

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH)



Trade name : Hardener H411
Revision date : 01.06.2022
Print date : 01.06.2022

Version (Revision) : 3.0.0 (2.0.0)

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

1.1 Product identifier

Hardener H411 (H411.21515)

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

Relevant identified uses

Coatings and paints, fillers, putties, thinners. The product is intended for professional use.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier : MONOPOL AG
Street/P.O.Box : Oberrohrdorferstrasse 51
Country code/Postal code/Town/City : 5442 Fislisbach
Telephone : +41 56 484 77 77
Telefax : +41 56 484 77 99
Contact : info@monopol-colors.ch

1.4 Emergency telephone number

+41 44 251 51 51

2. Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP]

Flam. Liq. 3 ; H226 - Flammable liquids : Category 3 ; Flammable liquid and vapour.
Acute Tox. 4 ; H332 - Acute toxicity (inhalative) : Category 4 ; Harmful if inhaled.
Skin Irrit. 2 ; H315 - Skin corrosion/irritation : Category 2 ; Causes skin irritation.
Eye Irrit. 2 ; H319 - Serious eye damage/eye irritation : Category 2 ; Causes serious eye irritation.
Skin Sens. 1 ; H317 - Skin sensitisation : Category 1 ; May cause an allergic skin reaction.
STOT SE 3 ; H335 - STOT-single exposure : Category 3 ; May cause respiratory irritation.
STOT RE 2 ; H373 - STOT-repeated exposure : Category 2 ; May cause damage to organs through prolonged or repeated exposure.

2.2 Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms



Flame (GHS02) · Health hazard (GHS08) · Exclamation mark (GHS07)

Signal word

Warning

Hazard components for labelling

ALIPHATIC POLYISOCYANATE /HDI-BASED ; CAS No. : 28182-81-2
XYLENE ; CAS No. : 1330-20-7
HEXAMETHYLENE-DI-ISOCYANATE ; CAS No. : 822-06-0

Hazard statements

H226 Flammable liquid and vapour.
H373 May cause damage to organs through prolonged or repeated exposure.
H332 Harmful if inhaled.
H315 Causes skin irritation.

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H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

Precautionary statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P501 Dispose of contents/container to

Special rules for supplemental label elements for certain mixtures

EUH204 Contains isocyanates. May produce an allergic reaction.

Additional information

P240 - Ground and bond container and receiving equipment. P241 - Use explosion-proof [electrical/ventilating/lighting/...] equipment. P242 - Use non-sparking tools. P243 - Take action to prevent static discharges. P302+P352 - IF ON SKIN: Wash with plenty of water/.... P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P362+P364 - Take off contaminated clothing and wash it before reuse.

2.3 Other hazards

None

3. Composition/information on ingredients

3.2 Mixtures

Hazardous ingredients

ALIPHATIC POLYISOCYANATE /HDI-BASED ; REACH No. : 01-2119488934-20 ; EC No. : 931-274-8; CAS No. : 28182-81-2

Weight fraction : $\geq 70 - < 75$ %
Classification 1272/2008 [CLP] : Acute Tox. 4 ; H332 Skin Sens. 1 ; H317 STOT SE 3 ; H335

2-METHOXY-1-METHYLETHYL ACETATE ; REACH No. : 01-2119475791-29 ; EC No. : 203-603-9; CAS No. : 108-65-6

Weight fraction : $\geq 10 - < 15$ %
Classification 1272/2008 [CLP] : Flam. Liq. 3 ; H226
Substance with a common (EC) occupational exposure limit value.

