



MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER: **Enviro™ ABS Filament**

CHEMICAL NAME: Acrylonitrilic-Butadiene-Styrene Copolymer

MATERIAL USE: Plastics

CHEMICAL FORMULA: $(C_3H_3N, C_4H_6, C_8H_8)_x$

3D PrintLife
6746 Wedgewood Place
Los Angeles, CA 90068
800-201-3249

2. COMPOSITION INFORMATION ON INGREDIENTS

CAS #	Component	Percent by Wt. Min./Max.
25038-59-9	PET	.5 / 2.0
	Proprietary Resin	.5 / 2.0
9003-56-9	Acrylonitrile-Butadiene-Styrene Copolymer	97 / 93
	Additives	

3. HAZARDS IDENTIFICATION

Hazard Score: 0 = Minimal 1 = Slight 2 = Moderate 3 = Severe * = Chronic Hazard

HMIS Ratings:

Health: 1 Fire: 1 Physical Hazard: 0 Personal Protection: Safety Glasses, Gloves

NFPA Ratings: Fire:

1 Reactivity: 0

Emergency Overview:

This product is not considered flammable according to OSHA but will burn on prolonged exposure to flame or high temperature. Slipping hazard. CAUTION! Accumulated fine dusts may form a catastrophic explosive air-dust mixture.

Potential Health Effects: Eye

Contact with hot or molten material may cause severe thermal injury including in extreme blindness. Contact of powder or fines with eye may cause mechanical irritation.

Potential Health Effects: Skin

Contact with hot or molten material may cause severe thermal burns. Contact of fine powder or fines with skin may cause mild irritation that is increased by mechanical rubbing or if skin is dry.

Potential Health Effects: Ingestion

Ingestion of this product is unlikely. However, ingestion of product may produce gastrointestinal irritation and disturbances.

Potential Health Effects: Inhalation

Inhalation of fine particles may cause respiratory irritation. Fumes produced during thermal processing may cause irritation to the respiratory system.

4. FIRST AID MEASURES

First Aid: Eyes

Remove contact lenses, if it can be done safely. Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention if symptoms develop or persist.

First Aid: Skin

Wash affected area with soap and water. Seek medical attention if symptoms develop or persist. In case of contact with molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product, or molten product that has cooled from skin without medical assistance

First Aid: Inhalation

Move affected individual to non-contaminated air. Loosen tight clothing such as collar, tie, belt, or waistband to facilitate breathing. Seek immediate medical attention if the individual is not breathing, unconscious, or if any other symptoms persist,

First Aid: Ingestion

Material is not expected to be absorbed from the gastrointestinal tract. DO NOT INDUCE VOMITING. Loosen tight clothing such as collar, tie, belt, or waistband. Seek immediate medical attention.

First Aid: Notes to Physician

For more detailed medical emergency support information call 1-800-561-6682 or 1-403-314-8767 (24 hours, NOVA Chemicals Emergency Response)

Burns should be treated as thermal burns. Molten resin will come off as healing occurs; therefore, immediate removal from skin is not necessary. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. After adequate first aid, no further treatment is required unless symptoms reappear. Ingested material should pass through the digestive system without injury.

5. FIREFIGHTING MEASUREMENTS

DECOMPOSITION	280°C
AUTOIGNITION	466°C
FLASH POINT	404°C
EXTINGUISHING MEDIA	Water spray, dry chemical, carbon dioxide.

Avoid high pressure, direct water stream that may spread molten or burning resins.

GENERAL FIREFIGHTING PROCEDURES Position upwind. Keep unnecessary personnel away. Move containers from fire area if you can do so without risk. Fight fire from maximum distance or use unmanned holders or monitor nozzles. Firefighters should wear full face, self-contained breathing apparatus and thermal protective clothing. Cool containers with flood quantities of water until well after fire is out. Control runoff waters to prevent entry into sewer, drains, ditches, underground or confined spaces and waterways.

FIRE & EXPLOSION HAZARDS Accumulated dusts may form an explosive mixture with the air. Risk of dust-air explosion is increased if flammable vapors are also present. May accumulate hazardous static charge.

