1. Identification

Product identifier

Trade name: ZZ® 360

This safety data sheet pertains to the following products:
ZZ® 360 Fire Protection Foam

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

General use: Di-/poly-isocyanate component to produce polyurethanes. For industrial purposes only.

Details of the supplier of the safety data sheet

Company name: ZAPP-ZIMMERMANN GmbH
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Emergency telephone number

+49 (0) 221 970 61 555

2. Hazard identification

Classification of the substance or mixture

Skin Irritation - Category 2	Causes skin irritation.
Eye Irritation - Category 2A	Causes serious eye irritation.
Respiratory Sensitizer - Category 1	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Sensitization - skin - Category 1	May cause an allergic skin reaction.
Carcinogenicity - Category 2	Suspected of causing cancer.
Specific Target Organ Toxicity (Single Exposure) - Category 3	May cause respiratory irritation.
Specific Target Organ Toxicity (Repeated Exposure) - Category 2	May cause damage to organs through prolonged or repeated exposure.

Label elements

Symbols:



Signal word: **Danger**

Hazard statements:

Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause respiratory irritation.
Suspected of causing cancer.
May cause damage to organs through prolonged or repeated exposure.

Precautionary statements:

Obtain special instructions before use.
Do not breathe dust/fume/gas/mist/vapors/spray.
Wash hands and face thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves/protective clothing/eye protection/face protection.
In case of inadequate ventilation wear respiratory protection.

IF ON SKIN: Wash with plenty of water/soap.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/attention.
Call a POISON CENTER/doctor if you feel unwell.
Specific treatment (see ' First aid ' on this label).
If skin irritation or rash occurs: Get medical advice/attention.
If eye irritation persists: Get medical advice/attention.
If experiencing respiratory symptoms: Call a POISON CENTER/doctor.
Take off contaminated clothing.

Store in a well-ventilated place. Keep container tightly closed.
Store locked up.

Dispose of contents/container to hazardous or special waste collection point.

Other hazards

Persons with over-sensitive breath ways (e.g. asthma, chronic bronchitis) are not allowed to use the product due to safety regulations.
Vapors and aerosols are the main dangers to the respiratory tract.
Respiratory symptoms may still occur several hours after overexposure.
Special danger of slipping by leaking/spilling product.

3. Composition/information on ingredients

Mixtures

Relevant ingredients:

CAS No.	Designation	Concentration	Classification
CAS 9016-87-9	4,4'-Diphenylmethane disocyanate (isomers, homologues)	< 30 %	Acute Toxicity - inhalative - Category 4. Skin Irritation - Category 2. Eye Irritation - Category 2. Respiratory Sensitizer - Category 1. Sensitization - skin - Category 1. Carcinogenicity - Category 2. Specific Target Organ Toxicity (Single Exposure) - Category 3. Specific Target Organ Toxicity (Repeated Exposure) - Category 2.
trade secret	Catalyst	< 1 %	Acute Toxicity - oral - Category 4. Specific Target Organ Toxicity (Repeated Exposure) - Category 2.
trade secret	Catalyst	< 0.05 %	Skin Corrosion - Category 1B. Eye Damage - Category 1. Sensitization - skin - Category 1B. Specific Target Organ Toxicity (Single Exposure) - Category 1. Specific Target Organ Toxicity (Repeated Exposure) - Category 1. Aquatic toxicity - acute - Category 1. Aquatic toxicity - chronic - Category 1.
trade secret	Polyole	< 100 %	not classified
trade secret	Phosphate	< 100 %	not classified
trade secret	Non-halogen flame retardant	< 100 %	not classified
trade secret	Smoke Suppressant	< 100 %	not classified
CAS 7732-18-5	Water	< 100 %	not classified
trade secret	Polysiloxanes	< 100 %	not classified
trade secret	Drying Agent	< 100 %	not classified

The actual concentration or concentration range is withheld as a trade secret.

4. First aid measures

General information: Immediately remove any wetted clothing, shoes or stockings.

In case of inhalation: Move victim to fresh air; if necessary, provide artificial respiration or oxygen. Do not allow victim to become chilled. Keep victim warm.
Keep victim calm and seek medical attention immediately.
If victim is at risk of losing consciousness, position and transport on their side.

