MMBtu (divide by) = 1,020

Vehicle Activity

	Transport Trucks	
Approximate Load Weight (tons) =	20	
Approximate Vehicle Weight (tons) =	20	
Vehicles Per Hour =	10	Maximum (Estimate)
Vehicles Per Year =	10,540	Based on total throughput delivered and removed multiplied by 1.5 for other trucking
Mean Vehicle Weight (tons) =	30	
Trip Length (ft) =	1,000	
Round Trip Distance (mi) =	0.38	

Unpaved Haulroads

Emission Equation AP-42 Section 13.2.2, Unpaved Roads (11/06), where:

$e = k [(s/12)^a (W/3)^b] [(365-p)/365]$

e = Emission factor, pounds per vehicle-mile-traveled, (lb/VMT)

	PM	PM_{10}	$PM_{2.5}$	
k =	4.9	1.5	0.15	dimensionless, particle size multiplier
sL =	10	10	10	surface material silt content $(g/m^2)^{(2)}$
W =	30	30	30	tons, mean vehicle weight
a =	0.7	0.9	0.9	constant
b =	0.45	0.45	0.45	constants
p =	148	148	148	no. days/year with 0.01 in of rain
e =	7.23	2.13	0.21	lb/VMT

Rounding to 2

Pollutant	No. of Vehicles		Miles Per Trip	Control Device		Emissions			
						Uncontrolled		Controlled	
	Per Hour	Per Year	(mi)	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
PM	10	10,540	0.38	None	0	27.49	14.49	27.49	14.49
PM_{10}	10	10,540	0.38	None	0	8.10	4.27	8.10	4.27
$PM_{2.5}$	10	10,540	0.38	None	0	0.80	0.42	0.80	0.42

Stack Testing

Stack testing was conducted on a combined discharge stack from Line 4000 and Line 4800 at a TeMa site in Italy. The emissions values are shown below and have been used to develop emission factors in pounds per ton of material being extruded. The stack test is attached to this application as an appendix.

Process Rates During Stack Testing

Line 4000 and Line 4800 = 1,500 kg/hr
3,307 lb/hr
1.6535 ton/hr

Chimney 13 Uncontrolled Emissions				Emission Factor
Parameter	Actual g/hr	Maximum g/hr	lb/hr	lb/ton
PM/PM10/PM2.5	82.9 ± 37.5	120.4	0.27	0.163289991
Alkaline Dust (NaOH)	<2.3	2.3	0.01	0.006047777
Total Organic Carbon (TOC)	229.8 ± 92.6	322.4	0.71	0.429392198
Sec-Butanol (Secondary Butanol)	9.4	9.4	0.02	0.012095555
Iso-propanol	9.5	9.5	0.02	0.012095555
Toluene	18.8	18.8	0.04	0.02419111
Acetone	26.5	26.5	0.06	0.036286665
Ethyl acetate	20.9	20.9	0.05	0.030238887
n-Pentane	9.4	9.4	0.02	0.012095555
n-Hexane Solvents	285.8	285.8	0.63	0.381009979
Acetaldehyde	17.61 ± 5.5	23.11	0.05	0.030238887
2-Propanal (Acrolein)	<0.34	0.34	0.001	0.000604778
Formaldehyde	2.63 ± 0.9	3.53	0.01	0.006047777
Crotonaldehyde (2-Butenal)	1	1	0.002	0.001209555
Butirraldehyde (Butyraldehyde)	1.87	1.87	0.004	0.002419111
Propionaldehyde	1.6	1.6	0.004	0.002419111
Glutaraldehyde	<0.69	0.69	0.002	0.001209555
Valeraldehyde (Pentaldehyde)	1.42	1.42	0.003	0.001814333
Isovaleraldehyde (Isopentanal)	1.24	1.24	0.003	0.001814333
Benzaldehyde	0.9	0.9	0.002	0.001209555
2,5-Dimethylbenzaldehyde	<0.62	0.62	0.001	0.000604778
Hexaldehyde	1.11	1.11	0.002	0.001209555
o-Tolualdehyde	<0.55	0.55	0.001	0.000604778
m-Tolualdehyde	<0.55	0.55	0.001	0.000604778
p-Tolualdehyde	<0.55	0.55	0.001	0.000604778
Total Emissions VOC/HAPS and VOCs Only			0.93	0.560628969

VOC/HAPs
VOCs ONLY

ATTACHMENT O

MONITORING, RECORDKEEPING, REPORTING, TESTING PLANS

ATTACHMENT O

MONITORING/RECORDKEEPING/REPORTING/TESTING PLANS

TeMa North America, LLC plans to follow the monitoring, recordkeeping, reporting, and testing required by the issued permit.

ATTACHMENT P

PUBLIC NOTICE

LEGAL ADVERTISEMENT

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that TeMa North America, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction permit for an extrusion manufacturing facility located in the Burr Business Park, 2 Steeley Way, Kearneysville, Jefferson County, West Virginia. The latitude and longitude coordinates are: 39.356546 and -77.870943.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: PM of 34.03 tons per year (tpy) including fugitive emissions of 14.49, PM10 of 23.81 tpy including fugitive emissions of 4.27 tpy, PM2.5 of 19.96 tpy including fugitive emissions of 0.42 tpy, VOC of 4.99 tpy, Toluene of 0.24 tpy, N-Hexane of 3.72 tpy, Acetaldehyde of 0.30 tpy, Acrolein of 0.006 tpy, Formaldehyde of 0.06 tpy, and Propionaldehyde of 0.024 tpy with a total HAPs of 4.36 (including natural gas combustion HAPs.

The facility will begin operation under the permit on or about September 15, 2018. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, Extension 1250, during normal business hours.

Dated this the (PLEASE INSERT DATE) day of July 2018.

