

Tenax® Dry Reinforcement Non-Crimp Fabric

DRNF PB1/PB3

Product Information on Safe Handling

Revision 01 (en), print data 18 July 2018, updated 18 July 2018

According to Regulation (EC) No 1907/2006 [REACH] Article 3(3) this product is classified as article, hence no obligation exists to create a safety data sheet as required by REACH Article 31/32. This Product Information was created in the style of REACH Annex II/Regulation (EU) 2015/830 to inform about a safe and careful handling with this product.

Chapter 1: Identification of the article and of the company

1.1	Product Identifier	Tenax® Dry Reinforcement Non-Crimp Fabric
1.1.1	Product types	Tenax®-E DRNF Tenax®-E DRNF PB1 Tenax®-E DRNF PB3
1.2	Recommended Use	Use to produce molded composite parts for aerospace application.
1.2.1	Uses advised against	None.
1.3	Details of the supplier	
1.3.1	Address	Teijin Carbon Europe GmbH Kasinostr. 19-21 42103 Wuppertal GERMANY Tel: +49 202 32-3225 Homepage: www.tejincarbon.com
1.3.2	Responsible department/ competent person	Dr Axel Leuchter General Manager Quality & Compliance E-Mail: safety@tejincarbon.com

Chapter 2: Hazards identifications

2.1	Classification	This product is an article , and hence does <u>not</u> require a classification and labelling according to EU regulations.
2.1.1	Self-Classification according to Regulation (EC) No 1272/2008 [CLP]	Not classified as hazardous. See chapter 3.
2.2	Self-Labeling elements according to Regulation (EC) No 1272/2008 [CLP]	Not subject to labelling.
2.2.1	Precautionary instruction	P280: Wear protective gloves.
2.2.2	Supplemental hazard information (EU)	EUH208: "Contains reaction product: bisphenol-A-(epichlorhydrin); epoxy resin (number average molecular weight ≤ 700) and 2-(chloromethyl)oxirane; Formaldehyde; Phenol. May produce an allergic reaction."
2.3	Other hazards	
2.3.1	Product meets the criteria for classification acc. to Annex XIII of REACH Reg. (EC) No 1907/2006 as PBT or vPvB	Not applicable
2.3.2	Other hazards which do not result in classification	Risk of skin burns cause of hot melt.

Chapter 3: Composition/information of ingredients

3.1	Product type	This product is an article acc. to regulation (EC) 1907/2006 [REACH]. It does not contain any substances that are intended to be released under normal or foreseeable applications.
3.1.1	Description	Pre-impregnated carbon fiber composition.
3.2	Composition/information of ingredients	

Tenax® Dry Reinforcement Non-Crimp Fabric

DRNF PB1/PB3

Product Information on Safe Handling

Revision 01 (en), print data 18 July 2018, updated 18 July 2018

Content by weight % (w/w)	Substance	CAS No EINECS/ELINCS EU-INDEX	GHS/CLP:
≥ 96	Carbon fiber based on polyacrylonitrile (PAN)	308063-67-4 / 7440-44-0 Polymer: (231-153-3) -	Not classified

Chapter 4: First aid measures

4.1 Description of first aid measures

- 4.1.1 General information** Avoid contact with unprotected body parts.
- 4.1.2 Inhalation** In the case of vapors or dust inhalation, bring affected person to fresh air. If respiratory irritation persists, seek medical attention.
- 4.1.3 Skin contact** In the case of contact with skin, rinse affected area thoroughly with lot of cold water. Do not use warm water since it aggravates the skin itching/irritation. Consult a doctor if skin irritation persists.
After contact with molten material, cool skin rapidly with plenty of cold water. Do not remove solidified product. In the case of burns by molten product, medical treatment is necessary
- 4.1.4 Eye contact** In the case of eye contact, rinse the affected eye thoroughly for a few minutes. Remove contact lenses, if present and easy to do, continue rinsing. If eye irritation persists, seek medical attention.
- 4.1.5 Ingestion** Not applicable.
- 4.2 Most important symptoms and effects, both acute and delayed**
Preexisting sensitization and skin disorders may be aggravated.
- 4.3 Indication of any immediate medical attention and special treatment needed**
Symptomatic treatment.

