



ECOMATERIALS INC.

8 King St. E., Suite 1700 Toronto, ON, Canada, M5C 1B5
www.ecomaterials.ca



MATERIAL SAFETY DATA SHEET

1. PRODUCT AND COMPANY INFORMATION

A. Company Information

Product Name : Duramax
Company : Ecomaterials Inc.
Address : 8 King Street East Suite 1700, Toronto, ON, Canada, M5C 1B5
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B. Recommended use of chemical and restrictions on use

- Recommended use : Abrasive material, etc.
- Restrictions on use : Foodstuffs

2. HAZARDS IDENTIFICATION

A. Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

- Health Hazard: Skin/Eye Irritation - Category 2
Specific Target Organ Toxicity (Single Exposure) - Category 3
Target Organ: respiratory system
- Environment Hazard: Not applicable
- Physical Hazard: Not applicable

B. Label elements including precautionary statements

- Symbols:



- Signal Word: Warning
- Hazard Statements
 - H315 Causes skin irritation
 - H319 Causes serious eye irritation
 - H335 May cause respiratory irritation
- Precautionary Statements
 - Prevention
 - P261 Avoid breathing dust/fumes/gas/mist/vapors/spray.
 - P264 Wash thoroughly after handling.
 - P271 Use only outdoors or in a well-ventilated area.
 - P280 Wear protective gloves/protective clothing/eye protection/face protection.
 - Responses
 - P302+P352 IF ON SKIN: wash with plenty of soap and water.



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P304+P340 IF INHALED: Remove victim to fresh air and Keep at rest in a position comfortable for breathing.
P305+P351+P338 IF in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312 IF exposed: call a POISON CENTER or doctor/physician
P332+P313 IF SKIN irritation occurs: Get medical advice/attention.
P337+P313 If eye irritation persists: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.

Storage

P402 Store in a dry place.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal

P501 Dispose of contents/ container to an approved waste disposal plant.

C. NFPA Rating

- Health: 1 Flammability: 0 Reactivity: 0 Water reactivity: 0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	CAS No.	Conc. %
Slags, steelmaking	65996-71-6	100%

4. FIRST AID MEASURES

A. In case of eye contact

- Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

B. In case of skin contact

- Wash off with soap and plenty of water.

C. If inhaled

- If breathed in, move person into fresh air.
- If not breathing, give artificial respiration.
- Consult a physician.

D. If swallowed

- Rinse mouth with water.
- Never give anything by mouth to an unconscious person.

E. Potential health effect

- May be harmful if swallowed.



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F. Other medical attention.

- Medical personnel should be aware of the protective measure of the substance.

5. FIRE-FIGHTING MEASURES

A. Suitable extinguishing media

- Dry chemical, carbon dioxide

B. Unsuitable extinguishing media

- Water spray

C. Specific hazards arising from chemical

- none flammability material.

D. Specific protective equipment for fire-fighters

- Fire fighters should enter area wearing respiratory protection and protective equipment.

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions

- Wear protective gloves/protective clothing/eye protection/face protection
- Ensure adequate ventilation
- Protect from moisture.
- Avoid breathing dust.
- Avoid contact with skin and eyes.

B. Environmental precautions

- Don't dispose the product into drainages.

C. Methods and materials for containment and cleaning up

- Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

A. Precautions for safe handling

- Avoid breathing dust.
- Avoid contact with skin and eyes.
- Wear protective gloves/protective clothing/eye protection/face protection
- Provide appropriate exhaust ventilation at places where dust is formed.
- Keep in suitable, closed containers for transportation.



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B. Conditions for safe storage

- Store in a well-ventilated place. Keep container tightly closed.
- Avoid stack more than 3 stages for long-period.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

A. Components with workplace control parameter

- Scheduling blasting when the least number of people would be exposed.
- Using vacuums equipped with High Efficiency Particulate Air (HEPA) filters or wet methods when removing accumulated dust.
- Blasting in a specified location that is as far away as possible from other employees. - Stopping other work and clearing people away while blasting is taking place.
- Cleaning up paint chips, dust, and used abrasive as soon as possible after blasting has finished.
- Avoiding blasting in windy conditions.

