

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

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

1.1 Product identifier

Trade name : HARDENER HY 991

Unique Formula Identifier (UFI) : 2453-N0FU-N00Y-WPX2

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

Use of the Substance/Mixture : Hardener

1.3 Details of the supplier of the safety data sheet

Company : Huntsman Advanced Materials (Europe) BV
Address : Grijpenlaan 18
3300 Tienen
Belgium

Telephone : +41 61 299 20 41
Telefax : +41 61 299 20 40

E-mail address of person responsible for the SDS : Global_Product_EHS_AdMat@huntsman.com

1.4 Emergency telephone

Emergency telephone : Berlin: 0049 30 19 24 0 & 0049 30 30 68 6 7 11
Bonn: 0049 228 19 27 0 & 0049 228 28 7 3 32 11
Erfurt: 0049 361 73 07 30
Freiburg: 0049 761 16 24 0
Göttingen: 0049 51 19 24 0 & 0049 551 38 31 80
Homburg: 0049 6841 19 24 0
Mainz: 0049 6131 19 24 0 & 0049 6131 23 24 66
München: 0049 89 19 24 0
Nürnberg: 0049 911 39 8 2 45 1
EUROPE: +32 35 75 1234
France ORFILA: +33(0)145425959
ASIA: +65 6336-6011
China: +86 20 39377888
+86 532 83889090
India: + 91 22 42 87 5333
Australia: 1800 786 152
New Zealand: 0800 767 437
USA: +1 800-424-9300

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Skin corrosion, Sub-category 1C H314: Causes severe skin burns and eye damage.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version	Revision Date:	SDS Number:	Date of last issue: 03.03.2023
1.4	30.07.2024	400001009243	Date of first issue: 09.11.2016

Print Date 24.09.2024

Serious eye damage, Category 1	H318: Causes serious eye damage.
Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Long-term (chronic) aquatic hazard, Category 2	H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements

Labeling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal Word : Danger

Hazard Statements : H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H411 Toxic to aquatic life with long lasting effects.

Precautionary Statements : **Prevention:**
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

Response:

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

P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.

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

P391 Collect spillage.

Hazardous ingredients which must be listed on the label:

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine
2,4,6-tris(dimethylaminomethyl)phenol
Amines, polyethylenepoly-, triethylenetetramine fraction

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Chemical nature : Polyamines

Hazardous ingredients

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine	68082-29-1 Polymer	Skin Irrit. 2; H315 Eye Dam. 1; H318 Aquatic Chronic 2; H411	≥ 70 - < 90
2,4,6-tris(dimethylaminomethyl)phenol	90-72-2 202-013-9 603-069-00-0 01-2119560597-27	Acute Tox. 4; H302 Skin Corr. 1C; H314 Eye Dam. 1; H318	≥ 5 - < 10
Amines, polyethylenepoly-, triethylenetetramine fraction	90640-67-8 292-588-2 01-2119487919-13	Acute Tox. 4; H302 Acute Tox. 4; H312 Skin Corr. 1B; H314 Eye Dam. 1; H318 Skin Sens. 1; H317 Aquatic Chronic 3; H412	≥ 3 - < 5

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice : Move out of dangerous area.
Consult a physician.
Show this material safety data sheet to the doctor in attendance.
Treat symptomatically.
Get medical attention if symptoms occur.

Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing
If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Avoid inhalation, ingestion and contact with skin and eyes.
No action shall be taken involving any personal risk or without

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

- suitable training.
It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.
- In case of skin contact : Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
If on skin, rinse well with water.
If on clothes, remove clothes.
- In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.
- If swallowed : Clean mouth with water and drink afterwards plenty of water.
Keep respiratory tract clear.
Do NOT induce vomiting.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

4.2 Most important symptoms and effects, both acute and delayed

- Risks : May cause an allergic skin reaction.
Causes serious eye damage.
Causes severe burns.

