SAFETY DATA SHEET



Hardtop AS/HB Comp B

Section 1. Identification	
GHS product identifier	: Hardtop AS/HB Comp B
Other means of identification	: Not available.
Product code	: 448
Product description	: Hardener.
Product type	: Liquid.
Relevant identified uses of the	substance or mixture and uses advised against

Identified uses		
Use in coatings - Industrial use Use in coatings - Professional use		

Manufacturing country	: Jotun Thailand Limited 700/353 Amata Nakorn Industrial Estate (BIP 2) Moo 6, Tumbol Donhualoh, Amphur Muang Chonburi Chonburi 20000 Thailand
	Phone: + 66 2 022 9888 Fax: + 66 2 022 9888 , + 66 38 214 375
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Emergency telephone number	: Jotun Thailand Limited Phone: + 66 2 022 9888 ext. 2100, 2400, 2402

Section 2. Hazards identification

Classification of the substance or mixture	 FLAMMABLE LIQUIDS - Category 3 ACUTE TOXICITY (inhalation) - Category 4 SKIN CORROSION/IRRITATION - Category 3 SKIN SENSITISATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Narcotic effects) - Category 3
GHS label elements Hazard pictograms	

	V V
Signal word	: Warning.
Hazard statements	 H226 - Flammable liquid and vapour. H316 - Causes mild skin irritation. H317 - May cause an allergic skin reaction. H332 - Harmful if inhaled. H335 - May cause respiratory irritation. H336 - May cause drowsiness or dizziness.

Precautionary statements

Section 2. Hazards identification

Prevention	 P280 - Wear protective gloves. P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P261 - Avoid breathing vapour.
Response	 P304 + P312 - IF INHALED: Call a POISON CENTER or doctor if you feel unwell. P363 - Wash contaminated clothing before reuse. P302 + P352 - IF ON SKIN: Wash with plenty of water. P333 + P313 - If skin irritation or rash occurs: Get medical advice or attention.
Storage	 P403 + P233 - Store in a well-ventilated place. Keep container tightly closed. P403 + P235 - Keep cool.
Disposal	 P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Other hazards which do not : None known. result in classification

Section 3. Composition/information on ingredients

Substance/mixture	:	Mixture
Other means of identification	:	Not available.

CAS number/other identifiers		
CAS number	:	Not applicable.
EC number	:	Mixture.
Product code	:	448

Ingredient name	%	CAS number
hexane, 1,6-diisocyanato-, homopolymer	≥50 - ≤75	28182-81-2
n-butyl acetate	≥10 - ≤25	123-86-4
2-methoxy-1-methylethyl acetate	≥10 - ≤25	108-65-6
xylene	<10	1330-20-7
ethylbenzene	≤3	100-41-4

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures			
Eye contact	: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.		
Inhalation	: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.		

Section 4. First aid measures

Skin contact	: Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Ingestion	: Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects		
Eye contact	:	No known significant effects or critical hazards.
Inhalation	:	Harmful if inhaled. May cause drowsiness or dizziness. May cause respiratory irritation.
Skin contact	1	Causes mild skin irritation. May cause an allergic skin reaction.
Ingestion	1	No known significant effects or critical hazards.
Over-exposure signs/symptor	<u>ns</u>	
Eye contact	:	Adverse symptoms may include the following: pain or irritation watering redness
Inhalation	-	Adverse symptoms may include the following: respiratory tract irritation coughing nausea or vomiting headache drowsiness/fatigue dizziness/vertigo unconsciousness
Skin contact	:	Adverse symptoms may include the following: irritation redness
Ingestion	;	No specific data.
Indication of immediate medica	al a	ttention and special treatment needed, if necessary
Notes to physician	:	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Specific treatments	1	No specific treatment.
Protection of first-aiders	:	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Firefighting measures

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Extinguishing media		
Suitable extinguishing media	:	Use dry chemical, CO ₂ , water spray (fog) or foam.
Unsuitable extinguishing media	-	Do not use water jet.
Specific hazards arising from the chemical	:	Flammable liquid and vapour. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.
Hazardous thermal decomposition products	:	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides
Special protective actions for fire-fighters	:	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
Special protective equipment for fire-fighters	:	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protection	ve equipment and emergency procedures
For non-emergency personnel	: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	: Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
Methods and material for cont	ainment and cleaning up
Small spill	: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Large spill	: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling	:	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	:	Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidising materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name		Exposure limits
n-butyl acetate xylene		ACGIH TLV (United States, 1/2021). STEL: 150 ppm 15 minutes. TWA: 50 ppm 8 hours. Ministry of Labor (Thailand, 8/2017).
ethylbenzene		TWA: 100 ppm 8 hours. Ministry of Labor (Thailand, 8/2017). TWA: 100 ppm 8 hours.
Recommended monitoring procedures	atmosphere or biological monitoring m of the ventilation or other control meas	
Appropriate engineering controls	contaminants below any recommende	Is to keep worker exposure to airborne ed or statutory limits. The engineering controls concentrations below any lower explosive
Environmental exposure controls		
ndividual protection measures		
Hygiene measures	eating, smoking and using the lavator Appropriate techniques should be use Contaminated work clothing should no	bughly after handling chemical products, before y and at the end of the working period. I to remove potentially contaminated clothing. I be allowed out of the workplace. Wash Ensure that eyewash stations and safety ocation.
Eye/face protection	indicates this is necessary to avoid ex dusts. If contact is possible, the follow	should be used when a risk assessment posure to liquid splashes, mists, gases or ving protection should be worn, unless the of protection: chemical splash goggles.
Skin protection	- 0	

