SAFETY DATA SHEET

Unidirectional Sheet Material with a polyurethane based matrix from DSM Dyneema.

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name : Unidirectional Sheet Material with a polyurethane based matrix from DSM Dyneema.

Internal code : WW15843

Chemical formula : Not applicable.

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

Recommended use : Ballistic protection applications; protective equipment .

1.3 Details of the supplier of the safety data sheet

Supplier : DSM Dyneema BV
PO Box 1163, 6160 BD Geleen
Mauritslaan 49, 6129 EL Urmond
The Netherlands
telephone + 31-(0)46-476 79 99
E-mail: info.dyneema@dsm.com
website http://www.dyneema.com

e-mail address of person responsible for this SDS : Info.Worldwise@dsm.com

1.4 Emergency telephone number

Emergency telephone number : Netherlands: +31 46 476 55 55
Fax: +31 46 476 64 40

Remarks : For product specification data we refer to the product specification sheet.

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Preparation

Classification according to Directive 1999/45/EC [DPD]

The product is not classified as dangerous according to Directive 1999/45/EC and its amendments.

Classification : Not classified.

Physical/chemical hazards : Combustible.

Human health hazards : Based on the available data of this product no hazardous properties are known.

Environmental hazards : Based on the available data of this product no hazardous properties are known.

Remarks : Hazard during processing: to minimise a possible safety risk of HB-type panels being squeezed out of the press during compression moulding, precautionary measures are advised, as described in Technical Bulletin LP43, which is available from your local Dyneema Sales Manager.

2.2 Label elements

Hazard symbol or symbols :

Indication of danger :

: According to EU Directives 67/548/EEC and 1999/45/EC this product does not require labelling with symbols and/or R-phrases.

Safety phrases : Not applicable.

Hazardous ingredients :

2.3 Other hazards

Other hazards which do not result in classification : Air contaminants may be formed during use of the product.

SECTION 3: Composition/information on ingredients

Substance/mixture : Preparation

Chemical description : Base polymer: Polyethylene (ultra-high molecular weight) > 80 % , < 20 % Polyurethane based matrix

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs or vPvBs or have been assigned a workplace exposure limit and hence require reporting in this section.

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact : Not applicable

Inhalation : Not applicable.

Skin contact : Wash with soap and water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

Ingestion : Not applicable.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : May cause eye irritation. (redness).

Inhalation : Not applicable.

Skin contact : There is no known acute effect after over-exposure to this product.

Ingestion : There is no known acute effect after over-exposure to this product.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Small fire

Suitable : Use dry chemical or CO_2.

Large fire

Suitable : Use dry chemical powder. Alcohol-resistant foam.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : No specific hazard.

Hazardous combustion products : In case of fire, may produce hazardous decomposition products such as carbon monoxide, carbon dioxide, (dense) black smoke, aldehydes, organic acids.

5.3 Advice for firefighters

Special protective actions for fire-fighters : No special measures required.

Special protective equipment for fire-fighters : Wear suitable protective clothing. Self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also Section 8 for additional information on hygiene measures.

6.2 Environmental precautions : No special measures required.

6.3 Methods and materials for containment and cleaning up

Small spill : Vacuum or sweep up material and place in a designated, labelled waste container. Clean up affected area with a large amount of water.

Large spill : Vacuum or sweep up material and place in a designated, labelled waste container. Recycle, if possible. Prevent formation of dust clouds. Clean up affected area with a large amount of water.

6.4 Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

Protective measures : Use with adequate ventilation.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities : Store in a fireproof location. Keep away from incompatible materials and avoid specific conditions (See section 10). Keep away from oxidizing substances. Take precautionary measures against electrostatic discharges.

7.3 Specific end use(s)

Recommendations : Not available.

Industrial sector specific solutions : Not available.

Remarks : Keep away from oxidizing substances.Take precautionary measures against electrostatic discharges.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker or exposure or environmental releases.

8.1 Control parameters

Occupational exposure limits

Triethylamine	***[Air contaminant - General manufacturing process]*** **EH40/2005 WELs (United Kingdom (UK), 12/2011). Absorbed through skin.** STEL: 17 mg/m³ 15 minutes. TWA: 2 ppm 8 hours. TWA: 8 mg/m³ 8 hours. STEL: 4 ppm 15 minutes.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

No DNELs/DMELs available.

PNECs

No PNECs available

8.2 Exposure controls

Appropriate engineering controls : Use only with adequate ventilation.

Individual protection measures

Hygiene measures : When using do not eat, drink or smoke. Wash hands after handling compounds and before eating, smoking and using the lavatory and at the end of the day.

Eye/face protection : Safety glasses with side shields.

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Skin and body : Working clothes.

Respiratory protection : No special protection is required. In case of insufficient ventilation, wear suitable respiratory equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Advice on personal protection is applicable for high exposure levels. Select proper personal protection based on a risk assessment of the actual exposure situation.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	Solid. [sheets]
Colour	:	translucent - White.
Odour	:	Slight Amine-like.
Odour threshold	:	Not available.
pH	:	Not available.
Melting point/freezing point	:	150 to 200 °C
Initial boiling point and boiling range	:	Decomposes. >300 °C
Softening range	:	Not available.
Flash point	:	>400 °C
Evaporation rate	:	Not available.
Flammability (solid, gas)	:	Not available.
Burning time	:	Not available.
Burning rate	:	Not available.
Upper/lower flammability or explosive limits	:	Not available.
Vapour pressure	:	Not available.
Vapour density	:	Not available.
Relative density	:	0.95 to 0.98 (Water = 1)
Density (g/cm³)	:	0.95 to 0.98 g/cm³
Bulk density	:	Not available.
Solubility	:	Insoluble in the following materials: cold water.
Solubility in water	:	Not available.
Partition coefficient: n-octanol/water	:	Not available.

Auto-ignition temperature	:	Not available.
Decomposition temperature	:	>300°C
Viscosity	:	Not available.
Explosive properties	:	Not available.
Oxidising properties	:	Not available.

9.2 Other information

Remarks	:	Physical and chemical properties based on Polyethylene (ultra-high molecular weight)

SECTION 10: Stability and reactivity

10.1 Reactivity	:	No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	:	Stable under recommended storage and handling conditions (see Section 7).
10.3 Possibility of hazardous reactions	:	Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid	:	Keep away from heat, sparks and flame.
10.5 Incompatible materials	:	No special recommendations.
10.6 Hazardous decomposition products	:	No specific data.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Conclusion/Summary	:	Not available.

Acute toxicity estimates

Not available.

Irritation/Corrosion

Conclusion/Summary		
Eyes	:	Not available.
Skin	:	Not available.
Respiratory	:	Not available.

Sensitisation

Conclusion/Summary		
Skin	:	Not available.
Respiratory	:	Not available.

Mutagenicity

Conclusion/Summary	:	Not available.

Carcinogenicity

Conclusion/Summary	:	Not available.

Reproductive toxicity

Conclusion/Summary	:	Not available.

Teratogenicity

Conclusion/Summary	:	Not available.

Potential acute health effects

Eye contact	:	No known significant effects or critical hazards.
Inhalation	:	No known significant effects or critical hazards.
Skin contact	:	No known significant effects or critical hazards.
Ingestion	:	No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	:	No specific data.

Inhalation : No specific data.
Skin contact : No specific data.
Ingestion : No specific data.
General : No known significant effects or critical hazards.
Carcinogenicity : No known significant effects or critical hazards.
Mutagenicity : No known significant effects or critical hazards.
Teratogenicity : No known significant effects or critical hazards.
Developmental effects : No known significant effects or critical hazards.
Fertility effects : No known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

Conclusion/Summary : Not available.

12.2 Persistence and degradability

Conclusion/Summary : Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Unidirectional Sheet Material with a polyurethane based matrix from DSM Dyneema.	-	-	Not readily

12.3 Bioaccumulative potential

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.
Mobility : Not available.

12.5 Results of PBT and vPvB assessment

PBT : Not applicable.
vPvB : Not applicable.

12.6 Other adverse effects : No known significant effects or critical hazards.
Remarks : is not biodegradable and not toxic to aquatic organisms.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal : Waste must be disposed of in accordance with national and local environmental regulations.
Hazardous waste : Within the present knowledge of the supplier, this product is not regarded as hazardous waste, as defined by EU Directive 91/689/EEC.

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.
Special precautions : This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-	-
14.3 Transport hazard class(es)	-	-	-	-
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

14.6 Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Remarks : Not regulated

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable.

15.2 Chemical Safety Assessment : No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Not classified.

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Not classified.	

Full text of abbreviated H statements : Not applicable.

Full text of classifications [CLP/GHS] : Not applicable.

Full text of abbreviated R phrases : Not applicable.

Full text of classifications [DSD/DPD] : Not applicable.

Alterations compared to the previous version : Alterations compared to the previous version are marked with a little (blue) triangle.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number
vPvB = Very Persistent and Very Bioaccumulative

Sources of key data : Literature data and/or investigation reports are available through the manufacturer.

Internal code : WW15843

Training advice : Before handling this substance/preparation, the personnel involved should be instructed by means of this safety data sheet.

Notice to reader

The information contained in the Safety Data Sheet is based on our data available on the date of publication. The information is intended to aid the user in controlling the handling risks; it is not to be construed as a warranty or specification of the product quality. The information may not be or may not altogether be applicable to combinations of the product with other substances or to particular applications.
The user is responsible for ensuring that appropriate precautions are taken and for satisfying themselves that the data are suitable and sufficient for the product's intended purpose. In case of any unclarity we advise consulting the supplier or an expert.

History

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