

### 1. CHEMICAL PRODUCT AND PRODUCER OR SUPPLIER IDENTIFICATION

1.1 Product identification		
Trade name:	<ul> <li>Polyamide 6 granules (hereinafter PA6)</li> <li>Depending on range of relative viscosity values Polyamide 6 is manufactured of the grades as follows:</li> <li>Polyamide 6 grade PA6-210, first and second quality;</li> <li>Polyamide 6 grade PA 6-310, first and second quality;</li> <li>Polyamide 6 grade PA 6-220/320, first and second quality;</li> <li>Polyamide 6 grade GRODNAMID 33;</li> <li>Polyamide 6 grade GRODNAMID 27.</li> </ul>	
Other ways of identification:	Polymer	
	Nylon 6; Perlon; Polycaprolactam; Poly [imino(l-oxo-1,6-hexanediyl)]	
Recommendations and restrictions on application:	PA6 are differentiated by application: Grades GRODNAMID 33, GRODNAMID 27 are intended for manufacture of polyamide yarns for different purposes, monofilament yarns, molded articles, polymer composite materials, polymer foil. Grades PA6-210, PA6-310 of first quality are intended for manufacture of polyamide yarns for different purposes; monofilament yarns, molded articles and polymer composite materials without presenting requirements towards their appearance in regards to inclusions. Grades PA6-210, PA6-310 of second quality and grade PA6-220/320 are intended for manufacture of polymer composite materials, mass-coloured in black.	
1. 2 Identi	fication of producer or supplier	
Full official name of organization:	Joint Stock Company «Grodno Azot» Branch «Khimvolokno Plant»	
Full mailing address:	ul. Slavinskogo,4, 230026, Grodno, Republic of Belarus	
Contact phone:	+375 (152) 73-87-20, 73-86-56	
E-mail:	office@grodno-khim.by	
Факс:	+375 (152) 39-19-00	

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# 2. HAZARDS IDENTIFICATION

Hazard classification :	PA6 is not toxic product and under normal conditions has not adverse effects onto human body. Under parameters of acute oral and dermal toxicity PA6 belongs to the hazard category 4 (low-hazard substances). PA6 has not adverse effect onto environment (stable, chemically inert, water insoluble, does not affect quality of subsoil and surface waters), possesses biochemical stability.
Classification according to GHS:	
Marking elements according to GHS	Not classified as dangerous product as per GHS.
and safety precautions:	In accordance with the enforced European legislation PA6 is not dangerous or toxic, it is not required to be marked under GHS and GOST 31340-2013 (with reference to the available data). According to EU Regulation No. 1272/2008 [CLP] PA6 is not classified as per criteria of the Global Harmonization System. Danger warning label is not required for PA6. According to Directives 67/548/EEC or 1999/45/EC PA6 isn't required to be pre-marked as per EU directives.
Other dangers:	If prescriptions/instructions on storage and usage are met, there are not known special risks. At fine dust formation during transportation or processing: danger of dust explosion. Dust may irritate skin, eyes and respiratory tracts. Molten PA6 may cause severe burns. Results of evaluation of the substance reference to persistent, bioaccumulative, toxic (PBT) and very persistent, very bioaccumulative (vPvB): PA6 is not subject to the PBT/vPvB criteria of REACH regulation, Annex XIII.

## 3. COMPOSITION (INFORMATION ON INGREDIENTS)

It's a product of caprolactam hydrolytic polymerization, corresponds to chemical formula (-NH-(CH<sub>2</sub>)<sub>5</sub>-CO-)<sub>n</sub>

Ingredient	Content, %	Information on ingredients
1. Polyamide	up to 98-100	CAS No. 25038-54-4,
		EC No. 607-506-6.
		Synonyms: Nylon 6; Perlon; Polycaprolactam;
		Poly[imino(1-oxo-1,6-hexanediyl)].
		MACw.a.= $5mg/m^3$ (aerosol), hazard class - 3.

Do not contain other ingredients or admixtures that affect classification of products.

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4. FIRST-AID MEASURES		
At inhalation:	At appearance of discomfort feelings after dust inhalation: bring the affected person to fresh air, ensure rest, warm; rinse the mouth with water, plentiful drink, at necessity seek medical attention.	
At skin contact:	Molten PA6 may cause severe burns. Do not remove PA6 out of skin without medical assistance. After getting molten PA6 promptly cool down the injured skin areas with water. Consult a physician.	
At eye contact:	Rinse eyes with plenty of warm water, at necessity consult a physician.	
At ingestion:	Drink a plenty of water, saline purge. At state of health aggravation seek medical attention.	
Observed signs and symptoms:	At proper usage it doesn't constitute any danger. Cases of acute poisoning are not described. Dust may cause skin irritation, eye irritation and redness.	

