

**SAFETY DATA SHEET OF MIXTURE**
**SECTION 1. IDENTIFICATION OF THE MIXTURE AND OF THE UNDERTAKING**
**1.1. PRODUCT IDENTIFIER**

Trade name	Tarfuse® PA LM
Other names or synonyms	None
REGISTRATION No.	The product is a polymer and is not subject to registration. Caprolactam monomer registered: RSI No 01-2119457029-36-0005.

**1.2. RELEVANT IDENTIFIED USES OF THE MIXTURE AND USES ADVISED AGAINST**

**Identified uses:**  
Filament for 3D printing in FDM technology.  
**Uses advised against:**  
Not applicable

**1.3. DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET**

**Grupa Azoty S.A.**  
33-101 Tarnów, ul. E. Kwiatkowskiego 8  
POLAND  
tel. +4814 633 07 81 ÷ 85  
fax +4814 633 07 18  
Contact data of the person responsible for the MSDS: [tb@grupaazoty.com](mailto:tb@grupaazoty.com)

**1.4. EMERGENCY TELEPHONE NUMBER**

**Rescue services: 112**  
**Substantive aid of Grupa Azoty S.A.:**  
**+4814 637 21 00, 637 31 00 Available 24/7**

**SECTION 2. HAZARDS IDENTIFICATION**
**2.1 CLASSIFICATION OF THE MIXTURE**

Classification according to the regulation of the European Parliament and of the Council (EC) No 1272/2008 (CLP)  
According to the regulation of the European Parliament and the Council (EC) No 1272/2008 (CLP):

- The product contains no hazardous substances in amounts affecting classification
- The product is not subject to REACH registration in accordance with regulation of the European Parliament and of the Council (EC) 1907/2006 dated 18 December 2006

**2.2 LABEL ELEMENTS**

Labelling according to Regulation (EC) No 1272/2008 (CLP):

- Hazard pictograms: The product does not require labelling.
- Signal word: The product does not require labelling.
- Hazard statements: The product does not require labelling.
- Precautionary statements: The product does not require labelling.

**2.3 OTHER HAZARDS**

Under recommended conditions of utilisation possibility of thermal burns.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**
**3.1 MIXTURES**

Components of the mixture: polyamide 6 (CAS 25038-54-4), additives.

**SECTION 4. FIRST AID MEASURES**
**4.1 DESCRIPTION OF FIRST AID MEASURES**
**IF INHALED**

Persons exposed to volatile products of decomposition must be removed from the contaminated area, provided with fresh air, protected from body heat loss. Provide medical assistance. Personnel conducting action in contaminated atmospheres must be equipped with gas masks or breathing apparatus.

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**IF SWALLOWED**

Risk of choking if swallowed, remove material and seek medical attention.

**IF ON SKIN**

In the event of burns caused by melted product, immediately cool the burn area with a cold water jet, dress with e.g. sterile gauze and seek medical assistance. If the skin is mechanically damaged by filament, apply a sterile dressing gauze to the wound and seek medical attention.

**IN CASE OF CONTACT WITH EYES**

If the eye becomes clogged with small pieces of the product, rinse carefully with running water for 15 minutes. In case of large pieces of the product, carefully remove from the eye with e.g. a piece of soft, clean cloth or soft paper. When a contaminant is stuck in the eye or the eye is injured, an ophthalmological check is necessary. In case of eye contact with the melted product, rinse immediately with running water carefully for 15 minutes and seek medical attention.

**FIRST AID MEASURES**

Not applicable.

**4.2 MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED**

No information.

**4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED**

Symptomatic treatment.

**SECTION 5. FIREFIGHTING MEASURES****5.1 EXTINGUISHING MEDIA****SUITABLE EXTINGUISHING MEDIA:**

Water, foam, powders, carbon dioxide. Avoid directing a jet of water onto burning, molten material.

**UNSUITABLE EXTINGUISHING MEDIA:**

Missing information

**5.2 SPECIAL HAZARDS ARISING FROM THE MIXTURE**

Substances that can generate during fire: carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), hydrogen cyanide (HCN), nitrogen oxides (NO<sub>x</sub>), ammonia (NH<sub>3</sub>). Combustion products are soluble in water, producing acids, bases and salts. Under specific conditions accompanying the combustion, trace amounts of other poisonous substances can not be ruled out. Forming of further products of combustion and oxidation depends on the fire's circumstances. During combustion, the product may melt, forming flowing streams, drops or sticky pools. During extinguishing, the melted material may solidify again as a result of cooling.

