



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

**PERMIT DETERMINATION FORM
(PDF)**

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

1. NAME OF APPLICANT (AS REGISTERED WITH THE WV SECRETARY OF STATE'S OFFICE):

M&G Polymers USA, LLC

2. NAME OF FACILITY (IF DIFFERENT FROM ABOVE):

3. NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODE:

3 2 5 2 1 1

4A. MAILING ADDRESS: PO Box 8

Apple Grove, WV 25502

4B. PHYSICAL ADDRESS: 27610 Huntington Rd

Apple Grove, WV 25502

5A. DIRECTIONS TO FACILITY (PLEASE PROVIDE MAP AS ATTACHMENT A):

WV Rt.2 approximately 13 miles south of Pt. Pleasant and 30 miles north of Huntington, WV

5B. NEAREST ROAD:
State Rt. 2

5C. NEAREST CITY OR TOWN:
Apple Grove

5D. COUNTY:
Mason

5E. UTM NORTHING (KM):
4279.97

5F. UTM EASTING (KM):
397.86

5G. UTM ZONE:
17

6A. INDIVIDUAL TO CONTACT IF MORE INFORMATION IS REQUIRED:
Scott Whitwer

6B. TITLE:
QA/ Environmental

6C. TELEPHONE:
304-576-4589

6D. FAX:
304-576-4625

6E. E-MAIL:
Scott.b.whitwer@gruppomgus.com

7A. DAQ PLANT I.D. NO. (FOR AN EXISTING FACILITY ONLY):

0_5_3_ - 0_0_0_5_4_

7B. PLEASE LIST ALL CURRENT 45CSR13, 45CSR14, 45CSR19 AND/OR TITLE V (45CSR30) PERMIT NUMBERS ASSOCIATED WITH THIS PROCESS (FOR AN EXISTING FACILITY ONLY):
R30-05300054-2011

7C. IS THIS PDF BEING SUBMITTED AS THE RESULT OF AN ENFORCEMENT ACTION? IF YES, PLEASE LIST:

8A. TYPE OF EMISSION SOURCE (CHECK ONE):

- NEW SOURCE ADMINISTRATIVE UPDATE
 MODIFICATION OTHER (PLEASE EXPLAIN IN 11B)

8B. IF ADMINISTRATIVE UPDATE, DOES DAQ HAVE THE APPLICANT'S CONSENT TO UPDATE THE EXISTING PERMIT WITH THE INFORMATION CONTAINED HEREIN?

- YES NO

9. IS DEMOLITION OR PHYSICAL RENOVATION AT AN EXISTING FACILITY INVOLVED? YES NO

10A. DATE OF ANTICIPATED INSTALLATION OR CHANGE:

12/14/2015

10B. DATE OF ANTICIPATED START-UP:

12/14/2015

11A. PLEASE PROVIDE A DETAILED PROCESS FLOW DIAGRAM SHOWING EACH PROPOSED OR MODIFIED PROCESS EMISSION POINT AS ATTACHMENT B.

11B. PLEASE PROVIDE A DETAILED PROCESS DESCRIPTION AS ATTACHMENT C.

12. PLEASE PROVIDE MATERIAL SAFETY DATA SHEETS (MSDS) FOR ALL MATERIALS PROCESSED, USED OR PRODUCED AS ATTACHMENT D. FOR CHEMICAL PROCESSES, PLEASE PROVIDE A MSDS FOR EACH COMPOUND EMITTED TO AIR.

13A. REGULATED AIR POLLUTANT EMISSIONS:

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

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

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

POLLUTANT	HOURLY PTE (LB/HR)	YEARLY PTE (TON/YR) (HOURLY PTE MULTIPLIED BY 8760 HR/YR) DIVIDED BY 2000 LB/TON
PM	NA	NA
PM ₁₀	NA	NA
VOCs	<0.01	<0.01
CO	NA	NA
NO _x	NA	NA
SO ₂	NA	NA
Pb	NA	NA
HAPs (AGGREGATE AMOUNT)	<0.01	<0.01
TAPs (INDIVIDUALLY)* Benzene	<0.01	<0.01
OTHER (INDIVIDUALLY)*	NA	NA

* ATTACH ADDITIONAL PAGES AS NEEDED

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

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

14. CERTIFICATION OF DATA

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

SIGNATURE OF RESPONSIBLE OFFICIAL: _____

TITLE: QA / ENVIRONMENTAL MANAGER

DATE: 11/24/2015.

