

Revision Date 28-Dec-2022*** product code **TP08** 02-Jan-2023 Version / Revision Issuing date

5.00*** Supersedes Version

Norbornene melt

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

1.1. Product identifier

Identification of the substance/preparation

Norbornene melt

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

CAS-No 498-66-8 EC No. 207-866-0

Registration number (REACh) 01-2119635054-0000

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

Identified uses Transported isolated intermediate (1907/2006)

1.3. Details of the supplier of the safety data sheet

TOPAS Advanced Polymers GmbH Company/Undertaking Identification

> Am Prime Parc 9 65479 Raunheim

Germany

Product Information email: info@topas.com

Tel: +49 (0) 69 / 945158 000

1.4. Emergency telephone number

+49 (0)69-305 6418 available 24/7 **Emergency telephone number**

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Flammable liquid Category 2, H225 Serious eye damage/eye irritation Category 2, H319

Reproductive toxicity Category 2, H361

Environmental hazard Aquatic Chronic 2; H411

2.2. Label elements

Hazard pictograms Flame

> **Exclamation mark** Environment Health Hazard



Revision Date 28-Dec-2022*** product code **TP08**Version / Revision 8

Norbornene melt



Signal word

Warning

Hazard statements H225: Highly flammable liquid and vapour.

H319: Causes serious eye irritation.

H411: Toxic to aquatic life with long lasting effects.

H361: Suspected of damaging fertility or the unborn child.

Precautionary statements P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition

sources. No smoking.

P240: Ground and bond container and receiving equipment.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection. P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P313: IF exposed or concerned: Get medical advice/ attention.

P391: Collect spillage.

2.3. Other hazards

Caution Hot!

PBT and vPvB assessment This substance is not considered to be persistent, bioaccumulating nor toxic

(PBT), nor very persistent nor very bioaccumulating (vPvB)

(FBT), Not very persistent not very bloaccumulating (VFVB)

Endocrine disruptingThe substance is not listed on the candidate list according to Art. 59(1), REACh.
The substance was not assessed as having endocrine disrupting properties

according to regulation 2017/2100/EU or 2018/605/EU.

SECTION 3: Composition / information on ingredients

3.1. Substances

Component	CAS-No	1272/2008/EC	Concentration (%)
Bicyclo [2.2.1]-hept-2-en	498-66-8	Flam. Sol. 2; H228 Eye Irrit. 2; H319	> 98



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

Version / Revision 8

Norbornene melt

		Repr. 2; H361 Aquatic Chronic 2; H411 ATE 9577 mg/kg (oral) ATE 4350 mg/kg (dermal) ATE 26,6 (inhalation)	
Toluene	108-88-3	Flam. Liq. 2; H225 Repr. 2; H361d Asp. Tox. 1; H304 STOT RE 2; H373 Skin Irrit. 2; H315 STOT SE 3; H336 Aquatic Chronic 3; H412 ATE 5580 mg/kg (oral) ATE 12267 mg/kg (dermal) ATE 28 (inhalation)	< 2%

SECTION 4: First aid measures

4.1. 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.

Protection of First-aiders

First aider needs to protect himself. For further specification, refer to section 8 of the SDS.

4.2. 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.

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



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

Norbornene melt

Treat symptomatically

Version / Revision

SECTION 5: Firefighting measures

5.1. 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.

5.2. Special hazards arising from the substance or mixture

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

5.3. Advice for firefighters

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.

Precautions for firefighting

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.

SECTION 6: Accidental release measures

6.1. Personal 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 emergency responders. Stay upwind/keep distance from source.

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

Methods for containment

Stop the flow of material, if possible without risk.



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

Version / Revision 8

Norbornene melt

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).

6.4. Reference to other sections

For personal protective equipment see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe 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

7.2. Conditions for safe storage, including any incompatibilities

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.

