GUARDIAN™ | TURF INFILL

TECHNICAL DATA SHEET Guardian Bio-Based TPE Infill

*Patent Pending

DESCRIPTION/APPLICATION

Guardian TPE Infill is a specialty flexible TPE product formulated for lower field temperatures, high melt (>350°F), softer feel, (nonabrasive, air blown particles) and ideal compaction for athletic performance. Made with natural components from corn and soy.

GENERAL PROPERTIES	VALUE	METHOD
Particle Size (mm)	2.0 – 3.35	
Particle Shape	Round/Medium Sphericity	
Bulk Density (g/cm3)	0.65	
Specific Gravity (+/- 0.02)	1.18	ASTM D-792 Method B
Hardness Delayed 10 sec, Shore A (+/- 3)	65	ASTM D-2240

MECHANICAL PROPERTIES	VALUE	METHOD
Tensile Strength, psi	845	ASTM D-638
Elongation, %	265	ASTM D-638
100% Modulus, psi	580	ASTM D-638

RECOMMENDED STOCK TEMPERATURE	< 325°F

Preparation Date: 03/01/2019

GUARDIAN™ | TURF INFILL

SAFETY DATA SHEET

Guardian Bio-Based TPE Infill

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

1.1 Product identifier

Product Name • Guardian TPE Infill

Type • Thermoplastic Elastomer (TPE)

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

Relevant identified use(s) • Flexible TPE for Synthetic Turf

Use(s) advised against • Do not mix or follow with ACETAL in an extrusion or injection molding machine.

1.3 Details of the supplier of the safety data sheet

Manufacturer • Guardian Innovations, LLC
3044 Adriatic Ct
Peachtree Corners, GA 30071
United States
www.GuardianSports.com
Sales@GuardianSports.com

Telephone (General) • +1 (770) 667-6004

1.4 Emergency telephone number

Manufacturer • +1 (770) 667-6004

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.

UN GHS

According to: UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

2.1 Classification of the substance or mixture

UN GHS
- Not classified

2.2 Label elements

UN GHS

Hazard statements
- No label element(s) required

2.3 Other hazards

UN GHS
- According to the Globally Harmonized System for Classification and Labeling (GHS) this product is not considered hazardous.

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

3.2 Mixtures

Composition				
Chemical Name	**Identifiers**	**%**	**LD50/LC50**	**Classifications According to Regulation/Directive**
Polyvinyl Chloride	CAS:9002-86-2	<=90%	NDA	**UN GHS**: STOT RE 2 (Lungs) **EU DSD/DPD**: Xn; R48/20 **EU CLP**: STOT RE 2, H373 **OSHA HCS 2012**: STOT RE 2 (Lungs); Comb. Dust
Plasticizer	NDA	0% TO 60%	NDA	**UN GHS**: Not Classified **EU DSD/DPD**: Not Classified **EU CLP**: Not Classified **OSHA HCS 2012**: Not Classified
Inert Fillers	NDA	0% TO 50%	NDA	**UN GHS**: Not Classified **EU DSD/DPD**: Not Classified **EU CLP**: Not Classified
Impact Modifiers	NDA	0% TO 50%	NDA	**UN GHS**: Not Classified **EU DSD/DPD**: Not Classified **EU CLP**: Not Classified
Flame Retardants	NDA	0% TO 30%	NDA	**UN GHS**: Not Classified **EU DSD/DPD**: Not Classified **EU CLP**: Not Classified
Process Aid	NDA	0% TO 25%	NDA	**UN GHS**: Not Classified **EU DSD/DPD**: Not Classified **EU CLP**: Not Classified
Lubricants	NDA	0% TO 20%	NDA	**UN GHS**: Not Classified **EU DSD/DPD**: Not Classified **EU CLP**: Not Classified
Colorant	NDA	0% TO 15%	NDA	**UN GHS**: Not Classified **EU DSD/DPD**: Not Classified **EU CLP**: Not Classified
Heat stabilizer	NDA	1% TO 10%	NDA	**UN GHS**: Not Classified **EU DSD/DPD**: Not Classified **EU CLP**: Not Classified
Vinyl Chloride	**CAS**: 75-01-4 **EC Number**: 200-831-0 **EU Index**: 602-023-007	0.001%	Inhalation-Rat LC50 • 18pph 15 Minute(s)	**UN GHS**: Not Classified **EU DSD/DPD**: Not Classified **EU CLP**: Not Classified **OSHA HCS 2012**: Not Classified

TPE is an inert material in its normal usage; all of the ingredients listed above are encapsulated in the TPE matric and typical concentrations are indicated.