HAZARDOUS COMBUSTION PRODUCTS Upon decomposition, this product emits carbon dioxide, carbon monoxide, styrene, and/or low molecular weight hydrocarbons

LOWER EXPLOSION LIMIT %	Not applicable
UPPER EXPLOSION LIMIT %	Not applicable

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES Stop leak and contain spill. Prevent entry into sewers, drains, underground or confined spaces, and waterways. Spilled product may create a dangerous slipping hazard. Use appropriate tools to put the spilled solid in an appropriate recovery or waste disposal container. Reuse or recycle where possible. Meet any applicable regulations.

EVACUATION PROCEDURES Isolate Area. Keep unnecessary personnel away.

SPECIAL PROCEDURES Contact local police/emergency services an appropriate telephone numbers. Ensure that statutory and regulatory reporting requirements in the applicable jurisdiction are met. Wear appropriate protective equipment and clothing during clean-up. Individuals without appropriate protective equipment should be excluded from area of spill until cleanup is complete.

7. HANDLING AND STORAGE

HANDLING PROCEDURES Handle in contained and properly designed equipment systems. Use with adequate ventilation. Avoid ingestion and inhalation. Keep away from uncontrolled heat and incompatible materials. Ground all material-handling and transfer equipment to dissipate buildup of static electricity. Keep handling areas free of loose pellets and dust accumulation. Mechanical operations involving this material should be done in such a manner as to prevent or minimize dust generation. Small amounts of fines or dust contained in granular resins may accumulate in material handling systems. If permitted to accumulate, these fine dusts can, under certain conditions, pose an explosion hazard. Every effort should be made to prevent suspension, concentration, or accumulation of fine dusts in, or around, material handling systems. For additional information on control of static and minimizing

potential dust and fire hazards, refer to NFPA 654, "Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids, 2006 Edition." Spilled product may create a dangerous slipping hazard

STORAGE PROCEDURES Storage area should be clearly identified, well-illuminated, and clear of obstruction. Adequate security must be provided so that unauthorized personnel do not have access to product/material. Store in grounded, properly designed and approved vessels and away from incompatible materials. Store and use away from heat, sparks, open flame, or any other ignition source. DO NOT enter filled bulk containers and attempt to walk over product, due to risk of slipping and possible suffocation. Use a fall arrest system when working near open bulk containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE GUIDELINES

A: General Product Information: Refer to published exposure limits- use effective control measures and PPE to maintain worker exposure to concentrations that are below those limits. Ensure that eyewash stations and safety showers are in close proximity to work locations.

B: Component Exposure Limits: ACGIH, OSHA, NOISH, EPA, Alberta, and Ontario have not developed exposure limits for any of this product's components

ENGINEERING CONTROLS Engineering methods to reduce hazardous exposure are preferred controls. Methods include mechanical ventilation (dilution and local exhaust) process or personal enclosure, remote and automated operation, control of process conditions, leak detection and repair systems, and other process modifications. Ensure that all exhaust ventilation systems are discharged to outdoors, away from intake and ignition sources. Supply sufficient replacement air to make up for air removed by exhaust systems. Administrative (procedure) controls and use of personal protective equipment may also be required.

PERSONAL PROTECTION EQUIPMENT

EYES: Wear safety glasses during normal handling product. Wear full-face shield during thermal processing if contact with molten material is likely.

SKIN, HANDS, FEET: Use impervious gloves when handling product. Wear safety footwear with good traction to prevent slipping. Work clothing that sufficiently prevents skin contact should be worn, such as coveralls and/or long sleeves and pants.

RESPIRATORY: If engineering controls and ventilation are not sufficient to prevent build-up of aerosols, vapors, or dusts, appropriate NIOSH/MSHA approved air-purifying respirators or self-contained breathing apparatus (SCBA) appropriate for exposure potential should be used. Air-supplied breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirator.