## 5. FIRE & EXPLOSION-FIGHTING MEASURES AND MEANS

Fire & explosion hazard:	PA6 granulated belongs to the group of combustible inflammable materials with a moderate smoke-forming ability.
Characteristics of fire & explosion hazard:	PA6 melting temperature makes up 213-216 °C, ignition point - 395°C, self-ignition point - 440°C. Air-borne dust (aerosol) of PA6 is fire dangerous. Low concentration limit of flame propagation - $32 \text{ g/m}^3$
Characteristic of danger provoked by combustion and thermal destruction products:	At temperature exceeding 300°C there begins thermal destruction of PA6, followed by emission of destruction products: caprolactam, ammonia, carbon oxide and dioxide. At exposure to open flame PA6 flushes without explosion and burns as smoky flame with formation of melt and emitting of gaseous products of thermal destruction. At burning products of thermal destruction and burning are emitted including caprolactam, ammonia, carbon oxide and dioxide, nitrogen oxide. Nitrogen dioxide NO <sub>2</sub> : MACw.a 2 mg/m <sup>3</sup> , hazard class 3; acute toxicity at inhalation effect, hazard class 2; skin and eye irritation, hazard class 1B.

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Ammonia NH<sub>3</sub> MACw.a. - 20 мг/м, hazard class 4; acute toxicity at inhalation effect, hazard class 3; skin erosion /irritation, hazard class 1B; hazard for aquatic habitat – acute toxicity, hazard class 1. Carbon dioxide CO<sub>2</sub> at significant content in air decreases oxygen content in it, evokes narcotic effect, irritates mucous membranes. Carbon oxide (II) possesses acute toxicity at inhalation effect of class 3. Carbon oxide CO evokes asphyxia due to oxygen displacement from oxyhemoglobin of blood, affects central and peripheral nervous systems. MACw.a. of carbon oxide -  $20 \text{ mg/m}^3$ . Caprolactam: MACw.a. - 10 mg/m<sup>3</sup>, hazard class 3. It provokes irritation to visual organs and respiratory system. At fire outbreak - fire-protection suit completed with

Personal protection means at fire extinguishing:

Specifics at fire extinguishing:

At fire the following fire extinguishing means are used: carbon dioxide gas, chemical foam, fine spray of water, water with wetters, phosphorous powder; indoors – foam extinguishers or carbon-dioxide sand, felted cloth. At large fires – isolate dangerous hazard, extinguish fire from maximal distance with fine sprayed water, air-mechanical foam, dry bicarbonate powder, carbon-dioxide gas. There are no forbidden fire extinguishing means

### 6. MEASURES TO PREVENT AND LIQUIDATE ACCIDENTAL AND EMERGENCY SITUATIONS AND THEIR CONSEQUENCES

self-contained self-rescue device.

Measures to ensure individual and collective security at accidental and emergency situations:	There is no required to take special measures. In case of melt leakage/spillage there is appeared danger of creation of particular slippery surfaces. At contact with PA6 melt it is possible to get thermal burns.
Precautionary measures at accidental and emergency situations ensuring environment protection:	There shall be foreseen measures excluding PA6 getting into sanitary sewerage and storm sewage systems, surface water bodies.
Neutralization and purification methods:	At PA6 spillage it shall be collected into separate tare with its further disposal according to the legislation in force. Do not admit PA6 entering into surface waters.

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## 7. RULES OF CHEMICAL PRODUCTS STORAGE AND HANDLING AT LOADING AND UNLOADING WORKS

