SAFETY DATA SHEET

Revision Date	**28-Dec-2022**	product code	**TP08**
Version / Revision	**1**	Issuing date	11-Sep-2023
Supersedes Version	--		

Norbornene melt

1: Identification

Product identifier

Identification of the substance/preparation

Norbornene melt

Chemical Name Bicyclo-[2.2.1] hept-2-ene

CAS-No 498-66-8

Recommended uses and restrictions on use

Supplier information

Supplier

Polyplastics USA, Inc.
27240 Haggerty Road, Suite E-20
Farmington Hills, MI 48331
United States

Product Information email: info@topas.com

Emergency telephone number NCEC +1 202 464 2554 available 24/7

2. Hazards identification

2.1. Classification of the substance or mixture

This substance is classified in accordance with paragraph (d) of §1910.1200 (GHS-US classification).

Serious eye damage/eye irritation Category 2A, H319
Reproductive toxicity Category 2, H361
Flammable liquid Category 2, H225
Environmental hazard Aquatic Chronic 2; H411

OSHA Specified Hazards Not applicable.

2.2. Label elements

Revision Date	**28-Dec-2022**	product code **TP08**
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Norbornene melt

Signal word **Warning**

Hazard statements

H225: Highly flammable liquid and vapor.
H319: Causes serious eye irritation.
H361: Suspected of damaging fertility or the unborn child.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof electrical/ ventilating/ lighting equipment.
P242: Use non-sparking tools.
P243: Take precautionary measures against static discharge.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P264: Wash hands thoroughly after handling.
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.

Response

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P370 + P378: In case of fire: Use appropriate media for extinction.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313: If eye irritation persists: Get medical advice/ attention.
P308 + P313: IF exposed or concerned: Get medical advice/ attention.

Storage

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

Disposal

P501: Dispose of contents/container in accordance with local regulation.

2.3. Other hazards

Caution Hot!

3. Composition / Information on ingredients

Component	CAS-No	Concentration (%)
Bicyclo [2.2.1]-hept-2-en	498-66-8	> 98
Toluene	108-88-3	< 2%

4. First aid measures

Norbornene melt

Description of first aid measures

General advice
Remove/Take off immediately all contaminated clothing. Remove contaminated, soaked clothing immediately and dispose of safely. First aider needs to protect himself.

Inhalation
Aerate with fresh air. When symptoms persist or in all cases of doubt seek medical advice.

Eyes
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.

Skin
Wash off immediately with soap and plenty of water. When symptoms persist or in all cases of doubt seek medical advice.

Ingestion
Do not induce vomiting without medical advice. Obtain medical attention.

Most important symptoms and effects, both acute and delayed

Main symptoms
Exposure may result in reddening, tears and itching of the eyes and soreness in the nose and throat, together with coughing, Repeated and prolonged exposure to solvents may cause brain and nervous system damage.

Advice for the rescuer

Wear appropriate personal protective equipment (see section 8) if required

Special note for doctor

Treat symptomatically

5. Firefighting measures

Extinguishing media

Suitable extinguishing media
foam, dry chemical, carbon dioxide (CO2).

Unsuitable Extinguishing Media
Do not use a solid water stream as it may scatter and spread fire.

Special hazards

Vapours are heavier than air and may spread along floors
Under conditions giving incomplete combustion, hazardous gases produced may consist of:
carbon monoxide (CO)
carbon dioxide (CO2)
Combustion gases of organic materials must in principle be graded as inhalation poisons

Fire precautions and protective measures

Keep people away from and upwind of fire
Cool closed containers exposed to fire with water spray
Dike and collect water used to fight fire

Special protective equipment for firefighters
Fire fighter protection should include a self-contained breathing apparatus (NIOSH-approved or EN 133) and full fire-fighting turn out gear.

6. Accidental release measures

Personnel precautions, protective equipment and emergency procedures

Personal precautions
Avoid contact with skin and eyes. Keep away from heat and sources of ignition. Avoid breathing vapors or mists. Ensure adequate ventilation, especially in confined areas. Keep people away from and upwind of spill/leak.
For emergency responders: Personal protection see section 8. For non-emergency personnel: For personal protective equipment see section 8.

Environmental precautions
Prevent further leakage or spillage. Do not flush into surface water or sanitary sewer system.