GENERAL: Personal protective equipment (PPE) should not be considered a long-term solution to exposure control. Employer programs to properly select, fit, maintain, and train employees to use equipment must accompany PPE. Consult a competent industrial hygiene resource, the PPE manufacturer's recommendation, and/or applicable regulations to determine hazard potential and ensure adequate protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance: White solid bead

Odor: Slight, sweet odor

Vapor pressure: Not applicable

Boiling point: Not applicable

Solubility (H₂O): Insoluble

Dispersion Properties: Is not dispersed in cold or hot water
Auto ignition: 466 to 552 degrees C (871 to 1025 degrees F)
Flash point: 404 degrees C (759 degrees F) (Ethylene- Vinyl acetate copolymer)
Flash point Method: Closed Cup
Flammability Classification: Not considered flammable according to OSHA
Color: Off White
pH: Not applicable
Vapor Density@ 0 degrees C (Air=1): Not applicable
Melting Point: 103 degrees C (217.4 degrees F)
Specific gravity (Water =1): 1.05
Evaporation Rate (n-Butyl Acetate=1): Not applicable
Softening Point: 95 to 105 degrees C (23 to 221 degrees F)
Lower Flammable Limit (LFL): Not available
Upper Flammable Limit (UFL): Not available

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: This product is under normal use conditions for shock, vibration, pressure, and ambient temperature.
CHEMICAL STABILITY: CONDITIONS TO AVOID: Avoid processing material over 300 degrees C (572 degrees F)
INCOMPATIBILITY: Not resistant to oxidizing agents, partially dissolves in organic solvents
POSSIBILITY OF HAZARDOUS REACTIONS OR HAZARDOUS POLYMERIZATION: Will not occur
CORROSIVITY: Not considered corrosive
HAZARDOUS DECOMPOSITION: Upon decomposition, this product emits carbon dioxide, carbon monoxide, styrene, and/or low molecular weight hydrocarbons
SPECIAL REMARKS: May burn or react violently with fluorine/oxygen mixtures with 50-100% fluorine. May be decomposed by strong oxidizing agents. (Ethyl/Vinyl Acetate Copolymer)

11. . TOXICOLOGICAL INFORMATION

ACUTE TOXICITY: GENERAL PRODUCT INFORMATION:
Product is considered essentially inert and non-toxic. Exposure to high levels of dusts may be irritating to the eyes. Skin/eye contact with molten or heated material may cause burns. Vapors/heated fumes may be irritating to the respiratory system.
No information for the product as a tested mixture.
The following information has been found for its components.
When heated, this material release fumes and/or vapors that are irritating to the eyes, skin, nose, and respiratory tract. Inhalation if high concentrations of fumes or vapors may cause headaches, nausea, shortness of breath, and cough. Contact of unprotected skin or eyes with molten or heated material can cause serious thermal burns.
ACUTE TOXICITY – LD50/LC50: No LD50/LC50's are available for this product's components. CHRONIC TOXICITY: GENERAL MATERIAL INFORMATION: No information available for this product as a tested mixture
CHRONIC TOXICITY: CARCINOGENICITY EFFECTS: ACGIH, EPA, IARC, OSHA, and NTP Carcinogen lists have been checked for selected similar materials or those components with CAS registry numbers.
Polyethylene terephthalate (25038-59-9)
IARC: Supplement 7 [1987]; Monograph 19 [1979] (Group 3 (not classifiable))

12. ECOLOGICAL INFORMATION

ECOTOXICITY

A: GENERAL PRODUCT INFORMATION: No information available for the product as a tested mixture. Sewer/waterway obstruction; if aquatic animals ingest polymer, digestive tract obstruction may occur. Polymers are expected to be non-toxic, but small particles may have adverse physical effects on aquatic and terrestrial organisms.

B. COMPONENT ANALYSIS- ECOTOXICITY- AQUATIC TOXICITY: No ecotoxicity data are available for this product's components.

ENVIRONMENTAL FATE/MOBILITY: Sinks in water. Beads are persistent in aquatic and terrestrial systems. Product should be recovered from water and land following spills. This product has not been found to migrate through soils.

PERSISTENCE/DEGRADABILITY: Beads are persistent in aquatic and terrestrial systems. Do not allow product to enter sewer or waterways. Not expected to biodegrade. Integrated environmental half-life expected to be ≥ 100 days.

BIOACCUMULATION/ACCUMULATION:

A: GENERAL PRODUCT INFORMATION: Beads may accumulate in the digestive system of birds and aquatic life, causing injury and possible death to starvation.

