ivm Chemicals
coatings & polymers technologies

Safety Data Sheet
29 CFR Parts 1910 1915 1926

Printing date 10/18/2013 Reviewed on 10/18/2013

*
1 Identification

· **Product identifier**
· **Product number** LNB99
· **Trade name: Hardener**
· **Application of the substance / the mixture** Professional uses

· **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/MSDS 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**


GHS02 Flame

Flam. Liq. 2	H225	Highly flammable liquid and vapour.


GHS08 Health hazard

Resp. Sens. 1A	H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Repr. 2	H361	Suspected of damaging fertility or the unborn child.
STOT RE 2	H373	May cause damage to organs through prolonged or repeated exposure.
Asp. Tox. 1	H304	May be fatal if swallowed and enters airways.


GHS07

Acute Tox. 4	H332	Harmful if inhaled.
Skin Irrit. 2	H315	Causes skin irritation.
Eye Irrit. 2A	H319	Causes serious eye irritation.
Skin Sens. 1	H317	May cause an allergic skin reaction.
STOT SE 3	H335-H336	May cause respiratory irritation. 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 GHS08

· **Signal word** Danger

(Contd. on page 2)

ivm Chemicals
coatings & polymers technologies

Safety Data Sheet
29 CFR Parts 1910 1915 1926

Printing date 10/18/2013 Reviewed on 10/18/2013

Product number LNB99
Trade name: Hardener

(Contd. of page 1)

· **Hazard-determining components of labeling:**
Homopolymer of HDI
toluene
hexamethylene-di-isocyanate
xylene

· **Hazard statements**

H225	Highly flammable liquid and vapour.
H332	Harmful if inhaled.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317	May cause an allergic skin reaction.
H361	Suspected of damaging fertility or the unborn child.
H335-H336	May cause respiratory irritation. May cause drowsiness or dizziness.
H373	May cause damage to organs through prolonged or repeated exposure.
H304	May be fatal if swallowed and enters airways.

· **Precautionary statements**

P301+P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P303+P361+P353	IF ON SKIN : Remove/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.
P501	Dispose of contents/container in accordance with local/regional/national/ international regulations.

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 2
Fire = 4
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = *2
Fire = 4
Reactivity = 0

*
3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:** Mixture: consisting of the following components.

· **Dangerous components:**		
28182-81-2	Homopolymer of HDI Acute Tox. 4, H332; Skin Sens. 1, H317; STOT SE 3, H335	25-29.9%
141-78-6	ethyl acetate Flam. Liq. 2, H225 Eye Irrit. 2, H319; STOT SE 3, H336	25-29.9%

(Contd. on page 3)

ivm Chemicals
coatings & polymers technologies

Safety Data Sheet
29 CFR Parts 1910 1915 1926

Printing date 10/18/2013 Reviewed on 10/18/2013

Product number LNB99
Trade name: Hardener

(Contd. of page 2)

123-86-4	n-butyl acetate Flam. Liq. 3, H226 STOT SE 3, H336	15- <50%
108-88-3	toluene Flam. Liq. 2, H225 Repr. 2, H361; STOT RE 2, H373; Asp. Tox. 1, H304 Skin Irrit. 2, H315; STOT SE 3, H336	12.5-15%
1330-20-7	xylene Flam. Liq. 3, H226 Acute Tox. 4, H312; Acute Tox. 4, H332; Skin Irrit. 2, H315	5-9.99%
108-65-6	2-methoxy-1-methylethyl acetate Flam. Liq. 3, H226	2.5-4.99%
822-06-0	hexamethylene-di-isocyanate Acute Tox. 3, H331 Resp. Sens. 1, H334 Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317; STOT SE 3, H335	0.1-<0.5%

*
4 First-aid measures

· **Description of first aid measures**
· **General information:**
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
· **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.
Take off immediately all contaminated clothing, include underwear and shoes (if necessary).
Rinse thoroughly with plenty of water for at least 20 minutes and take medical advise. If medical advise is needed have products container or label at hand.
· **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.
· **Most important symptoms and effects, both acute and delayed**
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, 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**
Formation of toxic gases is possible during heating or in case of fire.

(Contd. on page 4)

Safety Data Sheet
29 CFR Parts 1910 1915 1926

Product number LNB99
Trade name: Hardener

(Contd. of page 3)

· **Advice for firefighters**
· **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.
· **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.
Do not flush with water or aqueous cleansing agents
· **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.

*
7 Handling and storage

· **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 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 item 7.