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

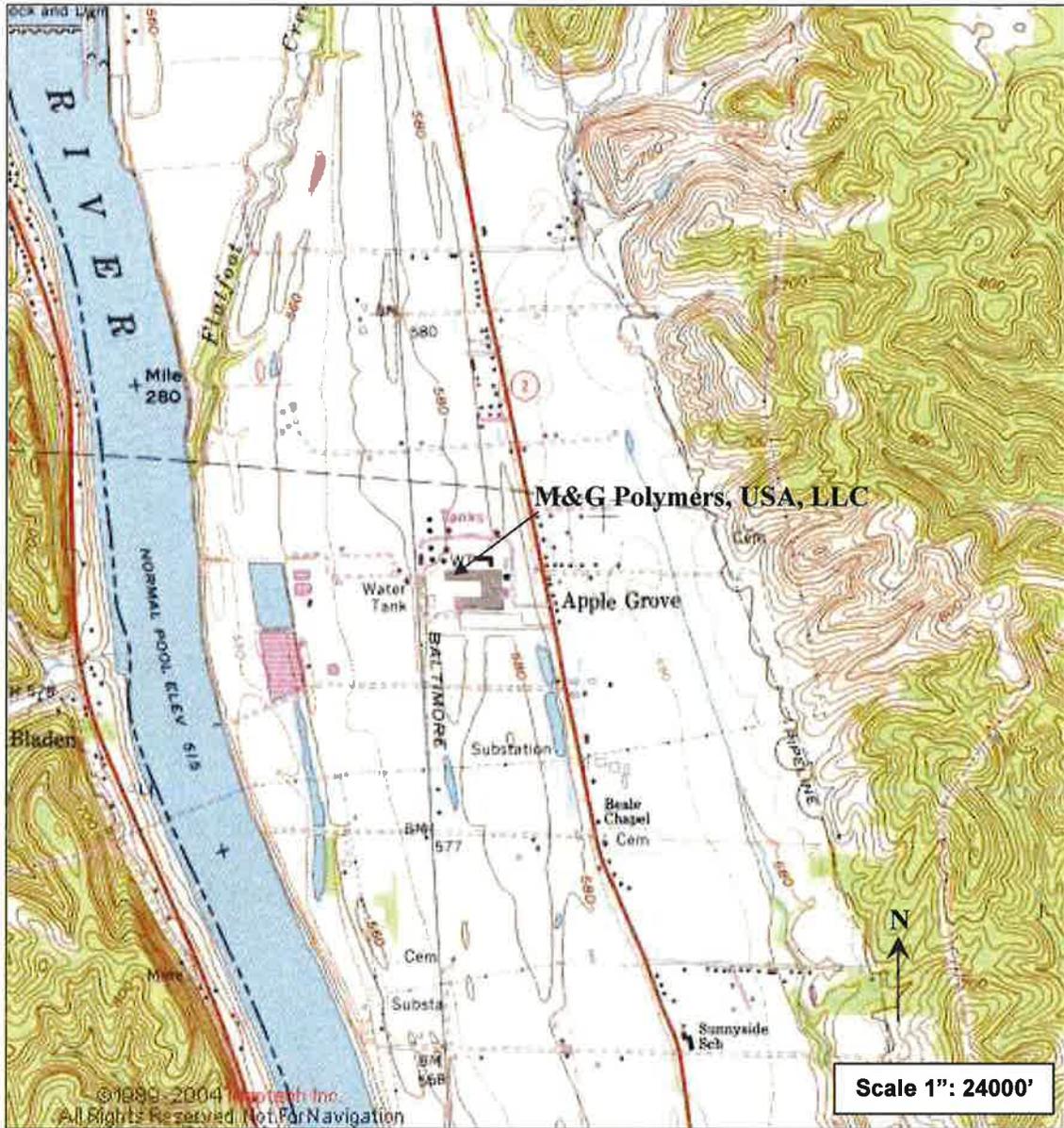
NOTE: PLEASE CHECK ENCLOSED ATTACHMENTS:

