

1. Chemicals and company information

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|----------------------------------------------------------------|----------------------------------------------------------|
| (1) Product name
Grade | Carbon black Master batch
CB9193 |
| (2) Recommended use of the product and restrictions on its use | |
| ① Recommended use of the product | Compound |
| ② Limitations on use of the product | No data |
| (3) Supplier information | |
| ① Company | Muil Chemical Co., Ltd |
| ② Address | 237, Yeosusandan-ro, Yeosu-si, Jeollanam-do, 59619 Korea |
| ③ Tel: | +82-61-690-9425 |

2. Hazard and Risks

- | | |
|-------------------------------------------------------------|----------------|
| (1) Hazard classification | Not applicable |
| (2) Warning label items, including precautionary statements | |
| ① Symbols | Not applicable |
| ② Signal word | No data |
| ③ Hazard statement | No data |
| ④ Precautionary statements | |

Prevention	P201 Obtain instructions before use.
	P202 Do not handle until all safety precautions have been read and understood.
	P235 + P410 Keep at the low temperature and avoid direct sunlight
	P260 Avoid breathe dust, fume, gas, mist, vapors, spray
	P264 Wash thoroughly after handling
	P270 Do not eat, drink or smoke while using this product.
Response	P308 + P313 If exposed, then seek medical advice
	P314 If you feel unwell, get the medical advice.
Storage	P405 Seal and store
	P407 Keep space between the stacks
	P420 Keep away from other materials
Disposal	P501 Dispose of contents container according to applicable regulations

(3) Other hazards which do not fall under Hazard category (NFPA)

① Carbon Black

Health	0
Flammability	1
Reactivity	No data

② EBS

Health	1
Flammability	1
Reactivity	0

③ Polyethylene (PE Wax)

Health	1
Flammability	1
Reactivity	0

Reference: National Fire Protection Association (NFPA)

*NFPA 1, Fire Code, advances fire and life safety for the public and first responders as well as property protection by providing a comprehensive, integrated approach to fire code regulation and hazard management. It addresses all the bases with extracts from and references to more than 130 NFPA® codes and standards including such industry benchmarks as NFPA 101, NFPA 54, NFPA 58, NFPA 30, NFPA 13, NFPA 25, and NFPA 72.

3. Composition/Information on Ingredients

Chemical Name	Common name	CAS number	Contents
Carbon Black	Carbon Black	1333-86-4	
N-[2-Octadecanoylamino]ethyl] octadecanamide	Ethylene Bis Stearamide	110-30-5	
Poly(ethylene)	Polyolefine wax	9002-88-4	
Stylene-Ethylen-Butylene-Stylene	SEBS Block Copolymer	14808-60-7.	
			>99%

4. First Aid Measures

(1) Eye contact	If it gets on your eyes, wash it carefully with water for 20 minutes.
	If eye irritation occurs, seek medical advice
(2) Skin contact	If skin irritation or rash occurs, seek medical advice
	Take off contaminated clothing and wash before reuse
	Remove contaminated clothing and shoes and isolate contaminated areas
	Wash your skin and eyes immediately with plenty of water for at least 20 minutes if you contacted with this material
(3) Inhaled	If exposure then get medical advice
	Move to a place with fresh air
	Please keep warm and stabilize
(4) Ingestion	If exposed or feel uncomfortable, then seek medical advice
	If substance is ingested or inhaled, do not use artificial respiration with mouth-to-mouth method and use appropriate respiratory medical equipment.
(5) Other precautions from physician	Let the health care worker to know about the material and take protective measures

5. Fire - Fighting Measures

(1) Suitable extinguishing media	Use alcohol foam, carbon dioxide or water spray for digestion related to this material
	Use dry sand or earth for digestion
(2) Specific hazards arising from the chemical	Stable at the room temperature
	Can be decomposed at a high temperature and generates a toxic gas
(3) Protective equipment and precautions for fire-fighting	Rescuers should wear appropriate protective equipment.
	Extinguish the area and maintain safety distance
	Be careful because it reacts (vigorously) with water to release flammable, corrosive, toxic gases.
	Move container from fire area if it is not hazardous.
	In case of tank fire, extinguish at maximum distance
	In the case of fire in a tank then cool the tanks with large amounts of water even after the fire was extinguished.
	In the case of fire in a tank, then stay away
In the case of a large fire in a tank, use unmanned firefighting equipment and allow it to retreat if it is not possible	