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
- Administer oxygen if breathing is difficult. Do not use mouth to mouth method if victim inhaled the substance; give artificial respiration with the aid of a pocket mask with a one-way valve or other respiratory medical device. Give artificial respiration if victim is not breathing. Get medical attention immediately.

Skin
- No known health hazards appear to be posed by the contact of Guardian Synthetic Infill with unprotected skin. If irritation develops and persists, get medical attention.

Eye
- In case of contact with substance, irritation may result from the physical presence of any particles in the eye. Flush with clear water. Contact a physician if irritation persists.

Ingestion
- If swallowed, rinse mouth with water (only if the person is conscious). Do NOT induce vomiting. Do not use mouth to mouth method if victim ingested the substance. No known health hazards appear to be posed by the ingestion of small amounts of Guardian Synthetic Infill. A physician should be consulted if large amounts are 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
- Immediate medical attention after exposure to this material not expected to be necessary. No special treatment indicated related to exposure to this material.

Section 5 - Firefighting Measures

5.1 Extinguishing media

Suitable Extinguishing Media
- Carbon dioxide or water. In case of fire use media as appropriate for surrounding fire.

Unsuitable Extinguishing Media
- None known.

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards
- TPE will not continue to burn after ignition without an external fire source.

Hazardous Combustion
- 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
-

Emergency Procedures
-

6.2 Environmental precautions

-

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures

- Spill area can be washed with water. Place unusable material into a closed, properly labeled container compatible with the product.

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

-

7.2 Conditions for safe storage, including any incompatibilities

Storage

- Store in a cool, dry, well-ventilated place.

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**	**Canada British Columbia**	**Canada Manitoba**	**Canada Ontario**	**Canada Quebec**
Vinyl Chloride (75-01-4)	TWAS	1ppm TWA	1 ppm TWA	Not Established	1ppm TWA (designated substances regulation); 1ppm TWA (applies to workplaces to which the designated substances regulation does not apply.	1ppm TWAEV; 2.6 MG/M3 TWAEV
	Designated Substances	Not established	Not established	Present	Not Established	Not established
Polyvinyl Chloride	TWAs	1MG/M3 TWA (respirable fraction)	1MG/M3 TWA (respirable)	Not established	1MG/M3 TWA (respirable)	10 mg/m3 TWAEV (including dust, inert or nuisance particles: containing no asbestos and <1% Crystalline silica total dust) as particles not otherwise classified (PNOC)

Exposure Limits/Guidelines (Con't.)		
Vinyl Chloride (75-01-4)	STELs	5 ppm STEL (see 29 CFR 1910.1017)
	TWAs	1 ppm TWA
Polyvinyl Chloride	TWAs	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction) as Particulates not otherwise classified (PNOC)

8.2 Exposure controls

Engineering Measures/Controls

- Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable

Personal Protective Equipment

Respiratory

- Under normal use conditions, respiratory protection should not be needed. However, as deemed required, respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use NIOSH or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face

-

Skin/Body

- Clean clothing should be sufficient under normal use conditions.

