CAPROLACTAM

CAPROLACTAM

Product portfolio

NYLON 6

CAPROLACTAM
SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and the company/undertaking

1.1	**PRODUCT IDENTIFIER**	
	Trade name:	KAPROLAKTAM
	International chemical name / CAS Number	e-caprolactam, hexano-6-lactam/105-60-2
	Identification number:	613-069-00-2
	Registration number:	01-2119457029-36-0009
1.2	**RELEVANT IDENTIFIED USES OF THE SUBSTANCE OR MIXTURE AND USES ADVISED AGAINST**	
	Identified uses	**Uses by workers in industrial settings**
	1	Manufacture/import of Caprolactam
	2	Distribution of Caprolactam
	3	Industrial formulation of solid preparations
	4	Formulation of liquid preparations (industrial)
	5	Use as intermediate
	6	Use as monomer for polyamide, polymers, thermoplastics
	7	Use as monomer for resins
	8	Use as monomer for thermo hardened resins
	9	Use as plasticizer for polyamide
	10	Use in leather tanning, finishing, impregnation, coatings and paints
		Uses by professional workers
	11	Use as laboratory chemical
	4	Formulation of liquid preparations (professional)
		Uses by users
	12	Use in coatings/paints (consumer)
	Uses advised against:	None known

1.3	**DETAILS OF THE SUPPLIER'S SAFETY DATA SHEET**		
	Manufacturer:	SPOLANA s.r.o.	
	Registered office:	SPOLANA s.r.o., ul.Práce 657, 277 11 Neratovice	
	Company ID:	451 47 787	
	Telephone:	Tel: +420 315 662 555	Fax: +420 315 666 633
	Responsible person:	Tel: +420 315 662 555	E-mail: reach@spolana.cz
1.4	**EMERGENCY TELEPHONE NUMBER**		
	Klinika pracovního lékařství VFN a 1. LF UK Toxikologické informační středisko Na Bojišti 1, 120 00, Praha 2	Tel: **+420 224 919 293**, **+420 224 915 402**, E-mail: **tis@vfn.cz** Information only for health risks – acute poisoning of humans and animals	

SECTION 2: Hazard identification

	Substance classification:	**The substance has the following classifications:** Acute inhalation and oral toxicity Hazard Category 4 Serious eye damage/eye irritation, Hazard Category 2 Skin corrosion/irritation, Hazard Category 2 Specific target organ toxicity – Single exposure, Hazard Category 3, Respiratory tract irritation	
	Dangerous health effects:	According to our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.	
	Dangerous environmental effects.	The substance does not meet classification criteria.	
2.1	**SUBSTANCE OR MIXTURE CLASSIFICATION**		
	Classification according to (EC) 1272/2008:	Codes for hazard classes and categories	Acute Tox. 4 (Inhalation – dust) Acute Tox. 4 (Oral) Skin Irrit. 2 Eye Irrit. 2 STOT SE 3 (Irritating to respiratory system)
		Hazard Codes phrase	H332, H302, H319, H335, H315
2.2	**LABEL ELEMENTS**		
	Hazard pictogram(s):	 GHS07 V	
	Signal word:	Warning	
	Hazard statement(s):	H319 Causes serious eye irritation. H315 Causes skin irritation. H332 Harmful if inhaled. H302 Harmful if swallowed. H335 May cause respiratory irritation.	

	Precautionary statement(s):	P261 Avoid breathing dust/fume/gas/mist/vapours/spray. P280 Wear protective gloves/protective clothing/eye protection/face protection. P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P305+P351+P338 IF CONTACT IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P301 + P330 IF SWALLOWED: Rinse mouth. P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
2.3	**OTHER HAZARDS:**	
	None known	

SECTION 3: Composition/information about ingredients

3.1	**SUBSTANCES**				
	Major component identifier:	Name.	E-caprolactam (approx. 100 %)		
		Identification	Index number	CAS number	EC number
		number:	613-069-00-2	105-60-2	203-313-2
	Major component identifier:	Name.			
		Identification	Index number	CAS number	EC number
		number:			