By: TeMa North America, LLC
Tonj Ciotti
Chief Executive Officer
395 Steeley Way
Kearneysville, West Virginia 25430

APPENDIX

STACK TEST

Spett.le
TEMA TECHNOLOGIES AND MATERIALS s.r.l.
Via dell'Industria, 21
31029 - Vittorio veneto (TV)

RAPPORTO DI PROVA N.
TEST REPORT N.
18LA00598

Misure eseguite presso l'azienda: SAMPLING ADDRESS:	TEMA TECHNOLOGIES AND MATERIALS s.r.l. Via dell'Industria, 21 31029 - Vittorio veneto (TV)
Matrice: MATRIX:	emissioni in atmosfera. EMISSIONS IN ATMOSPHERE

CAMINO 13
Ingresso impianto Vepal
VEPAL PLANT INPUT

Data inizio campionamento: SAMPLING START DATE:	14/02/2018
Data fine campionamento: SAMPLING END DATE:	14/02/2018
Prelievo eseguito da: SAMPLING OPERATOR:	Gabriele Buso, Stefano Vaccaro
Rapporto di prova redatto da: TEST REPORT EDITOR:	Luca Barison
Condizioni di esercizio all'atto del prelievo: SYSTEM OPERATING CONDITIONS DURING SAMPLING: (informazioni fornite dal committente) (INFORMATIONS GIVEN BY CUSTOMER)	Linea 4000 e Linea 4800 in attività
N° verbale di campionamento: SAMPLING REPORT N°:	953
N° accettazione: LIMS N°:	18-000367
Data accettazione campioni: LIMS DATE:	14/02/2018
Data inizio analisi: ANALYSIS START DATE:	14/02/2018
Data fine analisi: ANALYSIS END DATE:	21/02/2018
Data emissione rapporto di prova (RdP): TEST REPORT ISSUE DATE:	23/02/2018

Informazioni aggiuntive
ADDITIONAL INFORMATIONS

Decreto di Autorizzazione di riferimento: LAW REFERENCE	D.Lgs N.152 del 03 aprile 2006 e ss.mm.ii. Autorizzazione Unica Ambientale Decreto N.53-2016 del 12/02/2016 della Provincia di Treviso.
Finalità delle prove: TEST PURPOSE:	verifica interna delle emissioni in atmosfera non valida ai fini del controllo della conformità dei limiti secondo All. VI parte quinta del D.Lgs 152:2006. INFORMAL TEST OF ATMOSPHERE EMISSIONS, NOT VALID AS OFFICIAL LAW LIMITS COMPLIANCE CHECK.

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ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO
LAB N° 1011

I° CICLO DI MISURA MEASURING 1st CYCLE		
Data e ora inizio prelievo: SAMPLING START DATE AND TIME:	14/02/2018	09:00
Data e ora fine prelievo: SAMPLING END DATE AND TIME:	14/02/2018	09:45
Durata (minuti): MINUTES OF SAMPLING:		45

PARAMETRI FISICI PHYSICAL PARAMETERS

MISURA DI PORTATA - Metodo UNI EN ISO 16911-1:2013 (escluso annex B, C, D, E) FLOW RATE MESURING	**U.M.**	**Valore** VALUE
Diametro punto di prelievo SAMPLING POINT DIAMETER	m	0,85
Sezione punto di prelievo SAMPLING POINT SECTION	m^2	0,5672
Temperatura MEAN TEMPERATURE	°C	20
Massa volumica VOLUMIC MASS	kg/m^3	1,163
Pressione statica MEAN STATIC PRESSURE	mbar	-13,9
Pressione atmosferica MEAN ATMOSPHERIC PRESSURE	mbar	998
Velocità media MEAN FLOW VEOLITY	m/sec	20,1
Portata effluente normalizzata umida WET GAS VOLUME FLOW RATE, UNDER STD. CONDITIONS OF T. AND P.	Nm^3/h	37.050
Portata effluente normalizzata secca DRY GAS VOLUME FLOW RATE, UNDER STD. CONDITIONS OF T. AND P.	Nm^3/h	37.050
PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**U.M.**	**Valore** VALUE
Vapore acqueo WATER VAPOUR *Metodo: UNI EN 14790:2017*	%vv	0,1
Ossigeno * OXYGEN	%vv	20,9 [a]
Anidride carbonica * CARBON DIOXIDE	%vv	0,1 [a]

RISULTATI ANALITICI ANALYTICAL RESULTS

PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**Volume di camp.** **Nm^3**	**Concentrazione** CONCENTRATION **mg/Nm^3**
Polveri totali TOTAL DUST *Metodo: UNI EN 13284-1:2003*	0,387	2,4
Nebbie alcaline (NaOH) * ALKALINE DUST *Metodo: UNI EN 13284-1:2003 + NIOSH 7401:1994*	0,387	< 0,1
Carbonio organico totale (TOC) TOTAL ORGANIC CARBON *Metodo: UNI EN 12619:2013*	-	4,2
sec-Butanolo (Cl.III - Tab.D DLgs n°152/2006) * SEC- BUTHANOL *Metodo: UNI CEN/TS 13649:2015*	0,023	< 0,4
iso-Propanolo (Cl.IV - Tab.D DLgs n°152/2006) ISO-PROPANOL *Metodo: UNI CEN/TS 13649:2015*	0,023	< 0,4
Toluene (Cl.IV - Tab.D DLgs n°152/2006) TOLUENE *Metodo: UNI CEN/TS 13649:2015*	0,023	0,4
Acetone (Cl.V - Tab.D DLgs n°152/2006) ACETONE *Metodo: UNI CEN/TS 13649:2015*	0,023	0,9
Etilacetato (Cl.V - Tab.D DLgs n°152/2006) ETHYLACETATE *Metodo: UNI CEN/TS 13649:2015*	0,023	0,4
n-Pentano (Cl.V - Tab.D DLgs n°152/2006) N-PENTANE *Metodo: UNI CEN/TS 13649:2015*	0,023	< 0,4
Altri solventi (come n-esano) * OTHER SOLVENT (EXPRESSED AS N-HEXANE) *Metodo: UNI CEN/TS 13649:2015*	0,023	6

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ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO
LAB N° 1011

PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**Volume di camp.** **Nm^3**	**Concentrazione** **mg/Nm^3**
Acetaldeide (Cl.II - Tab.D DLgs n°152/2006) ACETALDEYDE *Metodo: EPA TO 11A:1999*	0,029	0,45
2-Propenale (Acroleina) (Cl.II - Tab.D DLgs n°152/2006) * 2-PROPANALE *Metodo: EPA TO 11A:1999*	0,029	< 0,02
Formaldeide (Cl.II - Tab.D DLgs n°152/2006) FORMALDEHYDE *Metodo: EPA TO 11A:1999*	0,029	0,1
Crotonaldeide (Cl.II - Tab.D DLgs n°152/2006) * CROTONALDEHYDE *Metodo: EPA TO 11A 1999*	0,029	< 0,03
Butirraldeide (Cl.III - Tab.D DLgs n°152/2006) * BUTYRRALDEHYDE *Metodo: EPA TO 11A 1999*	0,029	0,06
Propionaldeide (Cl.III - Tab.D DLgs n°152/2006) * PROPYONALDEHYDE *Metodo: EPA TO 11A 1999*	0,029	0,05
Glutaraldeide * GLUTARALDEHYDE *Metodo: EPA TO 11A 1999*	0,029	< 0,03
Valeraldeide (Pentanale) * VALERALDEHYDE *Metodo: EPA TO 11A 1999*	0,029	0,03
Isovaleraldeide * ISOVALERALDEHYDE *Metodo: EPA TO 11A 1999*	0,029	0,05
Benzaldeide * BENZALDEHYDE *Metodo: EPA TO 11A 1999*	0,029	< 0,02
2,5-Dimetilbenzaldeide * 2,5-DIMETHYLBENZALDEHYDE *Metodo: EPA TO 11A 1999*	0,029	< 0,03
Esaldeide * HEXALDEHYDE *Metodo: EPA TO 11A 1999*	0,029	0,04
o-Tolualdeide * O-TOLUALDEHYDE *Metodo: EPA TO 11A 1999*	0,029	< 0,03
m-Tolualdeide * M-TOLUALDEHYDE *Metodo: EPA TO 11A 1999*	0,029	< 0,03
p-Tolualdeide * P-TOLUALDEHYDE *Metodo: EPA TO 11A 1999*	0,029	< 0,03

PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**Volume di camp.** **Nm^3**	**Concentrazione** **mg/Nm^3**
Totale S.O.V. Cl.I - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	-	< 0,2
Totale S.O.V. Cl.I+II - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	-	1
Totale S.O.V. Cl.I+II+III - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II+III *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	-	1,3
Totale S.O.V. Cl.I+II+III+IV - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II+III+IV *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	-	2
Totale S.O.V. Cl.I+II+III+IV+V - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II+III+IV+V *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	-	9,5

Il presente rapporto riguarda solo i campioni sottoposti a prova. THIS TEST REPORT REFER EXLUSIVELY TO THE TESTED SAMPLES

Il presente rapporto non può essere riprodotto parzialmente, salvo approvazione scritta del laboratorio di prova. ANY DUPLICATES OF THIS REPORT MUST BE AUTHORIZED

Nelle sommatorie e nelle medie dei dati analitici in concentrazione, per i valori <LOQ (inferiore al limite di quantificazione), si applicano i valori LOQ/2 come previsto dal Rapporto ISTISAN 04/15 del 2004; negli altri casi si applicano i valori LOQ.
AS DEFINITE IN ISTISAN REPORTS, IN SUM AND EVERAGE FOR VALUES <RL ARE APPLIED RL/2 VALUES

* La prova non rientra nell'ambito dell'accreditamento ACCREDIA. THE TEST IS NOT ACCREDITATED BY ACCREDIA

[a] Valore assunto in base alle attività afferenti. ASSUMED VALUE ON PLANT ACTIVITY BASED

Le analisi dei solventi con il metodo UNI CEN/TS 13649:2015, sono state eseguite a seguito di verifica positiva delle efficienze di desorbimento dei principali analiti sul substrato di campionamento. THE SOLVENT ANALISYS WITH METHOD UNI CEN/TS 13649:2015 ARE PERFORMED AFTER EXTRACTION PROCEDURE EFFICENCY POSITIVE CHECK.

Le analisi delle aldeidi con il metodo EPA TO 11A:1999, sono state eseguite a seguito di verifica positiva delle efficienze di desorbimento dei principali analiti sul substrato di campionamento. THE ALDEHYDES ANALISYS WITH METHOD EPA TO 11A:1999 ARE PERFORMED AFTER EXTRACTION PROCEDURE EFFICENCY POSITIVE CHECK.

Condizioni di campionamento, eventuali scostamenti ed idoneità secondo UNI EN 15259:2008 SAMPLING CONDITIONS		
Campionamento effettuato rispettando tutti gli affondamenti previsti. SAMPLING PERFORMED RESPECTING ALL GRID MEASUREMENT		
Il piano delle misure rispetta i requisiti imposti dal Punto 6.2.1 , lettera C, punti 1,2,3 e 4 della Norma UNI EN 15259:2008. THE MEASUREMENT PLANE RESPECT THE 6.2.1 POINT OF UNI EN 15259:2008		
Verifiche condizioni operative e strumentali e dati di assicurazione di qualità: OPERATIVE AND INSTRUMENTAL SAMPLING CHECK		
Condizioni strumentali di campionamento SAMPLING INSTRUM. CONDITIONS	**Richieste dei metodi**	**Esito** OUTCOME
Leak-test iniziali e finali linee di campionamento IN. & FIN. SAMPLING LINES LEAK-TEST	assenza flusso e conteggio litri alle pompe	OK
Temperatura di condizionamento dei filtri prima della pesatura FILTERS HEATER TEMP.	160°C o minore per successive analisi sul particolato	OK
Letture gas zero e span, Carbonio organico totale (TOC) GAS 0 AND SPAM OTRCOMES FOR TOC	Metodo: UNI EN 12619:2013	OK
Grado di isocinetismo rispetto al flusso nominale SAMPLING ISOKINETISM GRADE	da 95% a 115%	OK
Verifica trascinamento nei supporti di recupero CONTAMINATIONS CHECK	**Richieste dei metodi**	**Esito** OUTCOME
Metodo: UNI CEN/TS 13649:2015	<5% del totale nel recupero fiala	OK
Metodo: EPA TO 11A 1999	<5% del totale nel recupero fiala	OK