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
IWA = Time Weighted Averages are based on 8h/day. 40h/week exposures
= Time Weighted Averages Exposure Value

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

Material Description			
Physical Form	Solid	Appearance/Description	Pellet of varying size, harness, and color with a potential slight odor.
Color	Various colors	Odor	Potential slight odor.
Odor Threshold	No data available		
General Properties			
Boiling Point	No data available	Melting Point/Freezing Point	No data available
Decomposition Temperature	Temperatures of 300°F (150°C) or greater over an extended period of time may cause thermal degradation of TPE resin	pH	No data available
Specific Gravity/Relative Density	1.31	Water Solubility	Insoluble
Viscosity	No data available	Explosive Properties	No data available
Oxidizing Properties	No data available		
Volatility			
Vapor Pressure	< 1 mmHg (torr)	Vapor Density	No data available
Evaporation Rate	No data available		

Flammability			
Flash Point	> 600 F (> 315.5556 C)	UEL	No data available
LEL	No data available	Autoignition	No data available
Flammability (solid, gas)	No data available		
Environmental			
Octanol/Water Partition coefficient	No data available		

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 under normal temperatures and pressures.

10.3 Possibility of hazardous reactions

- Under normal conditions of storage and use, hazardous polymerization will not occur.

10.4 Conditions to avoid

- Instantaneous temperatures above 420°F/215°C, prolonged heating at processing temperatures, or excessive shear/heat combinations during processing can generate hazardous decomposition products.

10.5 Incompatible materials

- Polyvinyl chloride materials should not come into contact with acetal or acetal copolymers in elevated temperature processing equipment. The two materials are not compatible and will react in a violent decomposition when mixed under conditions of heat or pressure. Strong oxidizing agents.

10.6 Hazardous decomposition products

- Overheating may cause thermal degradation of TPE compound. Fumes and vapors (including CO, CO2, and HCl) may be generated during this thermal degradation. Emissions are also possible during normal operating conditions, and may accumulate within an inadequately ventilated facility.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Components		
Polyvinyl Chloride (<= 90%)	9002-86-2	

GHS Properties	Classification
Respiratory sensitization	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
Serious eye damage/Irritation	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
Acute toxicity	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
Aspiration Hazard	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
Carcinogenicity	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
Skin corrosion/Irritation	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
Skin sensitization	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
STOT-RE	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
STOT-SE	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
Toxicity for Reproduction	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
Germ Cell Mutagenicity	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available

Potential Health Effects

Inhalation

Acute (Immediate)	• Exposure to dust may cause irritation. Processes such as cutting, grinding, crushing, or impact may result in generation of excess amounts of airborne dusts in the workplace. Nuisance dusts may affect the lungs but reactions are typically reversible.
Chronic (Delayed)	• No data available

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 deposit in eyes
Chronic (Delayed)	• Exposure to dust may cause mechanical irritation

Ingestion

Acute (Immediate	• Excessive concentrations of nuisance dust in the workplace may cause mechanical irritation to mucous membranes
Chronic (Delayed)	• No data available

Carcinogenic Effects •

Carcinogenic Effects				
	CAS	OSHA	IARC	NTP
Vinyl Chloride				

Key to abbreviations
TD = Toxic Dose

Section 12 - Ecological Information

12.1 Toxicity

- Based on the high molecular weight of this polymeric material, transport of this compound across biological membranes is unlikely. Accordingly, the probability of environmental toxicity or bioaccumulation in organisms is remote.

12.2 Persistence and degradability

- Not subject to biodegradation.

12.3 Bioaccumulative potential

- Material data lacking.

12.4 Mobility in Soil

- Material data lacking.

12.5 Results of PBT and vPvB assessment

- PBT and vPvB assessment has not been carried out.

12.6 Other adverse effects

- Material data lacking.

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 Packaging 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 73/78 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**
Polyvinyl Chloride	9002-86-2	Yes	No	No	Yes	Yes
Vinyl Chloride	75-01-4	Yes	No	Yes	No	Yes

Canada

Labor

Canada – WHMIS – Classifications of Substances

• Vinyl Chloride	75-01-4	Uncontrolled product A, B1, D2A, D2B, F
• Polyvinyl Chloride	9002-86-2	Classification criteria according to WHMIS

