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According to Regulation (EC) No 1907/2006 [REACH] Art. 3 (3) this product is classified as article, hence no obligation exists to create a safety data sheet as required by REACH Art. 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® Carbon Filament Yarn
1.1.1	Product types	Tenax® HTA Tenax® HTS* Tenax® HMA Tenax® STS Tenax® IMS* Tenax® ITS Tenax® UMS Tenax® UTS
1.1.2	*Exceptions	Tenax®-JHTS40 A23, nickel-coated Tenax®-E HTS45 P12 Tenax®-E IMS65 P12
1.2	Recommended use	Manufacturing of Carbon Composites
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 not require a classification and labelling according to EU regulations.
2.1.1	Classification according to Regulation (EC) No 1272/2008 [CLP]	Not classified as hazardous. See chapter 3
2.2	Labelling elements	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)“. May produce an allergic reaction.
2.3	Other hazards	

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- 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

Chapter 3: Composition/information of ingredients

- 3.1 **Product type** This product is an article acc. to regulation (EC) No 1907/2006 [REACH]. It does not contain any substances, which are intended to be released under normal or foreseeable applications.

- 3.1.1 **Description** Carbon filament yarn with mixtures of epoxy resins as sizing.

3.2 Composition/information of ingredients

Content by weight [% w/w]	Substance	CAS No EINECS/ELINCS No EU-INDEX No	GHS/CLP:
≥ 95	Carbon fiber based on polyacrylonitrile (PAN)	308063-67-4 / 7440-44-0 Polymer: (231-153-3) -	Not classified

3.2.1 Comment on component parts

The product contains epoxy resins based on bisphenol-A-(epichlorhydrin) with different averaged molecular weights.

Chapter 4: First aid measures

4.1 Description of first aid measures

- 4.1.1 **General information** No special measures necessary. Avoid contact with unprotected body parts.
- 4.1.2 **Inhalation** In the case of fibre dust inhalation, bring affected person to fresh air. If respiratory irritation persist, 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.
- 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 persist, 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

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- 5.1.2 Not suitable extinguishing media for safety reasons**
Full water jet
- 5.2 Special hazards arising from the article**
At temperatures above ≥ 650 °C, decomposition of the carbon fiber can cause respirable fibre particles (WHO-fibres).
- 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.
- 6.2 Environmental precautions**
No special measures are required.
- 6.3 Methods and material for containment and cleaning up**
Fibre dust shall be extracted at the point of origin by an integrated extraction or vacuumed by an industrial vacuum cleaner. Filter recommendation: class B1 IP65 or type 22 IIIC according to DIN IEC 62784, at least filter class cat. M. For cleaning of tools, devices and floors, pick up settled fibre dust with a damp cloth (once a day). An accidentally spilled material should be taken up mechanically and dispose of 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**
During mechanical processing, dust should be kept to a minimum and taken place under (local) extraction. Avoid skin contact by wearing appropriate protective clothing (suitable gloves).
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: ≤ 50 °C, relative humidity: ≤ 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**

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Substance	CAS No	Occupational exposure limits (OEL)		Sources
		Limit value 8 h	Limit value short time	
General dust limit ASGW	-		1,25 A mg/m ³ ⁽²⁾ 10 E mg/m ³ ⁽²⁾	TRGS 900, 521 GESTIS Limit Values Germany (AGS)
Carbon fibres	-	2 fibre particles/cm ³		GESTIS Limit Values Belgien VLEP/GWBB
		3 mg/m ³ ⁽¹⁾		GESTIS Limit Values China (wird zz. erstellt)

⁽¹⁾ = Inhalable aerosol and vapor

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

8.1.2 DN(M)EL/PNEC-value Not specified

8.2 Exposure controls Individual protection measures, such as personal protective equipment:



8.2.1 Additional advice on system design

Ensure adequate ventilation on workplace. In case of fibre dust formation, it is recommended use an extraction. Technical machinery, electric and electronic devices should be protected against short circuit while fibre dust appear.

8.2.2 Eye protection None

8.2.3 Hand protection In case of possible skin contact with the product, wear protective gloves according to i.e. EN 374, for adequate protection. In any case, the protective gloves should be tested for its workplace-specific suitability (e.g. mechanical resistance, product compatibility and antistatic properties).

8.2.4 Additional protective measures

Personal protective equipment should be selected specifically for the work place.

8.2.5 Respiratory protection In case of fibre dust formation, use breathing apparatus for short term (≤ 20 min.).
Half-/quarter mask with P2 filter or
particle-filtering semi-/ fine dust masks FFP2 or
PAPR with TH 1 P protection level

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, continuous fibre

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Color Black
Odor Odorless

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]	ca. 3500		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 applicable		
Vapor density [°C]	Not applicable		
Relative Density [°C]	1.7 – 2.0 g/cm ³		At 23 °C
Solubility (solvents) [°C]	Not available		
Partition coefficient: n-Octan/Water [K _{ow}]	Not applicable		
Auto-ignition temperature [°C]	Not applicable		
Decomposition temperature [°C]	≥ 650 carbon fiber ≥ 200 epoxy resin		Ambient air
Viscosity, flow time [23 °C]	Not applicable		
Viscosity, dyn. [mPas/20 °C]	Not applicable		
Explosive properties	Not available		
Oxidizing properties	None		

9.2 Other information

Parameter	Value	Method	Remarks
Carbon fibre filament diameter	≥ 5,0 µm		
Spec. electr.conductivity	1,0 – 1,8 10 ⁻³ Ohm cm		

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.

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- 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 article, it is not possible to determine a waste code number according to the European

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Waste 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.
- 13.2 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** -
- 14.8.2 Hazard Number** -
- 14.8.3 Tunnel restriction code** -
- 14.8.4 EmS Number** -

Chapter 15: Regulatory information

- 15.1 Safety, health and environmental regulations/specific legislations**

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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-Regulation (2004/42/EG)** Product does not emit volatile organic components.
- 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** None 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.
- 15.1.7 SVHC (candidate list)** The product does not contain Substances of Very High Concern acc. to REACH Reg. (EC) No 1907/2006, Art. 57 above legal concentration limits of ≥ 0.1 wt %.
- 15.1.8 RoHS 2011/65/EU / (EU) 2015/863** This carbon fiber product does not contain any substances listed in RoHS (or contains in concentrations below the limits as specified therein).
- 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.
In view of the data content, this information sheet has been completely revised. Unlike previous definition, Teijin Carbon (former Toho Tenax) has concluded that Carbon Fiber and its products is regarded as an article in accordance with REACH Regulation (EC) No 1907/2006. Teijin Carbon 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.
- Revision 02** Chapter 01: 1.3.1 Definition of sides, 1.3.2 Details of responsible contact persons
- Revision 03** Chapter 01: 1.3.1 Definition of sides, 1.3.2 Details of responsible contact persons have been deleted.
Chapter 8: 8.1.1 OEL 250,000 fibres/m³ (recommendation) has been deleted due to the fact that the indicated precautionary measures are unfounded.
8.2.2 eye protection is not necessary.
Chapter 15: has been revised and further regulations have been added.
- Revision 04** All chapters have been revised due to Toho Tenax's renaming into Teijin Carbon.

16.2 Hazard information (Chapter 2 and 3)

16.2.1 Supplemental hazard information (EU)

EUH 208: contains „reaction product: bisphenol-A-(epichlorhydrin); epoxy resin (number average molecular weight ≤ 700)”H.
May produce an allergic reaction.

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16.3 Literature references and sources for data

16.3.1 Regulations

In their respective current versions:

REACH-VO (EC) No 1907/2006
VO (EU) Nr. 2015/830 „amending REACH“
CLP-VO (EC) Nr. 1272/2008
TRGS 521 „Fibre Dust“
TRGS 900 „Occupational Exposure Limits“
Waste directive 2008/98/EC
VwVwS
VOC (2004/42/CE),
Ozon-VO (EC) No 2037/2000
Greenhouse gases Reg. EU No 517/2014
National Maternity Protection as well as Youth Employment Acts
DIN IEC 62784 „Requirements for vacuum cleaners...“
National Workplace Exposure Limits of corresponding countries

16.3.2 Internet

Sources:

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

16.4 Abbreviations

Abbreviations and their meanings:

A	Alveolengängige Fraktion (respirable fraction)
ADR	Europäische Übereinkommen über die internationale Beförderung gefährlicher Güter auf der Straße (Accord européen relatif au transport international des marchandises Dangereuses par Route)
AGS	Ausschuss für Gefahrstoffe (Committee on Hazardous Substances)
AGW	Arbeitsplatzgrenzwert (Occupational limit values)
a.n.g.	Anderweitig nicht genannt (otherwise not mentioned)
ASGW	Allgemeiner Staubgrenzwert (general dust limit)
ATE	Schätzwert der akuten Toxizität (Acute Toxicity Estimates)
AVV	Abfallverzeichnis-Verordnung (Waste Catalogue Regulation)
CAS-Nr.	Registrierungsnummer des "Chemical Abstract Services"
CLP	Einstufung, Kennzeichnung und Verpackung (Classification, Labelling and Packaging)
E	Einatembare Fraktion (inhalable fraction)
ECHA	European Chemicals Agency
EG / EU	Europäische Gemeinschaft (European Union)
EINECS	European Inventory of Existing Commercial Chemical Substances
ELNICS	European List of Notified Chemical Substances
EUH	EU-Gefahrenhinweise (EU-Hazard Statement)

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GESTIS	Stoffdatenbank (Gefahrstoffinformationssystem/Internationale Grenzwerte für chemische Substanzen) der Deutschen Gesetzlichen Unfallversicherung DGUV (Substance Database (Hazardous Substance Information System / International Limit Values for Chemical Substances) of the German Social Accident Insurance DGUV)
GHS	Weltweit harmonisierte System zur Einstufung und Kennzeichnung (Globally Harmonised System for Classification and Labelling)
GWBB	Arbeitsplatzgrenzwerte (Granswaarden voor beroepsmatige blootstelling)
H	Gefahrenhinweis (Hazard Statement)
HTA / HTS	„High Tenacity“ Carbon fiber
HMA	„Intermediate High Tenacity“ Carbon fiber
IATA	Internationale Luftverkehrs-Vereinigung (International Air Transport Association)
IATA-DGR	Gefahrgutvorschrift für den Transport im Luftverkehr (Dangerous Goods Regulations by the „International Air Transport Association“)
IBC-Code	International Code for the Construction and Equipment of Ships carrying Dangerous Goods (Internationaler Code für den Bau und die Ausrüstung von Schiffen, die gefährliche Güter befördern)
ICAO-TI	Technische Anleitung der „Internationalen Zivilluftfahrt Organisation“ (Technical Instructions by the „International Civil Aviation Organisation“)
IMDG	Internationaler Seeverkehrskodex für gefährliche Güter (International Maritime Code for Dangerous Goods)
IMS	„Intermediate Modulus“ Carbon fiber
IRAC	Internationale Agentur für Krebsforschung (International Agency for Research of Cancer)
ITS	„Intermediate High Tenacity“ Carbon fiber
JArbSchG	Jugendschutzgesetz (Youth Protection Act)
Marpol	Internationales Übereinkommen zum Schutz der Meeresumwelt (international agreements on the marine environment)
MuSchArbV	Verordnung zum Schutze der Mütter am Arbeitsplatz. (regulation to protect mothers at work)
OEL	Arbeitsplatzgrenzwert (occupational exposure limits)
P	Sicherheitshinweis (Precaution Statement)
PAN	Polyacrylnitril (polyacrylnitrile)
PAPR	Filtergerät mit Gebläse (Powered Air Purifying Respirator)
PBT	Persistent, Bioaccumulative and Toxic substance
PNEL	Konzentration, bei der keine Wirkung auftritt (Predicted No Effect Concentration)
P_{ow}	Verteilungskoeffizient n-Oktanol/Wasser (Partition coefficient n-octanol/water)
REACH	Registrierung, Bewertung, Zulassung und Beschränkung von Stoffen (Registration, Evaluation, Authorisation and Restriction of Chemicals)
RID	Verordnung über die internationale Beförderung gefährlicher Güter auf der Schiene (Regulation Concerning the International Transport of Dangerous Goods by Rail)
RoHS	Beschränkung von gefährlichen Stoffen (Restriction on Hazardous Substances)
STP	Kläranlage (Sewage treatment plant)
SVHC	Besonders besorgniserregende Substanzen (Substances of Very High Concern for Authorization)
TRGS	Technische Regeln für Gefahrstoffe (Technical Rules for Hazardous Substances)
UMS	„Ultra Modulus“ Carbon fiber
US EPA	Ministerium für Umweltschutz der Vereinigten Staaten (United States Environmental Protection Agency)
UTS	„Ultra High Tenacity“ Carbon fiber

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VLEP	Arbeitsplatzgrenzwerte (Valeurs limites d'exposition professionnelle)
VO	Verordnung (Regulation)
VOC	Flüchtige organische Verbindungen (Volatile Organic Compounds Directive)
vPvB	Very Persistent and very Bioaccumulative
VwVwS	Verwaltungsvorschrift wassergefährdende Stoffe (German Regulation on Substances Hazardous to Water)
WHO	Weltgesundheitsorganisation (World Health Organisation)
% w/w	Gewichtsprozent (Weight Percent)

16.5 Other information

16.5.1 Customs tariff number 68151010

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.