

1 Identification

- **Product identifier**
 - *Product number* TX72
 - *Trade name:* **HARDENER**
 - *Application of the substance / the mixture* For professional use
- **Details of the supplier of the safety data sheet**
 - *Manufacturer/Supplier:*
IVM Chemicals Srl
Viale della Stazione 3 -27020 Parona (PV)Italy -Tel +39 038425441
 - *Information department:*
Environmental Health and safety office
hseoffice@ivmchemicals.com
 - *Emergency telephone number:*
ChemTel Expert Assistance Hotline/SDS Fax Access by dialing 1-800-255-3924 or for International +1-813-248-0585.

2 Hazard(s) identification

- **Classification of the substance or mixture**

Flammable Liquids 2	H225 Highly flammable liquid and vapor.
Eye Irritation 2A	H319 Causes serious eye irritation.
Sensitization - Skin 1	H317 May cause an allergic skin reaction.
Specific Target Organ Toxicity - Single Exposure 3H336	May cause drowsiness or dizziness.

· Label elements

- *GHS label elements*
The product is classified and labeled according to the Globally Harmonized System (GHS).

- *Hazard pictograms*



GHS02 GHS07

- *Signal word* Danger

- *Hazard-determining components of labeling:*

Polyisocyanate HDI/TDI
n-butyl acetate
ethyl acetate

- *Hazard statements*

H225 Highly flammable liquid and vapor.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H336 May cause drowsiness or dizziness.

- *Precautionary statements*

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

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· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



· **HMIS-ratings (scale 0 - 4)**



3 Composition/information on ingredients

· **Chemical characterization: Mixtures**

· **Description:** Mixture: consisting of the following components.

· **Dangerous components:**

123-86-4	n-butyl acetate ⚠ Flammable Liquids 3, H226 ⚠ Specific Target Organ Toxicity - Single Exposure 3, H336	40-49.99%
141-78-6	ethyl acetate ⚠ Flammable Liquids 2, H225 ⚠ Eye Irritation 2A, H319; Specific Target Organ Toxicity - Single Exposure 3, H336	30-39.99%
26426-91-5	Polyisocyanate HDI/TDI ⚠ Eye Irritation 2A, H319; Sensitization - Skin 1, H317	20-24.99%
822-06-0	hexamethylene diisocyanate ⚠ Acute Toxicity - Inhalation 1, H330 ⚠ Sensitization - Respiratory 1, H334 ⚠ Acute Toxicity - Oral 4, H302; Skin Irritation 2, H315; Eye Irritation 2A, H319; Sensitization - Skin 1, H317; Specific Target Organ Toxicity - Single Exposure 3, H335	<0.1%
26471-62-5	m-tolyldiene diisocyanate ⚠ Acute Toxicity - Inhalation 1, H330 ⚠ Sensitization - Respiratory 1, H334; Carcinogenicity 2, H351 ⚠ Skin Irritation 2, H315; Eye Irritation 2A, H319; Sensitization - Skin 1, H317; Specific Target Organ Toxicity - Single Exposure 3, H335 Aquatic Chronic 3, H412	<0.1%

4 First-aid measures

· **Description of first aid measures**

· **General information:**

Immediately remove any clothing soiled by the product.

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

personal protective equipment for first aid responders is recommended. (please see section 8)

· **After inhalation:**

Supply fresh air and to be sure call for a doctor.

In case of unconsciousness place patient stably in side position for transportation.

· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.

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- **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- **After swallowing:** Do not induce vomiting; immediately call for medical help.
- **Information for doctor:**
 - **Most important symptoms and effects, both acute and delayed**
Allergic reactions
For symptoms and effects caused by substances, refer to Section 11.
 - **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

- **Extinguishing media**
 - **Suitable extinguishing agents:**
Alcohol resistant foam
Alcohol resistant foam, CO, powder, water spray/mist.
 - **For safety reasons unsuitable extinguishing agents:**
Do not use a jet water stream as it may scatter and spread fire.
- **Special hazards arising from the substance or mixture**
In case of fire, the following can be released:
Nitrogen oxides (NO_x)
Carbon monoxide (CO)
- **Advice for firefighters**
Cool by spraying with water the containers to prevent product decomposition and the development of substances potentially hazardous for health and also, in the case of closed containers exposed to flames to prevent explosions.
 - **Protective equipment:**
Hardhat with visor, fireproof clothing, suitable gloves and if necessary respiratory protective device.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Keep away from ignition sources
- **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to Section 13.
Ensure adequate ventilation.
- **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
- **Protective Action Criteria for Chemicals**

· PAC-1:		
123-86-4	n-butyl acetate	5 ppm
141-78-6	ethyl acetate	1,200 ppm
· PAC-2:		
123-86-4	n-butyl acetate	200 ppm

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141-78-6	ethyl acetate	1,700 ppm
· PAC-3:		
123-86-4	n-butyl acetate	3000* ppm
141-78-6	ethyl acetate	10000** ppm

7 Handling and storage

· Handling:

· Precautions for safe handling

Ensure good ventilation/exhaustion at the workplace.