4.3 Indication of any immediate medical attention and special treatment needed

- Treatment : Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

- Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO₂)
Dry chemical
- Unsuitable extinguishing media : Exercise caution when using a high volume water jet as it may scatter and spread fire

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version	Revision Date:	SDS Number:	Date of last issue: 03.03.2023
1.4	30.07.2024	400001009243	Date of first issue: 09.11.2016

Print Date 24.09.2024

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	Carbon oxides Nitrogen oxides (NOx)

5.3 Advice for firefighters

Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Use personal protective equipment. Refer to protective measures listed in sections 7 and 8.
----------------------	---	--

6.2 Environmental precautions

Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
---------------------------	---	---

6.3 Methods and material for containment and cleaning up

Methods for cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.
-------------------------	---	---

6.4 Reference to other sections

For disposal considerations see section 13., See Section 1 for emergency contact information., For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures	:	Ensure that eyewash stations and safety showers are close to the workstation location.
Local/Total ventilation	:	Ensure adequate ventilation.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

- Advice on safe handling : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons. Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.
Do not breathe vapors/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
To avoid spills during handling keep bottle on a metal tray.
Dispose of rinse water in accordance with local and national regulations.
- Advice on protection against fire and explosion : Normal measures for preventive fire protection.
- Hygiene measures : When using do not eat or drink. When using do not smoke.
Wash hands before breaks and at the end of workday.

7.2 Conditions for safe storage, including any incompatibilities

- Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Keep in properly labeled containers.
- Advice on common storage : For incompatible materials please refer to Section 10 of this SDS.
- Storage class (TRGS 510) : 8A
- Recommended storage temperature : 2 - 40 °C
- Further information on storage stability : Stable under normal conditions.

7.3 Specific end use(s)

- Specific use(s) : No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Contains no substances with occupational exposure limit values.

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006

Substance name	End Use	Exposure routes	Potential health effects	Value

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version
1.4

Revision Date:
30.07.2024

SDS Number:
400001009243

Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

2,4,6-tris(dimethylaminomethyl)phenol	Workers	Inhalation	Long-term systemic effects	0,53 mg/m3
	Workers	Inhalation	Acute systemic effects	2,1 mg/m3
	Workers	Dermal	Long-term systemic effects	0,150 mg/kg
	Workers	Dermal	Acute systemic effects	0,600 mg/kg
	Consumers	Inhalation	Long-term systemic effects	0,130 mg/m3
	Consumers	Inhalation	Acute systemic effects	0,130 mg/m3
	Consumers	Dermal	Long-term systemic effects	0,075 mg/kg
	Consumers	Dermal	Acute systemic effects	0,075 mg/kg
	Consumers	Oral	Long-term systemic effects	0,075 mg/kg
Amines, polyethylenepoly-, triethylenetetramine fraction	Workers	Inhalation	Long-term systemic effects	0,54 mg/m3
	Consumers	Inhalation	Long-term systemic effects	0,096 mg/m3
	Consumers	Oral	Long-term systemic effects	14 mg/kg bw/day

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006

Substance name	Environmental Compartment	Value
2,4,6-tris(dimethylaminomethyl)phenol	Fresh water	0,046 mg/l
	Sea water	0,005 mg/l
	Remarks:Assessment Factors	
	Sewage treatment plant	0,262 mg/l
	Remarks:Assessment Factors	
	Freshwater - intermittent	0,46 mg/l
Amines, polyethylenepoly-, triethylenetetramine fraction	Soil	0,025 mg/kg
	Fresh water	0,027 mg/l
	Sea water	0,003 mg/l
	Sewage treatment plant	0,13 mg/l
	Fresh water sediment	8,572 mg/kg dry weight (d.w.)
	Sea sediment	0,857 mg/kg dry weight (d.w.)
	Soil	1,25 mg/kg dry weight (d.w.)

8.2 Exposure controls

Personal protective equipment

Eye/face protection : Eye wash bottle with pure water
Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

problems.

Hand protection

Material : butyl-rubber
Break through time : > 8 h

Material : Ethyl Vinyl Alcohol Laminate (EVAL)
Break through time : > 8 h

Material : Nitrile rubber
Break through time : 10 - 480 min

Remarks : Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).
Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. The suitability for a specific workplace should be discussed with the producers of the protective gloves.

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

Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines
Equipment should conform to EN 14387

Filter type : Combined particulates, ammonia/amines and organic vapor type (AK-P)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state : liquid

Color : amber

Odor : No data is available on the product itself.

Odor Threshold : No data is available on the product itself.

Melting point/freezing point : No data is available on the product itself.

Boiling point : > 200 °C

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

Flammability (solid, gas) : No data is available on the product itself.

Lower explosion limit / Lower flammability limit : No data is available on the product itself.

Upper explosion limit / Upper flammability limit : No data is available on the product itself.