Following skin contact: Immediately clean with water and soap and, if available, apply a generous amount of polyethylene glycol 400. In case of skin reactions, consult a physician.

After eye contact: Immediately flush eyes with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Remove contact lenses, if present and easy to do. Continue rinsing. Afterwards, consult an ophthalmologist immediately.

After swallowing: Rinse mouth. Do not induce vomiting. Immediately get medical attention.

Most important symptoms/effects, acute and delayed

Causes serious eye irritation. Causes skin irritation. May cause an allergic skin reaction. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause damage to organs through prolonged or repeated exposure. May cause respiratory irritation.

Information to physician

Product causes irritation of respiratory tracts and may possibly increase sensitivity of skin and respiratory tracts. Treatment of the acute irritation or bronchial narrowing is mainly symptomatic. Depending on the scale of exposition, as well as aches and pains resulting, long-term medical care may be required.

5. Fire-fighting measures

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media:

Foam, dry chemical powder, carbon dioxide
In case of large fires: also water spray jet

Extinguishing media which must not be used for safety reasons:

strong water jet

Specific hazards arising from the chemical

In case of fire may be liberated: Isocyanate vapors, traces of hydrogen cyanide, nitrous fumes, carbon monoxide

Protective equipment and precautions for firefighters

Wear self-contained breathing apparatus and protective clothing to protect skin and eyes.

Additional information: Heating causes rise in pressure with risk of bursting.
Cool endangered containers with water spray and, if possible, remove from danger zone.
Remove persons not involved upwind.
Do not allow water used to extinguish fire to enter drains, ground or waterways.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Avoid exposure. Keep unprotected people away. Wear appropriate protective equipment.
Provide adequate ventilation. Avoid contact with the substance.
Use a breathing protection against vapors/aerosol.

Environmental precautions:

Do not allow to penetrate into soil, waterbodies or drains.

Methods and material for containment and cleaning up

Methods for clean-up: Take up mechanically, placing in appropriate containers for disposal. Final cleaning.

Additional information: Special danger of slipping by leaking/spilling product.

7. Handling and storage

Precautions for safe handling

Advices on safe handling: Avoid exposure - obtain special instructions before use.
Provide adequate ventilation, and local exhaust as needed.
Airflow should move away from persons.
The effectiveness of the facilities must be checked at regular intervals.
Avoid contact with skin and eyes. Wear appropriate protective equipment.
Do not breathe dust or mist. Work place should be equipped with a shower and an eye rinsing apparatus.

Conditions for safe storage, including any incompatibilities

Requirements for storerooms and containers:
Keep containers tightly closed and at a temperature between 41 °F and 86 °F. Keep in a cool, well-ventilated place. Keep container dry. Protect from humidity and water.

Do not allow the product to enter the ground.

Hints on joint storage: Keep away from food and drinks.

Further details: Use caution when opening containers under pressure.

8. Exposure controls/personal protection

Control parameters

Occupational exposure limit values:

CAS No.	Designation	Type	Limit value
9016-87-9	4,4'-Diphenylmethane disocyanate (isomers, homologues)	USA: NIOSH: Ceiling	0.2 mg/m³; 0.02 ppm
		USA: NIOSH: TWA	0.05 mg/m³; 0.005 ppm
trade secret	Catalyst	USA: ACGIH: STEL	10 mg/m³ (inhalable fraction Aerosol)
		USA: ACGIH: STEL	50 ppm (vapor)
		USA: ACGIH: TWA	25 ppm (vapor)
trade secret	Catalyst	USA: ACGIH: STEL	0.2 mg/m³ (may be absorbed through the skin)
		USA: ACGIH: TWA	0.1 mg/m³ (may be absorbed through the skin)
		USA: IDLH: TWA	25 Sn/m3
		USA: NIOSH: TWA	0.1 mg/m³ (may be absorbed through the skin)
		USA: OSHA: TWA	0.1 mg/m³

Appropriate engineering controls

Provide good ventilation and/or an exhaust system in the work area.

