

ABS Filament

1. Chemical product and company information

a	Chemical product	Acrylonitrile butadiene styrene
b	Usage	For industrial conversion as a raw material for manufacture of articles or goods.
c	Chemical type	Thermoplastic
d	Company information	3D4Makers BV, Waarderweg 56, 2031 BP Haarlem, The Netherlands
e	Telephone number	+ 31 (0) 238200584

2. Hazards identification

a	Classification of the mixture	
	Classification (REGULATION (EC) No 1272/2008)	Not classified
	Classification according to EU Directives 67/548/EEC or 1999/45/EC	Not a hazardous substance or mixture.
b	label elements	
	Labelling - REGULATION (EC) No 1272/2008	This product is not classified as dangerous according to EC criteria.
c	Other hazards	
	No information available	

3. Composition/information on ingredients

a	Mixture				
	CAS-No. / EC-No. / Index	REACH No.	Amount	Component	Classification: REGULATION (EC) No 1272/2008
	CAS-No. 9003-56-9 EC-No. Polymer	—	>= 99.0%	Acrylonitrile/ butadiene/ styrene resin	Not classified
	CAS-No. / EC-No. / Index	Amount	Component	Classification: 67/548/EEC	

CAS-No. >= 99.0 %
9003-56-9
EC-No.
Polymer

Acrylonitrile/
butadiene/
styrene resin

Not classified.

4. First aid measures

a Description of first aid measures

General advice	First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Skin Contact	Wash skin with plenty of water. Seek first aid or medical attention as needed. If molten material comes in contact with the skin, do not apply ice but cool under ice water or running stream of water. DO NOT attempt to remove the material from skin. Removal could result in severe tissue damage. Seek medical attention immediately. Suitable emergency safety shower facility should be immediately available.
Eye Contact	Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.
Ingestion	If swallowed, seek medical attention. May cause gastrointestinal blockage. Do not give laxatives. Do not induce vomiting unless directed to do so by medical personnel.

b Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

c Indication of immediate medical attention and special treatment needed

If burn is present, treat as any thermal burn, after decontamination. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Firefighting measures

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|--|---|
| a Extinguishing Media | Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. |
| c Special hazards arising from the substance or mixture | |

Hazardous Combustion Products

During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Carbon monoxide. Carbon dioxide.
Combustion products may include trace amounts of: Styrene. Hydrogen cyanide.

Unusual Fire and Explosion Hazards

Pneumatic conveying and other mechanical handling operations can generate combustible dust. To reduce the potential for dust explosions, do not permit dust to accumulate. Dense smoke is produced when product burns.

c Advice for firefighters

Fire Fighting Procedures

Keep people away. Isolate fire and deny unnecessary entry. Soak thoroughly with water to cool and prevent re-ignition. If material is molten, do not apply direct water stream. Use fine water spray or foam. Cool surroundings with water to localize fire zone. Hand held dry chemical or carbon dioxide extinguishers may be used for small fires.

Special Protective Equipment for Firefighters

Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. Accidental release measures

a Personal precautions, protective equipment and emergency procedures

Spilled material may cause a slipping hazard. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection

b Environmental precautions

Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

b Methods and materials for containment and cleaning up

Contain spilled material if possible. Sweep up. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. Handling and storage

- a **Handling**

No smoking, open flames or sources of ignition in handling and storage area. Good housekeeping and controlling of dusts are necessary for safe handling of product. Avoid breathing process fumes. Use with adequate ventilation. When appropriate, unique handling information for containers can be found on the product label. Workers should be protected from the possibility of contact with molten resin. Do not get molten material in eyes, on skin or clothing. Pneumatic conveying and other mechanical handling operations can generate combustible dust. To reduce the potential for dust explosions, electrically bond and ground equipment and do not permit dust to accumulate. Dust can be ignited by static discharge.
- b **Storage**

Store in accordance with good manufacturing practices.
- c **Specific end uses**

See the technical data sheet on this product for further information.

8. Exposure controls/personal protection

- a **Exposure limits**

None established
- b **Engineering controls**

Personal Protection

 - Eye protection**

Use safety glasses (with side shields). Safety glasses (with side shields) should be consistent with EN 166 or equivalent. If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles. Chemical goggles should be consistent with EN 166 or equivalent. If exposure causes eye discomfort, use a full-face respirator.
 - Hand protection**

Chemical protective gloves should not be needed when handling this material. Consistent with general hygienic practice for any material, skin contact should be minimized. Use gloves with insulation for thermal protection (EN 407), when needed. Use gloves to protect from mechanical injury. Selection of gloves will depend on the task.
 - Skin and body protection**

No precautions other than clean body-covering clothing should be needed.
 - Respiratory protection**

Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. Use an approved air-purifying respirator when vapors are generated at increased temperatures or when dust or mist is present. Use the following CE approved air-purifying respirator: When dust/mist are present use a/an Particulate filter, type P2. When combinations of vapors, acids, or dusts/mists are present use a/an Organic vapor cartridge with a particulate pre-filter, type AP2.