XYLENE ; REACH No. : 01-2119488216-32 ; EC No. : 215-535-7; CAS No. : 1330-20-7

Weight fraction : $\geq 10 - < 15$ %
Classification 1272/2008 [CLP] : Flam. Liq. 3 ; H226 Asp. Tox. 1 ; H304 STOT RE 2 ; H373 Acute Tox. 4 ; H312 Acute Tox. 4 ; H332 Skin Irrit. 2 ; H315 Eye Irrit. 2 ; H319 STOT SE 3 ; H335

ETHYLBENZENE ; REACH No. : 01-211955267-33 ; EC No. : 202-849-4; CAS No. : 100-41-4

Weight fraction : $\geq 1 - < 5$ %
Classification 1272/2008 [CLP] : Flam. Liq. 2 ; H225 Asp. Tox. 1 ; H304 STOT RE 2 ; H373 Acute Tox. 4 ; H332

HEXAMETHYLENE-DI-ISOCYANATE ; REACH No. : 01-2119457571-37 ; EC No. : 212-485-8; CAS No. : 822-06-0

Weight fraction : $\geq 0.1 - < 0.5$ %
Classification 1272/2008 [CLP] : Acute Tox. 3 ; H331 Resp. Sens. 1 ; H334 Skin Irrit. 2 ; H315 Skin Sens. 1 ; H317 Eye Irrit. 2 ; H319 STOT SE 3 ; H335 EUH204

Additional information

For full text of Hazard- and EU Hazard-statements: see SECTION 16.

3.3 Additional information

Paint material, solventborne

4. First aid measures

4.1 Description of first aid measures

General information

When in doubt or if symptoms are observed, get medical advice. Never give anything by mouth to an unconscious person or a

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person with cramps.

Following inhalation

Remove casualty to fresh air and keep warm and at rest. Keep at rest. If breathing is irregular or stopped, administer artificial respiration. If unconscious but breathing normally, place in recovery position and seek medical advice.

In case of skin contact

Remove contaminated, saturated clothing immediately. After contact with skin, wash immediately with plenty of water and soap. Do not wash with: Solvents/Thinner

After eye contact

Remove contact lenses, keep eyelids open. In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist.

Following ingestion

Call a physician in any case! Keep at rest. Do NOT induce vomiting.

4.2 Most important symptoms and effects, both acute and delayed

No information available.

4.3 Indication of any immediate medical attention and special treatment needed

None

5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

alcohol resistant foam Extinguishing powder Carbon dioxide (CO₂) Water spray jet

Unsuitable extinguishing media

Full water jet

5.2 Special hazards arising from the substance or mixture

Burning produces heavy smoke.

5.3 Advice for firefighters

Special protective equipment for firefighters

Use suitable breathing apparatus.

5.4 Additional information

Use water spray jet to protect personnel and to cool endangered containers. Do not allow run-off from fire-fighting to enter drains or water courses.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Remove all sources of ignition. Provide adequate ventilation. Do not breathe gas/fumes/vapour/spray. See protective measures under point 7 and 8.

6.2 Environmental precautions

Cover drains. If the product contaminates lakes, rivers or sewages, inform appropriate authorities in accordance with local regulations.

6.3 Methods and material for containment and cleaning up

For cleaning up

Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents). Clean with detergents. Avoid solvent cleaners.

6.4 Reference to other sections

None

7. Handling and storage

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7.1 Precautions for safe handling

Prevent the creation of inflammable or explosive concentrations of vapour in air and avoid vapour concentrations higher than the OEL (=Occupational Exposure Limit). Only use the material in places where open light, fire and other flammable sources can be kept away. Take precautionary measures against static discharges. Wear anti-static footwear and clothing. It is recommended to design all work processes always so that the following is excluded: Skin contact Eye contact Do not breathe gas/fumes/vapour/spray. When using do not eat, drink, smoke, sniff. Comply with the health and safety at work laws. For personal protection see Section 8. Respiratory protection necessary at: spray application

Protective measures

Measures to prevent fire

Vapours are heavier than air, spread along floors and form explosive mixtures with air.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Always close containers tightly after the removal of product. Never use pressure to empty container. Only allow access to authorised staff. Keep away from sources of ignition - No smoking. Always close containers tightly after the removal of product. Soils have to conform to the "Guidelines for avoidance of ignition hazards due to electrostatic charges (TRGS 727)".