Personal protection equipment (PPE)

Respiratory protection: Respiratory protection must be worn whenever the TLV (WEL) levels have been exceeded.
Filter type: Full-facepiece, air-purifying respirator equipped with a combination organic vapor/N95 filter cartrige.

Hand protection: protective gloves according to OSHA Standard - 29 CFR: 1910.138
Glove material:
Nitrile rubber - NBR >= 0,35 mm
Butyl caoutchouc (butyl rubber) - IIR >= 0,5 mm,
Fluororubber (Viton) - FKM (>= 0,4 mm)
polyvinyl chloride - PVC (>= 0,5 mm).
Breakthrough time: >480 min.
Observe glove manufacturer's instructions concerning penetrability and breakthrough time.

Eye protection: Tightly sealed goggles according to OSHA Standard - 29 CFR: 1910.133 or ANSI Z87.1-2010.

Body protection: Wear suitable protective clothing.

General hygiene considerations:
Avoid exposure - obtain special instructions before use.
Avoid contact with the substance. Do not breathe dust or mist.
Work place should be equipped with a shower and an eye rinsing apparatus.
Wash hands before breaks and after work.
Take off immediately all contaminated clothing.
Keep away from food, drink and animal feedingstuffs.

Environmental exposure controls

Refer to 6.: Section "Environmental precautions".

9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state at 68 °F and 101.3 kPa	liquid
Color:	red brown
Odor:	characteristic
Odor threshold:	No data available
Melting point/freezing point:	not determined
Initial boiling point and boiling range:	not determined
Flammability:	not determined
Explosion limits:	LEL (Lower Explosion Limit): not applicable UEL (Upper Explosive Limit): not applicable
Flash point/flash point range:	not applicable
Evaporation rate:	No data available
Auto-ignition temperature:	not applicable
Decomposition temperature:	No data available
pH:	not applicable
Dynamic viscosity:	not relevant
Water solubility:	practically insoluble
Partition coefficient: n-octanol/water:	not determined
Vapor pressure:	at 77 °F: <= 0.00001 kPa

Density:	approx 1.3 g/mL
Vapor density:	No data available
Particle characteristics:	Not applicable

Additional information

Oxidizing characteristics:	no
Bulk density:	not applicable

10. Stability and reactivity

Reactivity: Reactions with alcohols, amines, liquid acids and bases.
Contact with Water liberates carbon dioxide.

Chemical stability: Stable under recommended storage conditions.

Possibility of hazardous reactions:
No hazardous reaction when handled and stored according to provisions.

Conditions to avoid: No data available

Incompatible materials: Amines, alcohols, water

11. Toxicological information

Information on toxicological effects

Toxicological effects: The statements are derived from the properties of the single components. No toxicological data is available for the product as such.

Acute toxicity (oral): Based on available data, the classification criteria are not met.

Acute toxicity (dermal): Based on available data, the classification criteria are not met.

Acute toxicity (inhalative): Based on available data, the classification criteria are not met.

Skin corrosion/irritation: Skin Irritation - Category 2 = Causes skin irritation.

Serious eye damage/irritation: Eye Irritation - Category 2A = Causes serious eye irritation.

Sensitisation to the respiratory tract: Respiratory Sensitizer -
Category 1 = May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin sensitisation: Sensitization - skin - Category 1 = May cause an allergic skin reaction.

Germ cell mutagenicity/Genotoxicity: Lack of data.

Carcinogenicity: Carcinogenicity - Category 2 = Suspected of causing cancer.

Reproductive toxicity: Lack of data.

Effects on or via lactation: Lack of data.

Specific target organ toxicity (single exposure): Specific Target Organ Toxicity (Single Exposure) - Category 3 = May cause respiratory irritation.

Specific target organ toxicity (repeated exposure): Specific Target Organ Toxicity (Repeated Exposure) -
Category 2 = May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard: Lack of data.

Other information:

Persons with over-sensitive breath ways (e.g. asthma, chronic bronchitis) are not allowed to use the product due to safety regulations.