Chapter 5: Firefighting measures

- 5.1 Extinguishing media**
- 5.1.1 Suitable extinguishing media** Foam, dry powder, water spray jet, carbon dioxide.
- 5.1.2 Not suitable extinguishing media for safety reasons**
Full water jet.
- 5.2 Special hazards arising from the article**
At temperatures above ≥ 200 °C, hazardous decomposition and degradation products like
- Nitrogen oxide (NO_x)
- Carbon oxide (CO_x)
can be released emerging from the matrix composition.
Further increase of temperature above ≥ 650 °C can cause
- WHO-fibres
coming from the disintegrating CF-material.
- 5.3 Advice for firefighters** Do not inhale explosion and/or combustion gases. Use self-contained breathing apparatus. Fire residues and contaminated firefighting water must be disposed of in accordance with local regulations.

Chapter 6: Accidental release measures

- 6.1 Personal precautions, protective equipment and emergency procedure.**
Avoid contact with skin and eyes.
Ensure there is sufficient ventilation.
Avoid dust formation.
Keep away from sources of ignition.
Take precautionary measures against static discharges.

Tenax® Dry Reinforcement Non-Crimp Fabric

DRNF PB1/PB3

Product Information on Safe Handling

Revision 01 (en), print data 18 July 2018, updated 18 July 2018

- 6.2 **Environmental precautions** No special measures are required.
- 6.3 **Methods and material for containment and cleaning up**
Dust at the point of origin shall be vacuumed with industrial vacuum cleaner (recommendation class B1 IP65 or Typ 22 class IIIC acc. to DIN IEC 62784; at least filter class cat. M), or shall be wet absorbed. Accidentally split product shall be taken up mechanically. Dispose of contaminated material in accordance with regulations.
- 6.4 **Reference to other sections** See Chapter 7, 8 and 13.

Chapter 7: Handling and storage

- 7.1 **Precautions for safe handling** At all stages of the operation/processing, ensure extraction of dust and/or vapor by adequate ventilation, especially in confined areas. Avoid overheating if handled improperly.

General hygiene rules must be observed: Wash hands before breaks and at the end of work. Protect skin by using skincare ointment.
- 7.2 **Conditions for safe storage, including any incompatibilities**
Store and keep the article away from direct sunlight and other UV-light source in dry rooms in the original packaging. Recommended storage temperature: $\leq 50\text{ }^{\circ}\text{C}$, relative humidity: $\leq 85\%$.
- 7.3 **Specific end uses** See product use, Chapter 1.2.

Chapter 8: Exposure controls/personal protection

8.1 Control parameters

8.1.1 Ingredients with occupational exposure limits to be monitored

Substances	CAS No	Occupational exposure limits (OEL)		Sources
		Limit value Eight hours	Limit value Short term	
Workplace limits for dust in general (allgemeiner Staubgrenzwert ASGW)	-		1.25 A mg/m ³⁽²⁾ 10 E mg/m ³⁽²⁾	TRGS 900, 521 GESTIS Limit Values Germany (AGS)
Carbon fibre	-	2 fibre particles/cm ³		GESTIS Limit Values Belgium VLEP/GWBB
		3 mg/m ³⁽¹⁾		GESTIS Limit Values China
Polymer dust	-	5 mg/m ³⁽¹⁾		GESTIS Limit Values Latvia

⁽¹⁾ = Inhalable aerosol and vapor

⁽²⁾ = 15 minutes reference period / exceedance factor 2

- 8.1.2 **DNEL/PNEC-Values** Not specified.
- 8.2 **Exposure controls** Individual protection measures when processing the product, such as personal protective equipment:



8.2.1 Additional advice on system design

Ensure adequate ventilation on workplace. Mechanical processing should be preferable taken place in confined areas or separate facilities. Technical machinery, electric and electronic devices should be protected against static charge and short circuit.

Tenax® Dry Reinforcement Non-Crimp Fabric

DRNF PB1/PB3

Product Information on Safe Handling

Revision 01 (en), print data 18 July 2018, updated 18 July 2018

- 8.2.2 **Eye protection** None.
- 8.2.3 **Hand protection** Wear protective gloves when handling the product. For sufficient protection use gloves according to EN 374. Nevertheless, before using protection gloves for the first time, they should be tested for their workplace-specific suitability (e.g. mechanical resistance, product compatibility and antistatic properties). For further information, please contact the glove supplier.
- 8.2.4 **Additional protective measures** Personal protective equipment should be selected specifically for the work place.
- 8.2.5 **Respiratory protection** In the case of vapors and/or dust, use breathing apparatus. Short time (max. 20 min) filter device, filter A2P3.
- 8.2.6 **Delimitation and monitoring of the environmental exposition** Not specified.

Chapter 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

9.1.1 Appearance

- Form** Solid, fabric.
- Color** Black.to grey.
- Odor** Not specified.

9.1.2 Basic physical and chemical properties

Parameter	Value	Method	Remarks
Odor threshold	Not available		
pH level [20 °C]	Not applicable		
Melting point [°C]	≈ 3500 °C carbon fiber		
Initial boiling point/ Boiling range [°C]	Not specified		
Flash point [°C]	Not specified		
Evaporating temperature	Not available		
Inflammability (fest, gasförmig)	Not available		
Lower explosion limits	Not available		
Upper explosion limits	Not available		
Vapor pressure [Pa]	Not available		
Vapor density [°C]	Not available		
Relative Density [°C]	1.2 – 1.7		
Solubility (solvents) [°C]	Not available		
Partition coefficient: n-Octan/Water [K_{ow})]	Not applicable		
Auto-ignition temperature [°C]	Not available		
Decomposition temperature [°C]	≥ 650 °C carbon fiber ≥ 200 resin matrix		ambient air
Viscosity, flow time [23 °C]	Not available		
Viscosity, dyn. [mPas/20 °C]	Not available		
Explosive properties	Not available		
Oxidizing properties	None		

Tenax® Dry Reinforcement Non-Crimp Fabric

DRNF PB1/PB3

Product Information on Safe Handling

Revision 01 (en), print data 18 July 2018, updated 18 July 2018

9.2 Other information No information available.

Chapter 10: Stability and reactivity

10.1 **Reactivity** Product is not reactive and stable under conditions for transfer, storage and applications.

10.2 **Chemical stability** See Chapter 10.1.

10.3 **Possibility of hazardous reactions** Accumulation of fibre dust may entail the risk of a dust explosion in the present of air.

10.4 **Conditions to avoid** Do not heat up above decomposition temperature mentioned. See Chapter 5.2, 9.1.2.

10.5 **Incompatible materials** No information available.

10.6 **Hazardous decomposition products** None if used for intended purpose.

Chapter 11: Toxicological information

11.1 **Information on toxicological information** Toxicological effects of the product are not studied.

11.1.1 **Acute toxicity** Not specified.

11.1.2 **Skin corrosion/irritant** Not specified.

11.1.3 **Serious eye damage/eye irritation** Not specified.

11.1.4 **Respiratory or skin sensitization** Not specified.

11.1.5 **Germ cell mutagenicity** Not specified.

11.1.6 **Carcinogenicity** Not specified.

11.1.7 **Reproductive toxicity** Not specified.

11.1.8 **STOT-single exposure** Not specified.

11.1.9 **STOT-repeated exposure** Not specified.

11.1.10 **Aspiration hazard** Not specified.

11.1.11 **General information** Carbon fiber itself does not emit WHO-fibre particles that are respirable (IARC).
Definition of WHO-fibre particle:
length $\geq 5 \mu\text{m}$, diameter $\leq 3 \mu\text{m}$ and length-to-diameter ratio 3:1

Chapter 12: Ecological information

12.1 **Toxicity** Toxicity of the product is not studied.

12.2 **Persistence and degradability** Not specified.

12.3 **Bioaccumulative potential** Not specified.

12.4 **Mobility in soil** Not specified.

12.5 **Results of the PBT and vPvB assessment** Not applicable.

12.6 **Other adverse effects** Do not let the product enter the groundwater, open water, or the sewerage system.

Chapter 13: Disposal considerations

13.1 **Waste treatment methods** Article residues should be disposed of in compliance with Directive on Waste 2008/98/EC as well as national and regional regulations. For the product, it is not possible to determine a waste code number according to the European Waste

Tenax® Dry Reinforcement Non-Crimp Fabric

DRNF PB1/PB3

Product Information on Safe Handling

Revision 01 (en), print data 18 July 2018, updated 18 July 2018

Catalogue (EWC) as only the intended use by the customer enables an allocation. The waste code number has to be determined within the EU in accordance with the local waste disposer.

- 13.1.1 **Product** If necessary, coordinate disposal with the authorities.
- AVV-No. (recommended)** 061399 Wastes from inorganic chemical processes, if otherwise not specified.
160304 Inorganic wastes.
- 13.1.2 **Contaminated packaging** Non-contaminated packaging may be taken for recycling. Contaminated packaging must be disposed of like the article.
- AVV-No. (recommended)** 150101 Packaging made of paper and cardboard.
150102 Packaging made of plastic.

Chapter 14: Transport information

	Land transport (ADR/RID)	Inland waterways (ACN)	Marine transportation (IMDG)	Transport by air (ICAO-TI / IATA-DGR)
14.1 UN-Number	-			
14.2 UN proper shipping name	NO DANGEROUS GOODS			
14.3 Transport hazard class	-			
14.3.1 Label	-			
14.4 Packing group	-			
14.5 Environmental hazards	-			
14.6 Special precautions for user	See Chapter 6 to 8.			
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and IBC-Code	Not applicable.			
14.8 Additional information				
14.8.1 Limited quantities (LQ)	-			
14.8.2 Classification code	-			
14.8.3 Hazard Number	-			
14.8.4 Tunnel restriction code	-			
14.8.5 EmS Number	-			

Chapter 15: Regulatory information

- 15.1 **Safety, health and environmental regulations/specific legislations**
The national health and occupational safety regulations have to be considered when handling or processing the product.
- 15.1.1 **National regulations** See Chapter 8.
- 15.1.2 **VOC directive (2004/42/EG)** Not specified.
- 15.1.3 **Ozone layer (Reg. EC No. 2037/2000)**
Product does not contain substances that deplete the ozone layer.
- 15.1.4 **Employment restriction** Not known.
- 15.1.5 **Water pollution class** Not applicable.
- 15.1.6 **Fluorinated greenhouse gases (Reg. EU No. 517/2014)**
Product does not contain fluorinated greenhouse gases.

Tenax® Dry Reinforcement Non-Crimp Fabric

DRNF PB1/PB3

Product Information on Safe Handling

Revision 01 (en), print data 18 July 2018, updated 18 July 2018

- 15.1.7 **SVHC (candidate list)** Not specified.
- 15.1.8 **RoHS 2011/65/EU / (EU) 2015/863**
Not specified.
- 15.2 **Chemical safety assessment** Chemical safety assessments for substances in this product were not carried out.

Chapter 16: Other information

16.1 Changes compared to the last version

Revision 01

First edition

Unlike previous definition, the Teijin Carbon Europe GmbH has concluded that Carbon Fiber and its products is regarded as article in accordance with REACH Regulation (EC) 1907/2006. TCE has come to the firm conviction that during production Carbon Fiber is given a special shape, surface or design, which determines its function to a greater degree than does its chemical composition. Therefore, it has to be treated as an article.

16.2 Hazard information (Chapter 2 and 3)

16.2.1 Supplemental hazard information (EU)

EUH208: "Contains reaction product: bisphenol-A-(epichlorhydrin); epoxy resin (number average molecular weight ≤ 700). May produce an allergic reaction."

16.2.1 Self-Classification according to Regulation (EC) No 1272/2008 [CLP]

16.2.2 Self-Labeling elements according to Regulation (EC) No 1272/2008 [CLP].

16.2.3 Safety instructions

P280: Wear protective gloves.



16.2.4 Methods according to article 9 of (EC) No 1272/2008 (CLP) for the evaluation of available information

The product classification has been determined based on a mixture and in accordance with the technics of the calculation method.

16.3 Literature references and sources for data

16.3.1 Regulations

In their respective current versions:

REACH (EC) No 1907/2006
Regulation (EU) Nr. 2015/830 „amending REACH, Annex II“
CLP (EC) No 1272/2008
TRGS 521 „Fibre Dust“
TRGS 900 „Occupational Exposure Limits“
Waste directive 2008/98/EC
VwVwS
VOC (2004/42/CE),
Ozon (EC) No 2037/2000
Greenhouse gases Reg. (EU) No 517/2014
RoHS Directive 2011/65/EU and amendments
National Maternity Protection as well as Youth Employment Acts
National Workplace Exposure Limits of corresponding countries

16.3.2 Internet

Sources:

http://www.bgbau.de/gisbau
http://www.dguv.de
http://www.dguv.de/gestis

Tenax® Dry Reinforcement Non-Crimp Fabric

DRNF PB1/PB3

Product Information on Safe Handling

Revision 01 (en), print data 18 July 2018, updated 18 July 2018

16.4 Abbreviations

http://www.echa.europa.eu/candidate-list-table
http://www.baua.de
https://echa.europa.eu/de
http://eur-lex.europa.eu

A	Alveolar fraction
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
AGS	German Committee on Hazardous Substances
ATE	Acute Toxicity Estimated value
AVV	European List of Waste
BCF	Bioaccumulation factor
bw	Body weight
CAS No	Registration Number of the Chemical Abstracts Service
CLP	Classification, Labelling and Packaging
DGUV	Institute for Work and Health of the German Social Accident Insurance
DMEL	Derived Minimum Effect Level
DNEL	Derived No Effect Level
dw	Dry weight (Dry basis)
E	Inhalable fraction
EC	European Council
EC₅₀	Median effective concentration
ECHA	European Chemical Agency
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EU	European Union
EUH	EU-Hazard Statements
EWC	European Waste Catalogue
GHS	Globally Harmonized System
GWBB	Granswaarden voor beroepsmatige blootstelling
IARC	International Agency for Research of Cancer
IATA	International Air Transport Association
IC₅₀	Inhibition concentration, 50 %
IMDG	International Maritime Code for Dangerous Goods
LC₅₀	Lethal concentration, 50 %
LD₅₀	Median lethal dose
LOEC	Lowest Observed Effect Concentration
MARPOL	International Convention for the Prevention of Marine Pollution from Ships
MW	Molecular weight
NOAEL	No Observed Adverse Effect Level
NOEC	No Observed Effect concentration
NOELR	No Observable Effect Loading Rate
N.O.S.	not otherwise specified

Tenax® Dry Reinforcement Non-Crimp Fabric

DRNF PB1/PB3

Product Information on Safe Handling

Revision 01 (en), print data 18 July 2018, updated 18 July 2018

NTIS	National Technical Information Service, USA
PBT	Persistent, Bioaccumulative and Toxic substance
PNEC	Predicted No Effect Concentration
P_{ow}	Partition coefficient n-octanol/water
QSAR	Qualitative structure-activity relationship
REACH	Registration, Evaluation, Authorization and Restriction of Chemicals
REL	Recommended exposure limits
RID	International Carriage of Dangerous Goods by Road
STOT	Specific target organ toxicity
STP	Sewage treatment plant
SVHC	Substances of Very High Concern for Authorization
TRGS	German Technical Rule for Hazardous Substances
VLEP	Valeurs limites d'exposition professionnelle
vPvB	Very Persistent and very Bioaccumulative
VwVwS	German Administrative Regulation of Water-Polluting Substances
WHO	World Health Organisation
WHO-fibre	length ≥ 5 µm, diameter ≤ 3 µm and length-to-diameter ratio 3:1
% (w/w)	Weight Percent

16.5 Other information

16.5.1 Inventory Status

In general, articles are exempted from compulsory registration acc. to REACH regulation. Anyhow, all ingredients comply with the registration requirements acc. to REACH (registration or pre-registration), and additionally are listed in EINECS or ELINCS.

16.5.2 Disclaimer

This information is given to the best of our current knowledge and describes an article with regard to safety requirements. We would like to point out that it does not represent a guarantee of properties.