Flash point : 150 °C
Method: Pensky-Martens closed cup, closed cup

Autoignition temperature : No data is available on the product itself.

Decomposition temperature : > 200 °C

pH : 11 - 12

Viscosity
Viscosity, dynamic : 15 - 35 Pas (25 °C)

Solubility(ies)
Water solubility : soluble (20 °C)

Solubility in other solvents : No data is available on the product itself.

Partition coefficient: n-octanol/water : No data is available on the product itself.

Vapor pressure : < 0,008 hPa (25 °C)

Density : 0,95 g/cm³ (25 °C)

Relative density : 0,95 - 0,99

Relative vapor density : No data is available on the product itself.

Particle characteristics : No data is available on the product itself.

9.2 Other information

No data is available on the product itself.

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under normal conditions.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

10.3 Possibility of hazardous reactions

Hazardous reactions : No hazards to be specially mentioned.

10.4 Conditions to avoid

Conditions to avoid : None known.

10.5 Incompatible materials

Materials to avoid : Strong acids and strong bases
Strong oxidizing agents

None known.

10.6 Hazardous decomposition products

No hazardous decomposition products are known.

SECTION 11: Toxicological information

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

Acute toxicity

Not classified due to lack of data.

Product:

Acute oral toxicity : Acute toxicity estimate: > 2 000 mg/kg
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate: > 2 000 mg/kg
Method: Calculation method

Components:

2,4,6-tris(dimethylaminomethyl)phenol:

Acute oral toxicity : LD50 (Rat, male and female): 2 169 mg/kg
Method: OECD Test Guideline 401
Assessment: The component/mixture is low toxic after single ingestion.

Acute dermal toxicity : LD50 (Rat, male): > 1 ml/kg
Assessment: The substance or mixture has no acute dermal toxicity

Amines, polyethylenepoly-, triethylenetetramine fraction:

Acute oral toxicity : LD50 (Rat, male and female): 1 716,2 mg/kg
Method: OECD Test Guideline 401
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute dermal toxicity : LD50 (Rabbit, male and female): 1 465,4 mg/kg
Method: OECD Test Guideline 402
Assessment: The component/mixture is moderately toxic after single contact with skin.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

Skin corrosion/irritation

Causes severe burns.

Product:

Assessment : Corrosive, category 1C - where responses occur after exposures between 1 hour and 4 hours and observations up to 14 days.

Components:

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine:

Assessment : Severe skin irritation

2,4,6-tris(dimethylaminomethyl)phenol:

Species : Rabbit
Method : OECD Test Guideline 404
Result : Corrosive after 1 to 4 hours of exposure

Species : synthetic macromolecular bio-barrier
Method : OECD Test Guideline 435
Result : Corrosive after 1 to 4 hours of exposure

Amines, polyethylenepoly-, triethylenetetramine fraction:

Species : reconstructed human epidermis (RhE)
Assessment : Causes burns.
Method : OECD Test Guideline 435
Result : Corrosive after 3 minutes to 1 hour of exposure

Species : Rabbit
Assessment : Causes burns.
Method : OECD Test Guideline 404
Result : Corrosive after 3 minutes to 1 hour of exposure

Serious eye damage/eye irritation

Causes serious eye damage.

Components:

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine:

Assessment : Risk of serious damage to eyes.

2,4,6-tris(dimethylaminomethyl)phenol:

Species : Rabbit
Assessment : Corrosive
Method : Other guidelines
Result : Corrosive

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

Amines, polyethylenepoly-, triethylenetetramine fraction:

Species : Rabbit
Assessment : Risk of serious damage to eyes.
Method : OECD Test Guideline 405
Result : Irreversible effects on the eye

Respiratory or skin sensitisation

Skin sensitisation

May cause an allergic skin reaction.

Respiratory sensitisation

Not classified due to lack of data.

Components:

2,4,6-tris(dimethylaminomethyl)phenol:

Exposure routes : Skin
Species : Guinea pig
Method : OECD Test Guideline 406
Result : Does not cause skin sensitisation.

Amines, polyethylenepoly-, triethylenetetramine fraction:

Exposure routes : Skin
Species : Guinea pig
Assessment : Probability or evidence of skin sensitisation in humans
Method : OECD Test Guideline 406
Result : Probability or evidence of skin sensitisation in humans

Germ cell mutagenicity

Not classified due to lack of data.