## 7.1. Precautionary measures at handling with chemical products:

- safety measures and protection means at work with the products:	Combined supply and exhaust ventilation and emergency ventilation in working areas and local exhausts in dusting places and possible thermal destruction fume emissions. Dusting sources shall be equipped with local exhausts. Sealing of equipment, production processes and tanks for storage and transportation. Work rooms ventilation to meet MAC of working area. Usage of non-sparkling tools, air-tight equipment. All communication lines, tanks, machines and assemblies where static electricity may be accumulated shall be grounded. Usage of personal protective equipment, following personal hygiene practice	
- measures for environment protection: lin	Ensuring of air-tightness of equipment and communication nes, strict following process mode, expulsion of emergency situations, elimination of leakages and prevention of spillage at production, storage and transportation of PA6. Waste waters and scouring waters after flushing equipment, communication lines and channels shall be send to biological treatment.	
- recommendations for safe haulage and transportation	<ul> <li>PA6 is transported by all transportation kinds in covered vehicles or in universal containers in compliance with Rules of Carriage of Goods in force at this kind of transport. Transportation shall be performed in compliance with Rules of Safe Carriage of Goods in force at this kind of transport.</li> <li>It's admitted to perform PA6 shipment by packing units. At transportation by railway transport polyamide is transported by packages, carloads. By means of road and air transport polyamide is transport polyamide is transported in soft containers or by small consignments.</li> <li>Bags shall be put on wooden pallets. Tare shall be protected from atmospheric precipitations.</li> </ul>	
7.2. Safe storage conditions and time:		
- peculiarities of storage facilities or tanks construction:	PA6 shall be stored in roofed dry ventilated storage facilities in conditions preventing from dirties, mechanical damages of packaging, and excluding exposure to direct sunlight and at a distance of min. 1 m. from heating devices. Guarantee period is 1 year from manufacturing date. PA6 long-term storage time in manufacturer's tare in closed storage facility (temperature from 5 °C till 35 °C, air relative humidity max. 85 %, absence of aggressive substances) makes up 12-15 years with main properties maintaining for 80 %.	

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- incompartible substances and materials at storage:

- necessity in special electric equipment and measures to eliminate static electricity:

- materials recommended for tare and packaging:

Oxidizers, concentrated acids, increased humidity

To use explosion-proof electric, ventilation, lighting equipment. To take measures against static electricity discharge.

PA6 is packed into polymer PET/AL/PE multilayer bags under TS&LA (Technical Standard & Legislation Act) or in accordance with procurement contract.

A bag's top is thermally sealed up with two or three seams.

PA6 is packed into polyethylene bags for chemical goods with valve and hexagonal bottom and top under TS&LA or in accordance with procurement contract.

A valve tucked into a bag is glued up with polyethylene- or polypropylene-based adhesive tape under TS&LA or in accordance with procurement contract. Bags with PA6 are sent to the customer without forming unit load or formed into unit loads.

At forming unit load a cardboard layer corresponding to pallet dimensions is out onto a pallet; bags are put onto a pallet, a cardboard layer corresponding to pallet dimensions is put onto upper row; a pack is wrapped up with stretching polymer foil.

Packing materials used at forming unit load shall meet technical requirements provided under TS&LA or in accordance with procurement contract.

Nominal mass of PA6 packed in bags shall be 25 or 30 kg. Allowable deviation of actual net mass from nominal mass shall not exceed  $\pm 1,0$  %.

Under agreement with the customer it is admitted to pack PA6 into soft specialized containers for bulky PA6 with liner out of multilayer PET/AL/PE polymer foil under TS&LA or using other packaging materials under TS&LA ensuring maintaining PA6 quality and quantity.

Nominal mass of PA6 packed into soft specialized containers and allowable deviation of actual net mass from nominal mass is set under agreement with a customer.

Increase in water content during storage and transportation is not a reason for PA6 rejection thus as it is hygroscopic. Before processing it shall be dried up to water content (0,05-0,10)% depending on processing way.

PA6 in case of partial or full loss of consumer properties, liquid wastes after production or usage (after equipment and

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- additional special requirements:

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communication lines cleaning), leakages/spillages, not applicable for the intended usage are passed to disposal or dumping according to the legislation requirements.

#### 8. EXPOSURE CONTRLOLS AND PERSONAL PROTETION

Parameters subject to obligatory	MACw.a. 5 mg/m <sup>3</sup> , (polyamide, dust), 3 cl.
control:	MACw.a. $10 \text{ mg/m}^3$ , (caprolactam), 3 cl.
	MACw.a. 20 mg/m <sup>3</sup> , (ammonia) ,4 cl.
	MACw.a 20 mg/m <sup>3</sup> (carbon oxide), 4 cl.
Measures to maintain and control the set parameters:	Supply and exhaust ventilation of rooms, local exhaust devices on working places, usage of air-proof equipment, tare and communication lines. There shall be arranged constant control of harmful substances content in emissions during production.

example.



Employees' personal protection means: - for respiratory tract protection:

- for eye protection:

- for hands' skin protection:

- protective clothes:

Goggles with side shields (in a frame) (EN 166) At work with hot melts to use additionally heat-protective gloves, for example from fabric or leather (EN 407).

Respiratory protection at formation of air-permeable vapours/dust. At inadequate ventilation it is necessary to protect respiratory tracts. Dust filter of type P2 or FFP2 (moderate ability to catch solid and liquid particles, for

Filtering

industrial

breathing

Protective gloves, ointments, pastes.