ATTACHMENT A ATTACHMENT B ATTACHMENT C ATTACHMENT D ATTACHMENT E

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

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

www.dep.wv.gov/daq



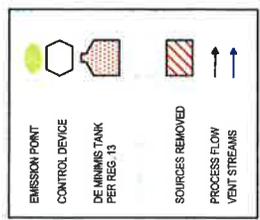
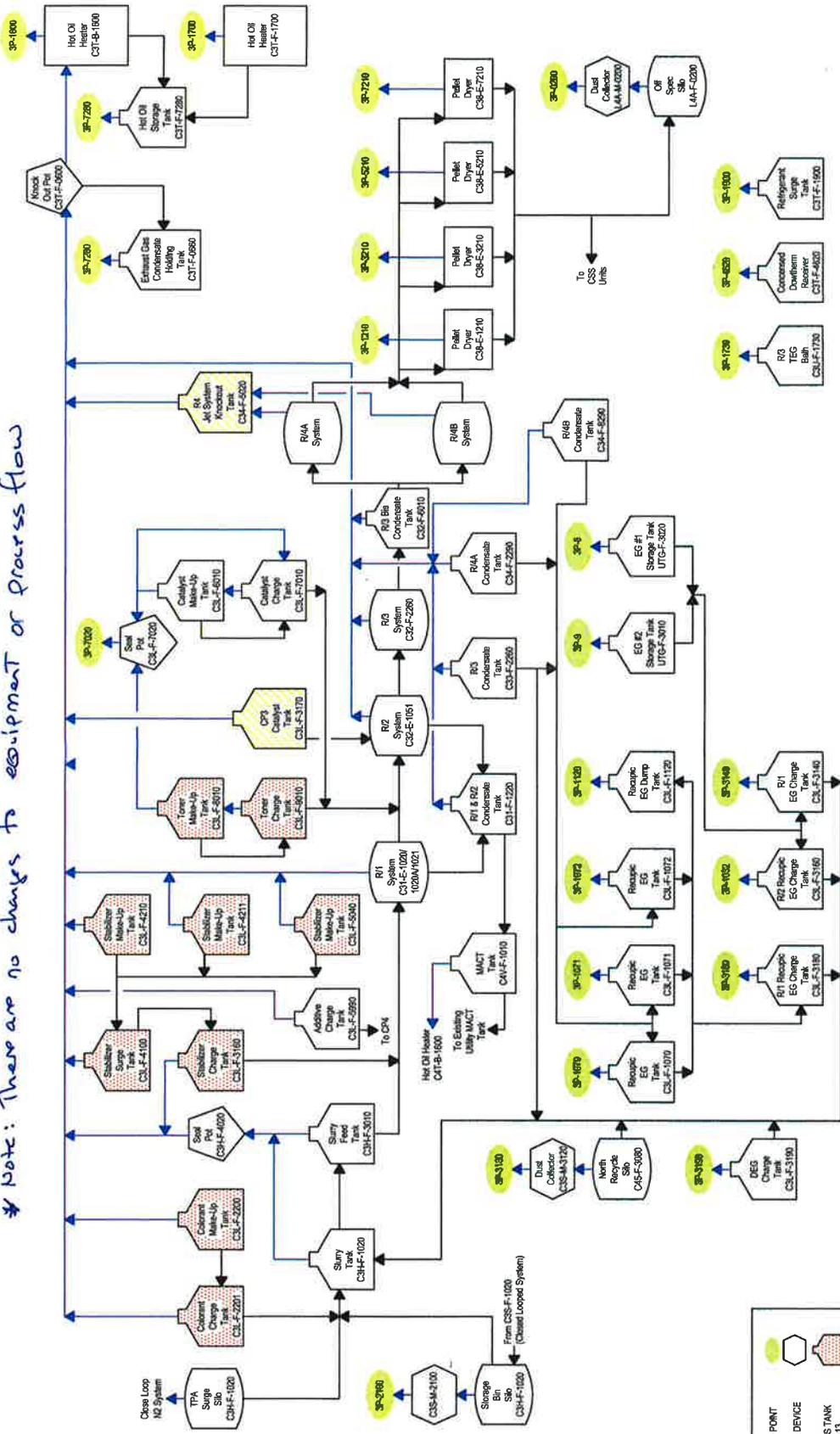
Attachment A