II° CICLO DI MISURA MEASURING 2ND CYCLE		
Data e ora inizio prelievo: SAMPLING START DATE AND TIME:	14/02/2018	09:50
Data e ora fine prelievo: SAMPLING END DATE AND TIME:	14/02/2018	10:25
Durata (minuti): MINUTES OF SAMPLING:		35

PARAMETRI FISICI PHYSICAL PARAMETERS

MISURA DI PORTATA - Metodo UNI EN ISO 16911-1:2013 (escluso annex B, C, D, E) FLOW RATE MESURING	**U.M.**	**Valore** VALUE
Diametro punto di prelievo SAMPLING POINT DIAMETER	m	0,85
Sezione punto di prelievo SAMPLING POINT SECTION	m^2	0,5672
Temperatura MEAN TEMPERATURE	°C	20
Massa volumica VOLUMIC MASS	kg/m^3	1,165
Pressione statica MEAN STATIC PRESSURE	mbar	-14,0
Pressione atmosferica MEAN ATMOSPHERIC PRESSURE	mbar	998
Velocità media MEAN FLOW VEOLITY	m/sec	20,1
Portata effluente normalizzata umida WET GAS VOLUME FLOW RATE, UNDER STD. CONDITIONS OF T. AND P.	Nm^3/h	37.150
Portata effluente normalizzata secca DRY GAS VOLUME FLOW RATE, UNDER STD. CONDITIONS OF T. AND P.	Nm^3/h	37.100
PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**U.M.**	**Valore**
Vapore acqueo WATER VAPOUR *Metodo: UNI EN 14790:2017*	%vv	0,1
Ossigeno * OXYGEN	%vv	20,9 [a]
Anidride carbonica * CARBON DIOXIDE	%vv	0,1 [a]

RISULTATI ANALITICI ANALYTICAL RESULTS

PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**Volume di camp.** **Nm^3**	**Concentrazione** **mg/Nm^3**
Polveri totali TOTAL DUST *Metodo: UNI EN 13284-1:2003*	0,393	2,1
Nebbie alcaline (NaOH) * ALKALINE DUST *Metodo: UNI EN 13284-1:2003 + NIOSH 7401:1994*	0,393	< 0,1
Carbonio organico totale (TOC) TOTAL ORGANIC CARBON (TOC) *Metodo: UNI EN 12619:2013*	-	7
sec-Butanolo (Cl.III - Tab.D DLgs n°152/2006) * SEC- BUTHANOL *Metodo: UNI CEN/TS 13649:2015*	0,022	< 0,5
iso-Propanolo (Cl.IV - Tab.D DLgs n°152/2006) ISO-PROPANOL *Metodo: UNI CEN/TS 13649:2015*	0,022	0,5
Toluene (Cl.IV - Tab.D DLgs n°152/2006) TOLUENE *Metodo: UNI CEN/TS 13649:2015*	0,022	0,5
Acetone (Cl.V - Tab.D DLgs n°152/2006) ACETONE *Metodo: UNI CEN/TS 13649:2015*	0,022	< 0,5
Etilacetato (Cl.V - Tab.D DLgs n°152/2006) ETHYLACETATE *Metodo: UNI CEN/TS 13649:2015*	0,022	< 0,5
n-Pentano (Cl.V - Tab.D DLgs n°152/2006) N-PENTANE *Metodo: UNI CEN/TS 13649:2015*	0,022	< 0,5
Altri solventi (come n-esano) * OTHER SOLVENT (EXPRESSED AS HEXANE) *Metodo: UNI CEN/TS 13649:2015*	0,022	6,4

PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**Volume di camp.** **Nm^3**	**Concentrazione** **mg/Nm^3**
Acetaldeide (Cl.II - Tab.D DLgs n°152/2006) ACETALDEHYDE *Metodo: EPA TO 11A:1999*	0,021	0,71
2-Propenale (Acroleina) (Cl.II - Tab.D DLgs n°152/2006) * 2-PROPANAL *Metodo: EPA TO 11A:1999*	0,021	< 0,02
Formaldeide (Cl.II - Tab.D DLgs n°152/2006) FORMALDEHYDE *Metodo: EPA TO 11A:1999*	0,021	0,08
Crotonaldeide (Cl.II - Tab.D DLgs n°152/2006) * CROTONALDEHYDE *Metodo: EPA TO 11A 1999*	0,021	0,07
Butirraldeide (Cl.III - Tab.D DLgs n°152/2006) * BUTIRRALDEHYDE *Metodo: EPA TO 11A 1999*	0,021	0,06
Propionaldeide (Cl.III - Tab.D DLgs n°152/2006) * PROPIONALDEHYDE *Metodo: EPA TO 11A 1999*	0,021	0,06
Glutaraldeide * GLUTARALDEHYDE *Metodo: EPA TO 11A 1999*	0,021	< 0,05
Valeraldeide (Pentanale) * VALERALDEHYDE *Metodo: EPA TO 11A 1999*	0,021	0,06
Isovaleraldeide * ISOVALERALDEHYDE *Metodo: EPA TO 11A 1999*	0,021	0,04
Benzaldeide * BENZALDEHYDE *Metodo: EPA TO 11A 1999*	0,021	0,03
2,5-Dimetilbenzaldeide * 2,5-DIMETHYLBENZALDEHYDE *Metodo: EPA TO 11A 1999*	0,021	< 0,04
Esaldeide * HEXALDEHYDE *Metodo: EPA TO 11A 1999*	0,021	0,04
o-Tolualdeide * O-TOLUALDEHYDE *Metodo: EPA TO 11A 1999*	0,021	< 0,04
m-Tolualdeide * M-TOLUALDEHYDE *Metodo: EPA TO 11A 1999*	0,021	< 0,04
p-Tolualdeide * P-TOLUALDEHYDE *Metodo: EPA TO 11A 1999*	0,021	< 0,04

PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**Volume di camp.** **Nm^3**	**Concentrazione** **mg/Nm^3**
Totale S.O.V. Cl.I - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	-	< 0,2
Totale S.O.V. Cl.I+II - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	-	1,3
Totale S.O.V. Cl.I+II+III - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II+III *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	-	1,7
Totale S.O.V. Cl.I+II+III+IV - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II+III+IV *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	-	2,6
Totale S.O.V. Cl.I+II+III+IV+V - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II+III+IV+V *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	-	9,7

Il presente rapporto riguarda solo i campioni sottoposti a prova. THIS TEST REPORT REFER EXLUSIVELY TO THE TESTED SAMPLES

Il presente rapporto non può essere riprodotto parzialmente, salvo approvazione scritta del laboratorio di prova. ANY DUPLICATES OF THIS REPORT MUST BE AUTHORIZED

Nelle sommatorie e nelle medie dei dati analitici in concentrazione, per i valori <LOQ (inferiore al limite di quantificazione), si applicano i valori LOQ/2 come previsto dal Rapporto ISTISAN 04/15 del 2004; negli altri casi si applicano i valori LOQ.
AS DEFINITE IN ISTISAN REPORTS, IN SUM AND EVERAGE FOR VALUES <RL ARE APPLIED RL/2 VALUES

* La prova non rientra nell'ambito dell'accreditamento ACCREDIA. THE TEST IS NOT ACCREDITATED BY ACCREDIA

[a] Valore assunto in base alle attività afferenti. ASSUMED VALUE ON PLANT ACTIVITY BASED

Le analisi dei solventi con il metodo UNI CEN/TS 13649:2015, sono state eseguite a seguito di verifica positiva delle efficienze di desorbimento dei principali analiti sul substrato di campionamento. THE SOLVENT ANALISYS WITH METHOD UNI CEN/TS 13649:2015 ARE PERFORMED AFTER EXTRACTION PROCEDURE EFFICENCY POSITIVE CHECK.

Le analisi delle aldeidi con il metodo EPA TO 11A:1999, sono state eseguite a seguito di verifica positiva delle efficienze di desorbimento dei principali analiti sul substrato di campionamento. THE ALDEHYDES ANALISYS WITH METHOD EPA TO 11A:1999 ARE PERFORMED AFTER EXTRACTION PROCEDURE EFFICENCY POSITIVE CHECK.

Condizioni di campionamento, eventuali scostamenti ed idoneità secondo UNI EN 15259:2008 SAMPLING CONDITIONS		
Campionamento effettuato rispettando tutti gli affondamenti previsti. SAMPLING PERFORMED RESPECTING ALL GRID MEASUREMENT		
Il piano delle misure rispetta i requisiti imposti dal Punto 6.2.1 , lettera C, punti 1,2,3 e 4 della Norma UNI EN 15259:2008. THE MEASUREMENT PLANE RESPECT THE 6.2.1 POINT OF UNI EN 15259:2008		
Verifiche condizioni operative e strumentali e dati di assicurazione di qualità: OPERATIVE AND INSTRUMENTAL SAMPLING CHECK		
Condizioni strumentali di campionamento SAMPLING INSTRUM. CONDITIONS	**Richieste dei metodi**	**Esito** OUTCOME
Leak-test iniziali e finali linee di campionamento IN. & FIN. SAMPLING LINES LEAK-TEST	assenza flusso e conteggio litri alle pompe	OK
Temperatura di condizionamento dei filtri prima della pesatura FILTERS HEATER TEMP.	160°C o minore per successive analisi sul particolato	OK
Letture gas zero e span, Carbonio organico totale (TOC) GAS 0 AND SPAM OTRCOMES FOR TOC	Metodo: UNI EN 12619:2013	OK
Grado di isocinetismo rispetto al flusso nominale SAMPLING ISOKINETISM GRADE	da 95% a 115%	OK
Verifica trascinamento nei supporti di recupero CONTAMINATIONS CHECK	**Richieste dei metodi**	**Esito** OUTCOME
Metodo: UNI CEN/TS 13649:2015	<5% del totale nel recupero fiala	OK
Metodo: EPA TO 11A 1999	<5% del totale nel recupero fiala	OK

III° CICLO DI MISURA MEASURING 3RD CYCLE		
Data e ora inizio prelievo: SAMPLING START DATE AND TIME:	14/02/2018	10:30
Data e ora fine prelievo: SAMPLING END DATE AND TIME:	14/02/2018	11:20
Durata (minuti): MINUTES OF SAMPLING:		50

PARAMETRI FISICI PHYSICAL PARAMETERS

MISURA DI PORTATA - Metodo UNI EN ISO 16911-1:2013 (escluso annex B, C, D, E) FLOW RATE MESURING	**U.M.**	**Valore** VALUE
Diametro punto di prelievo SAMPLING POINT DIAMETER	m	0,85
Sezione punto di prelievo SAMPLING POINT SECTION	m^2	0,5672
Temperatura MEAN TEMPERATURE	°C	20
Massa volumica VOLUMIC MASS	kg/m^3	1,163
Pressione statica MEAN STATIC PRESSURE	mbar	-13,9
Pressione atmosferica MEAN ATMOSPHERIC PRESSURE	mbar	998
Velocità media MEAN FLOW VEOLITY	m/sec	20,0
Portata effluente normalizzata umida WET GAS VOLUME FLOW RATE, UNDER STD. CONDITIONS OF T. AND P.	Nm^3/h	36.950
Portata effluente normalizzata secca DRY GAS VOLUME FLOW RATE, UNDER STD. CONDITIONS OF T. AND P.	Nm^3/h	36.950
PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**U.M.**	**Valore** VALUE
Vapore acqueo WATER VAPOUR *Metodo: UNI EN 14790:2017*	%vv	0,1
Ossigeno * OXYGEN	%vv	20,9 [a]
Anidride carbonica * CARBON DIOXIDE	%vv	0,1 [a]