SECTION 4: First aid measures

4.1	**DESCRIPTION OF FIRST AID MEASURES**	
	General advice: Avoid contact with the skin, eyes and clothing. Immediately remove contaminated clothing. **Securing the safety of both the victim and rescuer is a priority when administering first aid!** **General first aid principles:** **In life threatening situations administration of resuscitation is a priority** **The victim is not breathing** – administer artificial respiration immediately **Heart arrest** – administer cardiac massage immediately **Unconsciousness** – put the victim in a stabilized position on his/her side	
	Inhalation	Stop exposure immediately, take the victim out into fresh air. (Beware of contaminated clothing.) Protect the victim from getting cold. Seek medical attention.
	Skin contact:	Remove clothes. Rinse affected areas with plenty of ideally lukewarm water. Soap may be used only if the skin is not affected (injured). Burns caused by molten material require hospital treatment.
	Eye contact:	Immediately rinse the eyes with a stream of running water; open the lids with your fingers (even forcibly), remove any contact lenses. Rinse the eyes for at least 15 minutes. Consult an eye specialist.
	Ingestion:	Rinse mouth immediately and then drink plenty of water. Do not induce vomiting! If possible, administer medicinal coal. Seek medical treatment immediately.
4.2	**MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED**	
	Symptoms: The most important known symptoms and effects are described on the package labelling (see section 2) and in section 11.	
	Inhalation:	
	Skin contact:	
	Eye contact:	
	Ingestion:	
4.3	**INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED**	
	Treat according to symptoms (decontamination, vital functions), no known specific antidote. In life threatening situations, administration of resuscitation is a priority (section 4.1).	

SECTION 5: Firefighting measures

5.1	**EXTINGUISHING MEDIA**	
	Suitable extinguishing media	SMALL VOLUMES: Water spray, water, foam, carbon dioxide and dry powder extinguishers, or sand or soil. When water is used, the extensive solubility of Caprolaktam in water must be considered any any subsequent use of aqueous solutions. LARGE VOLUMES: Dry powder, heavy or medium-heavy foam or a stream of water in the form of a fine mist. Fire fighting: Remove containers from the fire area, providing it can be done safely. Use suitable extinguishing media. Stand on the windward side of the fire and out of low-lying areas. Cool the containers with water mist as long as the risk of fire is present. The mixture of caprolactam dust with air may ignite or explode. Its vapours in the mixture with air are explosive.
	Unsuitable extinguishing media:	None known.
5.2	**SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE**	
	These substances/groups of substances may be released in case of fire: Hydrogen cyanide, carbon oxides, nitrogen oxides. Do not inhale substance vapours or combustion products. Use an isolation respirator to protect the respiratory system. Caprolaktam contained in melt sublimes easily and its vapours mix with air to form an explosive mixture. The vapours are heavier than air. The vapours may accumulate in pits and hollows in the ground and thereby penetrate areas lying below ground level.	
5.3	**ADVICE FOR FIREFIGHTERS**	
	Use an isolation respirator to protect the respiratory system. Thermal decomposition may produce toxic by-products (e.g., cyanides, carbon oxides and nitrogen compounds). Collect contaminated extinguishing water separately, and do not allow it to reach sewage or effluent systems.	

SECTION 6: Accidental release measures

6.1	**PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES**
	Ensure adequate ventilation. Use breathing apparatus if exposed to vapours/dust/aerosol. Do not eat, drink or smoke while working with the product and after finishing work until you properly wash yourself with soap and hot water. Prevent direct contact with caprolactam. Do not touch any material leaking from packaging units. Keep unauthorized people away from the affected area. Isolate the hazardous area and prohibit entry. Inform a local emergency centre.
6.2	**ENVIRONMENTAL PRECAUTIONS**
	Do not empty into drains. Retain and dispose of contaminated wash water. Clean the contaminated area as soon as possible. Stop the leak if it can be done without taking any personal risks. Soil contamination: Dig out capture areas such as lagoons or ponds to contain the leaking material. Minimize the spread of the harmful substance. In case of leakage in enclosed areas with a risk of explosion, reduce evaporation using a water spray.
6.3	**METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP**
	SMALL LEAKS: Allow the substance to solidify (solidification point: approx. 70°C). Collect the leaked material in suitable containers for neutralization. LARGE LEAKS: If the product is transported in the form of melt, prevent it from running by building protective walls or ditches in soil. First prevent contamination of water streams. Allow to solidify and sweep/shovel up. Store the broken chunks and contaminated soil in separate containers. Pump aqueous solutions, if any, into suitable means of transportation. Diluted solutions can be liquidated with biological treatment; highly concentrated solutions can be eliminated by incineration. Contaminated soil can be stored in suitable landfill only if respective regulations are observed. In case of a large accident, contact the manufacturer. For residues: Rinse away with water.
6.4	**REFERENCE TO OTHER SECTIONS**
	None.

