

ESSENTIUM TPU 90A FR

Thank you for your interest in Essentium, Inc. products. We are providing this material safety data sheet [MSDS] as a courtesy to your request. We certainly expect you to read the entire MSDS and to call us with any required points of clarification. Please follow all precautions identified in this document.

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SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Essentium TPU 90A FR
Supplier:	Essentium Inc.
Address:	19025 N. Heatherwilde Blvd. Suite 100 Pflugerville, TX 78660
Manufacturer:	Essentium Inc.
Address:	19025 N. Heatherwilde Blvd. Suite 100 Pflugerville, TX 78660
Supplier Emergency Contacts & Phone:	Essentium Inc. Email: Sales@Essentium3D.com Website: Essentium3D.com
Revision Date	01/09/2018

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT	CAS NO.	WT%
Thermoplastic Urethane	75701-44-9	< 70%
Flame Retardant		
1,3,5-Triazine-2,4,6(iH,3H,5H)-trione,		

All ingredients in quantities > 1.0% (0.1% for carcinogens) that are potentially hazardous per OSHA definitions.

SECTION 3: HAZARDS IDENTIFICATION

Hazard statement: Molten polymer will cause thermal burns. Please take all precautions necessary to avoid burns by the molten polymer.

Precautionary statement: None

Signal word: None

Potential health effects: See section 11 for more information

Environmental precautions: See section 12 for more information

Other hazards: If small particles are generated during further processing, handling, or by other means, combustible dust concentrations in air may form. See sections 7 and 8 for additional information.

SECTION 4: FIRST AID MEASURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial best practices are followed. Precautions should be taken to avoid inhalation and eye contact.

General Advice: Remove contaminated clothing

Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.

Skin contact: Adverse effects are not expected from accidental skin contact following occupational exposure. After contact with skin, wash with soap and water. If skin irritation persists, call a physician. Cool skin rapidly with cold water after contact with hot polymer. DO NOT attempt to remove hot polymer from skin or contaminated clothing as skin may be easily damaged. Call a physician immediately.

Ingestion: Drink water as a precaution. Never give anything by mouth to an unconscious person. Do not induce vomiting without medical advice. Call a physician immediately.

Inhalation: Move to fresh air, keep person calm. Assist in breathing if necessary. Call a physician immediately.

SECTION 5: FIRE-FIGHTING MEASURES

Suitable extinguishing media: Carbon dioxide, water spray, dry powder, and foam

Unsuitable extinguishing media: None known

Special protective equipment for firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Special hazards arising from substance: Hazards during fire-fighting: carbon monoxide, carbon dioxide, hydrogen cyanide, nitrogen oxides, phosphorus compounds, isocyanate

Further information: Do not breathe in fumes

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions: No special precautions necessary.

Environmental precautions: No special precautions necessary.

Methods for cleaning up: Spills should be contained and placed in suitable containers for disposal.

SECTION 7: HANDLING AND STORAGE

Safe handling advice: Use personal protective equipment. Avoid contact with skin and eyes. Low hazard for usual industrial or commercial handling. Workers should be protected from the possibility of contact with molten material during fabrication. Avoid dust formation. If small particles are generated during further processing, handling, or by other means, combustible dust concentrations in air may form. Protect from moisture and impurities. Keep the floor clear. Provide suitable exhaust for ventilation during the drying process and in the area surrounding the melt outlet and processing machines.

Storage: Segregate from foods and animal feeds. Avoid extreme heat and deposition of dust.

Suitable materials for containers: Paper/Fiberboard, HDPE, LDPE

Precautions: No special precautions required

Dangerous reaction: No dangerous reactions are known

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure control:

Engineering measures: Provide local exhaust ventilation to control dust.

Exposure guidelines:

COMPONENT	ACHGIH TLV	OSHA PEL
Triphenyl phosphate	TWA: 3 mg/m ³	PEL 3 mg/m ³

Personal protective equipment:

Eye protection: Safety glasses or goggles with side-shields to protect from hot molten substance/product

Skin and body protection: Body protection is not required

Respiratory protection: Respirator must be worn if exposed to dust. Wear respirator with dust filter. Consult an industrial hygiene professional prior to respirator selection and use. Use a positive-pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

Hand protection: Preventive skin protection, gloves

Hygiene measures: Wear protective clothing to prevent contact during mechanical processing and or hot melt conditions. Avoid inhalation of dust. When using, do not eat, drink, or smoke. Hands and/or face should be washed before breaks and at the end of the shift, At the end of the shift the skin should be cleaned and skin care agents applied.