RISULTATI ANALITICI ANALYTICAL RESULTS

PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**Volume di camp.** **Nm^3**	**Concentrazione** **mg/Nm^3**
Polveri totali TOTAL DUST *Metodo: UNI EN 13284-1:2003*	0,404	2,2
Nebbie alcaline (NaOH) * ALKALINE DUST *Metodo: UNI EN 13284-1:2003 + NIOSH 7401:1994*	0,404	< 0,1
Carbonio organico totale (TOC) TOTAL ORGANIC CARBON (TOC) *Metodo: UNI EN 12619:2013*	-	7,5
sec-Butanolo (Cl.III - Tab.D DLgs n°152/2006) * SEC-BUTHANOL *Metodo: UNI CEN/TS 13649:2015*	0,033	0,3
iso-Propanolo (Cl.IV - Tab.D DLgs n°152/2006) ISO-PROPANOL *Metodo: UNI CEN/TS 13649:2015*	0,033	< 0,3
Toluene (Cl.IV - Tab.D DLgs n°152/2006) TOLUENE *Metodo: UNI CEN/TS 13649:2015*	0,033	0,6
Acetone (Cl.V - Tab.D DLgs n°152/2006) ACETONE *Metodo: UNI CEN/TS 13649:2015*	0,033	0,9
Etilacetato (Cl.V - Tab.D DLgs n°152/2006) ETHYLACETATE *Metodo: UNI CEN/TS 13649:2015*	0,033	0,9
n-Pentano (Cl.V - Tab.D DLgs n°152/2006) N-PENTANE *Metodo: UNI CEN/TS 13649:2015*	0,033	0,3
Altri solventi (come n-esano) * OTEHR SOLVENT (EXPRESSED AS N-HEXANE) *Metodo: UNI CEN/TS 13649:2015*	0,033	10,1

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PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**Volume di camp.** **Nm^3**	**Concentrazione** **mg/Nm^3**
Acetaldeide (Cl.II - Tab.D DLgs n°152/2006) ACETALDEHYDE *Metodo: EPA TO 11A:1999*	0,031	0,34
2-Propenale (Acroleina) (Cl.II - Tab.D DLgs n°152/2006) * 2-PROPANAL *Metodo: EPA TO 11A:1999*	0,031	< 0,02
Formaldeide (Cl.II - Tab.D DLgs n°152/2006) FORMALDEHYDE *Metodo: EPA TO 11A:1999*	0,031	0,04
Crotonaldeide (Cl.II - Tab.D DLgs n°152/2006) * CROTONALDEHYDE *Metodo: EPA TO 11A 1999*	0,031	< 0,02
Butirraldeide (Cl.III - Tab.D DLgs n°152/2006) * BUTIRRALDEHYDE *Metodo: EPA TO 11A 1999*	0,031	0,03
Propionaldeide (Cl.III - Tab.D DLgs n°152/2006) * PROPIONALDEHYDE *Metodo: EPA TO 11A 1999*	0,031	0,03
Glutaraldeide * GLUTARALDEHYDE *Metodo: EPA TO 11A 1999*	0,031	< 0,03
Valeraldeide (Pentanale) * VALERALDEHYDE *Metodo: EPA TO 11A 1999*	0,031	0,03
Isovaleraldeide * ISOVALERALDEHYDE *Metodo: EPA TO 11A 1999*	0,031	< 0,02
Benzaldeide * BENZALDEHYDE *Metodo: EPA TO 11A 1999*	0,031	0,03
2,5-Dimetilbenzaldeide * 2,5DIMETHYLBENZALDEHYDE *Metodo: EPA TO 11A 1999*	0,031	< 0,03
Esaldeide * HEXALDEHYDE *Metodo: EPA TO 11A 1999*	0,031	< 0,02
o-Tolualdeide * O-TOLUALDEHYDE *Metodo: EPA TO 11A 1999*	0,031	< 0,03
m-Tolualdeide * M-TOLUALDEHYDE *Metodo: EPA TO 11A 1999*	0,031	< 0,03
p-Tolualdeide * P-TOLUALDEHYDE *Metodo: EPA TO 11A 1999*	0,031	< 0,03

PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**Volume di camp.** **Nm^3**	**Concentrazione** **mg/Nm^3**
Totale S.O.V. Cl.I - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	-	< 0,2
Totale S.O.V. Cl.I+II - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	-	0,7
Totale S.O.V. Cl.I+II+III - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II+III *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	-	1,1
Totale S.O.V. Cl.I+II+III+IV - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II+III+IV *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	-	1,8
Totale S.O.V. Cl.I+II+III+IV+V - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II+III+IV+V *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	-	14,1

Il presente rapporto riguarda solo i campioni sottoposti a prova. THIS TEST REPORT REFER EXLUSIVELY TO THE TESTED SAMPLES

Il presente rapporto non può essere riprodotto parzialmente, salvo approvazione scritta del laboratorio di prova. ANY DUPLICATES OF THIS REPORT MUST BE AUTHORIZED

Nelle sommatorie e nelle medie dei dati analitici in concentrazione, per i valori <LOQ (inferiore al limite di quantificazione), si applicano i valori LOQ/2 come previsto dal Rapporto ISTISAN 04/15 del 2004; negli altri casi si applicano i valori LOQ.
AS DEFINITE IN ISTISAN REPORTS, IN SUM AND EVERAGE FOR VALUES <RL ARE APPLIED RL/2 VALUES

* La prova non rientra nell'ambito dell'accreditamento ACCREDIA. THE TEST IS NOT ACCREDITATED BY ACCREDIA

[a] Valore assunto in base alle attività afferenti. ASSUMED VALUE ON PLANT ACTIVITY BASED

Le analisi dei solventi con il metodo UNI CEN/TS 13649:2015, sono state eseguite a seguito di verifica positiva delle efficienze di desorbimento dei principali analiti sul substrato di campionamento. THE SOLVENT ANALISYS WITH METHOD UNI CEN/TS 13649:2015 ARE PERFORMED AFTER EXTRACTION PROCEDURE EFFICENCY POSITIVE CHECK.