SECTION 7: Handling and storage

7.1	**PRECAUTIONS FOR SAFE HANDLING**
	Ensure thorough ventilation of storage and work areas. During transportation in silo trucks, the product is covered with nitrogen. Do not climb in! Do not eat, drink or smoke while working with the product and after finishing work until you properly wash yourself with soap and hot water. When handling and storing the product, follow the valid safety regulations.
7.2	**CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES**
	Keep separate from acids and bases. Keep separate from oxidants. Store in sealed containers. Prevent contact with water or moisture. Suitable materials for containers: Stainless steel 1.4301 (V2), aluminium, Stainless steel 1.4401 Further information about storage conditions: keep under nitrogen. Store and handle the product in accordance with all common regulations and standards. Store at room temperature. Vapours may form an explosive mixture with air. Take precautionary measures against static discharges. Keep away from heating, open fire, sparks and other possible sources of ignition.
7.3	**SPECIFIC END USE(S)**
	Caprolaktam flakes are supplied in 25 kg open, paper, 2-ply sewn bags with a sealed PE insert. Other types of packaging units (quantity and type of packaging) can be agreed upon with the customer. Transported by rail (covered cars), ISO containers or other covered means of transportation.
	Melted Caprolaktam is filled into 40 m^3 or 47 m^3 railroad cisterns provided with heating coils and a thermometer or into railroad containers or car cisterns. If heated, the temperature of melted Caprolaktam should be maintained at 75–90 °C and must not exceed 90°C. The stated storage temperature should be noted. A protective atmosphere of nitrogen is maintained above melted Caprolaktam to prevent oxidation of the product in atmospheric oxygen. Maximum oxygen content is 50 ppm. To maintain oxygen content of less than 50 ppm in an inert atmosphere, both the customer and the supplier are obliged to secure a minimum overpressure of 0.02 MPa of nitrogen in the cistern, refill the inert atmosphere in the cistern, or to empty the cistern only with nitrogen that does not contain more than 10 ppm of oxygen. The conditions for filling railroad containers and car cisterns and for good protection during transport are specified upon agreement with the customer. The technical suitability of the means of transportation is the carrier's responsibility. The cisterns are reserved only for this substrate.

SECTION 8: Exposure controls/personal protection

8.1 CONTROL PARAMETERS

National occupational exposure limit values:

Name of substance (component(s)):	CAS	8-hour limit PEL [mg/m^3]	Short-term limit NPK-P [mg/m^3]	Note
s-caprolactam dust	105-60-2	1	3	
E-caprolactam vapours	105-60-2	10	40	

Occupational exposure limit values according to Directives 39/2000/EC and 15/2006/EC

Name of substance (component(s)):	CAS	8-hour limit TWA [mg/m^3]	Short-term limit STEL [mg/m^3]	Note
e-caprolactam dust and vapours	105-60-2	10	40	

Recommended monitoring procedures:
Collect a sample of the working environment using a sample collection head to determine dustiness and subsequent evaluation by weighing (dust).
Collect a sample of the working environment on a sorbent material, desorption by methanol, and analytical determination of HPLC according to the PV2012 OSHA method.