Site Location Map

Attachment B

Process Flow Diagram

* Note: There are no changes to equipment or process flow



M & G Polymers USA, LLC	
M&G APPLE GROVE PLANT	
CP-3 Process Flow Diagram	
October 2015	
Apple Grove, West Virginia	
PROJECT NO.:	540640.00007
REVIEWED BY:	JG
DRAWN BY:	DS
DATE:	10/23/2015

ATTACHMENT C

Process Description

M&G Polymers plans to replace the heat transfer fluid, Therminol 66® with Dowtherm RP ® in the CP-3 unit. The current equipment is designed to accommodate this change. The heat transfer material is used in a closed loop system, and there will no equipment changes (piping or tanks) associated with this change. During normal operations emissions are vented to the Hot Oil Heater (C3T-B-1600) during stripping. Emissions are calculated to be less than 0.01 lb/hr of total HAPs (Total HAPs include: benzene, toluene, ethyl benzene and naphthalene) and less than 0.01 TPY of Total HAPs that could be emitted from emission point 3P-1600.

Attachment D
Safety Data Sheet



SAFETY DATA SHEET

THE DOW CHEMICAL COMPANY

Product name: DOWTHERM™ RP Heat Transfer Fluid

Issue Date: 04/16/2015

Print Date: 06/15/2015

THE DOW CHEMICAL COMPANY encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: DOWTHERM™ RP Heat Transfer Fluid

Recommended use of the chemical and restrictions on use

Identified uses: Intended as a heat transfer fluid for closed-loop systems. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

COMPANY IDENTIFICATION

THE DOW CHEMICAL COMPANY
2030 WILLARD H DOW CENTER
MIDLAND MI 48674-0000
UNITED STATES

Customer Information Number:

800-258-2436

SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-424-9300

Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification

This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Other hazards

no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: Naphthalene, 1,2,3,4-tetrahydro-5-(1-phenylethyl)-

This product is a substance.

Component

CASRN

Concentration

1,2,3,4-Tetrahydro-5-(1-phenylethyl)naphthalene	60466-61-7	>= 85.0 %
1,2,3,4-Tetrahydro-6-(1-phenylethyl)naphthalene	6196-98-1	<= 15.0 %

4. FIRST AID MEASURES

Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin contact: Wash off with plenty of water.

Eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist. Suitable emergency eye wash facility should be available in work area.

Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed

Notes to physician: Maintain adequate ventilation and oxygenation of the patient. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Unsuitable extinguishing media: Do not use direct water stream. May spread fire.

Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Liquid mist of this product can burn. Flammable concentrations of vapor can accumulate at temperatures above flash point; see Section 9.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Do not use direct water stream. May spread fire. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Keep upwind of spill. Ventilate area of leak or spill. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. Spills or discharge to natural waterways is likely to kill aquatic organisms.

Methods and materials for containment and cleaning up: Small spills: Absorb with materials such as: Non-combustible material. Collect in suitable and properly labeled containers. Large spills: Contain spilled material if possible. Dike area to contain spill. Wash the spill site with large quantities of water. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Avoid contact with eyes, skin, and clothing. Avoid breathing vapor. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Store in original container. Store away from incompatible materials. See STABILITY AND REACTIVITY section. Additional storage and handling information on this product may be obtained by calling your sales or customer service contact.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

None established

Exposure controls

Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use chemical goggles.

Skin protection

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Polyvinyl chloride ("PVC" or "vinyl"). Styrene/butadiene rubber. Viton. Examples of acceptable glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR").
NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: When prolonged or frequently repeated contact could occur, use protective clothing chemically resistant to this material. Selection of specific items such as faceshield, boots, apron, or full-body suit will depend on the task.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions, no respiratory protection should be needed; however, if material is heated or sprayed, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Liquid.
Color	Colorless to yellow
Odor	Mild
Odor Threshold	No test data available
pH	Not applicable
Melting point/range	-34 °C (-29 °F) <i>Literature</i>
Freezing point	-34 °C (-29 °F) <i>Literature</i>

