HT MATERIALS SCIENCE

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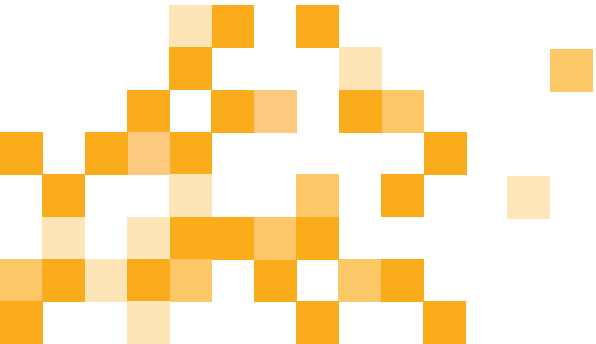
MAXWELL™ EG | SAFETY DATA



MAXWELL™ EG

According to Annex II of
Regulation (EC) 1907/2006 (REACH)
Version n° 01, Date of Issue: 03.06.2019

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Trade name:	Maxwell™ EG
Chemical description:	Submicron aluminum oxide particles dispersed in water and ethylene glycol solution
Chemical type:	Mixture

1.2. Relevant identified uses of the substance or mixture and uses advised against

Energy savings additive for heat transfer fluids

1.3. Details of the supplier of the safety data sheet

Company name:	HT Materials Science Italy srl
Address:	SP7 Lecce – Arnesano snc, 73010 – Z.A. Arnesano (LE), IT
Phone:	+39 0832 407997
E-mail:	Francesco.Micali@HTMaterialsScience.com

1.4. Emergency telephone number

+39 0832 407997

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) 1272/2008 (CLP)
Acute toxicity (oral), Hazard Category 4; H302
Specific target organ toxicity — Repeated exposure, Hazard Category 2; H373o

2.2. Label elements

Labelling according to Regulation (EC) 1272/2008 (CLP)

Hazard pictograms:		
Signal word:	Warning	
Hazard statements:	H302	Harmful if swallowed.
	H373	May cause damage to kidney through prolonged or repeated exposure if swallowed.
Precautionary statements:	P260	Do not breathe dust/mist/vapours.
	P264	Wash hands thoroughly after handling.
	P270	Do not eat, drink or smoke when using this product.
	P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
	P314	Get medical advice/attention if you feel unwell.
	P501	Dispose of contents/container to an approved waste disposal plant.

Substances that contribute to the classification of the mixture:	Ethane-1,2-diol

2.3. Other hazards

Physical and chemical:
Not expected under recommended conditions of use and storage.

For human health:
Contact with eyes and skin may cause mechanical irritation. High concentrations of dust/mist/vapours may be irritant to the upper respiratory tract. The product contains ethylene glycol: ingestion may cause nausea, vomiting, abdominal discomfort or diarrhea. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis) and kidney failure.

For the environment:
Product constituents do not satisfy the criteria for PBT or vPvB classification according to Annex XIII of Regulation (EC) 1907/2006 (REACH).

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Mixtures

Constituents	CAS no	EC no	INDEX no	Registration no	CLP classification	% w/w
Ethane-1,2-diol[1]	107-21-1	203-473-3	603-027-00-1	01-2119456816-28	Acute Tox. 4; H302 STOT RE 2; H373	35 - 45
Aluminum oxide	1344-28-1	215-691-6	-	17-2120071875-46	not hazardous	15 - 20

[1]Substance with a Union workplace exposure limit.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

General information:	Call a POISON CENTER/doctor if you feel unwell or in case of doubt on health conditions. The first responders must always wear appropriate personal protective equipment (see SECTION 8.2).
Contact with the eyes:	Rinse cautiously with water for several minutes, holding the eyelids open. If eye irritation occurs, get advice from an ophthalmologist.
Contact with the skin:	Wash with plenty of soap and water. If skin irritation or rash occurs, seek medical advice.
Inhalation:	If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms, call a POISON CENTER/doctor.
Ingestion:	Rinse mouth with water. Do not induce vomiting. Never give anything by mouth if the person is not conscious. Call a POISON CENTER/doctor if you feel unwell.

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

For information on important symptoms and effects, see SECTION 2 and SECTION 11.

4.3. Indication of any immediate medical attention and special treatment needed

For indication of any immediate medical attention, see SECTION 4.1. Basic first aid and symptomatic treatment.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable:	Use extinguishing media appropriate to the source of the fire and the surrounding area.
Unsuitable:	Do not use direct water stream (may spread fire).