National biological limit values:

DNEL	
Worker, Short-term exposure – local effects, inhalation:	5 mg/m^3
PNEC	Not available.
PNEC aqua (freshwater):	2 mg/L
PNEC aqua (marine water):	0.2 mg/L
PNEC aqua (intermittent release):	1 mg/L
PNEC sediment (freshwater):	18.7 mg/kg sediment dw
PNEC sediment (marine water):	1.87 mg/kg
PNEC soil:	2.55 mg/kg
PNEC STP:	1737 mg/1

8.2	EXPOSURE CONTROLS				
	Personal exposure control: Take appropriate technical measures to ensure that the maximum admissible concentration in the working environment is not exceeded.				
	Personal protective equipment:				
	Respiratory protection:	Respirator or protective mask with an insert against organic vapours (e.g., AVEC S-97 with insert filter A2). An isolation respirator must be worn while fighting an accident in an environment with high concentration.			
	Eye protection:	Employees must wear goggles or a face shield while working. To ensure the availability of first aid, install an eye water fountain and a safety shower within reach.			
	Hand protection:	Protective gloves with the following specifications:			
		Wor activity	Glove material	Minimum layer thickness	Time of penetration (minutes)
		Common work activities with the possible risk of contamination	Nitril (KCL-730)	0.4 mm	480 min
		Use during the liquidation of leaks and during an accident	Nitril (KCL-736)	1 mm	480 min
		Notice: During further thermal processing, the employer must consider the risk of burns associated with the technology in use.			
		Note: Gloves must comply with the requirements of EU 89/686/EEC and standard EN 374.			
	Skin protection:	Employees are obliged to wear appropriate protective clothing to prevent contact with the product. When handling melt, it is also necessary to use suitable means to prevent burns or scalds to operating staff (according to the technical equipment in use at the decanting location).			
	Environmental exposure control: Do not discharge into the sewer system, water streams or soil.				

SECTION 9: Physical and chemical properties

9.1	INFORMATION ABOUT BASIC PHYSICAL AND CHEMICAL PROPERTIES	
	Appearance	White organic solid, hydroscopic substance in the forms of flakes, sheets or soft melt.
	Odour threshold:	No data available.
	pH (at 20°C):	7–8.5 (333 g/1, 20 °C)
	Granulometry	D10: 682.635 PM D50: 1159.418 PM D90: 1679.521 PM
	Melting point/freezing point (°C):	69.3 °C
	Initial boiling point and boiling range (°C):	270.8 °C (1,013 HPA)
	Flash point (°C):	Not applicable – solid substance 152 °C at 20° C and 1,013 hPa according to DIN 51758
	Evaporation rate:	No data available.
	Flammability (solid, gas):	Non-flammable solid substance
	Upper/lower flammability: or explosive limits	The mixture of its dust with air may ignite or explode. Its vapours in the mixture with air are explosive. upper (% vol.): 11.9 %(V) (188 °C) (air) lower (% vol.): 1.6 %(V) (136 °C) (air)
	Vapour pressure:	0.0014 hPa (20 °C), 0.089 hPa (60 °C)
	Vapour density:	3.91 (if air = 1) (literature data)
	Density:	1.105 at 20°C
	Solubility:	866.89 g/1 at 22°C (literature data)
	Partition coefficient n-octanol/water:	0.12 at 25°C
	Auto-ignition temperature:	The substance is not classified. 395 °C at 1,013 hPa according to DIN 51758
	Decomposition temperature:	No data available. No decomposition if correctly stored and handled.
	Viscosity:	Not applicable (the substance is solid at 20° C and 1,013 hPa)
	Explosive properties:	Non-explosive; explosive properties under certain conditions
	Oxidising properties:	No oxidising properties
	Stability in organic solvents and identity of relevant degradation products	Not applicable
	Dissociation constant	Not applicable

9.2	OTHER INFORMATION
	Soluble: chlorinated solvents, oil-based solvents, benzene, cyclohexane, chloroform, ethanol, methanol, ether, tetrahydrofurylalcohol, dimethylformamide. Self heating ability: it is not a substance capable of spontaneous heating. Surface tension: based on the chemical structure, surface activity is not to be expected.

SECTION 10: Stability and reactivity

10.1	REACTIVITY
	No corrosive effect on metal. Incomplete combustion results in the formation of toxic gases which contain mainly carbon monoxide, carbon dioxide, hydrogen cyanide and nitrogen oxides. Forms no flammable gases in the presence of water.
10.2	**CHEMICAL STABILITY**
	The product is stable if stored and handled as prescribed.