(Contd. on page 5)

Safety Data Sheet
29 CFR Parts 1910 1915 1926

Printing date 10/18/2013 Reviewed on 10/18/2013

Product number LNB99
Trade name: Hardener

(Contd. of page 4)

· **Control parameters**

· Components with limit values that require monitoring at the workplace:	
141-78-6 ethyl acetate	
PEL ()	Long-term value: 1400 mg/m³, 400 ppm
REL ()	Long-term value: 1400 mg/m³, 400 ppm
TLV ()	Long-term value: 1440 mg/m³, 400 ppm
123-86-4 n-butyl acetate	
PEL ()	Long-term value: 710 mg/m³, 150 ppm
REL ()	Short-term value: 950 mg/m³, 200 ppm Long-term value: 710 mg/m³, 150 ppm
TLV ()	Short-term value: 950 mg/m³, 200 ppm Long-term value: 713 mg/m³, 150 ppm
108-88-3 toluene	
PEL ()	Short-term value: C 300; 500* ppm Long-term value: 200 ppm *10-min peak per 8-hr shift
REL ()	Short-term value: 560 mg/m³, 150 ppm Long-term value: 375 mg/m³, 100 ppm
TLV ()	Long-term value: 75 mg/m³, 20 ppm BEI
1330-20-7 xylene	
PEL ()	Long-term value: 435 mg/m³, 100 ppm
REL ()	Short-term value: 655 mg/m³, 150 ppm Long-term value: 435 mg/m³, 100 ppm
TLV ()	Short-term value: 651 mg/m³, 150 ppm Long-term value: 434 mg/m³, 100 ppm BEI
108-65-6 2-methoxy-1-methylethyl acetate	
WEEL ()	Long-term value: 50 ppm
822-06-0 hexamethylene-di-isocyanate	
REL ()	Short-term value: C 0.14* mg/m³, C 0.02* ppm Long-term value: 0.035 mg/m³, 0.005 ppm *10-min
TLV ()	Long-term value: 0.034 mg/m³, 0.005 ppm

(Contd. on page 6)

ivm Chemicals
coatings & polymers technologies

Safety Data Sheet
29 CFR Parts 1910 1915 1926

Printing date 10/18/2013 Reviewed on 10/18/2013

Product number LNB99
Trade name: Hardener

(Contd. of page 5)

· **Ingredients with biological limit values:**

108-88-3 toluene	
BEI ()	0.02 mg/L Medium: blood Time: prior to last shift of workweek Parameter: Toluene 0.03 mg/L Medium: urine Time: end of shift Parameter: Toluene 0.3 mg/g creatinine Medium: urine Time: end of shift Parameter: o-Cresol with hydrolysis (background)
1330-20-7 xylene	
BEI ()	1.5 g/g creatinine Medium: urine Time: end of shift Parameter: Methylhippuric acids

· **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.
Pregnant women should strictly avoid inhalation or skin contact.

· **Breathing equipment:**
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

· **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.

· **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.

(Contd. on page 7)

ivm Chemicals
coatings & polymers technologies

Safety Data Sheet
29 CFR Parts 1910 1915 1926

Printing date 10/18/2013 Reviewed on 10/18/2013

Product number LNB99
Trade name: Hardener

(Contd. of page 6)

· **Eye protection:**

Tightly sealed goggles

*

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
· **Form:**	Fluid
· **Color:**	According to product specification
· **Odor:**	Characteristic
· **Odour threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
· **Melting point/Melting range:**	Undetermined.
· **Boiling point/Boiling range:**	77 °C (171 °F)
· **Flash point:**	-4 °C (25 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	315 °C (599 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
· **Explosion limits:**	
· **Lower:**	1.1 Vol %
· **Upper:**	11.5 Vol %
· **Vapor pressure at 20 °C (68 °F):**	97 hPa (73 mm Hg)
· **Density at 20 °C (68 °F):**	0.943 g/cm³ (7.869 lbs/gal)
· **Relative density**	Not determined.
· **Vapour 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)
· **Solvent content:**	
· **VOC content:**	70.1 % 661.1 g/l / 5.52 lb/gl
· **Solids content:**	29.9 %

(Contd. on page 8)

(Contd. of page 7)

· **Other information (HAPS)**

108-88-3	toluene	12.5-<15%
1330-20-7	xylene	5-9,99%
822-06-0	hexamethylene-di-isocyanate	0.1-<0.5%

*

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 according to specifications.
· **Possibility of hazardous reactions**
Reacts with strong acids and oxidizing agents.
Vapours may form explosive mixtures with air
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:**

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

*

11 Toxicological information

· **Information on toxicological effects**
Suspected of damaging fertility or the unborn child.
May cause damage to organs through prolonged or repeated exposure.
· **Acute toxicity:**