Le analisi delle aldeidi con il metodo EPA TO 11A:1999, sono state eseguite a seguito di verifica positiva delle efficienze di desorbimento dei principali analiti sul substrato di campionamento. THE ALDEHYDES ANALISYS WITH METHOD EPA TO 11A:1999 ARE PERFORMED AFTER EXTRACTION PROCEDURE EFFICENCY POSITIVE CHECK.

Condizioni di campionamento, eventuali scostamenti ed idoneità secondo UNI EN 15259:2008 SAMPLING CONDITIONS		
Campionamento effettuato rispettando tutti gli affondamenti previsti. SAMPLING PERFORMED RESPECTING ALL GRID MEASUREMENT		
Il piano delle misure rispetta i requisiti imposti dal Punto 6.2.1 , lettera C, punti 1,2,3 e 4 della Norma UNI EN 15259:2008. THE MEASUREMENT PLANE RESPECT THE 6.2.1 POINT OF UNI EN 15259:2008		
Verifiche condizioni operative e strumentali e dati di assicurazione di qualità: OPERATIVE AND INSTRUMENTAL SAMPLING CHECK		
Condizioni strumentali di campionamento SAMPLING INSTRUM. CONDITIONS	**Richieste dei metodi**	**Esito** OUTCOME
Leak-test iniziali e finali linee di campionamento IN. & FIN. SAMPLING LINES LEAK-TEST	assenza flusso e conteggio litri alle pompe	OK
Temperatura di condizionamento dei filtri prima della pesatura FILTERS HEATER TEMP.	160°C o minore per successive analisi sul particolato	OK
Letture gas zero e span, Carbonio organico totale (TOC) GAS 0 AND SPAM OTRCOMES FOR TOC	Metodo: UNI EN 12619:2013	OK
Grado di isocinetismo rispetto al flusso nominale SAMPLING ISOKINETISM GRADE	da 95% a 115%	OK
Verifica trascinamento nei supporti di recupero CONTAMINATIONS CHECK	**Richieste dei metodi**	**Esito** OUTCOME
Metodo: UNI CEN/TS 13649:2015	<5% del totale nel recupero fiala	OK
Metodo: EPA TO 11A 1999	<5% del totale nel recupero fiala	OK

VALORE MEDIO PONDERATO DELLE MISURE WEIGHTED MEAND MEASURING VALUE

PARAMETRI FISICI PHYSICAL PARAMETERS

MISURA DI PORTATA - Metodo UNI EN ISO 16911-1:2013 (escluso annex B, C, D, E) FLOW RATE MESURING	**U.M.**	**Valore** VALUE	**Incert. Estesa** EXTENDED UNCERTAINTY
Diametro punto di prelievo SAMPLING POINT DIAMETER	m	0,85	-
Sezione punto di prelievo SAMPLING POINT SECTION	m^2	0,5672	-
Temperatura MEAN TEMPERATURE	°C	20	-
Massa volumica VOLUMIC MASS	kg/m^3	1,164	-
Pressione statica MEAN STATIC PRESSURE	mbar	-13,9	-
Pressione atmosferica MEAN ATMOSPHERIC PRESSURE	mbar	998	-
Velocità media MEAN FLOW VEOLITY	m/sec	20,1	-
Portata effluente normalizzata umida WET GAS VOLUME FLOW RATE, UNDER STD. CONDITIONS OF T. AND P.	Nm^3/h	37.050	-
Portata effluente normalizzata secca DRY GAS VOLUME FLOW RATE, UNDER STD. CONDITIONS OF T. AND P.	Nm^3/h	37.050	± 9640
PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**U.M.**	**Valore** VALUE	**Incert. Estesa** EXTENDED UNCERTAINTY
Vapore acqueo WATER VAPOUR *Metodo: UNI EN 14790:2017*	%vv	0,1	-
Ossigeno * OXYGEN	%vv	20,9 [a]	-
Anidride carbonica * CARBON DIOXIDE	%vv	0,1 [a]	-

RISULTATI ANALITICI ANALYTICAL RESULTS

PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**CONCENTRAZIONE** CONCENTRATION		**FLUSSO DI MASSA** MASS FLOW	
	mg/Nm^3	**Valore limite** LIMIT VALUE	**g/h**	**Valore limite** LIMIT VALUE
Polveri totali TOTAL DUST *Metodo: UNI EN 13284-1:2003*	2,2 ± 0,8	-	82,9 ± 37,5	-
Nebbie alcaline (NaOH) * ALKALINE DUST *Metodo: UNI EN 13284-1:2003 + NIOSH 7401:1994*	< 0,1	-	< 2,3	-
Carbonio organico totale (TOC) TOTAL ORGANIC CARBON (TOC) *Metodo: UNI EN 12619:2013*	6,2 ± 0,5	-	229,8 ± 62,6	-
sec-Butanolo (Cl.III - Tab.D DLgs n°152/2006) * SEC-BUTHANOL *Metodo: UNI CEN/TS 13649:2015*	0,3	-	9,4	-
iso-Propanolo (Cl.IV - Tab.D DLgs n°152/2006) ISO-PROANOL *Metodo: UNI CEN/TS 13649:2015*	0,3	-	9,5	-
Toluene (Cl.IV - Tab.D DLgs n°152/2006) TOLUENE *Metodo: UNI CEN/TS 13649:2015*	0,5	-	18,8	-
Acetone (Cl.V - Tab.D DLgs n°152/2006) ACETONE *Metodo: UNI CEN/TS 13649:2015*	0,7	-	26,5	-
Etilacetato (Cl.V - Tab.D DLgs n°152/2006) ETHYLACETATE *Metodo: UNI CEN/TS 13649:2015*	0,6	-	20,9	-
n-Pentano (Cl.V - Tab.D DLgs n°152/2006) N-PENTANE *Metodo: UNI CEN/TS 13649:2015*	0,3	-	9,4	-
Altri solventi (come n-esano) * OTHER SOLVENT (EXPRESSED AS N-HEXANE) *Metodo: UNI CEN/TS 13649:2015*	7,7	-	285,8	-