10.3	**POSSIBILITY OF HAZARDOUS REACTIONS**
	Dangerous chemical reaction: with oxidation materials CAPROLACTAM + ACETIC ACID + DINITROGEN TRIOXIDE: The compound may explode if it is not cooled properly. CAPROLACTAM + OXIDATION AGENTS (STRONG): Risk of fire and explosion. Polymerization coupled with heat formation.
10.4	**CONDITIONS TO AVOID**
	Inappropriate storage conditions: keep away from heat, open fires, sparks and other possible sources of ignition. Fire or explosion may occur in contact with flammable materials. Avoid the formation of polymers in valves and pipes.
10.5	**INCOMPATIBLE MATERIALS**
	ACETIC ACID, DINITROGEN TRIOXIDE, OXIDIZING AGENTS (STRONG)
10.6	**HAZARDOUS DECOMPOSITION PRODUCTS**
	No hazardous decomposition products if stored and handled as prescribed/indicated. Incomplete combustion results in the formation of toxic gases which contain mainly carbon monoxide, carbon dioxide and nitrogen oxides.

SECTION 11: Toxicological information

11.1	**INFORMATION ABOUT TOXICOLOGICAL EFFECTS**
	A) **Acute toxicity** According to EU and GHS (acute oral/inhal Cat. 4) standards, Caprolactam is harmful if swallowed or inhaled. No signs of systemic toxicity. LD50 Oral (rat) = 1475 mg/kg bw (male) and 1876 mg/kg bw (female) LC50 Inhalation-aerosol (rat) = 8.16 mg/1 (male/female) with death of 1 in 10 animals at a limited dose of approx 5 mg/l. LD50 Dermal = >2000 mg/kg bw (rat)
	b) **Skin corrosion/irritation** No valid animal data available; classification as an irritant on all relevant routes of exposure according to human experience. In accordance with classification parametres (EC) 1272/2008. **Contact with the substance causes irritation.**
	c) **Serious eye damage/irritation** No valid animal data available; classification as an irritant on all relevant routes of exposure according to human experience. In accordance with classification parameters (EC) 1272/2008. **The substance causes irritation.**
	d) **Respiratory or skin sensitisation** **Does not indicate sensitization** during in Alarie test. **Does not indicate sensitization** during guinea pig maximization test or Buehler test. The data are conclusive but not sufficient for classification.
	e) **Germ cell mutagenicity** Most of the results from the numerous studies available show **no evidence of a mutagenic effect**.
	f) **Carcinogenicity** In long-term animal studies in which the substance was given in high concentrations by feed, a carcinogenic effect was not observed.
	g) **Reproductive toxicity** The results of animal studies gave no indication of a fertility impairment effect.
	h) **Specific target organ toxicity (STOT) – single exposure** The local respiratory irritation observed on the inhalation route of exposure. Classification STOT Single Exp. 3
	i) **Specific target organ toxicity (STOT) – repeated exposure** The substance may cause damage to the upper respiratory tract even after repeated inhalation, as shown in animal studies. After repeated exposure, the prominent effect is local irritation. No systemic effects observed.
	j) **Aspiration hazard** No aspiration hazard expected.

SECTION 12: Ecological information

12.1	**TOXICITY**
	There is a high probability that the product is not acutely harmful to aquatic organisms. Inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in suitably low concentrations. In accordance to classification parameters (EC) 1272/2008, the substance does not meet classification criteria.
	Fish LC0 (96 h) >100 mg/1, Oryzias latipes (OECD Guideline 203, semistatic) LC50 (96 h) 707.1 mg/1, Salmo gairdneri, syn. O. mykiss (OECD 203; ISO 7346; 84/449/EEC, C.l,static) Chronic toxicity to fish: Study scientifically not verified.
	Algae EC50 (72 h) > 1,000 mg/1 (growth rate), Selenastrum capricomutum (OECD Guideline 201, static)
	Daphnia Toxicity to aquatic invertebrates: EC50 (48h) >1000 mg/L Daphnia magna (OECD Guideline 202, part 1, static) Chronic toxicity to aquatic invertebrates: NOEC (21 d) >100 mg/1, Daphnia magna (OECD Guideline 211, semistatic)
	Bacteria Microorganisms/Effect on activated sludge:EC10 (17 h) 1737 mg/1, Pseudomonas putida (other, aquatic) Respiration of activated sludge is not inhibited at concentrations > 1000 mg/L.
12.2	**PERSISTENCE AND DEGRADABILITY**
	Epsilon-Caprolactam is readily biodegradable according to OECD criteria. In contact with water, the substance will slowly hydrolyze.
12.3	**BIOACCUMULATIVE POTENTIAL**
	There is no evidence that epsilon-Caprolactam bio-accumulates in organisms. Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not expected.
12.4	**MOBILITY IN SOIL**
	The substance will not evaporate into the atmosphere from a water surface. Adsorption into solid soil phase is not expected.
12.5	**RESULTS OF PBT AND VPVB ASSESSMENT**
	The substance is not a PBT or vPvB substance.
12.6	**OTHER ADVERSE EFFECTS**
	Other ecotoxicological advice: Do not release untreated into natural waters.