Storage Class (TRGS510)

3: Flammable liquids

Temperature class

T2

7.3. Specific end use(s)



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

Version / Revision

Norbornene melt

Transported isolated intermediate (1907/2006)

SECTION 8: Exposure controls / personal protection

8.1. Control parameters

Exposure limits European Union

Directive 98/24/EC

Directive 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU

· •					Skin Absorption
Toluene CAS: 108-88-3	192	50	384	100	Yes

Exposure limits UK

EH40 WELs

LI ITO WELS	LI 140 WEE3						
Component	TWA (mg/m³)	TWA (ppm)	STEL (mg/m³)	STEL (ppm)			
Toluene	191	50	384	100			
CAS: 108-88-3							

EH40 WELs and Appendix 5 Carcinogens

Elito WEEs and Appendix 5 Carellogens						
Component	Skin	Asphyxia	Respiratory	included w/o	Carcinogen	
	Absorption		irritant	limits		
Toluene	Yes					
CAS: 108-88-3						

DNEL & PNEC

This substance is registered as intermediate under strictly controlled conditions.

8.2. Exposure controls

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



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

Version / Revision

Norbornene melt

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.

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.

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.

Viton Suitable material

Skin and body protection

Impervious clothing.

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.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance solid Colour colourless Odour pungent

Odour threshold No data available

Melting point/freezing point 46 - 47 °C

95 - 96 °C @ 1013 hPa Boiling point or initial boiling

point and boiling range Flammability (solid, gas) No data available

Lower explosion limit 0,77 Vol % **Upper explosion limit** 6.5 Vol % -8 °C Flash point 450 °C **Autoignition temperature**

Decomposition temperature No data available No data available На

Evaporation rate No data available

0.13 g/l @20°C Water solubility **Partition coefficient** No data available

n-octanol/water (log value)



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

Version / Revision

Norbornene melt

Vapour pressure 301 hPa @ 59 °C

Density and/or relative density 0.8706 g/cm³ @20°C

Relative vapour density No data available

9.2. Other information

Molecular weight 94.2

SECTION 10: Stability and Reactivity

10.1. 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.

10.2. Chemical stability

Stable under normal conditions of handling, use and transportation.

10.3. 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.

10.4. Conditions to avoid

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

10.5. Incompatible materials

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

10.6. Hazardous decomposition products

No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

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		
Dermal	LD50	> 4350 ml/kg	rabbit		
Inhalative	LC50	> 26,6 mg/l (4h)	rat		



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

Version / Revision

Norbornene melt

Toluene (108-88-3)				
Routes of Exposure	Endpoint	Values	Species	Method
Oral	LD50	5580 mg/kg		
Dermal	LD50	12267 mg/kg		
Inhalative	LC50	28 mg/l (4h)		

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-ei	n (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				
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)					
Туре	Dose	Species	Method		
28-day	NOAEL: 500 m	g/kg/d rat, male/female	OECD 422		
90-day	NOAEL: 2,02 m	ng/l rat, male/female	OECD 413		



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

Version / Revision

Norbornene melt

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)					
Туре	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

In the absence of specific alerts no cancer testing is required

Toluene, CAS: 108-88-3 CMR Classification

Directive 1272/2008/EC, Annex VI: Repr. 2

11.2. Information on other hazards

Bicyclo [2.2.1]-hept-2-en (498-66-8)

Endocrine disrupting properties

The substance has not been identified as having endocrine disrupting properties in accordance with section 2.3 The substances contained in this mixture have not been identified as having endocrine disrupting properties in accordance with section 2.3

Toluene (108-88-3)

Endocrine disrupting properties



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

Version / Revision

Norbornene melt

The substance has not been identified as having endocrine disrupting properties in accordance with section 2.3 The substances contained in this mixture have not been identified as having endocrine disrupting properties in accordance with section 2.3

SECTION 12: Ecological information

12.1. Toxicity

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		

12.2. Persistence and degradability

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

Biodegradation

no significant degradation.