EN143,149).

apparatuses in accordance with TS&LA.

Usage of personal protective clothes according to conventional branch standards approved in the set order. Workwear: Body protection shall be chosen depending on kind of activity and on possible effect, for example, apron, protective boots, protective chemical suit (according to DIN-EN 465)

### 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Solid substance
Smell (smell threshold):	None
Colour:	Granules from natural colour till yellow tint
Crystallization point, °C:	n.a.
Boiling point, °C :	n.a.
Melting temperature:	213-216°C
Flash point:	n.a.

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Ignition point : Temperature of initial combustion:	395°C Self-ignition point - 440°C.
Upper/low flammability limits:	Air-borne dust (aerosol) of PA6 is fire dangerous. Low concentration limit of flame propagation is $32 \text{ g/m}^3$ .
Vapour pressure: Vapour density: Vapourization rate:	n.a. PA6 is non-volatile solid substance.
Decomposition point, °C	n.a.
Hydrogen factor, units pH	n.a.
Dynamic viscosity, mPa.s, at 20°C	n.a.
Density, g/cm <sup>3</sup> , at 20°C:	1,13-1,16
Partition coefficient : n-Octanol/water	No data
Solubility in water	Insoluble in water and fats. PA6 is soluble in creosol, concentrated acetic and sulphuric acids, fluorated alcohols, strong polar solutions.
<b>10. ST</b> A	ABILITY AND REACTIVITY
Chemical stability:	PA6 is stable. Not decomposes at common conditions, thermally stable, possesses biochemical resistance. Highly stable in abiotic conditions ( $t_{1/2} = 30-7$ days);
Possibility of dangerous reactions:	At following prescriptions/instructions on storage and application there are no dangerous reactions.
Conditions to avoid:	Temperatures above 320 °C
Incompatible substances and materials:	Incompatible with strong oxidizers
Danger decomposition products:	Nitrogen dioxide N0 <sub>2</sub> : MACw.a 2 mg/m <sup>3</sup> , hazard class 3; acute toxicity at inhalation exposure, hazard class 2; scin and eye irritation, hazard class 1B. <u>Ammonia NH<sub>3</sub></u> MACw.a 20 mg/m <sup>3</sup> , hazard class 4; acute toxicity at inhalation exposure, hazard class 3; skin erosion/irritation, hazard class 1B; Hazard for aquatic habitat - acute toxicity, hazard class 1. <u>Carbon oxide</u> CO <sub>2</sub> at significant content in air decreases oxygen content in it, evokes narcotic effect, irritates mucous membranes. Carbon oxide (II) possesses acute toxicity at inhalation effect of class 3.

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	<u>Carbon oxide CO</u> evokes asphyxia due to oxygen displacement from oxyhemoglobin of blood, affer and peripheral nervous systems. MACw.a. of carbon oxide - 20 mg/m <sup>3</sup> . <u>Caprolactam:</u> MACw.a 10 mg/m <sup>3</sup> , hazard class 3. It provokes visual organs and respiratory system	cts central
11. TOXIO	COLOGICAL INFORMATION	
Exposure pathways to a body:	Via respiratory tract, at getting intra (swallowing), skin, into eyes. Contact with molten PA6 may lea burns.	getting on d to thermal
Information on effects onto human body dangerous for health and their consequences:	In case of dust /aerosol formation –irritation of respiratory tracts at inhalation, slight eye irritation At getting into eyes may induce slight irritating e	l. ffect.
Information on dangerous long-term eff	fect onto a human body:	
- cumulativity:	Weak	
- percutaneous action:	Not established	
- sensibilizing action:	Not investigated	
- teratogenic action:	Not investigated.	
- cancerogenic effect:	Not investigated (human). Weak (animals)	
- mutagenic effect:	Not investigated	
- embryotropic effect:	Not investigated.	
- Acute toxicity:	Under parameters of acute intragastric toxicity PA substances of low danger (hazard class IV). LD <sub>50</sub> > oral, rats Under parameters of acute dermal toxicity DL <sub>50 cr</sub> substances of low danger (hazard class IV). DL <sub>50 c</sub>	A6 refers to 5000  mg/kg, at refers to aut > 2500
Dosages (concentrations),	mg/kg.	
possessing minimal toxic activity:	n.a.	
12. ECOLOGICAL INFO	RMATION	
Assessment of possible effect onto environment:	The main types of dangerous effect onto environic contamination with polyamide dust of atmospheric conglomerations, soil, appearance of shore depose At non-observance of handling rules, disorce disposal, dumping onto terrain and into water result of accidents and emergency situations. A polyamide disposal. Soil foulness. Formatic deposits.	ment are ic air of its. lered wastes basins, as a t unapproved on of shore
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Data on stability and transformation in environment:	PA6 stable. Not degraded at common conditions, thermally stable, possesses biochemical resistance. Highly stable in abiotic conditions ( $t_{1/2} = 30-7$ days);
Data on migration (in soil)	No data
Ecotoxicity parameters:	No data
Other types of unfavourable affect	PA6 is hardly dissolved in water so it can be eliminated out of water in designed treatment plants by mechanical separation. As per available test data PA6 is inert and nor a subject to decomposition. PA6 is not subject to effect of PBT-criteria (persistent/bioaccumulative/toxic) and vPvB-criteria (very persistent/very bioaccumulative). PA6 doesn't contain substances listed in Regulation (EU) 1005/2009 on substances that deplete the ozone layer.