Boiling point (760 mmHg)	332 - 355 °C (630 - 671 °F) <i>Literature</i>
Flash point	closed cup 194 °C (381 °F) <i>Pensky-Martens Closed Cup ASTM D 93</i>
Evaporation Rate (Butyl Acetate = 1)	< 0.1 <i>Estimated.</i>
Flammability (solid, gas)	Not applicable to liquids
Lower explosion limit	0.39 % vol <i>Literature</i> Approximately
Upper explosion limit	4.59 % vol <i>Literature</i>
Vapor Pressure	<= 1.0 mmHg at 20 °C (68 °F) <i>Literature</i>
Relative Vapor Density (air = 1)	Not available
Relative Density (water = 1)	1.03 at 16 °C (61 °F) <i>Literature</i>
Water solubility	< 0.01 % at 25 °C (77 °F) <i>Literature</i>
Partition coefficient: n-octanol/water	log Pow: 6.11 <i>Estimated.</i>
Auto-ignition temperature	385 °C (725 °F) <i>ASTM E659</i>
Decomposition temperature	No test data available
Kinematic Viscosity	30.8 cSt at 25 °C (77 °F) <i>Literature</i>
Explosive properties	no data available
Oxidizing properties	no data available
Molecular weight	236.4 g/mol <i>Literature</i>

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: no data available

Chemical stability: Thermally stable at typical use temperatures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Exposure to elevated temperatures can cause product to decompose.

Incompatible materials: Avoid contact with oxidizing materials. Avoid contact with: Mineral acids.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Acute toxicity

Acute oral toxicity

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

LD50, Rat, > 2,000 mg/kg No deaths occurred at this concentration.

Acute dermal toxicity

Prolonged skin contact is unlikely to result in absorption of harmful amounts.

LD50, Rabbit, > 2,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity

At room temperature, exposure to vapor is minimal due to low volatility. If material is heated or aerosol/mist is produced, concentrations may be attained that are sufficient to cause respiratory irritation and other effects. May cause central nervous system effects. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness.

The LC50 has not been determined.

Skin corrosion/irritation

Brief contact is essentially nonirritating to skin.

Prolonged contact may cause skin irritation with local redness.

Repeated exposure may cause irritation, even a burn.

Serious eye damage/eye irritation

May cause moderate eye irritation.

Corneal injury is unlikely.

Sensitization

Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

Repeated skin application to laboratory animals did not produce systemic toxicity.

Carcinogenicity

No relevant data found.

Teratogenicity

Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

Reproductive toxicity

In animal studies, did not interfere with reproduction.

Mutagenicity

In vitro genetic toxicity studies were negative.

Aspiration Hazard

Based on physical properties, not likely to be an aspiration hazard.

COMPONENTS INFLUENCING TOXICOLOGY:

1,2,3,4-Tetrahydro-5-(1-phenylethyl)naphthalene

Acute inhalation toxicity

At room temperature, exposure to vapor is minimal due to low volatility. If material is heated or aerosol/mist is produced, concentrations may be attained that are sufficient to cause respiratory irritation and other effects. May cause central nervous system effects. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness.

The LC50 has not been determined.

1,2,3,4-Tetrahydro-6-(1-phenylethyl)naphthalene

Acute inhalation toxicity

At room temperature, exposure to vapor is minimal due to low volatility. If material is heated or aerosol/mist is produced, concentrations may be attained that are sufficient to cause respiratory irritation and other effects. May cause central nervous system effects. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness.

The LC50 has not been determined.

12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

Toxicity

Acute toxicity to aquatic invertebrates

LC50, Daphnia magna (Water flea), 48 Hour, 0.0225 mg/l

Acute toxicity to algae/aquatic plants

Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species).

EbC50, Pseudokirchneriella subcapitata (green algae), 96 Hour, Biomass, > 0.07 mg/l

Toxicity to bacteria

EC50, activated sludge, 3 Hour, 0.062 mg/l, OECD 209 Test

Persistence and degradability

Biodegradability: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability. Material is inherently biodegradable (reaches > 20% biodegradation in OECD test(s) for inherent biodegradability).