Components:

2,4,6-tris(dimethylaminomethyl)phenol:

Genotoxicity in vitro : Concentration: 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Concentration: 2500 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Amines, polyethylenepoly-, triethylenetetramine fraction:

Genotoxicity in vitro : Test Type: reverse mutation assay
Test system: Salmonella typhimurium and E. coli
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

Result: positive

GLP: yes

Test Type: Micronucleus test

Test system: Human lymphocytes

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 487

Result: negative

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Species: Mouse (male and female)
Cell type: Bone marrow
Application Route: Intraperitoneal injection
Dose: 0 - 600 mg/kg
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity

Not classified due to lack of data.

Components:

Amines, polyethylenepoly-, triethylenetetramine fraction:

Species : Mouse, male
Application Route : Dermal
NOAEL : ≥ 50 mg/kg bw/day
Method : OECD Test Guideline 451
Result : negative

Species : Mouse, male
Application Route : Dermal
Exposure time : 104 weeks
NOAEL : ≥ 20 mg/kg bw/day
Method : OECD Test Guideline 451
Result : negative

Reproductive toxicity

Not classified due to lack of data.

Components:

2,4,6-tris(dimethylaminomethyl)phenol:

Effects on fertility : Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
Remarks: No significant adverse effects were reported

Amines, polyethylenepoly-, triethylenetetramine fraction:

Effects on fetal development : Test Type: Pre-natal
Species: Rat
Application Route: Oral
Dose: 75/325/750 mg/kg bw/day
Duration of Single Treatment: 10 d
General Toxicity Maternal: NOAEL: ≥ 750 mg/kg body weight

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version	Revision Date:	SDS Number:	Date of last issue: 03.03.2023
1.4	30.07.2024	400001009243	Date of first issue: 09.11.2016

Print Date 24.09.2024

Developmental Toxicity: NOAEL: \geq 750 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Test Type: Pre-natal
Species: Rabbit
Application Route: Dermal
Dose: 5/50/125 mg/kg bw/day
Duration of Single Treatment: 13 d
General Toxicity Maternal: NOAEL: 50 mg/kg body weight
Developmental Toxicity: NOAEL: \geq 125 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Reproductive toxicity - Assessment : The reprotoxic effects of Triethylenetetramine (TETA) are under further evaluation as part of the EU REACH program due in part to the aminoethyl ethanolamine (AEEA) content.

STOT-single exposure

Not classified due to lack of data.

STOT-repeated exposure

Not classified due to lack of data.

Repeated dose toxicity

Components:

2,4,6-tris(dimethylaminomethyl)phenol:

Species : Rat, male and female
NOEL : 15 mg/kg
Application Route : Ingestion
Exposure time : 1 032 h
Number of exposures : 7 d
Method : Subacute toxicity

Amines, polyethylenepoly-, triethylenetetramine fraction:

Species : Rat, male and female
NOAEL : 350 mg/kg
Application Route : Oral
Exposure time : 28 d
Number of exposures : 7 d
Dose : 100/350/1000 mg/kg bw/day
Method : OECD Test Guideline 407
Target Organs : Lungs
Remarks : Information given is based on data obtained from similar substances.

Species : Dog, male and female
NOAEL : 125 mg/kg
Application Route : Oral
Target Organs : Lungs
Remarks : Information given is based on data obtained from similar substances.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

Species : Dog, male and female
NOAEL : 50 mg/kg
Application Route : Oral
Method : Subchronic toxicity
Remarks : Information given is based on data obtained from similar substances.

Species : Rat, male and female
NOAEL : 50 mg/kg
Application Route : Oral
Exposure time : 26 weeks
Dose : 50/175/600 mg/kg bw/day
Method : OECD Test Guideline 408
Target Organs : Lungs
Remarks : Information given is based on data obtained from similar substances.

Species : Mouse, male and female
NOAEL : 92 mg/kg, 600 ppm
Application Route : Oral
Exposure time : 120/600/3000 ppm
Method : OECD Test Guideline 408
Remarks : Information given is based on data obtained from similar substances.

Aspiration toxicity

Not classified due to lack of data.