Methods and material used for collection and disposal of leak

Methods for containment
Stop the flow of material, if possible without risk.

Methods for cleaning up
DO NOT use combustible materials such as sawdust. Soak up with inert absorbent material. Allow to solidify, use mechanical handling equipment. Sweep up or vacuum up spillage and collect in suitable container for disposal. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).

Precautionary measures to prevent the occurrence of secondary disasters

Observe the presence of other hazardous chemicals and potential reactions near site of accident

7. Handling and storage

Handling

Advice on safe handling
Provide sufficient air exchange and/or exhaust in work rooms. Refill and handle product only in closed system.

Hygiene measures
When using, do not eat, drink or smoke Wash hands before breaks and immediately after handling the product

Advice on the protection of the environment
See Section 8: Environmental exposure controls

Incompatible products
Incompatible products:
strong oxidizing agents
acids and bases
radical initiators

Storage

Advice on protection against fire and explosion
Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). Ground and bond containers when transferring material. Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback. Vapours may form explosive mixture with air. In case of fire, emergency cooling with water spray should be available.

Technical measures/Storage conditions
Keep containers tightly closed in a dry, cool and well-ventilated place.

8. Exposure controls / Personal protection

Exposure limits United States of America

US ACGIH

Component	TWA (mg/m³)	TWA (ppm)	STEL (mg/m³)	STEL (ppm)
Toluene CAS: 108-88-3		20		

Component	Asphyxia	Carcinogenic category	Included w/o limits	Exposure as low as possible
Toluene CAS: 108-88-3		A4		

Component	Status
Toluene CAS: 108-88-3	listed

Component	TWA (mg/m³)	TWA (ppm)	Ceiling (mg/m³)	Ceiling (ppm)	Max. conc.	Time
Toluene CAS: 108-88-3		200		300	500 ppm	10MIN

Component	STEL (mg/m³)	STEL (ppm)	REL (mg/m³)	REL (ppm)
Toluene CAS: 108-88-3	560	150	375	100

Component	Potential cancer hazard	Concentration (mg/m³)	Concentration (ppm)	Listed w/o limits

Toluene CAS: 108-88-3			500	

Appropriate Engineering controls
Handle product only in closed system or provide appropriate exhaust ventilation at machinery. Vapors may cause flash fire or explosion.

Personal protective equipment

General industrial hygiene practice
Do not breathe vapours or spray mist. Avoid contact with skin, eyes and clothing. Ensure that eyewash stations and safety showers are close to the workstation location.

Hygiene measures
When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

Respiratory protection
Based on workplace contaminant levels and working limits of the respirator, use a respirator approved by NIOSH

Hand protection
Wear protective gloves. Recommendations are listed below. Other protective material may be used, depending on the situation, if adequate degradation and permeation data is available. If other chemicals are used in conjunction with this chemical, material selection should be based on protection for all chemicals present.
Suitable material Viton

Eye protection
Safety glasses with side-shields. In addition to goggles, wear a face shield if there is a reasonable chance for splash to the face.

Skin and body protection
Impervious clothing.

Thermal Hazard
When handling hot material, use heat resistant gloves.

Environmental exposure controls
Use product only in closed system. If leakage can not be prevented, the substance needs to be suck off at the emersion point, if possible without danger. Inform the responsible authorities in case of leakage into the atmosphere, or of entry into waterways, soil or drains.

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance solid
Colour colourless
Odour pungent
ur threshold No data available

Norbornene melt

pH	No data available
Melting point/freezing point	46 - 47 °C
Boiling point or initial boiling point and boiling range	95 - 96 °C @ 1013 hPa
Flash point	-8 °C
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Lower explosion limit	0,77 Vol %
Upper explosion limit	6,5 Vol %
Vapour pressure	301 hPa @ 59 °C
Relative vapour density	No data available
Density and/or relative density	0.8706 g/cm³ @20°C
Water solubility	0.13 g/l @20°C
Partition coefficient n-octanol/water (log value)	No data available
Autoignition temperature	450 °C
Decomposition temperature	No data available
Viscosity	No data available

9.2. Other information

Molecular weight	94.2

10. Stability and reactivity

Reactivity
The reactivity of the product corresponds to the typical reactivity shown by the substance group as described in any text book on organic chemistry.

