Material Safety Data Sheet
Iron Oxide – Natural Red

Edition: 05/05/2014
In compliance with Regulation (EC) No. 453/2010
amending Annex II of Regulation (EC) No 1907/2006

1) Identification of substance/preparation and of the company undertaking

Material	Red Iron Oxide
Synonyms	Diiron trioxide, Hematite
Form	Substance
EC No	215-275-4
CAS No	1317-60-8
REACH registration No. :	01-2119457614-35-0064
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1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Use of the substance/preparation:

Substance used as such, in formulation or in formulation of products such as:

Glaze colours
Ceramic colours
Brick stains
Concrete/Cementitious applications
Paints
Fertilisers
Glass

1.2.2. Uses advised against

None

Full text of use descriptors: see section 16.

2) Composition

Chemical identity: Diiron trioxide, hematite, α-Fe_2O^3

Constituents	Chemical formula	CAS No.	EINECS No.	Weight (%)
Hematite	α-Fe_2O_3	1317-60-8	215-275-4	78-98
Dolomite	$Ca(Mg,Fe)(CO_3)_2$	16389-88-1	240-440-2	≤11
Mica -group minerals	$KAl_2[(Si_3Al)O_{10}](OH)_2$	12001-26-2	310-127-6**	≤10

Quartz	α-SiO_2	14808-60-7	238-878-4	≤4
Accessory minerals	Non-hazardous	999999-99-4**	310-127-6**	≤1

** Generic CAS No. or EINECS No. to refer to any naturally occurring substance

3) Hazard Identification

3.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 (CLP)

Not classified

Classification according to Directive 67/548/EEC (DSD)

Not classified

GHS classification

Physical and chemical hazards: None known
Human health: Specific target organ toxicity Repeated exposure – Hazard category 2 (lung)
Environment: None known

Full text of H-phrases: see section 16
Full text of R-phrases: see section 16

Adverse physicochemical, human health and environmental effects

No additional information available

3.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 (CLP)

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Signal word (CLP): WARNING

Hazard statements (CLP):

H373:- May cause damage to lung through prolonged or repeated exposure by inhalation.

Precautionary statements (CLP):

P101:- If medical advice is needed have product container or label at hand.
P102:- Keep out of reach of children.
P103:- Read label before use.
P260:- Do not breathe dust.
P314:- Get medical advice/attention if you feel unwell.
P501:- Dispose of contents/container in accordance with local/regional/national/international regulations.

3.3. Other hazards

Other hazards which do not result in classification:

Handling and or/processing of this material may generate dust, which may cause mechanical irritation of the eyes, skin, nose and throat.

Summary:
None of the constituents of these products requires classification under the Regulation (EC) No. 1272/2008. However, these products must be considered as hazardous because they contain three substances that are referred as health hazards by some Organisations.

Hematite (CAS 1317-60-8): Prolonged inhalation of natural (hematite) or synthetic (α-Fe_2O_3, CAS 1309-37-1) diiron trioxide dust will cause roentgenologic changes in lung: the retained particles produce x-ray shadows indistinguishable from fibrotic pneumoconiosis. It has been named siderosis or iron/hematite pneumoconiosis. Most specialists regard these roentgenologic changes to be benign, without having any influence on lungfunction or progressing to fibrosis. However, some specialists believe the repeated exposure to iron oxide dust may cause a real pneumoconiosis, with chronic cough and shortness of breath. Likewise, a long-term exposure to diiron trioxide by direct contact with the eyes may stain them, leaving "rust rings" that although do not have any functional influence, may be unaesthetic.

Mica-group minerals: (CAS 12001-26-2): Repeated overexposure to dust of mica may irritate the lungs and may cause lung scarring (fibrotic pneumoconiosis). This produces an abnormal chest x-ray, cough and shortness of breath.

Quartz: (CAS 14808-60-7): Long-term exposure to quartz dust (a-SiO2 = crystalline silica) through inhalation may cause a special kind of fibrosis (scarring) of the lungs called silicosis, which produces a progressive disabling and sometimes may be fatal. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness and reduced pulmonary function. In addition, quartz dust from occupational sources is classified as Group 1 (Carcinogen to humans) by the International Agency for Research on Cancer. In fact, and taking into account the European Association of Silica Producers (EUROSIL) has stated that the crystalline silica must be classified as Specific Target Organ Toxicity – Repeated exposure, Hazard Category 2 (http://www.ima-reach-hub.eu/index.php?option=com_docman&task=doc_download&gid=53), the same classification has been applied to the present products.