Prevent formation of aerosols.

Protect against electrostatic charges.

Use explosion-proof apparatus / fittings and spark-proof tools.

· Information about protection against explosions and fires:

Keep ignition sources away - Do not smoke.

Protect against electrostatic charges.

· Conditions for safe storage, including any incompatibilities

· Storage:

· Requirements to be met by storerooms and receptacles:

Store in a cool, well-ventilated area, away from heat and sources of ignition

Provide solvent resistant, sealed floor.

Observe the label precautions, the expiration date for the use, if not indicated, is from delivery date of goods.

In cases where there is no reported expiration date, it means that the product must be used within 8 months.

· Information about storage in one common storage facility: Not required.

· Further information about storage conditions:

Keep receptacle tightly sealed.

Store in cool, dry conditions in well sealed receptacles.

· Specific end use(s) Those typical of the product and the instructions in the data sheet if required.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see section 7.

· Control parameters

· Components with limit values that require monitoring at the workplace:

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.

At this time, the remaining constituent has no known exposure limits.

123-86-4 n-butyl acetate

PEL Long-term value: 710 mg/m , 150 ppm

REL Short-term value: 950 mg/m , 200 ppm

Long-term value: 710 mg/m , 150 ppm

TLV Short-term value: 150 ppm

Long-term value: 50 ppm

141-78-6 ethyl acetate

PEL Long-term value: 1400 mg/m , 400 ppm

REL Long-term value: 1400 mg/m , 400 ppm

TLV Long-term value: 400 ppm

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822-06-0 hexamethylene diisocyanate

REL Long-term value: 0.035 mg/m , 0.005 ppm
 Ceiling limit value: 0.14* mg/m , 0.02* ppm
 *10-min

TLV Long-term value: 0.005 ppm
 BEI

26471-62-5 m-tolylidene diisocyanate

PEL Ceiling limit value: 0.14 mg/m , 0.02 ppm

REL LFC

TLV Short-term value: (0.14) NIC-0.021* mg/m , (0.02) NIC-0.003* ppm
 Long-term value: (0.036) NIC-0.007* mg/m , (0.005) NIC-0.001* ppm
 *(IFV) SEN; NIC-Skin; A3

- **Regulatory information**

PEL: Guide to Occupational Exposure Values (OSHA PELs)

REL: Guide to Occupational Exposure Values (NIOSH RELs)

TLV: Guide to Occupational Exposure Values (TLV)

- **Ingredients with biological limit values:**

822-06-0 hexamethylene diisocyanate

BEI 15 g/g creatinine

Medium: urine

Time: end of shift

Parameter: 1.6-Hexamethylene diamine with hydrolysis (nonspecific)

- **Regulatory information BEI:** Guide to Occupational Exposure Values (BEI)

- **Additional information:** The lists that were valid during the creation were used as basis.

- **Exposure controls**

- **Personal protective equipment:**

- **General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Avoid contact with the eyes and skin.

- **Breathing equipment:**

Short term filter device:



Suitable respiratory protective device recommended.

Filter A

- **Protection of hands:**



Protective gloves

Due to missing tests no recommendation to the glove material can be given for the product.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

The glove material has to be impermeable and resistant to the product .

- **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

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- **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

· Information on basic physical and chemical properties

· General Information

- **Color:** According to product specification
- **Odor:** Characteristic
- **Odor threshold:** Not determined.

· **pH-value:** Mixture is non-polar/aprotic.

· Change in condition

- **Melting point/Melting range:** Undetermined.
- **Boiling point/Boiling range:** 77 °C (170.6 °F)

· **Flash point:** -4 °C (24.8 °F)

· **Flammability (solid, gaseous):** Highly flammable.

· **Auto igniting:** 370 °C (698 °F)

· **Decomposition temperature:** Not determined.

· **Danger of explosion:** Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

· Explosion limits:

- **Lower:** 1.2 Vol %
- **Upper:** 11.5 Vol %

· **Vapor pressure at 20 °C (68 °F):** 97 hPa (72.8 mm Hg)

· **Vapor pressure at 50 °C (122 °F):** 360 hPa (270 mm Hg)

· **Density (+/- 0,03) at 20 °C (68 °F):** 0.975 g/cm (8.136 lbs/gal)

- **Relative density** Not determined.
- **Vapor density** Not determined.
- **Evaporation rate** Not determined.