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PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**CONCENTRAZIONE**		**FLUSSO DI MASSA**	
	mg/Nm^3	**Valore limite**	**g/h**	**Valore limite**
Acetaldeide (Cl.II - Tab.D DLgs n°152/2006) ACETALDEHYDE *Metodo: EPA TO 11A:1999*	0,48 ± 0,08	-	17,61 ± 5,5	-
2-Propenale (Acroleina) (Cl.II - Tab.D DLgs n°152/2006) * 2-PROPANAL *Metodo: EPA TO 11A:1999*	< 0,01	-	< 0,34	-
Formaldeide (Cl.II - Tab.D DLgs n°152/2006) FORMALDEHYDE *Metodo: EPA TO 11A:1999*	0,07 ± 0,01	-	2,63 ± 0,9	-
Crotonaldeide (Cl.II - Tab.D DLgs n°152/2006) * CROTONALDEHYDE *Metodo: EPA TO 11A 1999*	0,03	-	1	-
Butirraldeide (Cl.III - Tab.D DLgs n°152/2006) * BUTIRRALDEHYDE *Metodo: EPA TO 11A 1999*	0,05	-	1,87	-
Propionaldeide (Cl.III - Tab.D DLgs n°152/2006) * PROPIONALDEHYDE *Metodo: EPA TO 11A 1999*	0,04	-	1,6	-
Glutaraldeide * GLUTARALDEHYDE *Metodo: EPA TO 11A 1999*	< 0,02	-	< 0,69	-
Valeraldeide (Pentanale) * VALERALDEHYDE *Metodo: EPA TO 11A 1999*	0,04	-	1,42	-
Isovaleraldeide * ISOVALERALDEHYDE *Metodo: EPA TO 11A 1999*	0,03	-	1,24	-
Benzaldeide * BENZALDEHYDE *Metodo: EPA TO 11A 1999*	0,02	-	0,9	-
2,5-Dimetilbenzaldeide * 2,5-DIMETHYLBENZALDEHYDE *Metodo: EPA TO 11A 1999*	< 0,02	-	< 0,62	-
Esaldeide * HEXALDEHYDE *Metodo: EPA TO 11A 1999*	0,03	-	1,11	-
o-Tolualdeide * O-TOLUALDEHYDE *Metodo: EPA TO 11A 1999*	< 0,01	-	< 0,55	-
m-Tolualdeide * M-TOLUALDEHYDE *Metodo: EPA TO 11A 1999*	< 0,01	-	< 0,55	-
p-Tolualdeide * P-TOLUALDEHYDE *Metodo: EPA TO 11A 1999*	< 0,01	-	< 0,55	-

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PARAMETRO PARAMETER **Metodo (campionamento - analisi)** METHOD (SAMPLING - ANALYSIS)	**CONCENTRAZIONE**		**FLUSSO DI MASSA**	
	mg/Nm^3	**Valore limite**	**g/h**	**Valore limite**
Totale S.O.V. Cl.I - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	< 0,2	-	< 7,2	-
Totale S.O.V. Cl.I+II - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	1	-	36,1	-
Totale S.O.V. Cl.I+II+III - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II+III *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	1,3	-	49	-
Totale S.O.V. Cl.I+II+III+IV - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II+III+IV *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	2,1	-	77,3	-
Totale S.O.V. Cl.I+II+III+IV+V - Tab.D DLgs n°152/2006 * TOTAL VOLATILE SORGANIC SOLVENT CLASS I+II+III+IV+V *Metodo: DLgs n°152/2006 Parte Quinta All. I Parte I Tab. D*	11,3	-	419,9	-

L'incertezza estesa indicata è espressa come incertezza tipo composta moltiplicata per un fattore di copertura k=2; il livello di confidenza associato a tale intervallo è del 95% (numero di gradi di libertà effettivi>10). THE EXTENDED UNCERTAINTY IS EXPRESSED AS THE COMPOSED ONE, MULTIPLIED FOR A K=2; THE CONFIDENCE LEVEL IS 95%

Il presente rapporto riguarda solo i campioni sottoposti a prova. THIS TEST REPORT REFER EXLUSIVELY TO THE TESTED SAMPLES

Il presente rapporto non può essere riprodotto parzialmente, salvo approvazione scritta del laboratorio di prova. ANY DUPLICATES OF THIS REPORT MUST BE AUTHORIZED

Nelle sommatorie e nelle medie dei dati analitici in concentrazione, per i valori <LOQ (inferiore al limite di quantificazione), si applicano i valori LOQ/2 come previsto dal Rapporto ISTISAN 04/15 del 2004; negli altri casi si applicano i valori LOQ.
AS DEFINITE IN ISTISAN REPORTS, IN SUM AND EVERAGE FOR VALUES <RL ARE APPLIED RL/2 VALUES

* La prova non rientra nell'ambito dell'accreditamento ACCREDIA. THE TEST IS NOT ACCREDITATED BY ACCREDIA

[a] Valore assunto in base alle attività afferenti. ASSUMED VALUE ON PLANT ACTIVITY BASED

Le analisi dei solventi con il metodo UNI CEN/TS 13649:2015, sono state eseguite a seguito di verifica positiva delle efficienze di desorbimento dei principali analiti sul substrato di campionamento. THE SOLVENT ANALISYS WITH METHOD UNI CEN/TS 13649:2015 ARE PERFORMED AFTER EXTRACTION PROCEDURE EFFICENCY POSITIVE CHECK.

Le analisi delle aldeidi con il metodo EPA TO 11A:1999, sono state eseguite a seguito di verifica positiva delle efficienze di desorbimento dei principali analiti sul substrato di campionamento. THE ALDEHYDES ANALISYS WITH METHOD EPA TO 11A:1999 ARE PERFORMED AFTER EXTRACTION PROCEDURE EFFICENCY POSITIVE CHECK.

Il Responsabile Tecnico del Laboratorio
Dr. Alberto Milano

Rapporto di prova firmato digitalmente con profilo di ruolo Infocert dal Responsabile Tecnico del Laboratorio iscritto all'Albo dell'Ordine Interprovinciale dei Chimici del Veneto al numero 881 – Sezione A.

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