6. Accidental Release Measures

(1) Personal precautions and protective equipment	Do not breathe dust, fume, gas, mist, vapors, spray
	Wipe off any spills immediately and follow all protective precautions
	Isolate contaminated areas
	If you do not need to enter or do not have protective equipment, do not go in
	Remove all ignition sources
	Stop the leakage if it is not dangerous
	Do not touch a damaged container or spill without adequate protection
	Wear a full face protection even if it is not fire
	Cover with plastic sheet to prevent diffusion
	Prevent dust formation
(2) Protection of the environment	Note the substances and conditions to avoid
	Prevent entry into waterways, sewers, basements, and confined spaces
(3) Methods for cleaning up	Absorb spillage to prevent material damage
	Absorb spillage to prevent material damage.
	Keep the container according to the applicable laws and regulations.
	Absorb spillage with inert materials (eg. dry sand or earth) and place in a chemical waste container.
	Absorb liquid and rinse contaminated area with detergent and water.

7. Handling and Storage

(1) Safety Handling Tips	Do not handle until all safety precautions have been read and understood
	After contacting this product wash hands with plenty of water
	Avoid eating and smoking while using this product.
	Handle it outdoors or in a well-ventilated area
	Do not carry contaminated clothing out of the workplace

	Follow all MSDS and label precautions as product residues may remain after emptying containers
	Handle and store carefully
	Be careful while opening
	Avoid prolonged or repeated skin contact
	Note the substances and conditions to avoid
	Before starting work follow the engineering controls rules and wear personal protective clothes
	Be aware of the high temperature.
(2) Safe storage	Store only in original container
	Keep container tightly closed in a well-ventilated place
	Store and handle in accordance with all current regulations.
	The empty drum should be completely drained, properly blocked and immediately returned to the drum regulator or properly positioned
	Keep away food and drinks

8. Exposure Controls / Personal Protection

(1) Exposure standards for chemical substances, biological exposure standards, etc.	
① Local regulation	
Carbon Black	TWA - 3.5mg/m ³
EBS	No data
Polyethylene (wax)	No data
② ACGIH regulation	
Carbon Black	TWA 3 mg/m ³
EBS	No data
Polyethylene (wax)	No data
③ Biological exposure standard	No data
(2) Proper engineering management	Use process isolation, local exhaust ventilation or other engineering controls to keep air levels below exposure limits. Install the working facilities in order to make clean and comfortable work place
(3) Personal protective equipment	Wear a respirator that has been approved by the Korean Occupational Safety and Health Administration in accordance with the physicochemical properties of the substance being exposed

9. Physical & Chemical Properties

(1) Carbon Black	
① Appearance	
Form	Solid, powder, beads
Color	Black
② Odor	Odorless
③ Odor threshold	Not applicable
④ pH	>=6.5, Cpcentration: 50 g/l (20 °C)
⑤ Melting point / freezing point	> 3,000°C
⑥ Initial boiling point and boiling range	> 3,000°C
⑦ Flash point	Not applicable
⑧ Evaporation rate	Not applicable
⑨ Flammability (solid, gas)	>45 s Method: VDI2263
⑩ Upper / lower limit of burning or explosion range	Not determined / 50g/m ³ Medium: Dust, Method: VDI2263
⑪ Vapor pressure	Not applicable
⑫ Solubility	Insoluble
⑬ Vapor density	Not applicable
⑭ Specific gravity	1.7-1.9 g/cm ³ (20°C)
⑮ Partition coefficient: N-Octanol / water	Not applicable
⑯ Auto ignition temperature	>140°C, Method: IMDG-Code
⑰ Decomposition temperature	>400 °C, Method: VDI2263
⑱ Viscosity	Not applicable
⑲ Molecular weight	12.01
(2) EBS	
① Appearance	
Form	Solid, wax Powder, Bead