10-day Window: Fail

Biodegradation: 6 %

Exposure time: 28 d

Method: OECD Test Guideline 301B or Equivalent

10-day Window: Not applicable
Biodegradation: > 40 %
Exposure time: 28 d
Method: OECD Test Guideline 302B or Equivalent

Bioaccumulative potential

Bioaccumulation: Bioconcentration potential is high (BCF > 3000 or Log Pow between 5 and 7).
Partition coefficient: n-octanol/water(log Pow): 6.11 Estimated.

Mobility in soil

Expected to be relatively immobile in soil (Koc > 5000).
Partition coefficient(Koc): > 5000 Estimated.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Reclaimer. Incinerator or other thermal destruction device.

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(1,2,3,4-Tetrahydro-5-(1-phenylethyl)naphthalene)
UN number	UN 3082
Class	9
Packing group	III
Marine pollutant	1,2,3,4-Tetrahydro-5-(1-phenylethyl)naphthalene
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Environmentally hazardous substance, liquid, n.o.s.(1,2,3,4-Tetrahydro-5-(1-phenylethyl)naphthalene)
UN number	UN 3082
Class	9

Packing group III

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard

This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Acute Health Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

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

Pennsylvania Worker and Community Right-To-Know Act:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

United States TSCA Inventory (TSCA)

All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard Rating System

NFPA

Health	Fire	Reactivity
1	1	0

Revision

Identification Number: 101199007 / A001 / Issue Date: 04/16/2015 / Version: 9.0

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

THE DOW CHEMICAL COMPANY urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

ATTACHMENT E

Supporting Calculations

M&G Polymers – Dowtherm RP in CP-3

- **Basis:**
 - C3T-F-7640 Hot Oil Tank: 17,700 gal
 - Dowtherm Lights based on Dow Feb 2, 2010 letter
 - 8.13% lights generated per year.

% HAPS in Lights:

- Benzene = 1.3%
- Toluene = 31.6%
- Ethyl Benzene = 6.1%
- Naphthalene = 13.3%
- Other VOC = 47.7%

- Total lbs Dowtherm RP in tank:
 - $17,700 \text{ gal} * 8.34 \text{ lb/gal} * 1.03 = 152,047 \text{ lbs}$

- Total lights in tank:
 - $152,047 \text{ lbs} * 0.0813 = 12,361 \text{ lbs/yr}$ lights generated
 - Benz: $12,361 \text{ lb/yr} * 0.013 = 161 \text{ lbs/yr}$
 - Tol: $12,361 \text{ lb/yr} * 0.316 = 3,906 \text{ lbs/yr}$
 - EB: $12,361 \text{ lb/yr} * 0.061 = 754 \text{ lbs/yr}$
 - Naph: $12,361 \text{ lb/yr} * 0.133 = 1644 \text{ lbs/yr}$
 - Other VOC: $12,361 \text{ lb/yr} * 0.477 = 5,896 \text{ lbs/yr}$ (assume Dowtherm RP)

- Stripping occurs every 2 months for 2 days:
 - $2 \text{ days/event} * 24 \text{ hr/day} * 6 \text{ events/yr} = 288 \text{ hrs/yr}$

- 2 cfm will be used to strip lights:
 - $2 \text{ ft}^3/\text{min} * 60 \text{ min/hr} * 288 \text{ hr/yr} = 34,560 \text{ ft}^3/\text{yr}$

- Properties:
 - Benz VP = 100 mmHg MW = 78 lbs/lbm
 - Tol VP = 36.7 mmHg MW = 92 lbs/lbm
 - EB VP = 10 mmHg MW = 106 lbs/lbm
 - Naph VP = 1 mmHg MW = 128 lbs/lbm
 - DT-RP VP = <1 mmHg MW = ~300 lbs/lbm

Emission Estimate: (All lights accumulate in T66 lights tank)

- Benz: 161 lbs/yr * 1lbm/78lb = 2.1 lbm/yr
- Tol: 3,906 lbs/yr * 1lbm/92lb = 42.5 lbm/yr
- EB: 754 lbs/yr * 1lbm/106lb = 7.1 lbm/yr
- Naph: 1644 lbs/yr * 1lbm/128lb = 12.8 lbm/yr
- Dow RP: 5,896 lbs/yr * 1lbm/300lbs = 19.7 lbm/yr
84.2 lbm/yr

So mole fraction liquid:

- Benz: 2.1 lbm/yr * 1/84.2 = 0.025
- Tol: 42.5 lbm/yr * 1/84.2 = 0.50
- EB: 7.1 lbm/yr * 1/84.2 = 0.084
- Naph: 12.8 lbm/yr * 1/84.2 = 0.15
- Dow RP: 19.7 lbm/yr * 1/84.2 = 0.234

Mole Fraction gas:

- Benz: $0.025 * (100\text{mmHg}/760\text{ mmHg}) = 0.0033 * 34560\text{ft}^3/\text{hr} = 114\text{ ft}^3/\text{hr}$
- Tol: $0.50 * (36.7\text{mmHg}/760\text{ mmHg}) = 0.024 * 34560\text{ft}^3/\text{hr} = 834\text{ ft}^3/\text{hr}$
- EB: $0.084 * (10\text{mmHg}/760\text{ mmHg}) = 0.0011 * 34560\text{ft}^3/\text{hr} = 38\text{ ft}^3/\text{hr}$
- Naph: $0.15 * (1\text{mmHg}/760\text{ mmHg}) = 0.0002 * 34560\text{ft}^3/\text{hr} = 7\text{ ft}^3/\text{hr}$
- Dow RP: $0.234 * (1\text{mmHg}/760\text{ mmHg}) = 0.0003 * 34560\text{ft}^3/\text{hr} = 11\text{ ft}^3/\text{hr}$

Uncontrolled emissions:

- Benz: $114\text{ ft}^3/\text{hr} * (1\text{lbm}/359\text{ ft}^3) * 78\text{ lb}/\text{lbm} = 25\text{ lb}/\text{yr} * 1\text{yr}/288\text{hr} = 0.09\text{ lb}/\text{hr}$
- Tol: $834\text{ ft}^3/\text{hr} * (1\text{lbm}/359\text{ ft}^3) * 92\text{ lb}/\text{lbm} = 214\text{ lb}/\text{yr} * 1\text{yr}/288\text{hr} = 0.74\text{ lb}/\text{hr}$
- EB: $38\text{ ft}^3/\text{hr} * (1\text{lbm}/359\text{ ft}^3) * 106\text{ lb}/\text{lbm} = 11\text{ lbs}/\text{yr} * 1\text{yr}/288\text{hr} = 0.04\text{ lb}/\text{hr}$
- Naph: $7\text{ ft}^3/\text{hr} * (1\text{lbm}/359\text{ ft}^3) * 128\text{ lb}/\text{lbm} = 2.5\text{ lbs}/\text{yr} * 1\text{yr}/288\text{hr} = 0.009\text{ lb}/\text{hr}$
- Dow RP: $11\text{ ft}^3/\text{hr} * (1\text{lbm}/359\text{ ft}^3) * 300\text{ lb}/\text{lbm} = 9.2\text{ lbs}/\text{hr} * 1\text{yr}/288\text{hr} = 0.03\text{ lb}/\text{hr}$

Controlled Emissions: (Heater 99.8% efficient)

- Benz: $0.09\text{ lb}/\text{hr} * (1-0.998) = 0.0018\text{ lb}/\text{hr} * 288\text{ hr}/\text{yr} * 1\text{ton}/2000\text{lbs} = 2.6\text{e}^{-5}\text{ tpy}$
- Tol: $0.74\text{ lb}/\text{hr} * (1-0.998) = 0.0015\text{ lb}/\text{hr} * 288\text{ hr}/\text{yr} * 1\text{ton}/2000\text{lbs} = 0.00021\text{ tpy}$
- EB: $0.04\text{ lb}/\text{hr} * (1-0.998) = 0.00008\text{ lb}/\text{hr} * 288\text{ hr}/\text{yr} * 1\text{ton}/2000\text{lbs} = 1\text{ e}^{-5}\text{ tpy}$
- Naph: $0.009\text{ lb}/\text{hr} * (1-0.998) = 0.00002\text{ lb}/\text{hr} * 288\text{ hr}/\text{yr} * 1\text{ton}/2000\text{lbs} = 3\text{ e}^{-6}\text{ tpy}$
- Dow RP: $0.03\text{ lb}/\text{hr} * (1-0.998) = 0.00006\text{ lb}/\text{hr} * 288\text{ hr}/\text{yr} * 1\text{ton}/2000\text{lbs} = 9\text{ e}^{-6}\text{ tpy}$