SECTION 13: Disposal considerations – in accordance with national directions

13.1	WASTE TREATMENT METHODS
	A) **Possible hazards in disposing of the substance and contaminated packaging** Uncleaned empties should be disposed of in the same manner as the contents. Empty packaging units can be recycled; plastic parts can be burnt in an approved incinerator fitted with the appropriate degree of gaseous by-products cleaning (1200–1400°C during the second degree; at least the second degree of gaseous by-product cleaning.) The cisterns used to transport Caprolactam are returned to the manufacturer. The liquidation of the residual product in cisterns and the cleaning of cisterns is arranged by the manufacturer.
	b) Physical/chemical properties may affect waste treatment.
	c) Voiding waste disposal through sewerage. Harmful to water. Prevent leakage into the sewer system, water streams or soil.
	d) Special precautions for any recommended waste treatment. Observe all valid waste-related laws and regulations. Residual Caprolaktam is liquidated by burning in an approved incinerator with a temperature of 1200–1400°C during the second degree; the incinerator must be fitted with at least the second degree of gaseous by-product cleaning. Czech Republic: Waste Act No. 185/2001 Coll, as annotated, Waste catalogue (decree No. 93/2016 Coll) as annotated. European Union: Directive of the European Parliament and of the Council No. 2006/12/ES on waste.

SECTION 14: Transport information

Not classified as dangerous goods under transport regulations.

14.1	UN NUMBER

14.2	UN PROPER SHIPPING NAME
	ADR
	RID
	IMDG:
	ICAO/IATA:

14.3	TRANSPORT HAZARD CLASS(S)			
	ADR	RID	IMDG:	ICAO/IATA:
	Not classified	Not classified	Not classified	Not classified

	CLASSIFICATION			
	ADR	RID		

14.4	PACKAGING GROUP			
	ADR	RID	IMDG:	ICAO/IATA:

	HAZARD IDENTIFICATION NO. (KEMLER)
	ADR

	LABELS			
	ADR	RID	IMDG:	ICAO/IATA:

	NOTE			
	ADR	RID	IMDG:	ICAO/IATA:
			Marine pollutant: EmS:	PAO: CAO:

14.5	ENVIRONMENTAL HAZARDS
	Not a dangerous substance under transport regulations.

14.6	SPECIAL PRECAUTIONS FOR USER
	Caprolaktam flakes are filled into 25 kg open, paper, 2-ply sewn bags with a sealed PE insert. Other types of packaging units (quantity and type of packaging) can be agreed with the customer. Transported by rail (covered cars), ISO containers or other covered means of transportation. Melted Caprolaktam is filled into 40 m^3 or 47 m^3 railroad cisterns provided with heating coils and a thermometer and into railroad containers or car cisterns. If heated, the temperature of melted Caprolaktam must not exceed 90 °C. The protective atmosphere of nitrogen is maintained above melted Caprolaktam to prevent the oxidation of the product in atmospheric oxygen. Maximum oxygen content is 50 ppm. To maintain oxygen content of less than 50 ppm in an inert atmosphere, both the customer and the supplier are obliged to secure of 0.02 MPa of nitrogen in the cistern, refill the inert atmosphere in the cistern, or empty the cistern only with nitrogen that does not contain more than 10 ppm of oxygen. The conditions for filling railroad containers and car cisterns and for good protection during transport are specified upon agreement with the customer. The technical suitability of the means of transportation is the carrier's responsibility. The cisterns are reserved only for this substance.