Color	White solid
② Odor	None
③ Odor threshold	None
④ pH	(<8)
⑤ Melting point / freezing point	140 ~ 147 °C
⑥ Initial boiling point and boiling range	None
⑦ Flash point	285 °C
⑧ Evaporation rate	No data
⑨ Flammability (solid, gas)	No data
⑩ Upper / lower limit of burning or explosion range	No data
⑪ Vapor pressure	None
⑫ Solubility	Water solubility: insoluble
⑬ Vapor density	No data
⑭ Specific gravity	0.91
⑮ N-Octanol / water partition coefficient	None
⑯ Auto ignition temperature	No data
⑰ Decomposition temperature	260 °C
⑱ Viscosity	No data
⑲ Molecular weight	593.03

(3) Polyethylene (PE wax)

① Appearance	
Form	White powder
Color	White
② Odor	Odorless
③ Odor threshold	No data
④ pH	No data
⑤ Melting point / freezing point	104 ~ 110 °C
⑥ Initial boiling point and boiling range	No data
⑦ Flash point	No data
⑧ Evaporation rate	No data
⑨ Flammability (solid, gas)	No data
⑩ Upper / lower limit of burning or explosion range	No data
⑪ Vapor pressure	No data
⑫ Solubility	When heating, dissolve in benzene, toluene, xylene, insoluble in water
⑬ Vapor density	No data
⑭ Specific gravity	0.91 ~ 0.93 g/cm ³
⑮ Partition coefficient: N-Octanol / water	No data
⑯ Auto ignition temperature	330-410 °C
⑰ Decomposition temperature	No data
⑱ Viscosity	No data
⑲ Molecular weight	No data

10. Stability and Reactivity

(1) Possibility of chemical stability and adverse reaction	It is stable under normal conditions and does not easily explode or react.
(2) Conditions to avoid	Avoid flames, heat, sparks and contact with incompatible materials
(3) Substances to avoid	Combustible materials
(4) Hazardous substances generated during decomposition	During burning, pyrolysis or combustion can produce irritating and highly toxic gases
	Irritant, toxic gas

11. Toxicological Information

(1) Information on possible routes of exposure	No data
(2) Health hazard information	
① Acute toxicity	
② Oral	
Carbon Black	LD50 > 8000 mg/kg Rat, Method: Equivalent to OECD Test Guideline 401
EBS	LD50 > 5000 mg/kg (IUCLID)

	Polyethylene (wax)	No data
③	Percutaneous	
	Carbon Black	LD50 > 3000 mg/kg Rabbit
	EBS	LD50 > 2000 mg/kg (IUCLID)
	Polyethylene (wax)	No data
④	Inhale	No data
(3)	Skin corrosive or irritant	
	Carbon Black	Not irritating, Method: Equivalent to OECD Test Guideline 404
	EBS	Light skin irritation (Source: IUCLID, THOMSON)
	Polyethylene (wax)	No data
(4)	Severe eye damage or irritation	
	Carbon Black	Not irritating, Method: Equivalent to OECD Test Guideline 405
	EBS	Light eye irritation (Source: IUCLID, THOMSON)
	Polyethylene (wax)	No data
(5)	Respiratory sensitization	No data
(6)	Skin sensitization	No data
	Carcinogenicity	No data
(7)	Industrial Safety and Health Ac	No data
(8)	Notice of Ministry of Employment and Labor	
	Carbon Black	2
	EBS	No data
	Polyethylene (wax)	No data
(9)	IARC	
	Carbon Black	2B
	EBS	No data
	Polyethylene (wax)	No data
(10)	OSHA	No data
(11)	ACGIH	
	Carbon Black	A3
	EBS	No data
	Polyethylene (wax)	No data
(12)	NTP	No data
(13)	EU CLP	No data
(14)	Germ cell mutagenicity	No data
(15)	Reproductive toxicity	No data
(16)	Specific target organ toxicity (single exposure)	No data
(17)	Specific target organ toxicity (repeated exposure)	No data
(18)	Aspiration hazard	No data
12. Ecological Information		
(1)	Ecotoxicity	
①	Fish	
	Carbon Black	LC50 (Brachydanio rerio): 1000 mg/l 96 hr., Method: OECD 203, Tribolodonhakonensis)
	EBS	LC50 > 1.5 mg/l 96 hr Oryzias latipes (Source: OECD TG 203, GLP, NITE)
	Polyethylene (wax)	No data
②	Crustaceans	
	Carbon Black	EC50 > 5600 mg/l 24 hr., Daphnia magna (OECD Guideline 202, GLP)
	EBS	LC50 > 1.2 mg/l 48 hr., Daphnia magna (Source: OECD TG 203, GLP, NITE)
	Polyethylene (wax)	No data
③	Birds	
	Carbon Black	ErC50 > 10000 mg/l 72 hr., Other (Desmodesmussubspicatus)
	EBS	ErC50 > 1.6 mg/l 48 hr., Scenedesmussubspicatus (EbC50 > 1.6 mg/l 72 hr)
	Polyethylene (wax)	No data
(2)	Persistence and degradability	
①	Persistence	No data
②	Degradability	No data