Ingestion	Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.
Engineering Controls	Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

9. Physical and chemical properties

a Information on basic physical and chemical properties

Appearance	Filament
Colour	White
Odor	Odorless
Odor Threshold	No test data available
pH	Not applicable
Melting point	No test data available
Freezing Point	Not applicable
Boiling Point (760 mmHg)	Not applicable
Flash Point - Closed Cup	Not applicable
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	No
Flammable Limits In Air	Lower: Not applicable Upper: Not applicable
Vapor Pressure	Not applicable
Vapor Density (air = 1)	Not applicable
Specific Gravity (H2O = 1)) 1.05 - 1.07 Literature
Solubility in water (by weight)	Negligible
Partition coefficient, n-octanol/water (log Pow)	No data available for this product
Autoignition Temperature	No test data available
Decomposition Temperature	No test data available
Kinematic Viscosity	Not applicable
Explosive properties	No test data available
Oxidizing properties	No test data available

b Other information

Molecular Weight No test data available

10. Stability and reactivity

- a Reactivity** No dangerous reaction known under conditions of normal use
- b Chemical stability** Stable
- c Possibility of hazardous reactions** Polymerization will not occur
- d Conditions to Avoid** Avoid temperatures above 300 °C. Exposure to elevated temperatures can cause product to decompose.
- e Incompatible Materials** None known
- f Hazardous decomposition products** Decomposition products depend upon temperature, air supply and the presence of other materials. Processing may release fumes and other decomposition products. At temperatures exceeding melt temperatures, polymer fragments can be released. Fumes can be irritating.

11. Toxicological information

a Information on toxicological effects

Acute Toxicity

Ingestion Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. May cause choking if swallowed. Single dose oral LD50 has not been determined. Typical for this family of materials. Estimated. LD50, rat > 5,000 mg/kg

Aspiration hazard Based on physical properties, not likely to be an aspiration hazard.

Dermal No adverse effects anticipated by skin absorption. The dermal LD50 has not been determined. Typical for this family of materials. Estimated. LD50, rabbit > 2,000 mg/kg

Inhalation No adverse effects are anticipated from single exposure to dust. Vapors released during thermal processing may cause respiratory irritation. The LC50 has not been determined.

Eye damage/eye irritation Solid or dust may cause irritation or corneal injury due to mechanical action. Elevated temperatures may generate vapor levels sufficient to cause eye irritation. Effects may include discomfort and redness.

Skin corrosion/irritation Prolonged contact is essentially nonirritating to skin. Mechanical injury only. Under normal processing conditions, material is heated to elevated temperatures; contact with the material may cause thermal burns

Sensitization

Skin No relevant data found.

Respiratory	No relevant data found.
Repeated Dose Toxicity	Additives are encapsulated in the product and are not expected to be released under normal processing conditions or foreseeable emergency.
Chronic Toxicity and Carcinogenicity	No relevant data found.
Developmental Toxicity	No relevant data found.
Reproductive Toxicity	No relevant data found.
Genetic Toxicology	In vitro genetic toxicity studies were negative.

12. Ecological information

a Toxicity	Not expected to be acutely toxic, but material in pellet or bead form may mechanically cause adverse effects if ingested by waterfowl or aquatic life.
b Persistence and Degradability	This water-insoluble polymeric solid is expected to be inert in the environment. Surface photodegradation is expected with exposure to sunlight. No appreciable biodegradation is expected.
c Bioaccumulative potential	No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).
d Mobility in soil	In the terrestrial environment, material is expected to remain in the soil., In the aquatic environment, material will sink and remain in the sediment.
e Results of PBT and vPvB assessment	This mixture has not been assessed for persistence, bioaccumulation and toxicity (PBT).
f Other adverse effects	No relevant data found.

13. Disposal considerations

a Waste from methods	For uncontaminated material the disposal options include mechanical and chemical recycling or energy recovery. In some countries landfill is also allowed. For contaminated material the options remain the same, although additional evaluation is required. For all countries the disposal methods must be in compliance with national and provincial laws and any municipal or local by-laws. All disposal methods must be in compliance with the EU framework Directives 2008/98/EC and their subsequent adaptations, as implemented in National Laws and Regulations, as well as EU Directives dealing with priority waste streams. Transboundary shipment of wastes must be in compliance with Regulation (EC) No 1013/2006 and subsequent modifications.
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14. Transport information

ADR/RID

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|----------|-------------------------------------|--|
| a | UN number | Not applicable |
| b | UN proper shipping name | Proper Shipping Name: NOT REGULATED |
| c | Transport hazard class(es) | Not applicable |
| d | Packing Group | Not applicable |
| e | Environmental hazards | Not considered environmentally hazardous based on available data |
| f | Special precautions for user | Special Provisions: no data available
Hazard identification No: no data available |

ADNR / ADN

- | | | |
|----------|---|---|
| a | UN number | Not applicable |
| b | UN proper shipping name | Proper Shipping Name: NOT REGULATED |
| c | Transport hazard class(es) | Not applicable |
| d | Packing Group | Not applicable |
| e | Environmental hazards | Not considered environmentally hazardous based on available data |
| f | Special precautions for user | EMS Number: Not applicable |
| g | Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code | Not applicable |

ICAO/IATA

- | | | |
|----------|-------------------------------------|---|
| a | UN number | Not applicable |
| b | UN proper shipping name | Proper Shipping Name: NOT REGULATED |
| c | Transport hazard class(es) | Not applicable |
| d | Packing Group | Not applicable |
| e | Environmental hazards | Not considered environmentally hazardous based on available data |
| f | Special precautions for user | no data available |

15. Regulatory information

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|----------|---|--|
| a | Safety, health and environmental regulations/legislation specific for the substance or mixture | |
| | European Inventory of Existing Commercial Chemical Substances (EINECS) | The components of this product are on the EINECS inventory or are exempt from inventory requirements. |
| b | Chemical Safety Assessment | Not applicable |

16. Other Informaton

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