

1. Chemicals and company information

(1) Product name	Carbon Black Master batch
Grade	CB4493
(2) Recommended use of the product and restrictions on its use	
① Recommended use of the product	HIPS & GPPS 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	P280 Wear protective gloves, protective clothing, eye protection, face protection
	P308 + P313 If exposed, then seek medical advice
	P314 If you feel unwell, get the medical advice.
	P333 + P313 If skin irritation or rash occurs, seek medical advice
	P361 Remove all contaminated clothing
	P362 Take off contaminated clothing and wash before reuse.
Storage	P390 Absorb spillage to avoid material damage
	P403 + P233 Keep container tightly closed in a well-ventilated place.
	P403 + P235 Store in a well-ventilated place. Keep cool.
	P410 Avoid direct sunlight
Disposal	P420 Keep away from other materials
	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 Ethylene Bis Stearamide

Health	1
Flammability	1
Reactivity	0

③ Polystyrene

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]	Ethylene Bis-Stearamide	110-30-5	

octadecanamide			
Poly(1-phenylethene)	Polystyrene	9003-53-6	
			>99%

4. First Aid Measures

(1) Eye contact	If it gets on your eyes, wash it carefully with water for a few minutes. If possible, remove contact lenses and continue to wash.
	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
	For water leaks use the appropriate tools and vacuum cleaners, with high-performance filter system is equipped.
	Keep the container according to the applicable laws and regulations.

7. Handling and Storage

(1) Safety Handling Tips	Avoid breathing dust, fume, gas, mist, vapors, spray
	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
(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/m3
Ethylene Bis-Stearamide	No data
Polystyrene	No data
② ACGIH regulation	
Carbon Black	TWA - 3.5mg/m3
Ethylene Bis-Stearamide	No data
Polystyrene	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	Powder, bead
Color	Black
② Odor	Odorless
③ Odor threshold	No data
④ pH	Not applicable
⑤ Melting point / freezing point	(About 3550 °C)
⑥ Initial boiling point and boiling range	4200 °C
⑦ Flash point	> 500 °C
⑧ Evaporation rate	Not applicable
⑨ Flammability (solid, gas)	No data
⑩ Upper / lower limit of burning or explosion range	No data
⑪ Vapor pressure	No data
⑫ Solubility	Do not melt
⑬ Vapor density	Not applicable
⑭ Specific gravity	1.7-2.1
⑮ N-Octanol / water partition coefficient	No data
⑯ Auto ignition temperature	900 °C
⑰ Decomposition temperature	No data
⑱ Viscosity	No data
⑲ Molecular weight	12.01
(2) Ethylene Bis-Stearamide	
① Appearance	

Form	White solid (powder, bead)
Color	White
② Odor	Some stearic acid and amide odor
③ Odor threshold	Material
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	No data
⑫ Solubility	Water solubility: insoluble
⑬ Vapor density	No data
⑭ Specific gravity	0.91
⑮ N-Octanol / water partition coefficient	No data
⑯ Auto ignition temperature	No data
⑰ Decomposition temperature	260 °C
⑱ Viscosity	No data
⑲ Molecular weight	593.03

(3) Polystyrene

① Appearance	
Form	Solid
Color	Colorless
② Odor	No data
③ Odor threshold	No data
④ pH	No data
⑤ Melting point / freezing point	240 °C
⑥ Initial boiling point and boiling range	No data
⑦ Flash point	345 ~ 360 °C
⑧ Evaporation rate	No data
⑨ Flammability (solid, gas)	Contact with combustible material may cause fire.
⑩ Upper / lower limit of burning or explosion range	No data
⑪ Vapor pressure	0.00951 (at 25 °C, Estimate)
⑫ Solubility	0.035 (at 25 °C)
⑬ Vapor density	No data
⑭ Specific gravity	1.04-1.13 (Water=1)
⑮ N-Octanol / water partition coefficient	No data
⑯ Auto ignition temperature	427 °C
⑰ Decomposition temperature	No data
⑱ Viscosity	No data
⑲ Molecular weight	10,000-300,000 ((C8H8)x)

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	None (LD50 (Rat) 8,000 mg / kg Rat, Method: Same as OECD Test Guideline 401
Ethylene Bis-Stearamide	LD50 > 5000 mg/kg (Source: IUCLID)

Polystyrene	No data
③ Percutaneous	
Carbon Black	No data
Ethylene Bis-Stearamide	LD50 > 2000 mg/kg (Source: IUCLID)
Polystyrene	No data
④ Inhale	No data
(3) Skin corrosive or irritant	
Carbon Black	Non-irritant (same as OECD Test Guideline 404, rabbit) Edema: 0, erythema: 0
Ethylene Bis-Stearamide	Light skin irritation (Source : IUCLID, THOMSON)
Polystyrene	Causes skin irritation
(4) Severe eye damage or irritation	
Carbon Black	No data
Ethylene Bis-Stearamide	Non-irritant (same as OECD Test Guideline 405, Rabbit) Cornea / iris / conjunctiva / conjunctival edema: 0
Polystyrene	Mild eye irritation
(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	No data
(9) IARC	No data
(10) OSHA	No data
(11) ACGIH	
Carbon Black	A4
Ethylene Bis-Stearamide	No data
Polystyrene	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	LOC (Brachydanio rerio): 1,000 mg / l Exposure time: 96 h Method: OECD 203, LOC (Leuciscus idus melanotus): > 5,000 mg / l Exposure time: 14 d, Method: According to DIN 381412 part 15
Ethylene Bis-Stearamide	LC50 > 1.5 mg/l 96 hr Oryzias latipes
Polystyrene	No data
② Crustaceans	
Carbon Black	EC50 > 5600 mg/l 24 hr Method: OECD 202
Ethylene Bis-Stearamide	LC50 > 1.2 mg/l 48 hr Daphnia magna
Polystyrene	No data
③ Birds	
Carbon Black	No data
Ethylene Bis-Stearamide	EC50 > 10,000 mg/l 72 hr Method: OECD 201
Polystyrene	NOEC > 10,000 mg/l 72 hr Method: OECD 201
(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
 Ethylene Bis-Stearamide Not applicable
 Polystyrene Not applicable
 (4) Packing group 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
 Ethylene Bis-Stearamide Not applicable
 Polystyrene Not applicable
 ② Emergency Action
 Carbon Black S-J
 Ethylene Bis-Stearamide Not applicable
 Polystyrene 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 No data
 (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
 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

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17. Data

(1) Issued First Date	2012-06-22
(2) Number of revisions and date of last revision	
Number of revisions	3
Date of last revision	2015-06-01
(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.