B. Appropriate engineering controls

- Such as an enclosure or local exhaust ventilation with dust collection must be used to maintain airborne contamination levels below the exposure limits, where practicable.
- When abrasive blasting is being conducted outside a structure, the process must be restricted to a work zone which is identified by signs or similar means as being contaminated. Only properly protected workers, who are necessary equipment must be located near the nozzle in a position where the operators hands to perform the work.

C. Personal protective equipment

- Follow 'Abrasive Blasting Hazards in Shipyard Employment (OSHA 2006)
- OSHA requires controls, such as substitution, isolation, and ventilation, as the primary means of preventing or minimizing exposures to airborne contaminants during activities such as abrasive blasting in 29 CFR 1910.134(a).
- Abrasive blasting operators recommended wearing NIOSH-certified Type CE Abrasive blasting respirators
- Eye and face protection (if the respirator design does not provide this protection)
- A protective helmet (if the respirator design does not provide this protection)
- Heavy canvas or leather gloves and aprons to protect from the impact of abrasives
- Safety shoes or boots
- Hearing protectors to reduce noise levels below the OSHA PELs
- Fall protection (if protection from falling cannot be provided by railings)

9. PHYSICAL AND CHEMICAL PROPERTIES

A. Physical State: Spherical Solid Particles

B. Color: Black



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- C. Odor: none
- D. pH: 10~11
- E. Melting point: > 1000 °C
- F. Boiling Point: No data available
- G. Flash point: No data available
- H. Auto ignition temperature: No spontaneous combustion under 250 °C
- I. Vapor Pressure: 0 mmHg (at 20 °C)
- J. Density: 3.0~4.0 at 20 °C
- K. Partition coefficient (n-octanol/water): No data available
- L. Viscosity: No data available
- M. Water solubility: Insoluble at 20 °C
- N. Explosive properties: No self-reaction hazard * UN TDG test & Criteria - Test E3
- O. Decomposition temperature: No data available
- P. Lower explosion limit / Upper explosion limit: No data available

10. STABILITY AND REACTIVITY

- A. Chemical stability
 - Since the material itself is non-flammable, heated at a high temperature heating.
- B. Conditions to avoid
 - Avoid direct sunlight and moisture.
- C. Materials to avoid
 - Strong Acids,
- D. Hazardous decomposition products
 - No data available

11. TOXICOLOGICAL INFORMATION

- A. Acute toxicity



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- Oral: tested substance SMS
OECD Guideline 423, Wistar rat LD50 > 2000 mg/kg
- Dermal: tested substance SMS
OECD Guideline 402, Wistar rat LD50 > 4000 mg/kg
- Respirable: tested substance GGBS
OECD Guideline 403, Wistar rat LC50 (powder) (4h) > 5235 mg/m³
OECD-Guideline 412, Wistar rat, NOAEL > 24.9 µg/L (aerosol)

B. Skin irritation

- Skin: tested substance SMS
Acute irritant effect, OECD 404, New Zealand White rabbit
Result: not irritant

C. Eye damage

- Eye: tested substance SMS
Acute irritant effect, OECD 405, New Zealand White rabbit
Result: not irritant

D. Respiratory or skin sensitization

- Skin: tested substance SMS
OECD 406, Dunkin-Hartley guinea pig
Result: not sensitive

E. Germ cell mutagenicity

- Mutagenicity: tested substance SMS
Bacterial reverse mutation assay
OECD 471, Salmonella typhimurium
Result: no mutagenic effect
- Mutagenicity: tested substance SMS
Mammalian erythrocyte micronucleus test,
OECD 474, mouse
Result: no mutagenic effect

F. Carcinogenicity

- There are no specific and reliable animal studies on carcinogenicity. But one assessed study gives some hints towards a not existing carcinogenic potential of ferrous slags

G. Reproductive toxicity

- No evidence from acute tests or other data for any reproductive effects. No data available from studies dedicated especially to reproduction toxicity. As slags are similar to natural rocks, no reproductive effects have to be expected.

H. Experiences made in practice

- None.



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12. ECOLOGICAL INFORMATION

A. Toxicity

- Short-term fish toxicity, tested substance SMS
OECD 203, *Leuciscus idus*
LC0 (96 h) > 100 g/l
LC50 (96 h) > 100 g/l
- Short-term toxicity aquatic invertebrates, tested substance SMS
OECD 202, *Daphnia magna*
EC0 (48 h) > 100 g/l
EC50 (48 h) > 100 g/l
- Algae toxicity, tested substance SMS
OECD 201, *Desmodesmus subspicatus*
IC10 (72 h) 24 g/l
IC50 (72 h) 90 g/l

B. Persistence and degradability

- Methods for determination of persistence and degradability are not applicable for inorganic substances.

C. Bioaccumulative potential

- No evidence for bioaccumulation potential

D. Mobility in soil

- No data available

E. Other adverse effects

- No negative ecological effects are expected according to the present state of knowledge.

13. DISPOSAL CONSIDERATIONS

A. Disposal consideration

- Observe all environmental regulations.

B. Disposal precaution

- Avoid disposing to the environment.

14. TRANSPORT INFORMATION

A. UN TDG : No data available



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- B. IMDG : No data available
- C. IATA : No data available
- D. Marine pollution : Not applicable
- E. Special precaution : No data available
 - Fire EmS Guide
 - Spillage EmS Guide

15. REGULATORY INFORMATION

- A. Korea Industrial Safety and Health Act (GHS):
 - Skin/Eye Irritation - Category 2
 - Specific Target Organ Toxicity (single Exposure) - Category 3
 - Target Organ: respiratory system
- B. Korea Hazardous Materials Safety Control Act: Not hazardous
- C. Korea Toxic Chemicals Control Act: Not toxic
- D. Korea Persistent Organic Pollutants Control Act: Not applicable
- E. US OSHA Hazards (GHS): Skin/Eye Irritation, Specific Target Organ Toxicity

16. OTHER INFORMATION

- A. Issued Date: 2014. 11. 25
- B. Revision No.: 5
- C. Revision Date: 2018. 07. 20
- D. References
 - GHS Classification:
Korea MSDS Testing Lab Certificate, EC ESIS, US NLM
 - Physical and chemical properties: Korea MSDS Testing Lab Certificate
 - Transport information: Korea MSDS Testing Lab Certificate
 - Toxic & ecological information: OECD SIDS, IUCLID, US NLM, IARC, EC ESIS, CCRIS
- E. Acronyms and Websites
 - EC ESIS: European chemical Substances Information System, <http://esis.jrc.ec.europa.eu/>



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- IUCLID: International Uniform Chemical Information Database, <http://esis.jrc.ec.europa.eu/>
- US NLM: U.S. National Library of Medicine, <http://chem.sis.nlm.nih.gov/chemidplus>
- HSDB: U.S. Hazardous Substances Data Bank, <http://toxnet.nlm.nih.gov/>
- CCRIS: U.S. Chemical Carcinogenesis Research Information System, <http://toxnet.nlm.nih.gov/>
- IARC: International Agency for Research on Cancer, <http://monographs.iarc.fr/>

* Hazards Testing and Classification

Korea MSDS Testing Laboratory

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The product composition is provided by the mentioned company of this MSDS section 1. This MSDS is composed in line with The Korea Occupational Safety and Health Act Article 41 to protect the health of the employees, and for documentation. This MSDS is composed with reference to documents and criteria provided by KOSHA.