· Solubility in / Miscibility with

- **Water:** Not miscible or difficult to mix.

· **Partition coefficient (n-octanol/water):** Not determined.

· Viscosity:

- **Dynamic:** Not determined.
- **Kinematic at 20 °C (68 °F):** 29 s (ISO 3 mm)
- **Oxidising properties:** N.A.

· Solvent content:

- **VOC content:** 75.40 %
735.2 g/l / 6.14 lb/gal

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· Solids content:		24.5 %
· Other information (HAPS)		
822-06-0	hexamethylene diisocyanate	<0.1%
26471-62-5	m-tolylidene diisocyanate	<0.1%

10 Stability and reactivity

- **Reactivity** typical of the product as indicated in the data sheet
- **Chemical stability** The product is stable in normal conditions of storage and use recommended
 - **Thermal decomposition / conditions to be avoided:**
No decomposition if used and stored according to specifications.
- **Possibility of hazardous reactions** Vapours may form explosive mixtures with air
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** Acids, alkalis and oxidizing agents
- **Hazardous decomposition products:**

in case of possible formation of combustion:
 Carbon monoxide and carbon dioxide

11 Toxicological information

- **Information on toxicological effects**
 - **Acute toxicity:**

· LD/LC50 values that are relevant for classification:		
123-86-4 n-butyl acetate		
Oral	LD50	10,760 mg/kg (mouse)
Dermal	LD50	14,000 mg/kg (rabbit)
Inhalative	LC50/4 ore/h/saat	21.1 mg/l (mouse)
141-78-6 ethyl acetate		
Oral	LD50	4,934 mg/kg (rabbit)
Dermal	LD50	20,001 mg/kg (rabbit)
Inhalative	LC50/4 ore/h/saat	1,600 mg/l (mouse)
	LC0	22.6 ppm (mouse)
26426-91-5 Polyisocyanate HDI/TDI		
Oral	LD50	5,001 mg/kg (mouse)
822-06-0 hexamethylene diisocyanate		
Oral	LD50	738 mg/kg (mouse)
Dermal	LD50	7,001 mg/kg (rabbit)
Inhalative	LC50/4 ore/h/saat	0.124 mg/l (mouse)
26471-62-5 m-tolylidene diisocyanate		
Oral	LD50	5,110 mg/kg (mouse)
Dermal	LD50	9,401 mg/kg (rabbit)
Inhalative	LC50/4 ore/h/saat	0.107 mg/l (mouse)

- **Primary irritant effect:**
 - **on the skin:** No irritant effect.
 - **on the eye:** Irritating effect.

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- **Sensitization:** Sensitization possible through skin contact.
- **Additional toxicological information:**
 - Irritant
 - Causes serious eye irritation.
 - May cause an allergic skin reaction.
 - May cause drowsiness or dizziness.
 - Contains isocyanates. See information supplied by the manufacturer.
 - As from 24 August 2023 adequate training is required before industrial or professional use.

- **Carcinogenic categories**

- **IARC (International Agency for Research on Cancer - Cl. 1 and 2)**

26471-62-5	m-tolyldiene diisocyanate	2B
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- **NTP (National Toxicology Program)**

26471-62-5	m-tolyldiene diisocyanate	<0.1%
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- **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

- **Sensitisation**

Monomers / polymers isocyanate
 Particular characteristics / effects; prolonged exposure may irritate the eyes, nose, throat and respiratory tract.
 Isocyanate exposure may result in the delayed appearance of respiratory disorders, cough or asthma. Sensitive individuals may show exposure symptoms to isocyanates below workplace TLV values. Prolonged skin contact may result cause irritation and dehydration.

12 Ecological information

- **Toxicity**

- **Aquatic toxicity:**

123-86-4 n-butyl acetate

EC50	397 mg/l (algae) (72 h)
	44 mg/l (daphnia) (48 h)
LC50 (96 ore/h/saat)	18 mg/l (Fish)

141-78-6 ethyl acetate

EC50	165 mg/l (daphnia) (48 h)
LC50 (96 ore/h/saat)	230 mg/l (Fish)

822-06-0 hexamethylene diisocyanate

EC50	77.5 mg/l (algae) (72 h)
	89.2 mg/l (daphnia) (48 h)
LC50 (96 ore/h/saat)	82.9 mg/l (Fish)

26471-62-5 m-tolyldiene diisocyanate

EC50	12.5 mg/l (daphnia) (48h)
LC50 (96 ore/h/saat)	133 mg/l (Leuciscus idus melanotus)

- **Persistence and degradability** No further relevant information available.