4) First Aid Measures

4.1. Description of first aid measures

Inhalation: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.

Ingestion: Rinse mouth thoroughly. Get medical attention if any discomfort continues.

Skin contact: Wash skin with soap and water. Get medical attention if irritation persists after washing.

Eye contact: Make sure to remove any contact lenses from the eyes before rising. Rinse eye with water immediately. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

Acute symptoms: The product may cause irritation to the respiratory tract through inhalation (sneezing, runny nose, cough, sore throat, laryngitis, nausea and vomiting). High oral dosages may produce gastrointestinal disturbances (salivation, nausea, vomiting and diarrhoea) and abdominal pain.

Delayed symptoms: Long-term overexposure (6 to 10 years) to diiron trioxide dust through inhalation may mottle the lungs, a condition called siderosis that is generally considered as benign, although it causes x-ray shadows indistinguishable from fibrotic pneumoconiosis. However, some specialists believe that prolonged or repeated overexposure to diiron trioxide by inhalation may cause a real pneumoconiosis, with shortness of breath, chronic cough, dyspnoea and weakness. In addition, prolonged exposure by direct contact with eyes may stain them leaving “rust rings”. On the other hand, long-term exposure through inhalation may cause pneumoconiosis (with shortness of breath, chronic cough, dyspnoea and weakness) due to these products contain mica-group minerals, and/or silicosis (cough, shortness of breath, wheezing, non-specific chest illness and reduced pulmonary function) because of these products contain quartz (crystalline silica).

Indication of any immediate medical attention and special treatment needed: Victims that have inhaled or ingested high dosages of this product must get immediate medical attention. Because of the delayed diseases that this product might cause, persons exposed or concerned must be check-up periodically. See Section 11 for more detailed information on health effects and symptoms

5) Fire Fighting

5.1. Extinguishing media

Suitable extinguishing media: Water spray (fog), foam, dry chemical or CO2.

Unsuitable extinguishing media: Avoid use of high pressure water, which could generate dust.

5.2. Special hazards arising from the substance or mixture

Fire hazard: Not flammable.

Explosion hazard: No explosive properties known.

Reactivity: Stable under normal conditions of handling and storage.

5.3. Advice for firefighters

Protection during firefighting: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus with a full face-piece operated in positive pressure mode.

6) Accidental Release

6.1. Personal precautions, protective equipment and emergency procedures

General measures: Keep public away from danger area. See section 8.2.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Prevent entry to sewers and soil. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up: Sweep or shovel spills into appropriate container for disposal. Avoid dust production.

6.4. Reference to other sections

See section 8 and 13 for more information.

7) Handling/Storage

7.1. Precautions for safe handling

Precautions for safe handling:	Do not breathe dust. Wash hands plentifully and other exposed areas with water after handling. Remove contaminated clothing and shoes. Wash clothing before re-using.
Packagings:	Even those that have been emptied, will retain product residue. Always obey safety warnings and handle empty packagings as if they were full. Avoid all contact with this substance.
Hygiene measures:	When using do not eat, drink or smoke. Wash hands and other exposed areas with mild soap and water before eat, drink or smoke and when leaving work. Remove contaminated clothing and shoes.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in dry, cool, well-ventilated area. Keep away from food, drink and animal feeding stuffs.

7.3. Specific end use(s)

The identified uses for this product are detailed in section 1.2

8) Exposure Controls and Personal Protection

Occupational exposure limits.

Constituent	United Kingdom OEL
Hematite (1317-60-8)	LTEL: 10mg/m³ - Total dust
α-Fe_2O_3	LTEL: 4mg/m³ - Respirable dust
	STEL 10mg/m³ - 15mins
Quartz (14808-60-7)	TWA: 0.1mg/m³
α-SiO_2	STEL: 0.3mg/m3 (calculated)
Mica (12001-26-2)	TWA: 10mg/m³ - Total dust
$KAl_2[(Si_3Al)O_{10}](OH)_2$	TWA: 0.8mg/m³ - Respirable dust

OEL: Occupational exposure limit.