Canada – WHMIS – Ingredient Disclosure List

• Vinyl Chloride	75-01-4	.01%
• Polyvinyl Chloride	9002-86-2	Not Listed

Environment

Canada – CEPA – Priority Substances List

• Vinyl Chloride	75-01-4	Not Listed
• Polyvinyl Chloride	9002-86-2	Not Listed

United States

Labor

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

• Vinyl Chloride	75-01-4	Not Listed
• Polyvinyl Chloride	9002-86-2	Not Listed

U.S. – OSHA – Specifically Regulated Chemicals

• Vinyl Chloride	75-01-4	0.5 ppm Action Level (See 29 CFR 1910.1017); 5 PPM STEL (See 29 CFR 1910.1017, 15min)
• Polyvinyl Chloride	9002-86-2	Not Listed

Environment

U.S. – CAA (Clean Air Act) – 1990 Hazardous Air Pollutants		
• Vinyl Chloride	75-01-4	
• Polyvinyl Chloride	9002-86-2	Not Listed
U.S. – CERCLA/SARA – Hazardous Substances and their Reportable Quantities		
• Vinyl Chloride	75-01-4	1 lb final RQ; 0.454 kg final RQ
• Polyvinyl Chloride	9002-86-2	Not Listed
U.S. – CERCLA/SARA – Radionuclides and their Reportable Quantities		
• Vinyl Chloride	75-01-4	Not Listed
• Polyvinyl Chloride	9002-86-2	Not Listed
U.S. – CERCLA/SARA – Section 302 Extremely Hazardous Substances EPCRA RQs		
• Vinyl Chloride	75-01-4	Not Listed
• Polyvinyl Chloride	9002-86-2	Not Listed
U.S. – CERCLA/SARA – Section 302 Extremely Hazardous Substances TPQs		
• Vinyl Chloride	75-01-4	Not Listed
• Polyvinyl Chloride	9002-86-2	Not Listed
U.S. – CERCLA/SARA – Section 313 Emission Reporting		
• Vinyl Chloride	75-01-4	0.1% de minimis concentration
• Polyvinyl Chloride	9002-86-2	Not Listed
U.S. – CERCLA/SARA – Section 313 – PBT Chemical Listing		
• Vinyl Chloride	75-01-4	Not Listed
• Polyvinyl Chloride	9002-86-2	Not Listed
U.S. – TSCA (Toxic Substances Control Act) – Section 12(b) – Export Notification		
• Vinyl Chloride	75-01-4	Not Listed
• Polyvinyl Chloride	9002-86-2	Not Listed

United States - California

Environment

U.S. – California – Proposition 65 – Carcinogens List		
• Vinyl Chloride	75-01-4	
• Polyvinyl Chloride	9002-86-2	Not Listed
U.S. – California – Proposition 65 – Developmental Toxicity		
• Vinyl Chloride	75-01-4	Not Listed
• Polyvinyl Chloride	9002-86-2	Not Listed
U.S. – California – Proposition 65 – Maximum Allowable Dose Levels (MADL)		
• Vinyl Chloride	75-01-4	Not Listed
• Polyvinyl Chloride	9002-86-2	Not Listed
U.S. – California – Proposition 65 – No Significant Risk Levels (NSRL)		
• Vinyl Chloride	75-01-4	3µg/day NSRL
• Polyvinyl Chloride	9002-86-2	Not Listed
U.S. – California – Proposition 65 – Reproductive Toxicity – Female		
• Vinyl Chloride	75-01-4	Not Listed
• Polyvinyl Chloride	9002-86-2	Not Listed
U.S. – California – Proposition 65 – Reproductive Toxicity – Male		
• Vinyl Chloride	75-01-4	Not Listed Not
• Polyvinyl Chloride	9002-86-2	Listed

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

15.3 Other Information

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Section 16 - Other Information

Relevant Phrases (code & full text)

Revision Date
- 28/August/2015

Preparation Date
- 28/July/2015

Disclaimer/Statement of
- The technical data given herein is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release, and is not to be considered a warranty or quality specification. No guarantee is being given as to the end use performance. The product is sold on the basis that buyers test the product for their specific purposes. This information related to the material designated and may not be valid for such material used in combination with any other materials or in any process.

Key to abbreviations

NDA = No data available