**5.3 ADVICE FOR FIREFIGHTERS**

Use breathing apparatus and protective suit in case of fire.

**SECTION 6. ACCIDENTAL RELEASE MEASURES****6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES****6.1.1 For non-emergency personnel**

No particular precautions are necessary.

**6.1.2 For emergency responders**

No particular precautions are necessary.

**6.2 ENVIRONMENTAL PRECAUTIONS**

The product poses no hazard.

**6.3 METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP**

Collect unrolled material mechanically.

**6.4 REFERENCES TO OTHER SECTIONS**

In the event of fire - see Section 5.

See also Sections 8.2 and 13.

<b>SECTION 7. HANDLING AND STORAGE</b>
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In addition to information given in this section, relevant information may also be found in Section 8.

**7.1 PRECAUTIONS FOR SAFE HANDLING**

When used at room temperatures, no special precautions are necessary. Printing devices should be equipped with adequate ventilation equipment, heat shields. Avoid inhalation of thermal decomposition products. Avoid unrolling the filament due to the danger of entanglement and falling, as well as the possibility of mechanical damage to the skin from the filament or, in extreme cases, strangulation. Collect unrolled material mechanically.

Do not eat, drink or smoke in the area of application. Keep away from sources of open flame and sparks.

**7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES**

The material must be stored in dry rooms. Keep away from heat sources, open flames and sparks.

**7.3 SPECIFIC END USE(S)**

No uses other than in Section 1 have been identified.

<b>SECTION 8. EXPOSURE CONTROL/ PERSONAL PROTECTION</b>
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**8.1. CONTROL PARAMETERS**

Not applicable.

Recommended methodology: Not applicable.

**DNEL**

Not applicable.

**PNEC:**

Not applicable.

**8.2. EXPOSURE CONTROL**
**8.2.1 Appropriate engineering controls**

- a) Adequate ventilation must be provided for thermal processing.

**8.2.2 Individual protection measures such as individual equipment**

- a) Eye or face protection - safety goggles with side shields to protect against penetration of a piece of filament (according to EN 166 standard).
- b) Skin protection:
  - hand protection - when handling molten material, additionally use heat resistant gloves (according to EN 407).
  - body protection - if contact with molten product is possible, use protective clothing.
- c) Respiratory protection - in case of insufficient ventilation and emission of thermal decomposition products, use gas masks.

**8.2.3 Environmental exposure controls**

Not applicable.

<b>SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES</b>
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**9.1. INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES**

<b>APPEARANCE</b>	Solid in the form of a various coloured filament.
<b>ODOUR</b>	Not applicable
<b>ODOUR THRESHOLD</b>	Not applicable
<b>pH</b>	Not applicable
<b>MELTING POINT /FREEZING POINT</b>	Melting point: 215-225°C
<b>INITIAL BOILING POINT AND BOILING RANGE</b>	Not defined, the product undergoes decomposition.
<b>FLASH POINT</b>	>400°C

EVAPORATION RATE	Not applicable
FLAMMABILITY (SOLID, GAS)	Flammable solid
UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS	Not applicable
VAPOUR PRESSURE	Not applicable
VAPOUR DENSITY	Not applicable
RELATIVE DENSITY	1118 kg/m <sup>3</sup>
SOLUBILITY(IES)	Insoluble in water. At room temperature, soluble in: concentrated acids, phenol, m-cresol, hexafluoroisopropanol.
PARTITION COEFFICIENT: N-OCTANOL/WATER	Not applicable
AUTO-IGNITION TEMPERATURE	>400° C
DECOMPOSITION TEMPERATURE	>300° C
VISCOSITY	Not applicable
EXPLOSIVE PROPERTIES	The product is not explosive.
OXIDISING PROPERTIES	Not applicable

## 9.2. OTHER INFORMATION

BULK DENSITY	-
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## SECTION 10. STABILITY AND REACTIVITY

### 10.1 REACTIVITY

No hazardous reactions.