5.2. Special hazards arising from the substance or mixture

The product is not flammable. In case of fire, carbon oxides and metallic oxides may evolve.

5.3. Advice for firefighters

Evacuate and isolate the area until complete fire extinction. Limit access only to trained personnel. Firefighters must always wear appropriate protective equipment: positive pressure self-contained breathing apparatus [ref. EN 137]; fireproof clothing [ref. EN 469]; fireproof gloves [ref. EN 659]; firefighter's boots [ref. HO A29-A30]. Ensure adequate ventilation. Avoid breathing fumes/gases/vapours. Avoid contact with eyes, skin and clothing. Stay upwind. Remove containers if it can be done without risk. Alternatively, cool containers exposed to fire with water spray. Prevent the contaminated extinguishing water from flowing into drains or waterways.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment, and procedures in case of emergency

For non-emergency personnel:	Alert the emergency personnel. Avoid breathing dust/mist/vapours. Avoid contact with eyes, skin and clothing.
For emergency responders:	Evacuate and isolate the area until complete dispersion of the product. Eliminate all ignition sources if it can be done without risk. Ensure adequate ventilation. Avoid breathing dust/mist/vapours. Avoid contact with eyes, skin and clothing. Wear appropriate personal protective equipment (see SECTION 8.2).

6.2. Environmental precautions

Prevent the product from leaking into the environment and run off into drains, surface waters and groundwater. Alert competent authorities if significant amounts released into drains or watercourses.

6.3. Methods and material for containment and cleaning up

Absorb the spillage with an inert material. Collect with mechanical means or non-sparking tools. Transfer into a suitable and properly labelled container. Dispose of in accordance with all relevant local, regional and national regulations. Clean surfaces thoroughly to remove any residual contamination.

6.4. Reference to other sections

For information on personal protection see SECTION 8.2. For information on disposal considerations, see SECTION 13.1.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Ensure adequate ventilation. Avoid generation of dust. Avoid breathing dust/mist/vapours. Avoid contact with eyes, skin and clothing. Wear appropriate personal protective equipment (see SECTION 8.2). Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Avoid the accumulation of static discharges. Keep away from incompatible materials (see SECTION 10.5). Do not eat, drink or smoke when using this product. Wash hands after use. Handle in accordance with good industrial hygiene and safety practices.

7.2. Conditions for safe storage, including any incompatibilities

Store in a cool, dry and well-ventilated place. Store only in the original container, tightly closed and properly labelled. Avoid exposure to moisture and direct sunlight. Store away from heat, hot surfaces, sparks, open flames and other ignition sources. Avoid the accumulation of static discharges. Store away from incompatible materials (see SECTION 10.5).

7.3. Specific end use(s)

See SECTION 1.2.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Ethane-1,2-diol	DNEL worker - long term exposure - inhalation - local effects	= 35 mg/m³
	DNEL worker - long term exposure - inhalation - systemic effects	= 106 mg/kg bw/day
	DNEL general population - long term exposure - inhalation - local effects	= 7 mg/m³
	DNEL general population - long term exposure - dermal - systemic effects	= 53 mg/kg bw/day
	PNEC fresh water	= 10 mg/L
	PNEC intermittent releases (fresh water)	= 10 mg/L
	PNEC marine water	= 1 mg/L
	PNEC sediment (fresh water)	= 37 mg/kg dw
	PNEC sediment (marine water)	= 3.7 mg/kg dw
	PNEC sewage treatment plant	= 199.5 mg/L
	PNEC soil	= 1.53 mg/kg dw
	EUROPEAN UNION Limit value - 8 hours	= 20 ppm/52mg/m³ [vapour]
	EUROPEAN UNION Limit value - short term	= 40 ppm/104mg/m³ [vapour]
	IRELAND Limit value - 8 hours	= 10 mg/m³ [particulate]
	UK Limit value - 8 hours	= 10 mg/m³ [particulate]
	ACGIH TVL-STEL	= 100 mg/m³
Aluminum oxide	DNEL worker - long term exposure - inhalation - systemic effects	= 15.63 mg/m³
	DNEL worker - long term exposure - inhalation - local effects	= 6.58 mg/kg bw/day
	DNEL general population - long term exposure - oral - systemic effects	= 10 mg/m³ [inhalable fraction]
	IRELAND Limit value - 8 hours	= 4 mg/m³ [respirable fraction]
		= 10 mg/m³ [inhalable aerosol]
	UK Limit value - 8 hours	= 4 mg/m³ [respirable aerosol]
		= 15 mg/m³ [total dust]
	USA OSHA	= 5 mg/m³ [inhalable dust]
		= 1 mg/m³ [Al, metal and insoluble compounds]
	ACGIH TLV - TWA	

8.2. Exposure controls

Wear personal protective equipment in accordance with standards set by relevant legislation.
Consult the supplier in all cases before making a final decision.

