Safety Data Sheet

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product identifier

Product Name • **Polyvinyl Toluene & Organic fluors with Boron**

Synonyms • Plastic Scintillators

Product Code • BC-454; BC-45410; BC-49981; BC-49982

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified use(s) • Radiation detection

1.3 Details of the supplier of the safety data sheet

Manufacturer • Luxium Solutions

17900 Great Lakes Parkway
Hiram, OH 44234
United States

www.luxiumsolutions.com

Telephone (General) • 440-834-5600

1.4 Emergency telephone number

Contract # 6493674

U.S. & Canada • 1-800-255-3924 – VelocityEHS

International • +1-813-248-0585 – VelocityEHS

Section 2: Hazards Identification

EU/EEC

According to: Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 453/2010]
According to: EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

2.1 Classification of the substance or mixture

CLP • Not classified

DSD/DPD • Not classified

2.2 Label Elements

CLP

Hazard statements • No label element(s) required

DSD/DPD

Risk phrases • No label element(s) required

2.3 Other Hazards

CLP
- According to Regulation (EC) No. 1272/2008 (CLP) this material is not considered hazardous.

DSD/DPD
- According to European Directive 1999/45/EC this preparation is not considered dangerous.

United States (US)
According to: OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture

OSHA HCS 2012
- Not classified

2.2 Label elements

OSHA HCS 2012

Hazard statements
- No label element(s) required

2.3 Other hazards

OSHA HCS 2012
- This product is not considered hazardous under the U.S. OSHA 29 CFR 1910.1200 Hazard Communication Standard.

Canada
According to: WHMIS

2.1 Classification of the substance or mixture

WHMIS
- Not classified

2.2 Label elements

WHMIS
- No label element(s) required.

2.3 Other hazards

WHMIS
- In Canada, the product mentioned above is not considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

Section 3 - Composition/Information on Ingredients

3.1 Substances

- Material does not meet the criteria of a substance in accordance with Regulation (EC) No 1272/2008.

3.2 Mixtures

Composition					
Chemical Name	**Identifiers**	**%**	**LD50/LC50**	**Classifications According to Regulation/Directive**	**Comments**
Vinyl toluene	**CAS:**25013-15-4 **EINECS:**246-562-2	85.8002% TO 91.6329%	Ingestion/Oral-Rat LD50 • 2255 mg/kg	**EU DSD/DPD:** Xi; R36/37/38; R67 **EU CLP:** Flam. Liq. 3, H226; Skin Irrit. 2, H315; STOT SE 3: Resp. Irrit., H335; STOT SE 3: Narc., H336; **OSHA HCS 2012:** Flam. Liq. 3; Eye Irrit. 2; Skin Irrit. 2; STOT SE 3: Resp. Irrit. & Narc.	NDA

Boron	**CAS:**16872-09-6 **EINECS:**240-897-8	6.2258% TO 11.7813%	NDA	**EU DSD/DPD:** Not Classified **EU CLP:** Not Classified **OSHA HCS 2012:** Not Classified	NDA
Organic fluors	*Proprietary*	0% TO 2.5515%	NDA	**EU DSD/DPD:** Not Classified **EU CLP:** Not Classified **OSHA HCS 2012:** Not Classified	NDA
Organic fluors	*Proprietary*	0% TO 2.0523%	NDA	**EU DSD/DPD:** Xn; R22 **EU CLP:** Acute Tox. 4, H302 **OSHA HCS 2012:** Acute Tox. 4 (orl)	NDA
Organic fluors	*Proprietary*	0.0279% TO 0.0308%	Ingestion/Oral-Rat LD50 • 890 mg/kg	**EU CLP:** Community workplace exposure limit **OSHA HCS 2012:** Exposure limits	NDA
Organic fluors	*Proprietary*	0% TO 0.0041%	Ingestion/Oral-Rat LD50 • >10 g/kg	**EU CLP:** Community workplace exposure limit **OSHA HCS 2012:** Exposure limits	NDA

See Section 16 for full text of H-statements and R-phrases.