Section 8. Exposure controls/personal protection

Hand protection	: 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. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
	There is no one glove material or combination of materials that will give unlimited resistance to any individual or combination of chemicals. The breakthrough time must be greater than the end use time of the product. The instructions and information provided by the glove manufacturer on use, storage, maintenance and replacement must be followed. Gloves should be replaced regularly and if there is any sign of damage to the glove
	material. Always ensure that gloves are free from defects and that they are stored and used correctly. The performance or effectiveness of the glove may be reduced by physical/chemical damage and poor maintenance.
	Barrier creams may help to protect the exposed areas of the skin but should not be applied once exposure has occurred.
	Wear suitable gloves tested to EN374. Not recommended, gloves(breakthrough time) < 1 hour: PE, neoprene May be used, gloves(breakthrough time) 4 - 8 hours: Viton®, nitrile rubber, butyl rubber, PVC Recommended, gloves(breakthrough time) > 8 hours: 4H, Teflon, polyvinyl alcohol
	(PVA)
Body protection	: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.
Other skin protection	 Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection	: Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.
	Self-contained respiratory equipment must be worn by spray operator, even when good ventilation is provided. By other operations than spraying, in well ventilated areas, air-fed respirators could be replaced by a combination charcoal filter and particulate filter mask.

Section 9. Physical and chemical properties

Date of issue	: 01.07.2022 6/11
Evaporation rate	 Highest known value: 1 (n-butyl acetate) Weighted average: 0.73compared with butyl acetate
Burning rate	: Not applicable.
Burning time	: Not applicable.
Flash point	: Closed cup: 34°C (93.2°F)
Boiling point	: 127 to 145°C (260.6 to 293°F)
Melting point	: Not applicable.
рН	: Not applicable.
Odour threshold	: Not available.
Odour	: Characteristic.
Colour	: Colourless.
Physical state	: Liquid.
<u>Appearance</u>	

Section 9. Physical and chemical properties

Flammability (solid, gas)	: N	Not applicable.
Lower and upper explosive (flammable) limits	: 0	0.8 - 7.6%
Vapour pressure		Highest known value: 1.5 kPa (11.3 mm Hg) (at 20°C) (n-butyl acetate). Weighted average: 0.37 kPa (2.78 mm Hg) (at 20°C)
Vapour density		Highest known value: 4.6 (Air = 1) (2-methoxy-1-methylethyl acetate). Weighted average: 4.09 (Air = 1)
Relative density	: 1	1.04 g/cm ³
Solubility	: Ir	nsoluble in the following materials: cold water and hot water.
Partition coefficient: n-octanol/ water	: N	Not available.
Auto-ignition temperature	: L	_owest known value: 333°C (631.4°F) (2-methoxy-1-methylethyl acetate).
Decomposition temperature	: N	Not available.
SADT	: N	Not available.
Viscosity	: K	Kinematic (40°C): >20.5 mm²/s (>20.5 cSt)
Aerosol product		

Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
Incompatible materials	: Keep away from: oxidising agents, strong alkalis, strong acids, amines, alcohols, water. Uncontrolled exothermic reactions occur with amines and alcohols.
Hazardous decomposition products	 Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
n-butyl acetate	LC50 Inhalation Vapour	Rat	>21.1 mg/l	4 hours
-	LD50 Dermal	Rabbit	>17600 mg/kg	-
	LD50 Oral	Rat	13100 mg/kg	-
2-methoxy-1-methylethyl acetate	LD50 Dermal	Rabbit	>5 g/kg	-
	LD50 Oral	Rat	8532 mg/kg	_
xylene	LC50 Inhalation Vapour	Rat	20 mg/l	4 hours
,	LD50 Oral	Rat	4300 mg/kg	-
	TDLo Dermal	Rabbit	4300 mg/kg	-
ethylbenzene	LC50 Inhalation Vapour	Rat - Male	17.8 mg/l	4 hours
-	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	3500 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Hexamethylene diisocyanate, oligomers	Eyes - Moderate irritant	Rabbit	-	100 mg	-
	Skin - Moderate irritant	Rabbit	-	500 mg	-
xylene	Eyes - Mild irritant	Rabbit	-	87 milligrams	-
	Skin - Mild irritant	Rat	-	8 hours 60 microliters	-