The Dow Chemical Company

LARKIN LABORATORY

February 2, 2010

Mr. Gil Rogers
M&G Polymers USA, LLC
State Route 2
Apple Grove, WV 25502

Dear Gil,

Below is an estimate of thermal degradation of our DOWTHERM^{*} RP heat transfer fluid if operated at a 640° F heater exit temperature. As we discussed, this is a simplified model and assumes 24/7 operation 365 days/year. I have included the degradation of DOWTHERM A fluid also since Mark Tompkin asked about it's properties. As you can see, this estimates about 8% low boilers generated from the DOWTHERM RP over the course of the year.

Temperature °F	Volume %	DT-A	DT-RP
680	1	0.018	2.865
640	33	0.002	0.365
590	33	0.000	0.022
325	33	0.000	0.000
System Degradation, %/week		.001	.156
% low boilers, wt%/year		.01	8.13
Fluid life, years		>10	N/A
%high boilers, wt%/year		0.028	0.000

The typical low boilers generated have been analyzed and found to contain the following approximate percentages:

% of Total Low Boilers	
Benzene	1.3
Toluene	31.6
Ethyl Benzene	6.1
C9 compounds	2.4
Naphthalene	13.3
C10-C11 compounds	45.3

We recently received a sample of lights vented from a system containing about 5% lights and the sample contained about 65% lights, with the remainder DOWTHERM RP. As far as the rate of low boilers leaving the expansion tank on venting, that will depend on the nitrogen sweep rate you are using in the headspace of the tank. We recommend a 1-2 scfm sweep rate. At that rate you should have no more than 2 scfm of the lights/DOWTHERM mixture leaving the expansion tank.

Another alternative would be to use the same rate you are currently using on the system. The initial amount of low boilers should not be markedly different from the current system assuming you are waiting for the same level of low boilers to form and sweeping at the same rate. The annual rate should be about 2/3 of the current low boiler generation. For reference, the list below is of measured low boilers generated in partially hydrogenated terphenyl degradation:

Partially Hydrogenated Terphenyl Degradation Products:

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	% of Total Low Boilers
C1-C6 hydrocarbons	14.0
Benzene	11.0
Ethyl benzene	11.9
C9-C11 compounds	10.2
Biphenyl	3.5
C12-C15 compounds	50.4

As you can see, the degradation profile is similar with the exception of more toluene from the DOWTHERM RP fluid and more benzene and light hydrocarbons from the terphenyl fluid.

Mark Tompkin had asked about using DOWTHERM A instead. This would require significant changes to your system. The chart below shows the physical properties of DOWTHERM A and DOWTHERM RP at 640° F.

Temp F 640	Velocity ft/sec 7.0	Pipe ID In 1.000	DT-A	DT-RP
GPM (calc)	17.1			
Viscosity	cP		0.172	0.33
Heat Capacity	Btu/lb F		0.591	0.613
Density	lb/ft ³		47.67	49.69
Thermal Cond.	Btu/hr ft ² F/ft		0.0508	0.0521
Vapor Pressure	Psia		64.952	10.90
Reynolds Number	(Re)		241,609	130,194
Film coefficient	Btu/hr ft ² F		562	440
Pressure drop	psi/100 ft		4.70	5.47
Friction Factor	(f)		0.01560	0.01741

As you can see, the heat transfer of the DOWTHERM A is quite a bit better, but the vapor pressure is 65 psia, or about 80 psig. Your heat exchangers and other process equipment would have to be able to handle that in addition to the pump discharge pressure throughout the system. In addition, the DOWTHERM A fluid freezes at 54° F. This would require heat tracing throughout the system. Finally, the DOWTHERM A has a strong odor with an odor threshold of 1-5 ppb. This means you would smell it quite strongly any time it leaked. Since it was my impression you were looking for a replacement for the existing fluid with as few changes as possible, I do not suggest the DOWTHERM A in our previous meetings. If you are serious about evaluating this, I am happy to discuss it with you.

I hope this gives you enough information to work with. If I have left anything out or you need more information, please let me know.

Regards,

L. W. Budd Lee

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