Section 4 - First Aid Measures

4.1 Description of first aid measures

Inhalation
- Move victim to fresh air. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. If signs/symptoms continue, get medical attention.

Skin
- Wash skin with soap and water. If irritation develops and persists, get medical attention.

Eye
- Flush eyes with water for at least 15 minutes while holding eyelids open. If eye irritation persists: Get medical advice/attention.

Ingestion
- Do NOT induce vomiting. Obtain medical attention immediately if ingested.

4.2 Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to Physician
- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Section 5 - Firefighting Measures

5.1 Extinguishing media

Suitable Extinguishing Media
- Water fog, carbon dioxide, foam, dry chemical.

Unsuitable Extinguishing Media
- No data available.

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards
- May emit toxic fumes when exposed to high heat.

Hazardous Combustion Products
- No data available

5.3 Advice for firefighters

- Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions
- Ventilate the area before entry. Do not walk through spilled material. Wear appropriate personal protective equipment, avoid direct contact.

Emergency Procedures
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions. Keep unauthorized personnel away.

6.2 Environmental precautions

- Avoid release to the environment.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures
- Avoid generating dust.
  SMALL DRY SPILLS: With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.
  LARGE SPILLS: Cover powder spill with plastic sheet or tarp to minimize spreading.

6.4 Reference to other sections

- Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

Section 7 - Handling and Storage

7.1 Precautions for safe handling

Handling
- Use only with adequate ventilation. Minimize dust generation and accumulation. Wear appropriate personal protective equipment, avoid direct contact. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco.

7.2 Conditions for safe storage, including any incompatibilities

Storage
- Store in a cool, dry, well ventilated area.

7.3 Specific end use(s)

- Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

8.1 Control parameters

Exposure Limits/Guidelines				
	Result	**ACGIH**	**NIOSH**	**OSHA**
Organic fluors (Proprietary)	TWAs	Not established	10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable dust)	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
Organic fluors (Proprietary)	Ceilings	Not established	0.5 ppm Ceiling; 5 mg/m3 Ceiling	Not established
Organic fluors (Proprietary)	TWAs	2 mg/m3 TWA (inhalable fraction and vapor)	10 mg/m3 TWA	Not established
Vinyl toluene (25013-15-4)	TWAs	50 ppm TWA	100 ppm TWA; 480 mg/m3 TWA	100 ppm TWA; 480 mg/m3 TWA
	STELs	100 ppm STEL	Not established	Not established

Exposure Control Notations
ACGIH
- Vinyl toluene (25013-15-4): **Carcinogens:** (A4 - Not Classifiable as a Human Carcinogen)
- Organic fluors (Proprietary): **Carcinogens:** (A4 - Not Classifiable as a Human Carcinogen)

Exposure Limits Supplemental
ACGIH

- Vinyl toluene (25013-15-4): **TLV Basis - Critical Effects:** (eye and upper respiratory tract irritation)
- Organic fluors (Proprietary): **TLV Basis - Critical Effects:** (upper respiratory tract irritation)

8.2 Exposure controls

Engineering Measures/Controls
- Adequate ventilation systems as needed to control concentrations of airborne contaminants below applicable threshold limit values. Ensure that dust handling systems (such as exhaust ducts, dust collectors, vessels and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is not leakage from the equipment).

Personal Protective Equipment

Respiratory
- For limited exposure use an N95 dust mask. For prolonged exposure use an air-purifying respirator with high efficiency particulate air (HEPA) filters. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face
- Wear safety goggles.

Skin/Body
- Wear appropriate gloves. Wear long sleeves and/or protective coveralls.