Ingredients comments:
Dust contains respirable silica. Prolonged and/or massive inhalation of respirable silica dust may cause lung fibrosis. Commonly referred to as silicosis. Principal symptoms of silicosis are cough and breathlessness. Occupational exposure to respirable dust should be monitored and controlled. The product should be handled using methods and techniques that minimise or eliminate dust generation. The product contains less than 1% w/w RCS (respirable crystalline silica) as determine by the SWERF method. The respirable crystalline silica content can be measured using the "Size-Weighted Respirable Fraction – SWERF" method. All details about the SWERF method are available at www. crystallinesilica.eu

8.2. Exposure controls

Appropriate engineering controls**:**	Use as far as possible in a closed system. Provide a regular control of the atmosphere. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Local exhaust and general ventilation must be adequate to meet exposure standards. Please refer to the annex (exposure scenarios).
Hand protection:	Use gloves resistant to chemical products corresponding to EN 374:3. Take advice to gloves' manufacturer.
Eye protection:	Wear safety glasses with side shields according EN 166.
Skin and body protection:	Wear closed protective clothing.
Respiratory protection:	Use respiratory protection mask according to EN 140 or EN 405 with filter type P3 according to EN 143:2000 or FFP3 according to EN 149:2001.

Environmental exposure controls: Avoid release to the environment.

9) Physical/Chemical Properties

Physical state	Powder
Colour	Reddish brown
Odour	odourless
Odour threshold	Not applicable
pH	6.7 – 7.3
Relative evaporation rate (butylacetate=1)	No data available
Melting point	No data available
Freezing point	No data available
Initial Boiling point	>2,000^{0}C
Flash point	Not flammable
Self ignition temperature	Not applicable
Decomposition temperature	No data available

Flammability (solid, gas)	Not flammable
Vapour pressure	0.0mm Hg at 20^0C
Relative vapour density at 20 °C	No data available
Relative density	4.5 – 5.0
Bulk Density	0.8– 1.2
Solubility	Negligible
Log Pow	Not applicable
Log Kow	Not applicable
Viscosity, kinematic	Not applicable
Viscosity, dynamic	Not applicable
Explosive properties	Not explosive
Oxidising properties	No data available
Explosive limits	Not applicable

9.2. Other information

No additional information available

10) Stability/Reactivity

10.1) Reactivity

No specific reactivity hazards associated with this product.

10.2) Chemical stability

Stable under normal conditions of handling and storage.

10.3) Possibility of hazardous reactions

Not relevant.

10.4) Conditions to avoid

No specific conditions are likely to result in a hazardous situation.

10.5) Incompatible materials

Calcium hypochlorite, carbon monoxide, hydrogen peroxide, hydrazine, fluorine, bromine pentafluoride, chlorine trifluoride, oxygen difluoride and strong acids (hydrofluoric, nitric)

10.6) Hazardous decomposition products

None under normal circumstances. May evolve toxic fumes (iron oxides) when heated at 1565^0C

11) Toxicological Info

11.1. Information on toxicological effects

LD50 Rat (Oral): - >5,000mg/kg

Information on the likely routes of exposure:

These products are solid with a powder form. So, the likely routes of exposure are inhalation, eye and skin contact. Ingestion of high dosages of this product is unlikely but not impossible.

Symptoms related to the physical, chemical and toxicological characteristics:

The immediate symptoms are related to the physical form (powder) of these products because some of their particles have a rough and lamellar shape and may cause mechanical irritation to airways, digestive tract, eyes and skin, as would happen with any other non-toxic dust. So, symptoms such a sneezing, runny nose and coughing may suggest a short exposure to high dosages through inhalation, while gastrointestinal disturbances such a

salivation, nausea, vomiting and diarrhoea may suggest that a very high dosage has been swallowed. In addition, mechanical irritation of contaminated eyes or skin may appear by friction, as for example, by rubbing. In any case, it is unlikely that a short overexposure to this product may cause any delayed or chronic adverse effect.

However, symptoms such as chronic cough, dyspnoea, shortness of breath, wheezing, reduced pulmonary function and weakness may indicate that a lung disease could be developing. In fact, these products contain mica and quartz, which may cause pulmonary diseases (fibrosis, pneumoconiosis and silicosis) after a long overexposure by inhalation. In addition, prolonged overexposure (6 to 10 years) to hematite dust may cause siderosis, that is referred as a benign condition generally but causes x-ray shadows indistinguishable from fibrotic pneumoconiosis. Besides, long-term exposure by direct contact with eyes may stain them leaving unaesthetic “rust rings”.