14.7	TRANSPORT IN BULK ACCORDING TO ANNEX II OF MARPOL 73/78 AND THE IBC CODE

SECTION 15: Regulatory information

15.1	**SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC TO THE SUBSTANCE OR MIXTURE**
	Regulation of the European Parliament and of the Council (EC) No. 1907/2006 REACH Regulation (EC) 1272/2008 on classification, labelling and packaging (CLP) of substances and mixtures
15.2	**CHEMICAL SAFETY ASSESSMENT**
	Chemical safety assessment was performed.

SECTION 16: Other information

a)	Changes in the case of a revised safety data sheet. New safety data sheet according to Annex II Regulation (EC) 1907/2006 amended by Reg. (EC) 453/2010.	
b)	Key to abbreviations and acronyms: PBT persistent, bioaccumulative and toxic vPvB very persistent, very bioaccumulative Acute Tox. 4 (Inhalation - dust): Acute toxicity (inhal.), Hazard Category 4 Acute Tox. 4 (Oral): Acute toxicity (oral), Hazard Category 4 Skin Irrit. 2: Serious eye damage/eye irritation, Hazard Category 2 Eye Irrit. 2: Skin corrosion/irritation, Hazard Category 2 STOT SE 3 (Irritating to respiratory system): Specific target organ toxicity — Single exposure, Hazard Category 3, Respiratory tract irritation	
c)	Key literature references and sources for data: Regulation of the European Parliament and of the Council (EC) No. 1907/2006 **Registration documentation** according to Direction (EC) 1907/2006 REACH Appendix I, IV, VI a VII from Directive (EC) 1272/2008 CLP Act No. 350/2011 Coll., on chemical substances and on chemical preparations and on amendments to certain laws, as annotated Act No. 258/2000 Coll., on the protection of public health and on changes to certain related laws, as annotated Governmental decree No. 361/2007 Coll., which stipulates the conditions of protecting employees' health at work	
d)	**List of relevant phrases, hazard statements, safety phrases and precautionary statements**	
	H-phrases	H332 Harmful if inhaled. H302 Harmful if swallowed. H335 May cause respiratory irritation. P261 Avoid breathing dust/fume/gas/mist/vapours/spray. P270 Do not eat, drink or smoke when using this product. P271 Use only outdoors or in a well-ventilated area. P280 Wear protective gloves/protective clothing/eye protection/face protection. P264 Wash with plenty of water and soap thoroughly after handling. P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P312 Call a POISON CENTER or doctor/physician if you feel unwell. P305+P351+P338 IF CONTACT WITH EYES: Rinse cautiously with water for several minutes. Remove any contact lenses if safe and possible. Continue rinsing.
	P-phrases	P337 + P313 If eye irritation persists: Seek medical advice/attention. P362 Remove contaminated clothing and wash before reuse. P302 + P352 IF ON SKIN: Wash with plenty of soap and water. P332 + P313 If skin irritation occurs: Seek medical advice/attention. P301 + P330 IF SWALLOWED: rinse mouth. P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. P405 Store securely. P403 + P233 Store in a well-ventilated place. Keep container tightly closed. P501 Dispose of contents/container to a hazardous or special waste collection point.
e)	Suitable training for workers: People handling the product must be informed of the risk of possible life and health hazards and the requirements for the protection of health and the environment (see the respective provisions of the Labour Code)	
f)	More information: This Safety Data Sheet was prepared in accordance with the Regulation of the European Parliament and of the Council Regulation (EC) no. 1907/2006. The Safety Data Sheet contains the data necessary for ensuring safety and health at work and environmental protection. These data correspond to the current state of knowledge and experience and are in compliance with applicable laws and regulations. They may not be considered a guarantee of suitability for a specific application. Compliance with effective local laws is the responsibility of the buyer. Under Article 35 of the European Parliament and of the Council Regulation (EC) no. 1907/2006, each employer is required to provide workers and their representatives with access to the information about MSDS substances / preparations, the uses for workers and the effects they may be exposed to during their work.	