Information about Diphenylmethane diisocyanate (isomers, homologues):
A long-term studie with rats over two years with mechanically produced, inhalable aerosols (aerodyn. diametre of 95% under 5 µm) of polymer MDI (PMDI) and concentrations of 0.2, 1.0 and 6.0 mg PMDI/m³ showed the following results:
The group of animals exposed to the highest concentration suffered an increased incidence of lung tumours, persistent inflammatory changes to the nose, respiratory tract and lungs, and yellowish deposits in the respiratory tract and lungs.
The animals in the 1.0 mg/m³ group exhibited slight irritation and inflammatory changes to the nose, respiratory tract and lungs, but did not develop lung tumours and/or deposits.
Animals in the 0.2 mg/m³ group suffered no irritation: this concentration was therefore deemed to constitute the 'no-effect level'.

For carcinogenic effects:

Information about Diphenylmethane diisocyanate (isomers, homologues):
Carcinogen Status:

IARC Rating: Group 3

OSHA Carcinogen: not listed

NTP Rating: not listed

Information about Non-halogen flame retardant:
Carcinogen Status:

IARC Rating: Group 3

OSHA Carcinogen: not listed

NTP Rating: not listed

Symptoms

In case of inhalation: Irritation of nose, throat, lung.
Headache, throat dryness, respiratory complaints, chest pressure.
May cause sensitization by inhalation. Susceptible persons may develop ailments and allergic reactions with some delay.
In case of ingestion: May be harmful if swallowed.
After contact with skin:
In case of a prolonged contact tanning and irritating effects may occur.
After eye contact:
Produces for a short time a weak reddening and tumefaction of the conjunctiva as well as a weak, reversible rendering turbid of the cornea.

12. Ecological information

Ecotoxicity

Aquatic toxicity:

Information about Diphenylmethane diisocyanate (isomers, homologues):

Bacterial toxicity: EC50 > 100 mg/L /3h
Daphnia toxicity: EC50 Daphnia magna: > 1000 mg/L /24h
Fish toxicity: LC0 Danio rerio (zebrafish): > 1000 mg/L /96 h.

Persistence and degradability

Further details: Forms carbon dioxide and turns into a hard and insoluble by-product (poly urea) on the water's edge. This reaction is intensified by surface-active substances (e.g. liquid soaps) or water soluble solvents. Based upon current knowledge, poly urea is inert and will not decompose.

Bioaccumulative potential

Partition coefficient: n-octanol/water:

not determined

Mobility in soil

No data available

Other adverse effects

General information: Do not allow to penetrate into soil, waterbodies or drains.

13. Disposal considerations

Waste treatment methods

Product

Recommendation:

Non-reacted state:
ASN 080501*: Waste isocyanates
*= Evidence for disposal must be provided.

Reacted state:
ASN 080410: waste adhesives and sealants other than those mentioned in 08 04 09.

Dispose of waste according to applicable legislation.

Package

Recommendation:

Dispose of waste according to applicable legislation.
Handle contaminated packages in the same way as the substance itself.
Non-contaminated packages may be recycled.

14. Transport information

UN number

DOT, IMDG, IATA-DGR: not applicable

UN proper shipping name

DOT, IMDG, IATA-DGR: Not restricted

Transport hazard class(es)

DOT, IMDG, IATA-DGR: not applicable

Packing group

DOT, IMDG, IATA-DGR: not applicable

Environmental hazards

Marine pollutant: no

Transport in bulk according to IMO instruments

No data available

Special precautions for user

USA: Department of Transportation (DOT)

Proper shipping name: Not restricted

Sea transport (IMDG)

Proper shipping name: Not restricted
Marine pollutant: no

Air transport (IATA)

Proper shipping name: Not restricted

Further information

No dangerous good in sense of these transport regulations.