B. PBT CHEMICALS: None of this product's components exhibit PBT properties.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS

Disposal should be in accordance with local, state or national legislation.

EMPTY CONTAINER WARNINGS

Empty containers may contain product residue; follow MSDS and label warnings even after they have been emptied.

14. TRANSPORTATION INFORMATION

U.S./CANADIAN WASTE INFORMATION

A.GENERAL PRODUCT INFORMATION: This product if discarded. is not expected to be hazardous waste according to US or Canadian regulations. The use, mixing or processing of this product may alter this product. Check local, state, federal or provincial, environmental regulations prior to disposal. Preferred disposal methods for polymers in order of preference are: 1) clean and reuse if possible 2) recover and resale through plastic recyclers or resin brokers 3) incinerate with waste heat recovery and 4) landfill. Reuse, recycling, storing, **transportation, and disposal must be in accordance with applicable federal, state, provincial** and local regulations. **DO NOT ATTEMPT TO DISPOSE OF BY UNCONTROLLED IGNITION.**

Waste generator is advised to carefully consider hazardous properties and control measures needed or other materials that may be found in the waste.

COMPONENT WASTE NUMBERS: No EPA Waste Numbers are applicable for this products components

15. REGULATORY INFORMATION

A. INTERNATIONAL REGULATIONS: Components not identified on European Inventory of Existing Commercial Substances (EINECS) are exempt from the listing (i.e. as polymers whose monomers are listed). All the monomers are listed in EINECS.

COMPONENT ANALYSIS – INTERNATIONAL INVENTORY STATUS

B. USA STATE AND FEDERAL REGULATIONS: Ongoing occupational hygiene, medical surveillance program, or site emission or spill reporting may be required by federal or state regulations. Check for applicable reviews.

USA OSHA HAZARD COMMUNICATION CLASS: This product is not considered hazardous under 29 CFR 191.1200 (hazard communication)

USA RIGHT TO KNOW – FEDERAL: None of this product's components are listed on the state lists from NJ or PA. Some components (including those present only in trace quantities, and therefore not listed in this document) may be included on the Right to Know lists of other states. The reader is therefore cautioned to contact his or her NOVA Chemicals representative or NOVA Chemicals' Product Integrity group for further US State Right to Know information.

CANADIAN REGULATIONS- FEDERAL AND PROVINCIAL: Canadian Environmental Protection Act (CEPA): All components of this product are on the Domestic Substances List (DSL) and are acceptable for use under the provisions of CEPA.

WHMIS INGREDIENTS DISCLOSURE LIST (IDL): No components are listed in the WHMIS Ingredient Disclosure List (IDL)

WHMIS CLASSIFICATION: Workplace Hazardous Materials Information Systems (WHMIS): This product has been classified in accordance with Canadian Controlled Product Regulations (CPR) hazard criteria and this MSDS contains complete CPR-required information.

Not controlled under WHMIS (Canada)

OTHER REGULATIONS: Ongoing occupational hygiene, medical surveillance programs, or site emission or spill may be required by federal or provincial regulations.

16. OTHER INFORMATION

LABEL INFORMATION

PRECAUTIONS: Product is an off white, inert, solid bead with a slight odor. This product is not considered flammable according to OSHA, but will burn on prolonged exposure to flame or high temperature. Slipping hazard. CAUTION! Accumulated fine dusts may form catastrophic explosive dust mixture.

REFERENCES: Available on request

SPECIAL CONSIDERATIONS: For additional information on control of static and minimizing potential dust and fire hazards, refer to NFPA-654, "Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids, 2006 Edition"

Combustible dusts and other hazardous by-products may be produced as a result of processing or handling the material. Ensure adequate safety measures are taken to minimize exposure to any potential hazards.

FOR INFORMATION CONTACT:

3D Printlife
6746 Wedgewood Place
Los Angeles, CA 90066
800-201-3249

ADDITIONAL INFORMATION: The information given and the recommendations made herein apply to our product (s) alone and are not combined with other product(s). Such are based on our research and on data and other reliable sources and are believed to be accurate. No guaranty of accuracy is made. It is the purchaser's responsibility before using any product to verify this data under their own operating conditions and to determine whether the product is suitable for their purposes.