12) Ecological Information

Ecotoxicity: not regarded as dangerous for the environment.

12.1. Acute fish toxicity

All the constituents of these products display a negligible solubility and low content of heavy metals. So, it is unlikely that may cause any adverse effect to waters and aquatic life.

LC50(fish):- >1,000mg/kg

12.2. Persistence and degradability

This product is not readily biodegradable.

12.3. Bioaccumulative potential

The product is not bioaccumulating.

12.4. Mobility in soil Accidental spillage of these dusty products may cause a shallow penetration in soil. However, is unlikely that this would cause adverse ecological effects because of the negligible solubility of its constituents. Besides, all the constituents of these products are common minerals of soils.

12.5. Results of PBT and vPvB assessment

This substance/mixture does not meet the PBT or vPvB criteria of REACH, annex XIII.

12.6. Other adverse effects

None known.

13) Disposal Consideration

Waste treatment methods:

Dispose of this material and residues in accordance with local authority requirements.

Additional information:

Empty packaging can have residues or dusts and are subject to proper waste disposal, as above.

Ecology - waste materials:
See the European waste catalogue

14) Transport Information

14.1. UN number
The product is not covered by international regulation on transport of dangerous goods (IMDG, IATA, ADR/RID).

14.2. UN proper shipping name
Not classified for transportation.

14.3. Transport hazard class(es)
Not classified for transportation.

14.4. Packing group
Not classified for transportation.

14.5. Environmental hazards
Other information: No environmental hazards known with this product.

14.6. Special precautions for user
Not classified for transportation.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable.

15) Regulatory Information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture.

European community
None of the constituents of these products appear on the lists of the hazardous substances that are forbidden, restricted or submitted to special requirements by the following European regulations in force:
Council Regulation (EEC) No 793/93 on the evaluation and control of the risks of existing substances.
Directive 98/8/EC and its amendments on placing of biocidal products on the market and **Council Regulations (EC) No 304/2003 and 689/2008** related to Export and Import of Dangerous Chemicals.
Council Regulation (EC) No 1907/2006 on Registration, Evaluation and Authorization of Chemicals (REACH).
Directive 67/548/EEC and Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures.
Commission Regulation (EC) No 465/2008 about certain substances that are listed in EINECS and may be persistent, bio-accumulating and toxic.

International

Montreal Protocol: These products do not contain substances that produce the depletion of the Ozone Layer.
Kyoto Protocol: These products do not contain Greenhouse Gases. Rotterdam Convention: These products are not subjected to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.
Stockholm Convention: These products do not contain Persistent Organic Pollutants.
IARC (International Agency for Research on Cancer): Quartz (crystalline silica) is classified by IARC as a human carcinogen belonging to Group 1

16) Other Information

Abbreviations and acronyms:

ADN: European Agreement concerning international carriage of Dangerous goods by Inland waterways
ADR: European Agreement concerning international carriage of Dangerous goods by Road
AF: Assessment factor
BCF: Bioconcentration factor
Bw: Body weight
CAS: Chemical Abstracts Service
CLP: Classification, labelling, packaging
CSR: Chemical Safety Report
DMEL: Derived maximum effect level
DNEL: Derivative No effect Level
EC: European Community
ELV: Emission limit values
EN: European Norm
EUH: European Hazard Statement
EWC: European Waste catalogue
IATA: International Air Transport Association
ICAO: International Civil Aviation Organization
IMDG: International Maritime Dangerous Goods
LC50: Median lethal concentration
LD50: Median lethal dose
NOAEL: No-observed-adverse-effect-level
NOEC: No observed effect concentration
NOEL: No observed effect level
OEL: Operator exposure level
PBT: Persistent, bioaccumulative, Toxic
PEC: Predicted effect level
PNEC: Predicted No effect Concentration
REACH: Registration, evaluation and autorisation of chemicals
RID: Regulations concerning the international carriage of dangerous goods by rail
STEL: Short Term Exposure Limit
TWA: Time weighted average
vPvB: Very persistent, very bioaccumulative.

Training advice: None.

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.
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