Environmental Exposure Controls
- Follow best practice for site management and disposal of waste.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene

NIOSH = National Institute of Occupational Safety and Health

OSHA = Occupational Safety and Health Administration

STEL = Short Term Exposure Limits are based on 15-minute exposures

TLV = Threshold Limit Value determined by the American Conference of Governmental Industrial Hygienists (ACGIH)

TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

Section 9 - Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

Material Description			
Physical Form	Solid	Appearance/Description	Clear, blue, fluorescent plastic.
Color	Clear, blue.	Odor	Data lacking
Odor Threshold	Data lacking		
General Properties			
Boiling Point	Data lacking	Melting Point/Freezing Point	Data lacking
Decomposition Temperature	Data lacking	pH	Data lacking
Specific Gravity/Relative Density	> 1 Water=1	Water Solubility	Data lacking
Viscosity	Data lacking	Explosive Properties	Data lacking
Oxidizing Properties:	Data lacking		
Volatility			
Vapor Pressure	Data lacking	Vapor Density	Data lacking
Evaporation Rate	Data lacking		
Flammability			
Flash Point	Data lacking	UEL	Data lacking
LEL	Data lacking	Autoignition	Data lacking
Flammability (solid, gas)	Data lacking		
Environmental			
Octanol/Water Partition coefficient	Data lacking		

9.2 Other Information

- No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity

10.1 Reactivity

- No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

- Stable

10.3 Possibility of hazardous reactions

- Hazardous polymerization not indicated.

10.4 Conditions to avoid

- Temperatures over 300º C.

10.5 Incompatible materials

- No data available

10.6 Hazardous decomposition products

- Toxic fumes of carbon monoxide, carbon dioxide, borane, boron oxides.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Components		
Vinyl toluene (85.8002% TO 91.6329%)	25013-15-4	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • 2255 mg/kg; *Sense Organs and Special Senses:Eye*:**Lacrimation**; *Behavioral*:**Somnolence (general depressed activity)**; *Skin and Appendages:Other*:**Hair**; **Irritation:** Eye-Rabbit • 90 mg • Mild irritation; Skin-Rabbit • 100 % • Moderate irritation
Organic fluors (0% TO 2.0523%)	*Proprietary*	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • 1000 mg/kg; *Liver*:**Changes in liver weight**; **Multi-dose Toxicity:** Ingestion/Oral-Rat TDLo • 1680 mg/kg 14 Day(s)-Continuous; *Blood*:**Changes in serum composition (e.g., TP, bilirubin cholesterol)**; *Biochemical:Metabolism (intermediary)*:**Lipids, including transport**

GHS Properties	Classification
Acute toxicity	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
Skin corrosion/Irritation	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
Serious eye damage/Irritation	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
Skin sensitization	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
Respiratory sensitization	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
Aspiration Hazard	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking

Carcinogenicity	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
Germ Cell Mutagenicity	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
Toxicity for Reproduction	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
STOT-SE	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
STOT-RE	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking

Potential Health Effects

Inhalation

Acute (Immediate)
- Processes such as cutting, grinding, crushing, or impact may result in generation of excessive amounts of airborne dusts in the workplace. Nuisance dust may affect the lungs but reactions are typically reversible.

Chronic (Delayed)
- Repeated and prolonged exposure to dust may cause lung effects including pneumoconiosis.

Skin

Acute (Immediate)
- Exposure to dust may cause mechanical irritation.

Chronic (Delayed)
- No data available.

Eye

Acute (Immediate)
- Exposure to dust may cause mechanical irritation. Excessive concentrations of nuisance dust in the workplace may reduce visibility and may cause unpleasant deposits in eyes.

Chronic (Delayed)
- No data available.

Ingestion

Acute (Immediate)
- Excessive concentrations of nuisance dust in the workplace may cause mechanical irritation to mucous membranes.

Chronic (Delayed)
- No data available.

Key to abbreviations

LD = Lethal Dose

TD = Toxic Dose

Section 12 - Ecological Information

12.1 Toxicity

- Material data lacking.