12.3. Bioaccumulative potential

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

Bioaccumulative potential

log Pow: 4.1

12.4. Mobility in soil

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

No data available

12.5. Results of PBT and vPvB assessment

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

PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)

12.6. Endocrine disrupting properties



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

Version / Revision

Norbornene melt

The substance has not been identified as having endocrine disrupting properties in accordance with section 2.3. The substance was not assessed as having endocrine disrupting properties according to regulation 2017/2100/EU or 2018/605/EU.

12.7. Other adverse effects

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

No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

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.

SECTION 14: Transport information

ADR/RID

14.1. UN number or ID number UN 3176

14.2. UN proper shipping name

Flammable solid, organic, molten, n.o.s. (Norbornene)

14.3. Transport hazard class(es)

Class 4.1 14.4. Packing group II

14.5. Environmental hazards Fish and tree

14.6. Special precautions for user

ADR Tunnel restriction code (E)
Classification Code F2
Hazard Number 44

14.7. Transport in bulk according to Annex II not applicable*** of MARPOL and the IBC Code

SECTION 15: Regulatory information



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

Version / Revision

Norbornene melt

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

Regulation 1272/2008, Annex VI

Toluene, CAS: 108-88-3

Classification Flam. Liq. 2; H225

Repr. 2; H361d*** Asp. Tox. 1; H304 STOT RE 2*; H373** Skin Irrit. 2; H315 STOT SE 3; H336

Hazard statements H225, H361d***, H304, H373**, H315, H336

DI 2012/18/EU (Seveso III)

Category E2

Component	Status
Bicyclo [2.2.1]-hept-2-en	not subject
CAS: 498-66-8	
Toluene	regulated
CAS: 108-88-3	

National Regulatory Information

German storage class

Storage Class (TRGS510) 3: Flammable liquids

Water hazard class according to AwSV

KBwS Class 1 KBwS Number 2026

Maternity Protection Law The product falls into a hazard category which, in accordance with §11 of the

Maternity Protection Act, suggests an uncontrollable hazard. A risk assessment taking into account §10 and §11 as well as the general provisions of the Maternity Protection Act must be observed. The employment restrictions for the protection of

working mothers (MuschG) must be observed

Youth Employment Protection

Act

The employment restrictions for the protection of young people at work

(JArbSchG) must be observed

Other regulations

Toluene, CAS: 108-88-3 Reg 111/2005/EC DI 96/61/EC (water)



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

Version / Revision

Norbornene melt

Reg. 273/2004/EC, Annex I, Category 3 DI 92/85/EEC

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 (ÙS)

NZIoC (NZ)

Toluene, CAS: 108-88-3

AICS (AU)

DSL (CA)

IECSC (CN)

EC-No. 203-625-9 (EU)

ENCS (3)-2 (JP)

ISHL (3)-2 (JP)

ISHL 2-(8)-869 (JP)

KECI 97-1-298 (KR)

KECI KE-33936 (KR)

INSQ (MX)

PICCS (PH)

TSCA (ÙS)

NZIoC (NZ)

15.2. Chemical safety assessment

The Chemical Safety Assessment (CSR) has been generated (intermediate use under strictly controlled conditions)

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3

H228: Flammable solid.

H319: Causes serious eye irritation.

H411: Toxic to aquatic life with long lasting effects.

H225: Highly flammable liquid and vapour.

H361: Suspected of damaging fertility or the unborn child.

H304: May be fatal if swallowed and enters airways.

H373: May cause damage to organs through prolonged or repeated exposure if inhaled.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

Revision Date 28-Dec-2022***



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

Version / Revision

Norbornene melt

Issuing date 02-Jan-2023

Training advice

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

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 ***.

Disclaimer

This information is based on our present state of knowledge. It shall describe our products regarding safety requirements and shall not be construed as a guarantee or statement of condition and/or quality

End of Safety Data Sheet