(3) Bioaccumulative potential	
① Condensability	No data
② Biodegradable	No data
(4) Mobility in soil	No data
(5) Ozone layer harmful effect	No data
(6) Other harmful effects	No data

13. Disposal Considerations

(1) Disposal method	Dispose of contents and container in accordance with local regulations
(2) Disposal Considerations	Dispose of contents container according to applicable regulations.

14. Transport Information

(1) UN number	Not regulated as dangerous goods
(2) Proper shipping name	Not regulated as dangerous goods
(3) Hazard rating in transport	
Carbon Black	4
EBS	Not applicable
Polyethylene (wax)	Not applicable
(4) Packing group	
Carbon Black	I
EBS	Not applicable
Polyethylene (wax)	Not applicable
(5) Marine pollutants	Not applicable
(6) Special safety measures that the user needs or needs to know about transportation	
① Emergency measures in case of fire	
Carbon Black	F-A
EBS	Not applicable
Polyethylene (wax)	Not applicable
② Emergency Action	
Carbon Black	S-J
EBS	Not applicable
Polyethylene (wax)	Not applicable

15. Regulatory Information

(1) Regulation by the Industrial Safety and Health Act	No data
(2) Regulation under the Harmful Chemical Substance Control Act	No data
(3) Regulations under the Dangerous Goods Safety Management Act	No data
(4) Regulations under the Waste Management Act	Dispose of contents/containers in accordance with regulations prescribed in the Waste Management Law. This substance is not classified as designated waste.
(5) Regulation due to ozone layer hazard	Not applicable
(6) Other domestic and foreign regulations	
***Domestic regulation	
① Residual Organic Pollutant Control Act	Not applicable
***Foreign regulation	
② USA Administration Information (OSHA Regulation)	Not applicable
③ USA Administration Information (CERCLA Regulation)	Not applicable
④ USA Management Information (EPCRA 302 regulation)	Not applicable
⑤ USA Management Information (EPCRA 304 regulation)	Not applicable
⑥ USA Management Information (EPCRA 313 regulation)	Not applicable
⑦ USA Management Information (Rotterdam Convention substance)	Not applicable
⑧ USA Management Information (Stockholm Convention substance)	Not applicable
⑨ USA Management Information (Montreal Protocol substance)	Not applicable
⑩ EU classification information (confirmed classification result)	Not applicable

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|---|----------------------------------------------|----------------|
| ⑪ | EU classification information (hazard notes) | Not applicable |
| ⑫ | EU classification information (Safety notes) | Not applicable |

16. References

- (1) This Safety Data Sheet was compiled with data and information from the following sources: KOSHA, NITE, ESIS, NLM, SIDS, IPCS
- (2) **DISCLAIMER OF LIABILITY:** The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

17. Data

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|-----|-----------------------------------------------|------------|
| (1) | Issued First Date | 2017-12-28 |
| (2) | Number of revisions and date of last revision | |
| | Number of revisions | 0 |
| | Date of last revision | 2017-12-28 |
| (3) | Other | |

The Material Safety Data Sheets (MSDS) are prepared and edited with reference to the MSDS provided by the Korea Occupational Safety and Health Agency.