Hints on joint storage

Storage class (TRGS 510) (D) : 3

Do not store together with

Do not store together with Acid alkali Oxidizing agent

Further information on storage conditions

Always keep in containers of same material as the original one. See also instructions on the label. Avoid heating and direct sunlight. Keep away from sources of ignition - No smoking. Keep in a cool, well-ventilated place. Keep in a cool, well-ventilated place. Avoid contact with water. Exothermic reaction with: After contact with water: Danger of bursting container.

7.3 Specific end use(s)

None

8. Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values

2-METHOXY-1-METHYLETHYL ACETATE ; CAS No. : 108-65-6

Limit value type (country of origin) : MAK (CH)
Limit value : 275 mg/m³ / 50 ml/m³
Remark : SSC
Version : 22.02.2021

Limit value type (country of origin) : STEL (CH)
Limit value : 275 mg/m³ / 50 ml/m³
Remark : SSC
Version : 22.02.2021

Limit value type (country of origin) : TRGS 900 (D)
Limit value : 50 ppm / 270 mg/m³
Peak limitation : 1(I)
Remark : Y
Version : 06.11.2015

Limit value type (country of origin) : STEL (EC)
Limit value : 100 ppm / 550 mg/m³
Remark : H
Version : 08.06.2000

Limit value type (country of origin) : TWA (EC)
Limit value : 50 ppm / 275 mg/m³
Remark : H
Version : 08.06.2000

XYLENE ; CAS No. : 1330-20-7

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Limit value type (country of origin) : MAK (CH)
Limit value : 435 mg/m³ / 100 ml/m³
Remark : H B
Version : 22.02.2021

Limit value type (country of origin) : STEL (CH)
Limit value : 870 mg/m³ / 200 ml/m³
Remark : H B
Version : 22.02.2021

Limit value type (country of origin) : TRGS 900 (D)
Limit value : 100 ppm / 440 mg/m³
Peak limitation : 2(II)
Remark : H
Version : 06.11.2015

Limit value type (country of origin) : STEL (EC)
Limit value : 100 ppm / 442 mg/m³
Remark : H
Version : 08.06.2000

Limit value type (country of origin) : TWA (EC)
Limit value : 50 ppm / 221 mg/m³
Remark : H
Version : 08.06.2000

ETHYLBENZENE ; CAS No. : 100-41-4

Limit value type (country of origin) : MAK (CH)
Limit value : 220 mg/m³ / 50 ml/m³
Remark : H OL B
Version : 22.02.2021

Limit value type (country of origin) : STEL (CH)
Limit value : 220 mg/m³ / 50 ml/m³
Remark : H OL B
Version : 22.02.2021

Limit value type (country of origin) : TRGS 900 (D)
Limit value : 20 ppm / 88 mg/m³
Peak limitation : 2(II)
Remark : H, Y
Version : 06.11.2015

Limit value type (country of origin) : STEL (EC)
Limit value : 200 ppm / 884 mg/m³
Remark : H
Version : 08.06.2000

Limit value type (country of origin) : TWA (EC)
Limit value : 100 ppm / 442 mg/m³
Remark : H
Version : 08.06.2000

HEXAMETHYLENE-DI-ISOCYANATE ; CAS No. : 822-06-0

Limit value type (country of origin) : TRGS 900 (D)
Limit value : 0.005 ppm / 0.035 mg/m³
Peak limitation : 1/=2=(I)
Remark : Sa
Version : 06.11.2015

Biological limit values

XYLENE ; CAS No. : 1330-20-7

Limit value type (country of origin) : TRGS 903 (D)
Parameter : Xylene / Whole blood (B) / End of exposure or end of shift
Limit value : 1.5 mg/l

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Version : 31.03.2004
Limit value type (country of origin) : TRGS 903 (D)
Parameter : Methylhippuric (toluric) acid (all isomers) / Urine (U) / End of exposure or end of shift
Limit value : 2 g/l
Version : 31.03.2004
ETHYLBENZENE ; CAS No. : 100-41-4
Limit value type (country of origin) : TRGS 903 (D)
Parameter : Ethylbenzene / Whole blood (B) / End of exposure or end of shift
Limit value : 1 mg/l
Version : 31.03.2004
Limit value type (country of origin) : TRGS 903 (D)
Parameter : Mandelic acid plus phenylglyoxylic acid / Urine (U) / End of exposure or end of shift
Limit value : 800 mg/g Creatinine
Version : 31.03.2004

8.2 Exposure controls

Appropriate engineering controls

If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn.