11.2 Information on other hazards

Endocrine disrupting properties

Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

No data available

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

SECTION 12: Ecological information

12.1 Toxicity

Components:

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 1 - 10 ml/l
Exposure time: 96 h

Ecotoxicology Assessment

Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

2,4,6-tris(dimethylaminomethyl)phenol:

Toxicity to fish : LC50 (Cyprinus carpio (Carp)): 175 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates : LC50 (Palaeomonetes vulgaris (Grass shrimp)): 718 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Analytical monitoring: no
Test substance: Sea water

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): 84 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 201

NOEC (Desmodesmus subspicatus (green algae)): 6,25 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 201

Amines, polyethylenepoly-, triethylenetetramine fraction:

Toxicity to fish : LC50 (Poecilia reticulata (guppy)): 570 mg/l
Exposure time: 96 h
Test Type: semi-static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.1.

LC50 (Leuciscus idus (Golden orfe)): 200 - 500 mg/l
Exposure time: 96 h

LC50 (Pimephales promelas (fathead minnow)): 330 mg/l
End point: mortality

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: Fish Acute Toxicity Test

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 31,1 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.2.

Toxicity to algae/aquatic plants : ErC50 (Selenastrum capricornutum (green algae)): 20 mg/l
Exposure time: 72 h
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 201

EC10 (Selenastrum capricornutum (green algae)): 1,34 mg/l
Exposure time: 72 h
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Toxicity to microorganisms : NOEC (Bacteria): \geq 100 mg/l
Exposure time: 28 d
Method: OECD Test Guideline 216

EC50 (Bacteria): $>$ 100 mg/l
Exposure time: 28 h
Method: OECD Test Guideline 216

EC50 (Bacteria): 15,7 mg/l
Exposure time: 2 h
Test Type: static test
Test substance: Fresh water

NOEC (Bacteria): 1,3 mg/l
Exposure time: 2 h
Test Type: static test
Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : EC10: 1,9 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Toxicity to soil dwelling organisms : NOEC: ca. 62,5 mg/kg
Exposure time: 56 d
Species: Eisenia fetida (earthworms)
Method: OECD Test Guideline 222

EC50: $>$ 1 000 mg/kg

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

Exposure time: 56 d
Species: Eisenia fetida (earthworms)
Method: OECD Test Guideline 222

Ecotoxicology Assessment

Chronic aquatic toxicity : Harmful to aquatic life with long lasting effects.

12.2 Persistence and degradability

Components:

2,4,6-tris(dimethylaminomethyl)phenol:

Biodegradability : Test Type: aerobic
Inoculum: activated sludge, non-adapted
Concentration: 2 mg/l
Result: Not biodegradable
Biodegradation: 4 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

Amines, polyethylenepoly-, triethylenetetramine fraction:

Biodegradability : Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 162 d
Method: OECD Test Guideline 301D
Test substance: Fresh water

Test Type: aerobic
Inoculum: activated sludge
Result: Not inherently biodegradable.
Biodegradation: 20 %
Related to: Dissolved organic carbon (DOC)
Exposure time: 84 d
Method: OECD Test Guideline 302A
Test substance: Fresh water

12.3 Bioaccumulative potential

Components:

2,4,6-tris(dimethylaminomethyl)phenol:

Partition coefficient: n-octanol/water : Pow: $\geq 0,219$ (21,5 °C)
log Pow: -0,66 (21,5 °C)
Method: OPPTS 830.7550

Amines, polyethylenepoly-, triethylenetetramine fraction:

Partition coefficient: n-octanol/water : log Pow: -2,08 - 2,90 (20 °C)
Method: QSAR

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version	Revision Date:	SDS Number:	Date of last issue: 03.03.2023
1.4	30.07.2024	400001009243	Date of first issue: 09.11.2016

Print Date 24.09.2024

12.4 Mobility in soil

Components:

Amines, polyethylenepoly-, triethylenetetramine fraction:

Distribution among environmental compartments : Koc: 3162,28, log Koc: 3,5
Method: OECD Test Guideline 106

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties

Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher

12.7 Other adverse effects

Product:

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Dispose of contents and container in accordance with all local, regional, national and international regulations.
Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.