- **Substances Easily biodegradable**

123-86-4	n-butyl acetate	.
141-78-6	ethyl acetate	.

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· **Behavior in environmental systems:**

· **Bioaccumulative potential**

123-86-4	n-butyl acetate	Coefficiente di ripartizione n-ottanolo/acqua (Log Kow): 2,3
141-78-6	ethyl acetate	Coefficiente di ripartizione n-ottanolo/acqua (Log Kow): 0,68

· **Mobility in soil**

141-78-6	ethyl acetate	Basso potenziale di adsorbimento nel suolo
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· **Additional ecological information:**

· **General notes:**

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**

· **Recommendation:**

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

Hand over to hazardous waste disposers.

Dispose of contents and container in accordance with local state and federal regulations.

· **Uncleaned packagings:**

· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**

· DOT, IMDG, IATA

UN1263

· Note

Check viscosity and flash point at section 9

· **UN proper shipping name**

· DOT

Paint

· IMDG, IATA

PAINT

· **Transport hazard class(es)**

· DOT



· Class

3 Flammable liquids

· Label

3

· Class

3 Flammable liquids

· Label

3

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US

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· **IMDG, IATA**
 · **Class** 3 Flammable liquids
 · **Label** 3
· **Packing group**· **DOT, IMDG, IATA** II· **Environmental hazards:**· **Marine pollutant:** No· **Special precautions for user**

Warning: Flammable liquids

· **Hazard identification number (Kemler code):** 33· **EMS Number:** F-E, S-E· **Stowage Category** B· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**

Not applicable.

· **Transport/Additional information:**· **IMDG**· **Limited quantities (LQ)** 5L· **Excepted quantities (EQ)** Code: E2

Maximum net quantity per inner packaging: 30 ml

Maximum net quantity per outer packaging: 500 ml

· **UN "Model Regulation":**

UN 1263 PAINT, 3, II

15 Regulatory information

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

Requirements of Federal Register

· **Various regulations**· **SARA**· **Section 355 (extremely hazardous substances):**

None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings) :**

822-06-0	hexamethylene diisocyanate	<0.1%
26471-62-5	m-tolyldiene diisocyanate	<0.1%

· **TSCA (Toxic Substances Control Act):**

All components have the value ACTIVE.

· **Hazardous Air Pollutants**

822-06-0 hexamethylene diisocyanate

· **Proposition 65**· **Chemicals known to cause cancer:**

26471-62-5 m-tolyldiene diisocyanate * <0.1%

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 · **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed.

 · **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients is listed.

 · **Chemicals known to cause developmental toxicity:**

None of the ingredients is listed.

 · **Carcinogenic categories**

 · **EPA (Environmental Protection Agency)**

None of the ingredients is listed.

 · **TLV (Threshold Limit Value)**

26471-62-5 | m-tolyldiene diisocyanate | (A4)

 · **NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients is listed.

 · **National regulations:**

The product is subject to be labeled according with the prevailing version of the regulations on hazardous substances.

-
- Chemical safety assessment:**
- A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

-
- Department issuing SDS:**
- IVM Chemicals Srl

-
- Contact:**
- See emergency phone

-
- Date of preparation / last revision**
- 02/12/2024

 · **Abbreviations and acronyms:**

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

VOC: Volatile Organic Compounds (USA, EU)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety & Health

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

BEI: Biological Exposure Limit

Flammable Liquids 2: Flammable liquids . Category 2

Flammable Liquids 3: Flammable liquids . Category 3

Acute Toxicity - Oral 4: Acute toxicity . Category 4

Acute Toxicity - Inhalation 1: Acute toxicity . Category 1

Skin Irritation 2: Skin corrosion/irritation . Category 2

Eye Irritation 2A: Serious eye damage/eye irritation . Category 2A

Sensitization - Respiratory 1: Respiratory sensitisation . Category 1

Sensitization - Skin 1: Skin sensitisation . Category 1

Carcinogenicity 2: Carcinogenicity . Category 2

Specific Target Organ Toxicity - Single Exposure 3: Specific target organ toxicity (single exposure) . Category 3

Aquatic Chronic 3: Hazardous to the aquatic environment - long-term aquatic hazard . Category 3

 · **Sources**

REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL and following amendments

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Safety Data Sheet
acc. to OSHA HCS

Printing date 02/12/2024

Version number 468

Reviewed on 02/09/2024

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Agency ECHA web site
INRS Fiche Toxicologique
IARC International agency for research on cancer
· * *Data compared to the previous version altered.*

US