Personal protection equipment

Eye/face protection

Eye glasses with side protection

Skin protection

Hand protection

Tested protective gloves must be worn Use protective skin cream before handling the product.

Body protection

Wear anti-static footwear and clothing Following skin contact Wash immediately with: Water and soap Do not wash with: Solvents/Thinner

Respiratory protection

If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance : Liquid

Colour : colourless

Odour : Like solvent.

Safety characteristics

Initial boiling point and boiling range :	(1013 hPa)	not applicable
Flash point :		38 °C
Vapour pressure :	(50 °C)	not applicable
Density :	(20 °C)	1.1 g/cm ³
Solvent separation test :	(20 °C)	< 3 %
Flow time :	(20 °C)	>= 60 s

DIN-cup 4 mm

9.2 Other information

None

10. Stability and reactivity

10.1 Reactivity

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No information available.

10.2 Chemical stability

No information available.

10.3 Possibility of hazardous reactions

No information available.

10.4 Conditions to avoid

The product is chemically stable under recommended conditions of storage, use and temperature.

10.5 Incompatible materials

Oxidizing agent Exothermic reaction with: Alkali (lye), concentrated. Acid, concentrated. Exothermic reaction with: After contact with water: Danger of bursting container.

10.6 Hazardous decomposition products

When exposed to high temperatures may produce hazardous decomposition products such as carbon monoxide and dioxide, smoke, oxides of nitrogen.

11. Toxicological information

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

Acute toxicity

Acute oral toxicity

Parameter :	LD50 (2-METHOXY-1-METHYLETHYL ACETATE ; CAS No. : 108-65-6)
Exposure route :	Oral
Species :	Rat
Effective dose :	8500 mg/kg
Parameter :	LD50 (XYLENE ; CAS No. : 1330-20-7)
Exposure route :	Oral
Species :	Rat
Effective dose :	8700 mg/kg
Parameter :	LD50 (ETHYLBENZENE ; CAS No. : 100-41-4)
Exposure route :	Oral
Species :	Rat
Effective dose :	3500 mg/kg
Parameter :	LD50 (HEXAMETHYLENE-DI-ISOCYANATE ; CAS No. : 822-06-0)
Exposure route :	Oral
Species :	Rat
Effective dose :	710 mg/kg

Acute dermal toxicity

Parameter :	LD50 (XYLENE ; CAS No. : 1330-20-7)
Exposure route :	Dermal
Species :	Rabbit
Effective dose :	2000 mg/kg
Parameter :	LD50 (ETHYLBENZENE ; CAS No. : 100-41-4)
Exposure route :	Dermal
Species :	Rabbit
Effective dose :	5000 mg/kg
Parameter :	LD50 (HEXAMETHYLENE-DI-ISOCYANATE ; CAS No. : 822-06-0)
Exposure route :	Dermal
Species :	Rabbit
Effective dose :	570 mg/kg

Acute inhalation toxicity

Parameter :	LC50 (2-METHOXY-1-METHYLETHYL ACETATE ; CAS No. : 108-65-6)
Exposure route :	Inhalation
Species :	Rat
Effective dose :	35.7 mg/l
Parameter :	LC50 (XYLENE ; CAS No. : 1330-20-7)

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Exposure route : Inhalation
Species : Rat
Effective dose : 6350 mg/l
Parameter : LC50 (HEXAMETHYLENE-DI-ISOCYANATE ; CAS No. : 822-06-0)
Exposure route : Inhalation
Species : Mouse
Effective dose : 1570 mg/m³