Section 11. Toxicological information

Product/ingredient name	Route of exposure	Species	Result	
Hexamethylene diisocyanate, oligomers	skin	Mammal - species unspecified	Sensitising	

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Hexamethylene diisocyanate, oligomers	Category 3	-	Respiratory tract irritation
n-butyl acetate	Category 3	-	Narcotic effects
2-methoxy-1-methylethyl acetate	Category 3	-	Narcotic effects
xylene	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Name	- 3 7	Route of exposure	Target organs
ethylbenzene	Category 2	-	hearing organs

Aspiration hazard

Name	Result
	ASPIRATION HAZARD - Category 1 ASPIRATION HAZARD - Category 1

Potential acute health effects	
Eye contact	: No known significant effects or critical hazards.
Inhalation	: Harmful if inhaled. May cause drowsiness or dizziness. May cause respiratory irritation.
Skin contact	: Causes mild skin irritation. May cause an allergic skin reaction.
Ingestion	: No known significant effects or critical hazards.
Symptoms related to the physi	cal, chemical and toxicological characteristics

Inhalation	: Adverse symptoms may include the following: respiratory tract irritation coughing nausea or vomiting headache drowsiness/fatigue dizziness/vertigo unconsciousness
Ingestion	: No specific data.
Skin contact	: Adverse symptoms may include the following: irritation redness

Section 11. Toxicological information

Eye contact	: Adverse symptoms may include the following: pain or irritation watering redness
Potential chronic health	effects
General	: Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
Carcinogenicity	: No known significant effects or critical hazards.
Mutagenicity	: No known significant effects or critical hazards.

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Teratogenicity	: No known significant effects or critical hazards.
Developmental effects	: No known significant effects or critical hazards.
Fertility effects	: No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Dermal	13861.65 mg/kg
Inhalation (vapours)	183.36 mg/l
Inhalation (dusts and mists)	2.37 mg/l

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
xylene	Acute LC50 8500 µg/l Marine water	Crustaceans - Palaemonetes pugio	48 hours
ethylbenzene	Acute LC50 13400 µg/l Fresh water Acute EC50 7700 µg/l Marine water Acute EC50 2.93 mg/l Acute LC50 4.2 mg/l	Fish - Pimephales promelas Algae - Skeletonema costatum Daphnia Fish	96 hours 96 hours 48 hours 96 hours

Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
xylene ethylbenzene	-		Readily Readily

Bioaccumulative potential

Product/ingredient name	LogPow	BCF	Potential
Hexamethylene diisocyanate, oligomers	5.54	367.7	low
n-butyl acetate	2.3	-	low
2-methoxy-1-methylethyl acetate	1.2	-	low
xylene ethylbenzene	3.12 3.6		low low

Mobility in soil

Soil/water partition coefficient (K_{oc})

: Not available.

: 01.07.2022

Other adverse effects

: No known significant effects or critical hazards.

Date of issue	
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Section 12. Ecological information

Section 13. Disposal considerations

Disposal methods

The generation of waste should be avoided or minimised wherever possible. 2 Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and nonrecyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapour from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information				
	UN	IMDG	ΙΑΤΑ	
UN number	UN1263	UN1263	UN1263	
UN proper shipping name	Paint	Paint	Paint	
Transport hazard class(es)	3	3	3	
Packing group	Ш	111		
Environmental hazards	No.	No.	No.	
Special precautions for user	Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.	Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.	Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.	
Additional information	-	Emergency schedules F-E, <u>S-E</u>	-	

Section 14. Transport information

Transport in bulk according to : Not available.

IMO instruments

: Tunnel restriction code: (D/E)

Hazard identification number: 30

ADR / RID

Section 15. Regulatory information

Hazardous Substance Act B.E. 2535 (1992)

<u>I ype</u>			
Ingredient name	<u>Type</u>	<u>Authority</u>	Conditions
hexamethylene diisocyanate	3	Department of	-
		Industrial Works	
chlorobenzene	2	Department of	-
		Industrial Works	

No known specific national and/or regional regulations applicable to this product (including its ingredients).

Section 16. Other information

<u>History</u>		
Date of printing	:	01.07.2022
Date of issue/Date of revision	:	01.07.2022
Date of previous issue	:	27.05.2020
Version	:	1.15
Key to abbreviations	:	ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Internediate Bulk Container IMDG = International Maritime Dangerous Goods MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail UN = United Nations LogPow = logarithm of the octanol/water partition coefficient
References	:	Not available.

✓ Indicates information that has changed from previously issued version.

Notice to reader

The information in this document is given to the best of Jotun's knowledge, based on laboratory testing and practical experience. Jotun's products are considered as semi-finished goods and as such, products are often used under conditions beyond Jotun's control. Jotun cannot guarantee anything but the quality of the product itself. Minor product variations may be implemented in order to comply with local requirements. Jotun reserves the right to change the given data without further notice.

Users should always consult Jotun for specific guidance on the general suitability of this product for their needs and specific application practices.

If there is any inconsistency between different language issues of this document, the English (United Kingdom) version will prevail.