#### **13. RECOMMENDATIONS ON WASTES (RESIDUES) DISPOSAL**

Wastes collection and storage,	PA6 in case of partial or full loss of consumer properties,				
neutralization:	liquid wastes after production or usage (after equipment and				
	communication lines cleaning), spillages not applicable for the				
	intended usage are passed to neutralization/disposal or				
	dumping according to the legislation requirements.				

Safety measures at wastes treatment: PA6 in case of partial or full loss of consumer properties, liquid wastes after production or usage (after equipment and communication lines cleaning), spillages not applicable for the intended usage are passed to neutralization/disposal or dumping according to the legislation requirements.

> Safety measures at wastes (residues) treatment are similar to those used at treatment of main product (see. Chapters 7, 8 of MSDS)

Packaging treatment (neutraliza-	Packing shall be completely empty.
tion ways, possibility of reuse	Completely empty packaging may be sent to reprocessing.

#### **14. TRANSPORTATION INFORMATION**

UN No.:	None		
UN proper shipping name, transportation name:	Transportation name is indicated according to the regulations in force for respective transport type.		
Types of transportation means:	PA6 is transported by all types of transport in conformity with cargo transportation rules in force for that kind of transport.		
Hazard classification at transportation:	Not subject to Regulation on carriage of dangerous goods.		
Transportation marking and packaging group:	On each bag, unit load and soft specialized container to apply manipulation sign «Protect from moisture».		
Emergency card No.:	None		

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Recommendations on safe transportation: None

	1			1			
ADR	IMDG	IATA	ADN	RID			
14.1. UN number							
The material is not considered as dangerous according to transportation rules							
14.2. Official name for transportation							
N.a.	N.a.	N.a.	N.a.	N.a.			
14.3. Class (es) of types of risk referring to transport							
N.a.	N.a.	N.a.	N.a.	N.a.			
N.a.	N.a.	N.a.	N.a.	N.a.			
14.4. Packaging group							
N.a.	N.a.	N.a.	N.a.	N.a.			
14.5. Hazards for environment							
Dangerous for environment :	Dangerous for environment :	Dangerous for environment :	Dangerous for environment :	Dangerous for			
no	No	No	No	environment: No			
	Sea pollutant: No						
Absence of additional information							

#### 15. Information on national and international legislation

International legislation

Regulation CLP No.1272/2008 of the European Parliament and of the Council dd. December 16, 2008 concerning classification, marking and packing of substances and mixtures altering and cancelling Directives 67/548/EEC and 1999/45/EC and altering Regulation (EC) No 1907/2006 (text as per EEA)

#### 16. Additional information

Material Safety Data Sheet (MSDS) complies with Recommendations of UN ST/SG/AC. 10/30 (GHS) The Material Safety Data Sheet was initially developed as of 10.07.2017

The data presented in this Material Safety Data Sheet are based on knowledge and experience got at present and describes PA6 from the point of view of safety requirements. These data shall not be considered as description of properties of the goods (specification of PA6). You shall not make any conclusion on quality or applicability of PA6 for exact usage based upon data of Material Safety Data Sheet. End user of PA6 shall observe existing laws and prescriptions as well as legal norms.

Company-developer:

CJSC «Engineering and Ecological Centre «BELINECOMP», str. J. Kupaly, 3A 211440, Novopolotsk, Vitebsk region, Republic of Belarus Phone / fax +375 (214) 75-03-00 phone +375 (214) 75-14-75. E-mail: <u>ecomp@mail.ru</u>; Web: <u>http:// www.ecomp.by</u>\_

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