### 10.2 CHEMICAL STABILITY

The product is stable if stored as recommended.

### 10.3 POSSIBILITY OF HAZARDOUS REACTIONS

Not applicable.

### 10.4 CONDITIONS TO AVOID

Thermal decomposition: >300°C.

Additional notes: In order to prevent thermal decomposition, utilise the material within the printer nozzle temperature range 260-300°C, the temperature of 320°C should not be exceeded.

### 10.5 INCOMPATIBLE MATERIALS

Acids and oxidising agents.

### 10.6 HAZARDOUS DECOMPOSITION PRODUCTS

The product does not decompose under recommended conditions of use.  
In the event of fire - see Section 5.

## SECTION 11. TOXICOLOGICAL INFORMATION

### 11.1 INFORMATION ON TOXICOLOGICAL EFFECTS

According to previous experience and current information, when processed and handled correctly, the material does not create health hazards.

- acute toxicity;  
not applicable
- corrosive / irritating to the skin;  
not applicable
- serious eye damage/eye irritation;  
not applicable
- sensitization by inhalation or skin;  
not applicable
- mutagenic effect on germ cells;  
not applicable
- carcinogenicity;  
not applicable
- reproductive toxicity;  
not applicable
- action of target organ toxicity - single exposure;  
not applicable
- action of target organ toxicity - repeated exposure;  
not applicable
- an aspiration hazard.  
not applicable.

Likely routes of exposure and delayed, direct and chronic effects from short- and long-term exposure.

Not applicable.

## SECTION 12. ECOLOGICAL INFORMATION

### 12.1 TOXICITY

Not toxic.

### 12.2 PERSISTENCE AND DEGRADABILITY

The product is inert and does not decompose.

### 12.3 BIOACCUMULATIVE POTENTIAL

Due to its form and insolubility in water, biological availability of the product is unlikely.

In the natural environment, product decomposition requires a very long time.

### 12.4 MOBILITY IN SOIL

Not applicable.

### 12.5 RESULTS OF PBT AND VPVB ASSESSMENT

Not applicable.

### 12.6 OTHER ADVERSE EFFECTS

Negative ecological effects are unknown.

## SECTION 13. DISPOSAL CONSIDERATIONS

### 13.1 WASTE TREATMENT METHODS

According to the regulations in Section 15.

Waste material in the form of filaments, filament fragments, solidified compounds, production waste or finished products can be collected in publicly available containers or bags. Selective collecting is recommended. If the waste is not contaminated, it can be reprocessed. Reprocessing must be performed in accordance with conditions recommended for the given material grade in the product sheet. Other methods of handling waste are possible in accordance with current regulations.

Waste can be forwarded for recycling or disposal to facilities holding appropriate licences for managing this type of waste. Waste code number 07 02 13 - Waste plastic.

Deliver disposable packages to an authorised waste disposal facilities.

Reusable packages can be reused, after appropriate cleaning if necessary.

According to the regulations in Section 15.1.

## SECTION 14. INFORMATION ON TRANSPORT

The product is not classified as hazardous according to ADR, RID, ADN, IMDG/GGV See, ICAO/IATA transport regulations.

### 14.1 UN NUMBER:

Not applicable.

### 14.2. UN PROPER SHIPPING NAME

Not applicable.

### 14.3 TRANSPORT HAZARD CLASS(ES):

Not applicable.

### 14.4 PACKING GROUP:

Not applicable.

### 14.5 ENVIRONMENTAL HAZARDS:

None.

### 14.6 SPECIAL PRECAUTIONS FOR USERS:

Not applicable.

### 14.7 TRANSPORT IN BULK ACCORDING TO ANNEX II OF MARPOL AND THE IBC CODE:

Not applicable.

## OTHER INFORMATION

### LABELLING

RID, ADR: Not applicable.

IMDG: Not applicable.

ICAO/IATA: Not applicable.

CLASSIFICATION CODE (ADR/RID): Not applicable.

TANK CODE/ detailed ADR requirements: Not applicable.