12.2 Persistence and degradability

- Material data lacking.

12.3 Bioaccumulative potential

- Material data lacking.

12.4 Mobility in Soil

- Material data lacking.

12.5 Results of PBT and vPvB assessment

- No PBT and vPvB assessment has been conducted.

12.6 Other adverse effects

- No studies have been found.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Product waste
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	NDA	Not Regulated	NDA	NDA	NDA
TDG	NDA	Not Regulated	NDA	NDA	NDA
IMO/IMDG	NDA	Not Regulated	NDA	NDA	NDA
IATA/ICAO	NDA	Not Regulated	NDA	NDA	NDA

14.6 Special precautions for user
- None specified.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code
- Data lacking.

Section 15 - Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

SARA Hazard Classifications
- None

Inventory						
Component	**CAS**	**Canada DSL**	**Canada NDSL**	**EU EINECS**	**EU ELNICS**	**TSCA**
Boron	16872-09-6	No	Yes	Yes	No	Yes
Organic fluors	*Proprietary*	Yes	No	Yes	No	Yes
Organic fluors	*Proprietary*	No	Yes	Yes	No	Yes
Organic fluors	*Proprietary*	Yes	No	Yes	No	Yes
Vinyl toluene	25013-15-4	Yes	No	Yes	No	Yes
Organic fluors	*Proprietary*	Yes	No	Yes	No	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

• Vinyl toluene	25013-15-4	B3, D2B
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Uncontrolled product according to WHMIS

		classification criteria
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

Canada - WHMIS - Ingredient Disclosure List

• Vinyl toluene	25013-15-4	1 %
• Organic fluors	*Proprietary*	1 %
• Organic fluors	*Proprietary*	1 %
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	1 %
• Organic fluors	*Proprietary*	Not Listed

Environment

Canada - CEPA - Priority Substances List

• Vinyl toluene	25013-15-4	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

• Vinyl toluene	25013-15-4	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

• Vinyl toluene	25013-15-4	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

• Vinyl toluene	25013-15-4	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

• Vinyl toluene	25013-15-4	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed

• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

• Vinyl toluene	25013-15-4	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

• Vinyl toluene	25013-15-4	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

• Vinyl toluene	25013-15-4	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

• Vinyl toluene	25013-15-4	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

• Vinyl toluene	25013-15-4	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

• Vinyl toluene	25013-15-4	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

U.S. - California - Proposition 65 - Developmental Toxicity

• Vinyl toluene	25013-15-4	Not Listed

• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)

• Vinyl toluene	25013-15-4	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)

• Vinyl toluene	25013-15-4	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

• Vinyl toluene	25013-15-4	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

• Vinyl toluene	25013-15-4	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Boron	16872-09-6	Not Listed
• Organic fluors	*Proprietary*	Not Listed
• Organic fluors	*Proprietary*	Not Listed

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

Section 16 - Other Information

Relevant Phrases (code & full text)

- H226 - Flammable liquid and vapour
  H302 - Harmful if swallowed
  H315 - Causes skin irritation
  H335 - May cause respiratory irritation
  H336 - May cause drowsiness or dizziness
  R22 - Harmful if swallowed.
  R36/37/38 - Irritating to eyes, respiratory system and skin.
  R67 - Vapours may cause drowsiness and dizziness.

Revision Date	• 23/May/2023
Preparation Date	• 27/March/2015
Disclaimer/Statement of Liability	• Reasonable care has been taken in the preparation of this information, but the supplier gives no warranty of merchantability or of fitness for a particular purpose. Any product purchased is sold on the assumption the purchaser will make his own tests to determine the quality and suitability of the product. Supplier expressly disclaims any and all liability for incidental and/or consequential property damage arising out of the use of this product. No information provided shall be deemed to be a recommendation to use any product in conflict with any existing patent rights. Read the Safety Data Sheet before handling product.

Key to abbreviations

NDA = No data available