15. Regulatory information

National regulations - U.S. Federal Regulations

4,4'-Diphenylmethane disocyanate (isomers, homologues):	TSCA Inventory: listed Carcinogen Status: IARC Rating: Group 3 OSHA Carcinogen: not listed NTP Rating: not listed Other Environmental Laws: SARA Title III, Section 313, Toxic Release: NPFAS; De Minimis <=1.0 %; Thresholds 25000/10000 lbs
Catalyst:	TSCA Inventory: listed Clean Air Act: CAA Hazardous Air Pollutants: yes CAA SOCMI Chemical: yes Other Environmental Laws: CERCLA: RQ 5000 lbs. SARA Title III, Section 313, Toxic Release: NPFAS; De Minimis <=1.0 %; Thresholds 25000/10000 lbs NIOSH Recommendations: Occupational Health Guideline: 0272
Catalyst:	TSCA Inventory: listed
Polyole:	TSCA Inventory: listed
Phosphate:	TSCA Inventory: listed; UVCB
Non-halogen flame retardant:	TSCA Inventory: listed
Smoke Suppressant:	TSCA Inventory: listed
Water:	TSCA Inventory: listed
Polysiloxanes:	TSCA Inventory: listed; UVCB
Drying Agent:	Carcinogen Status: IARC Rating: Group 3 OSHA Carcinogen: not listed NTP Rating: not listed

National regulations - U.S. State Regulations

Catalyst: California Proposition 65: developmental
New York Right-To-Know: listed

Further regulations, limitations and legal requirements

No data available

16. Other information

Text for labeling: Contains < 30 % 4,4'-Diphenylmethane disocyanate (isomers, homologues), < 1 % Catalyst, < 0.05 % Catalyst, < 100 % Polyole, < 100 % Phosphate, < 100 % Non-halogen flame retardant, < 100 % Smoke Suppressant, < 100 % Water, < 100 % Polysiloxanes, < 100 % Drying Agent.
Contains Diphenylmethane diisocyanate (isomers, homologues).

Revision date: 11/28/2025

Date of first version: 11/28/2025

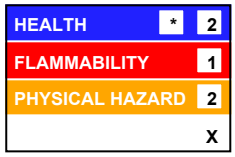
Reason of change: General revision: Safety Data Sheet according to HCS 2024 (29 CFR 1910.1200)

Hazard rating systems:



NFPA Hazard Rating:
Health: 2 (Moderate)
Fire: 1 (Slight)
Reactivity: 2 (Moderate)

HMIS Version III Rating:
Health: 2 (Moderate) - Chronic effects
Flammability: 1 (Slight)
Physical Hazard: 2 (Moderate)
Personal Protection: X = Consult your supervisor



Abbreviations and acronyms:

Acute Toxicity: Acute toxicity
Aquatic toxicity - acute: Hazardous to the aquatic environment - acute
Aquatic toxicity - chronic: Hazardous to the aquatic environment - chronic
AS/NZS: Australian Standards/New Zealand Standards
Carcinogenicity: Carcinogenicity
CAS: Chemical Abstracts Service
CFR: Code of Federal Regulations
CLP: Classification, Labelling and Packaging
DMEL: Derived minimal effect level
DNEL: Derived no-effect level
DOT: Department of Transportation's Safety Regulations (USA)
EC: European Community
EC50: Effective Concentration 50%
EmS: Emergency Response Procedures for Ships Carrying Dangerous Goods
EN: European Standard
EQ: Excepted quantities
Eye Damage: Eye damage
Eye Irritation: Eye irritation
IATA: International Air Transport Association
IATA-DGR: International Air Transport Association – Dangerous Goods Regulations
IBC Code: International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
IMDG Code: International Maritime Dangerous Goods Code
IMO: International Maritime Organization
LC0: Lethal concentration 0%
LEL: Lower Explosion Limit
MARPOL: Maritime Pollution: The International Convention for the Prevention of Pollution from Ships
OEL: Occupational Exposure Limit Value
OSHA: Occupational Safety and Health Administration
PBT: Persistent, bioaccumulative and toxic
PNEC: Predicted no-effect concentration
Respiratory Sensitizer: Sensitisation to the respiratory tract
Sensitization - skin: Skin sensitisation
Skin Corrosion: Skin corrosion
Skin Irritation: Skin irritation
STOT RE: Specific target organ toxicity - repeated exposure
STOT SE: Specific target organ toxicity - single exposure
TLV: Threshold Limit Value
TRGS: Technical Rules for Hazardous Substances
vPvB: Very persistent and very bioaccumulative
WEL: Workplace Exposure Limit

Department issuing data sheet

Contact person: see section 1: Department responsible for information