Chemical stability
Stable under normal conditions of handling, use and transportation.

Possibility of hazardous reactions
Hazardous polymerisation may occur. Polymerization is a highly exothermic reaction and may generate sufficient heat to cause thermal decomposition and/or rupture containers.

Conditions to avoid
Avoid any source of ignition. Avoid contact with heat, sparks, open flame and static discharge.

Incompatible materials
oxidizing agents, radical initiators, strong acids, strong bases.

Hazardous decomposition products
No decomposition if stored and applied as directed.

11. Toxicological information

Norbornene melt

Main symptoms
Exposure may result in reddening, tears and itching of the eyes and soreness in the nose and throat, together with coughing Repeated and prolonged exposure to solvents may cause brain and nervous system damage

Acute toxicity				
Bicyclo [2.2.1]-hept-2-en (498-66-8)				
Routes of Exposure	Endpoint	Values	Species	Method
Oral	LD50	9577 mg/kg	rat	OECD 401, in vivo
Dermal	LD50	> 4350 ml/kg	rabbit	OECD 402
Inhalative	LC50	> 26,6 mg/l (4h)	rat	OECD 403, in vivo, aerosol

Toluene (108-88-3)				
Routes of Exposure	Endpoint	Values	Species	Method
Oral	LD50	5580 mg/kg	rat	84/449/EEC B.1
Dermal	LD50	12267 mg/kg	rabbit	in vivo
Inhalative	LC50	28 mg/l (4h)	rat	OECD 403 (vapour)

Bicyclo [2.2.1]-hept-2-en, CAS: 498-66-8
Assessment
Based on available data, the classification criteria are not met for:
Acute oral toxicity
Acute dermal toxicity
Acute inhalation toxicity
STOT SE
Toluene, CAS: 108-88-3
Assessment
Based on available data, the classification criteria are not met for:
Acute oral toxicity
Acute dermal toxicity
Acute inhalation toxicity

Irritation and corrosion				
Bicyclo [2.2.1]-hept-2-en (498-66-8)				
Target Organ Effects	Species	Result	Method	
Eyes	rabbit	Low irritating potential severe irritation		
Skin	rabbit	No skin irritation		

Bicyclo [2.2.1]-hept-2-en, CAS: 498-66-8
Assessment
The available data lead to the classification given in section 2

Sensitization

Norbornene melt

Bicyclo [2.2.1]-hept-2-en (498-66-8)				
Target Organ Effects	Species	Evaluation	Method	
Skin	mouse	not sensitizing	OECD 429	

Bicyclo [2.2.1]-hept-2-en, CAS: 498-66-8

Assessment

Based on available data, the classification criteria are not met for:
Skin sensitization

Subacute, subchronic and prolonged toxicity				
Bicyclo [2.2.1]-hept-2-en (498-66-8)				
Type	Dose	Species	Method	
28-day	NOAEL: 500 mg/kg/d	rat, male/female	OECD 422	
90-day	NOAEL: 2,02 mg/l	rat, male/female	OECD 413	

Bicyclo [2.2.1]-hept-2-en, CAS: 498-66-8

Assessment

Based on available data, the classification criteria are not met for:
STOT RE

Carcinogenicity, Mutagenicity, Reproductive toxicity					
Bicyclo [2.2.1]-hept-2-en (498-66-8)					
Type	Dose	Species	Evaluation	Method	
Mutagenicity		V79 cells, Chinese hamster	negative	OECD 473 (Chromosomal Aberration)	In vitro study
Mutagenicity		V79 cells, Chinese hamster	negative	OECD 476 (Mammalian Gene Mutation)	In vitro study
Reproductive toxicity	NOAEL 500 mg/kg/d	rat, parental	negative	OECD 422	
Reproductive toxicity	NOAEL 500 mg/kg/d	rat, 1. Generation, male/female	negative	OECD 422	
Mutagenicity	5000 µg/plate	Salmonella typhimurium	negative	OECD 471 (Ames)	
Reproductive toxicity	NOAEL 300 mg/kg/d	rat	positive	OECD 414, Oral	

Bicyclo [2.2.1]-hept-2-en, CAS: 498-66-8

CMR Classification

not evaluated by:
NTP: (National Toxicity Program)
IARC: (International Agency for Research on Cancer)
OSHA: (Occupational Safety & Health Administration)