Special hazard: Workers should be protected from the possibility of contact with molten material during fabrication

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid filament	Bulk Density:	500 - 700 kg/m ³
Color:	White to light beige	Decomposition Temperature:	> 230°C
Odor:	No apparent odor	Boiling Point / Boiling Range:	Not available
pH:	Not applicable	Melting Point / Melting Range:	170 - 230°C
Softening Temperature	> 120 °C	Flash Point:	Not available
Vapor Pressure:	Not determined	Autoignition Temperature:	> 400 °C
Vapor Density:	Not determined	Water Solubility:	Insoluble
Evaporation Rate:	Not applicable	Solubility in Other Solvents:	Not determined
Relative Density:	1.12 - 1.20 g/cm ³		

SECTION 10: STABILITY AND REACTIVITY

Corrosive effect on metals: No corrosive effect

Oxidizing properties: Not fire propagating

Reactivity: None expected under conditions of normal use.

Chemical stability: Stable under recommended storage conditions

Hazardous decomposition products: Carbon monoxide, carbon dioxide, hydrogen cyanide

SECTION 11: TOXICOLOGICAL INFORMATION

Inhalation: Low hazard for usual industrial handling, may cause respiratory tract irritation

Eyes: Molten material will cause thermal burns

Skin: Molten material will cause thermal burns

Ingestion: Expected to be a low ingestion hazard

Oral: Type of Value: LD50
Species: Rat
Value: >5000 mg/kg

Other: No specific target organ toxicity (STOT)
No sensitizing effect
No aspiration hazard
No known chronic effects
Chemical structure does not suggest a specific alert to genetic toxicity
Chemical structure does not suggest a specific alert to carcinogenicity
Chemical structure does not suggest a specific alert to reproductive toxicity
Chemical structure does not suggest a specific alert to teratogenicity

SECTION 12: ECOLOGICAL INFORMATION

Water toxicity: There is a high probability that the product is not acutely harmful to aquatic organisms.

Toxicity to fish:

Information on triphenyl phosphate
LC50 (96 h) 0.4 mg/L, *Oncorhynchus mykiss* (other, static)
Literature data

Aquatic invertebrates:

Information on triphenyl phosphate
EC50 (48 h) 1.0 mg/L, *Daphnia magna* (See user defined text., static)
Literature data

Aquatic plants:

Information on: triphenyl phosphate
EC50 (96 h) 2 mg/L, *Selaginella selaginoides* (other, static)
Literature data

Biodegradable: Poorly biodegradable

Mobility: No data available

Other: This product contains no organically-bound halogens

SECTION 13: DISPOSAL CONSIDERATIONS

Waste from residues / unused products: In accordance with local, state and national regulations. Should not be released into the environment. Do not contaminate ponds, waterways or ditches with chemical or used container. Incinerate or dispose in a licensed facility.

Contaminated packaging: Dispose of in accordance with national, state, and local regulations

THE COMPANY HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION.

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION | PROPER SHIPPING NAME:

Not regulated for transportation

WATER TRANSPORTATION | PROPER SHIPPING NAME:

Not regulated for transportation

AIR TRANSPORTATION | PROPER SHIPPING NAME:

Not regulated for transportation

SECTION 15: REGULATORY INFORMATION

Regulatory requirements are subject to change and may differ between locations. It is the User's responsibility to ensure that all activities comply with all federal, state or provincial and local laws and regulations. The following specific information is made for the purpose of complying with numerous national, federal, state or provincial, and local laws and regulations. See other sections for health and safety information.

U.S. REGULATIONS

Sara 313 title III:	Not listed		
TSCA Inventory List:	Listed		
EPCRA 311/312:	Not hazardous		
NFPA Hazard Codes:	Health: 1	Fire: 0	Reactivity: 0
HMIS III Rating:	Health: 1	Flammability: 0	Physical hazard: 0

INTERNATIONAL REGULATIONS: Contact Essentium Inc. for more information.

Not meant to be all inclusive - selective regulations represented.

SECTION 16: OTHER INFORMATION

DISCLAIMER:

Essentium Inc. nor any of its subsidiaries assumes any liability whatsoever for transporting/handling the product. It is the buyer's/user's/ licensee's responsibility to ensure that its activities comply with all federal, state, provincial, or local laws and import/export requirements. We assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Essentium Inc. makes no warranties, expressed or implied, including but not limited to, any implied warranty of merchantability or fitness for a particular purpose or course of performance or usage of trade. Final determination of suitability of any material is the sole responsibility of the user.