11.2 Information on other hazards

Other adverse effects

Based on the properties of the isocyanate components and considering toxicological data on similar preparations, this preparation may cause acute irritation and/or sensitization of the respiratory system leading to an asthmatic condition, wheeziness and a tightness of the chest. Sensitized persons may subsequently show asthmatic symptoms when exposed to atmospheric concentrations well below the OEL (=Occupational Exposure Limit). Repeated exposure may lead to permanent respiratory disability. Exposure to component solvents vapours concentration in excess of the stated occupational exposure limit may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on kidney, liver and central nervous system. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness. Frequently or prolonged contact with skin may cause dermal irritation. The liquid splashed in the eyes may cause irritation and reversible damage. There no data available on the preparation itself. The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and classified for toxicological hazards accordingly. See Sections 2 and 15 for details.

12. Ecological information

12.1 Toxicity

No information available.

12.2 Persistence and degradability

No information available.

12.3 Bioaccumulative potential

No information available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

The substances in the mixture do not meet the PBT/vPvB criteria according to REACH, annex XIII.

12.6 Endocrine disrupting properties

No information available.

12.7 Other adverse effects

No information available.

12.8 Additional ecotoxicological information

No information available. Do not allow to enter into surface water or drains.

13. Disposal considerations

13.1 Waste treatment methods

Directive 2008/98/EC (Waste Framework Directive)

Contaminated packages must be completely emptied and can be re-used following proper cleaning. Handle contaminated packages in the same way as the substance itself.

14. Transport information

14.1 UN number

UN 1263

14.2 UN proper shipping name

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Land transport (ADR/RID)
PAINT RELATED MATERIAL

Sea transport (IMDG)
PAINT RELATED MATERIAL

Air transport (ICAO-TI / IATA-DGR)
PAINT RELATED MATERIAL

14.3 Transport hazard class(es)

Land transport (ADR/RID)

Class(es) : 3
Classification code : F1
Hazard identification number (Kemler No.) : 30
Tunnel restriction code : D/E
Special provisions : LQ 5 I · E 1 · Transport in containers with max. 450 litres contents are not subject to the regulations of ADR/RID.
Hazard label(s) : 3

Sea transport (IMDG)

Class(es) : 3
EmS-No. : F-E / S-E
Special provisions : LQ 5 I · E 1 · IMDG 2.3.2.5 (<= 450 l)
Hazard label(s) : 3

Air transport (ICAO-TI / IATA-DGR)

Class(es) : 3
Special provisions : E 1
Hazard label(s) : 3

14.4 Packing group

III

14.5 Environmental hazards

Land transport (ADR/RID) : No
Sea transport (IMDG) : No
Air transport (ICAO-TI / IATA-DGR) : No

14.6 Special precautions for user

None

15. Regulatory information

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

EU legislation

Authorisations and/or restrictions on use

Restrictions on use

Regulation (EC) No. 1907/2006 (REACH), Annex XVII (restrictions)

Use restriction according to REACH annex XVII, no. : 3

National regulations

Technische Anleitung Luft (TA-Luft) (D) :

Weight fraction (Number 5.2.5. I) : < 5 %

Water hazard class

Classification according to AwSV - Class (D) : 2 (Obviously hazardous to water)

15.2 Chemical Safety Assessment

No information available.

16. Other information

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16.1 Indication of changes

02. Label elements · 02. Label elements - Additional information · 03. Hazardous ingredients · 08. Occupational exposure limit values

16.2 Abbreviations and acronyms

None

16.3 Key literature references and sources for data

None

16.4 Classification for mixtures and used evaluation method according to regulation (EC) No 1272/2008 [CLP]

No information available.

16.5 Relevant H- and EUH-phrases (Number and full text)

H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H373	May cause damage to organs through prolonged or repeated exposure.

16.6 Training advice

None

16.7 Additional information

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material. We have no knowledge or control over the user's working conditions however. The product may not be used for any purpose other than that specified in chapter 1 unless written consent has been obtained. The user is responsible for the observance of all required statutory provisions.

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.