Evaluation

Suspected of damaging the unborn child
e absence of specific alerts no cancer testing is required

Norbornene melt

Toluene, CAS: 108-88-3
CMR Classification
Directive 1272/2008/EC, Annex VI: Repr. 2

Bicyclo [2.2.1]-hept-2-en, CAS: 498-66-8
Aspiration toxicity
Due to the viscosity, this product does not present an aspiration hazard

12. Ecological information

Ecotoxicity

Acute aquatic toxicity			
Bicyclo [2.2.1]-hept-2-en (498-66-8)			
Species	Exposure time	Dose	Method
Danio rerio (Zebra fish)	96h	LC50: > 7,5 mg/l	OECD 203
Poecilia retiaculata (guppy)	5 d	EC50: > 40 mg/l	
Daphnia magna (Water flea)	48h	EC50: 7,3 mg/l	OECD 202
Scenedesmus subspicatus	72h	EC50: 9,9 mg/l (Biomass)	OECD 201
Activated sludge (domestic)	3 h	EC50: > 1000 mg/l	OECD 209

Persistence/Degradability

Bicyclo [2.2.1]-hept-2-en, CAS: 498-66-8
Biodegradation
no significant degradation.

Bioaccumulative potential

Bicyclo [2.2.1]-hept-2-en, CAS: 498-66-8
Bioaccumulative potential
log Pow: 4.1

Mobility in soil

Bicyclo [2.2.1]-hept-2-en, CAS: 498-66-8
No data available

Other Adverse Effects

Bicyclo [2.2.1]-hept-2-en, CAS: 498-66-8
No data available

13. Disposal considerations

Norbornene melt

Product Information
Disposal required in compliance with all waste management related state and local regulations. The choice of the appropriate method of disposal depends on the product composition by the time of disposal as well as the local statutes and possibilities for disposal.

Uncleaned empty packaging
Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.

14. Transport information

IMDG

UN/ID No	UN 3176
Proper shipping name	Flammable solid, organic, molten, n.o.s.
Hazard Inducer	(Norbornene)
Class	4.1
Marking	Fish and tree
Packing group	II
Marine pollutant	yes
EmS	F-A, S-H

D.O.T. (49CFR)

UN/ID No	UN 3176
Hazard Inducer	(Norbornene)
Class	4.1
Marking	Fish and tree
Packing group	II
Marine pollutant	yes
Emergency Response Guide	133

15. Regulatory information

Toluene, CAS: 108-88-3
40CFR 63.100-.106, Table 2
40CFR 63.100-.106, Table 1: Group I
Clean Water Act Section 307(a)
CERCLA Hazardous Substance
CERCLA RQ 1000 LBS
EPCRA SARA Title III 313
de minimis concentration 1.0 %
DEA Essential Chemicals: Chemical Code Number: 6594

Toluene, CAS: 108-88-3
CA Hazardous Substances (Director's) List
CA Proposition 65
Text einfügen!
IL Chemical Safety Act
MN Hazardous Substances List

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NJ RTK List
PA RTK List
RI RTK List

International Inventories

Bicyclo [2.2.1]-hept-2-en, CAS: 498-66-8

AICS (AU)
DSL (CA)
NDSL (CA)
EC-No. 2078660 (EU)
ENCS (4)-1763 (JP)
ISHL 7-(2)-108 (JP)
KECI 2012-3-5388 (KR)
PICCS (PH)
TSCA (US)
NZIoC (NZ)

16. Other information

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Training advice
For effective first-aid, special training / education is needed.

Hazard Rating Systems

NFPA (National Fire Protection Association)

Health Hazard	2
Fire Hazard	3
Reactivity	1

HMIS (Hazardous Material Information System)

Health Hazard	2
Flammability	3
Physical Hazard	1

Sources of key data used to compile the datasheet
Information contained in this safety data sheet is based on TOPAS owned data and public sources deemed valid or acceptable. The absence of data elements required by OSHA, ANSI or Annex II, Regulation 1907/2006/EC indicates, that no data meeting these requirements is available.

Further information for the safety data sheet
For more information, consult the Technical Data Sheet (www.topas.com). Observe national and local legal requirements. Changes against the previous version are marked by ***.