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

SECTION 14: Transport information

14.1 UN number or ID number

ADN : UN 2735
ADR : UN 2735

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

RID : UN 2735
IMDG : UN 2735
IATA : UN 2735

14.2 UN proper shipping name

ADN : POLYAMINES, LIQUID, CORROSIVE, N.O.S.
(2,4,6-TRIS(DIMETHYL AMINOMETHYL)PHENOL)
ADR : POLYAMINES, LIQUID, CORROSIVE, N.O.S.
(2,4,6-TRIS(DIMETHYL AMINOMETHYL)PHENOL)
RID : POLYAMINES, LIQUID, CORROSIVE, N.O.S.
(2,4,6-TRIS(DIMETHYL AMINOMETHYL)PHENOL)
IMDG : POLYAMINES, LIQUID, CORROSIVE, N.O.S.
(2,4,6-TRIS(DIMETHYL AMINOMETHYL)PHENOL)
IATA : Polyamines, liquid, corrosive, n.o.s.
(2,4,6-TRIS(DIMETHYL AMINOMETHYL)PHENOL)

14.3 Transport hazard class(es)

	Class	Subsidiary risks
ADN	: 8	
ADR	: 8	
RID	: 8	
IMDG	: 8	
IATA	: 8	

14.4 Packing group

ADN
Packing group : III
Classification Code : C7
Hazard Identification Number : 80
Labels : 8

ADR
Packing group : III
Classification Code : C7
Hazard Identification Number : 80
Labels : 8
Tunnel restriction code : (E)

RID
Packing group : III
Classification Code : C7
Hazard Identification Number : 80
Labels : 8

IMDG
Packing group : III
Labels : 8
EmS Code : F-A, S-B

IATA (Cargo)

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version 1.4 Revision Date: 30.07.2024 SDS Number: 400001009243 Date of last issue: 03.03.2023
Date of first issue: 09.11.2016

Print Date 24.09.2024

Packing instruction (cargo aircraft) : 856
Packing instruction (LQ) : Y841
Packing group : III
Labels : Corrosive

IATA (Passenger)

Packing instruction (passenger aircraft) : 852
Packing instruction (LQ) : Y841
Packing group : III
Labels : Corrosive

14.5 Environmental hazards

ADN

Environmentally hazardous : yes

ADR

Environmentally hazardous : yes

RID

Environmentally hazardous : yes

IMDG

Marine pollutant : yes(Fatty acids, C18-unsatd., dimers, polymers with tall-oil fatty acids and triethylenetetramine)

14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - List of substances subject to authorisation (Annex XIV) : Not applicable

REACH - Candidate List of Substances of Very High Concern for Authorization (Article 59). : This product does not contain substances of very high concern.

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII) : Conditions of restriction for the following entries should be considered:
Number on list 3

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances. E2 ENVIRONMENTAL HAZARDS

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version	Revision Date:	SDS Number:	Date of last issue: 03.03.2023
1.4	30.07.2024	400001009243	Date of first issue: 09.11.2016

Print Date 24.09.2024

Water hazard class (Germany) : WGK 2 obviously hazardous to water
Classification according to AwSV, Annex 1 (5.2)

Other regulations:

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

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

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

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

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

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

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

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

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

TSCA : All substances listed as active on the TSCA inventory

Inventories

AICS (Australia), AIIC (Australia), DSL (Canada), IECSC (China), ENCS (Japan), KECI (Korea), NZIOC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States of America (USA))

15.2 Chemical Safety Assessment

Chemical Safety Assessments for all substances in this product are either Complete or Not applicable.

SECTION 16: Other information

Full text of H-Statements

H302 : Harmful if swallowed.
H312 : Harmful in contact with skin.
H314 : Causes severe skin burns and eye damage.
H315 : Causes skin irritation.
H317 : May cause an allergic skin reaction.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

HARDENER HY 991

Version	Revision Date:	SDS Number:	Date of last issue: 03.03.2023
1.4	30.07.2024	400001009243	Date of first issue: 09.11.2016

Print Date 24.09.2024

H318 : Causes serious eye damage.
H411 : Toxic to aquatic life with long lasting effects.
H412 : Harmful to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox. : Acute toxicity
Aquatic Chronic : Long-term (chronic) aquatic hazard
Eye Dam. : Serious eye damage
Skin Corr. : Skin corrosion
Skin Irrit. : Skin irritation
Skin Sens. : Skin sensitisation

Further information

Classification of the mixture:

Skin Corr. 1C	H314
Eye Dam. 1	H318
Skin Sens. 1	H317
Aquatic Chronic 2	H411

Classification procedure:

Calculation method
Calculation method
Calculation method
Calculation method

The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

The trademarks above are the property of Huntsman Corporation or an affiliate thereof.

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE.