

MATERIAL SAFETY DATA SHEET

MSDS-3

Carbon Fiber "TORAYCA" Sizing Type "1"

MSDS No. : CFA-001

Toray Carbon Fibers America, Inc.

Date: Dec. 3, 1999

1. COMPANY / IDENTIFICATION

SECTION: ACM Technology Department, CFA

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2. COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL TYPE: Carbon (Carbon Fiber)

CAS Number: 7440-44-0

SUBSTANCE () MIXTURE (O): UN CLASS & UN NUMBER: N. A.

Chemical Name	Comp. (%)	Chemical Formula (Constitutional Formula, Structural Formula)	CAS No.	TSCA
Carbon Fiber	≥94	Carbon Fiber	7440-44-0	Registered
Sizing Agent	≤2	Not open to public	Registered	Registered

3. HAZARDS IDENTIFICATION

3.1 CLASS NAME OF HAZARDOUS CHEMICALS FOR MSDS

Non-hazardous material

3.2 PHYSICAL & CHEMICAL HAZARDS

Explosive: N/A

3.3 ADVERSE HUMAN HEALTH EFFECTS

Acute Toxic Substance: No case of disease, which is caused by Carbon Fiber, has been reported. Short fiber, for example particles or fly, can cause the transient skin irritation.

3.4 ENVIRONMENTAL EFFECTS

3.4.1 Carbon fiber is electrically conductive, and it can cause the short-circuiting of electrical equipment.

3.4.2 Airborne Carbon Fiber can also disturb electrical equipment.

4. FIRST-AID MEASURES

4.1 INHALATION

Move to fresh air and wash inside mouth with water. If dizzy or unbalanced seek medical attention as soon as possible.

4.2 SKIN CONTACT

No special measures requested.

4.3 EYE CONTACT

Wash eyes with an excessive amount of water immediately for no less than 15 minutes. If contacts are being used, remove the lens and flush the eyes again with water for an additional 5 to 10 minutes. If the eyes feel uncomfortable or have prickling feeling, seek medical attention as soon as possible.

4.4 INGESTION

Rinse mouth with fresh water. Then drink two or three glasses of water. Induce vomiting by touching the finger to the back of the throat. Then seek medical attention as soon as possible.

5. FIRE-FIGHTING MEASURES

5.1 SPECIFIC HAZARDS WITH REGARD TO FIRE-FIGHTING MEASURES

Apply water from a safe distance to cool and protect surrounding area.

5.2 EXTINGUISHING MEDIA

In case of fire, use water spray, foam, dry chemical powder or carbon dioxide.

Dry chemical powder, carbon dioxide or dry sand should be used for small fires.

6. ACCIDENTAL RELEASE MEASURES

6.1 MEASURES FOR HANDLING PERSONNEL

No special measures requested

6.2 MEASURES FOR ENVIRONMENTAL EFFECTS

No special measures requested

6.3 MEASURES WHEN HANDLING SPILLED SUBSTANCE

N/A

7. HANDLING AND STORAGE

7.1 HANDLING

Exposure control for handling personnel: N/A

Protective measures against fire & explosion: N/A

Others: Touching Carbon Fiber directly can cause transient skin irritation. Hold the paper tube while handling bobbins.

7.2 STORAGE

Store bobbins in a cool, dark space. Low humidity is recommended.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

8.1 CONTROL PARAMETERS

No data are available for the product

Content	Carbon Fiber
LABOR SAFETY & HEALTH ACT(JAPAN) ppm (mg/m ³)	2.9mg/m ³ (reference value by "Kokuji" by Min. of Labor Japan (1995))
OSHA ppm (mg/m ³)	2.0mg/m ³ as the total dust of first class dust by the Japanese regulation (reference value) etc.
ACGIH ppm (mg/m ³)	10.0mg/m ³ as the "kyuunyusei" dust not classified to other categories, etc. (reference value)

8.2 ENGINEERING MEASURES

Local extract ventilation is recommended where dust and fly are generated by cutting or processing Carbon Fiber. Filter in ventilation is requested to prevent dust and fly from being discharged into open air.

8.3 PERSONAL PROTECTIVE EQUIPMENT

- 8.3.1 Respiratory protection: Adequate respirator is requested to keep from inhaling dust and fly particles.
- 8.3.2 Eye protection: Adequate protective goggles are requested to keep eyes from dust and fly.
- 8.3.3 Hand, skin and body protection: Adequate protective gloves are requested to keep skin from dust and fly.

9. PHYSICAL & CHEMICAL PROPERTIES

Appearance : Black fiber	Odor : None
Density : 1.6~2.0	Boiling point : N/A
Melting point : N/A	Vapor pressure : N/A

Vapor density : N/A	Solubility(%) : In soluble in water: N/A in others: N/A
Volatility : N/A	Others : N/A

10. PHYSICAL HAZARD (STABILITY & REACTIVITY)

Flash point : None	Spontaneous ignition temperature : None
Explosion limit (%) : None Upper: None Lower: None	Combustibility: Not Spontaneous Reactivity with water: None
Flammability : N/A	Dust explosion: N/A
Oxidizibility : Oxidized by strong oxidizer. Stable for other chemicals	Self-reactivity : None

Oxidation can progress slowly and become red-hot when exposed to high temperatures greater than 240°C in air.

11. TOXICOLOGICAL INFORMATION

Acute toxicity: N/A

Sub-chronic toxicity: N/A

Chronic toxicity: N/A

Carcinogenic effects: No silicosis case is reported on inhalation test with mouse.

Mutagenic effects: N/A

Irritant properties: Contact with fly or dust can cause skin pricking.

Teratogenic effects: N/A

12. ECOLOGICAL INFORMATION

Biodegradability: N/A

Bioaccumulation: N/A

Fish toxicity: N/A

13. DISPOSAL CONSIDERATION

13.1 In case of disposal, this product must be treated as industrial waste, separated from public waste.

13.2 This product should not be incinerated. Carbon fiber can not be incinerated well by a general incinerator, and the fibrous fragments, which may be generated by insufficient incineration, may cause the short-circuiting of electrical equipment.

14. TRANSPORTATION INFORMATION

N/A

15. REGULATORY INFORMATION

Regulatory/Classification	Reg. Info.	Substance Name	Allowed Concentration	
TSCA (USA) No.	N/A	7440-44-0 Carbon Fiber	N/A	N/A
EINECS No.	N/A	N/A	N/A	N/A
California Proposition 65	N/A	N/A	N/A	N/A
FDA	N/A	N/A	N/A	N/A
UL	N/A	N/A	N/A	N/A
CAS	N/A	7440-44-0	N/A	N/A
OSHA	N/A	N/A	N/A	N/A

16. OTHER INFORMATION

Although the information and recommendations set forth herein (hereinafter 'Information') are presented in good faith and believed to be correct as of the date hereof, Toray Carbon Fibers America Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving it will make their own determination as to its suitability for their purposes prior to use. In no event will Toray Carbon Fibers America Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. **NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.**