· LD/LC50 values that are relevant for classification:		
141-78-6 ethyl acetate		
Oral	LD50	4934 mg/kg (rabbit/królik/Kaninchen/conejo/lapin)
Dermal	LD50	>20000 mg/kg (Con)
Inhalative	LC0/6 h	>22.5 ppm (mouse)
	LC50/4 h	1600 mg/l (rat/szczur/mouse/souris/Maus/ratón)
123-86-4 n-butyl acetate		
Oral	LD50	10760 mg/kg (rat/szczur/mouse/souris/Maus/ratón)
Dermal	LD50	14000 mg/kg (rabbit/królik/Kaninchen/conejo/lapin)
Inhalative	LC50/4 h	>21.0 mg/l (rat/szczur/mouse/souris/Maus/ratón)
108-88-3 toluene		
Oral	LD50	5000 mg/kg (rat/szczur/mouse/souris/Maus/ratón)
Dermal	LD50	12124 mg/kg (rabbit/królik/Kaninchen/conejo/lapin)
Inhalative	LC50/4 h	5320 mg/l (mouse)
1330-20-7 xylene		
Oral	LD50	4300 mg/kg (rat/szczur/mouse/souris/Maus/ratón)
Dermal	LD50	2000 mg/kg (rabbit/królik/Kaninchen/conejo/lapin)
108-65-6 2-methoxy-1-methylethyl acetate		
Oral	LD50	8532 mg/kg (rat/szczur/mouse/souris/Maus/ratón)

(Contd. on page 9)

(Contd. of page 8)

Inhalative	LC50/4 h	35.7 mg/l (rat/szczur/mouse/souris/Maus/ratón)
822-06-0 hexamethylene-di-isocyanate		
Oral	LD50	738 mg/kg (rat/szczur/mouse/souris/Maus/ratón)
Dermal	LD50	593 mg/kg (rat/szczur/mouse/souris/Maus/ratón)

· **Primary irritant effect:**
· **on the skin:**
Irritant to skin and mucous membranes.
Causes skin irritation.
May cause an allergic skin reaction.
· **on the eye:**
Irritating effect.
Causes serious eye irritation.
· **Sensitization:** Sensitization possible through skin contact.
· **Additional toxicological information:**
Harmful
Irritant
May cause drowsiness or dizziness.
May cause respiratory irritation.

· **Carcinogenic categories**

· IARC (International Agency for Research on Cancer)		
108-88-3	toluene	3
1330-20-7	xylene	3

· NTP (National Toxicology Program)
None of the ingredients, in dangerous form, is listed.

· **More information**
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:	
141-78-6 ethyl acetate	
EC50	164 mg/l (daphnia)
123-86-4 n-butyl acetate	
EC50	648 mg/l (algae) 72h
	44 mg/l (daphnia) 48h
LC50 (96h)	18 mg/l (Fish)
108-88-3 toluene	
EC50	134 mg/l (algae)
	3.78 mg/l (invertebrates)

(Contd. on page 10)

(Contd. of page 9)

1330-20-7 xylene	
EC50	1 mg/l (daphnia)

· **Persistence and degradability** No further relevant information available.
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 2 (Self-assessment): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.
· **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** NA1263
· **IMDG, IATA** UN1263

· **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

· **IMDG, IATA**

· **Class** 3 Flammable liquids.
· **Label** 3

(Contd. on page 11)

ivm Chemicals
coatings & polymers technologies

Safety Data Sheet
29 CFR Parts 1910 1915 1926

Printing date 10/18/2013 Reviewed on 10/18/2013

Product number LNB99
Trade name: Hardener

(Contd. of page 10)

· **Packing group**
· **DOT, IMDG, IATA** II

· **Environmental hazards:**
· **Marine pollutant:** No

· **Special precautions for user** Warning: Flammable liquids
· **Danger code (Kemler):** 33
· **EMS Number:** F-E,S-E

· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable.

· **UN "Model Regulation":** UN1263, Paint, special provision 640D, 3, II

*
15 Regulatory information

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

Requirements of Federal Register

· **SARA**

· **Section 355 (extremely hazardous substances):**

None of the ingredients, in dangerous form, is listed.

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

108-88-3	toluene
1330-20-7	xylene
822-06-0	hexamethylene-di-isocyanate

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

All ingredients are listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**

None of the ingredients is listed.

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

108-88-3	toluene

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

None of the ingredients, in dangerous form, is listed.

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

108-88-3	toluene

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**

108-88-3	toluene	II
1330-20-7	xylene	I

· **TLV (Threshold Limit Value established by ACGIH)**

108-88-3	toluene	A4
1330-20-7	xylene	A4

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

None of the ingredients, in dangerous form, is listed.

(Contd. on page 12)

Safety Data Sheet
29 CFR Parts 1910 1915 1926

Printing date 10/18/2013 Reviewed on 10/18/2013

Product number LNB99
Trade name: Hardener

(Contd. of page 11)

· **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients, in dangerous form, 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 MSDS:** IVM Chemicals Srl
· **Contact:** See emergency phone
· **Abbreviations and acronyms:**
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
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
· **Sources**
Directive 1999/45/EC and following amendments
Directive 67/548/EEC and following amendments and adjustments
Agency ECHA web site
INRS Fiche Toxicologique
IARC International agency for research on cancer
· *** Data compared to the previous version altered.**