## SECTION 15. REGULATORY INFORMATION

### 15.1 SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC FOR THE MIXTURE

1. Regulation (EC) No. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (OJ EU L 396 of 30 Dec. 2006, as amended)
2. Polish Act of 25 February 2011 on chemical substances and mixtures (Polish No 63 item 322, as amended, including the amendment of 20 March 2015 - Polish Journal of Laws 2015, item 675),
3. Polish Act of 27 April 2001 Environmental Protection Law (Polish Journal of Laws No 62 item 627, as amended).
4. Polish Act of 14 December 2012 on waste (Polish Journal of Laws No 2013 item 21, as amended).
5. Regulation of the Ministry of Health of 10 August 2012 on the classification criteria and methods for chemicals and mixtures (consolidated text in the Ministry of Health Declaration of 12 January 2015, Polish Journal of Laws item 208).
6. Regulation of the Ministry of Health of 20 April 2012 on labelling of packaging of dangerous substances and mixtures and certain mixtures (consolidated text in the Ministry of Health Declaration of 2 March 2015 concerning the Declaration of the consolidated text of the Ministry of Health Regulation on labelling of packaging of dangerous substances and mixtures and certain mixtures, Polish Journal of Laws item 450).
7. Regulation of the Minister of Health of 25 August 2015 concerning labelling of sites, pipelines, containers and vessels utilised for storage or containing hazardous substances or mixtures (Polish Journal of Laws 2015, item 1368),
8. Polish Act of 19 August 2011 on the transport of hazardous goods (Polish Journal of Laws No 227 item 1367, as amended).
9. Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (OJ UE 31.12.2008, as amended),
10. Regulation of the Minister of Labour and Social Policy of 6 June 2014 on the maximum permissible concentrations and intensities of factors harmful to health in the working environment (Polish Journal of Laws 2014 item 817, as amended, together with the Regulation of the Minister of Family, Labour and Social Policy of 9 January 2020 amending the Regulation on the maximum permissible concentrations and intensities of harmful factors for health in the working environment, Polish Journal of Laws item 61.

11. Polish Act of 13 June 2013 on managing waste and waste packaging (Polish Journal of Laws 2013 item 888, as amended).

## 15.2 CHEMICAL SAFETY ASSESSMENT

Not required for polymers. Assessment has been performed for the following monomer: caprolactam in the chemical safety report submitted to ECHA under a joint registration, no. RSI 01-2119457029-36-0005.

<b>SECTION 16. OTHER INFORMATION</b>
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### AN EXPLANATION AND INDICATION OF WHERE CHANGES HAVE BEEN MADE TO THE PREVIOUS VERSION OF SAFETY DATA SHEET

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### A KEY OR LEGEND TO ABBREVIATIONS AND ACRONYMS USED IN THE SAFETY DATA SHEET

- ATE - acute toxicity estimate, ATE<sub>mix</sub> - calculated acute toxicity estimate of a mixture.
- DNEL (Derived no-effect level) - Derived dosing level (concentration), for which no adverse effects are observed [mg/kg, mg/l].
- PNEC (Predicted No Effect Concentration) - expected concentration which does not cause changes in the environment [mg/kg, mg/l].
- PBT - Persistent, Bioaccumulative and Toxic
- vPvB - Very persistent and very bioaccumulative
- REACH - Registration, Evaluation and Authorisation of Chemicals

### KEY LITERATURE REFERENCE AND SOURCES FOR DATA

- Chemical Safety Report submitted to ECHA under joint registration, no. RSI 01-2119457029-36-0005
- Information taken from ECHA website <http://echa.europa.eu>
- Physics and chemistry handbooks
- Plastics processing guides
- Data sheets of the mixture's components.

Information provided in this sheet is based on our current knowledge of the product. Its purpose is to describe the product solely as it relates to health, safety and environmental protection requirements. The product's user must observe relevant legal regulations.

### LIST OF RELEVANT R PHRASES, HAZARD STATEMENTS, SAFETY PHRASES AND/OR PRECAUTIONARY STATEMENTS

Not applicable.

### ADVICE ON APPROPRIATE TRAINING

Before attempting to work with the product, the user must familiarise themselves with the OHS rules for handling the substance, and with this data sheet. Users must be familiar with general rules of thermoplastics processing, as well as with instructions for working at the given station and operating plastics processing equipment.

*SEE: THE FOLLOWING PAGES OF THE SHEET*