Skin protection:	No special personal protective equipment required.

Hand protection:	Wear work gloves impervious to chemicals made of nitrile rubber or equivalent materials [ref. EN 374] with protection index 6 (thickness > 0.4 mm; permeation time > 480 minutes). However, since the product is a mixture of several constituents, the resistance of the glove material should be tested before use as it is not predictable in advance.
Eye protection:	Wear appropriate safety glasses with side shields [ref. EN 166].
Respiratory protection:	Not needed under recommended conditions of use. If workplace limits are/could be exceeded, wear a respirator with an ABEK filter [ref. EN 14387]. A final decision on respiratory protection must be taken in all cases based on known or anticipated exposure levels, product hazards and safe working limits of the selected device.
Technical and hygienic measures:	Provide local exhaust ventilation suction or other devices to maintain the levels of particles in the air below the recommended exposure limits. Ensure monitoring of emissions in the air and in the environment. Do not eat, drink or smoke when using this product. Wash hands after use. Wash periodically clothes and personal protective equipment to remove contaminants. Handle in accordance with good industrial hygiene and safety practices.
Environmental measures:	Ensure compliance with all relevant legislation regarding water protection and waste management. Avoid dispersing in the environment and discharging into drains, surface waters and groundwater.
Thermal hazards:	Not expected under recommended conditions of use and storage.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

a) Appearance:	white dispersion
b) Odour:	odourless
c) Odour threshold:	not relevant for product classification purposes
d) pH:	8.5 - 10.5 [data on products with similar composition]
e) Melting/freezing point:	approx. 2030 °C [data on aluminum oxide, melting point]
	< -20 °C [data on products with similar composition, freezing point]
f) Initial boiling point and boiling range:	105 - 107 °C [data on products with similar composition]
g) Flash point:	111 °C [data on propylene glycol]
h) Evaporation rate:	< 0.5 [calculated]
i) Flammability (solid, gas):	not flammable [based on the information on product constituents]
j) Upper/lower flammability or explosive limits:	lower flammability limit = 3.2 % vol [data on ethylene glycol]
	upper flammability limit = 15.3 % vol [data on ethylene glycol]
k) Vapour pressure:	15 - 20 mmHg @ 20 °C [data on products with similar composition]
l) Vapour density:	not relevant for product classification purposes
m)Relative density:	3.99 @ 20 °C [data on aluminum oxide]
	1.11 @ 20 °C [data on ethylene glycol]
n) Solubility:	dispersible in water
o) Partition coefficient: n-octanol/water:	log Kow = -1.36 @ 25 °C [data on ethlene glycol]
p) Auto-ignition temperature:	not self-igniting [based on the information on product constituents]
q) Decomposition temperature:	not relevant for product classification purposes
r) Viscosity:	not relevant for product classification purposes
s) Explosive properties:	not explosive [based on the information on product constituents]
t) Oxidising properties:	non-oxidising [based on the information on product constituents]

9.2. Other information

Not available.

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity

No danger of reaction with other substances under recommended conditions of use.

10.2. Chemical stability

Stable under recommended conditions of use and storage.

10.3. Possibility of hazardous reactions

Not known and/or expected.

10.4. Conditions to avoid

Avoid exposure to moisture and direct sunlight. Avoid the accumulation of static discharges.
Avoid contact with incompatible materials (see SECTION 10.5).

10.5. Incompatible materials

Strong acids, strong bases and strong oxidizers.

10.6. Hazardous decomposition products

Not expected under recommended conditions of use and storage.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

a) Acute toxicity

Ethane-1,2-diol	oral	(rat)	LD50 = 7712 mg/kg
	oral	(human, adult)	LD = 100 ml [estimated]
	inhalation	(rat)	LC50 > 2.5 mg/L (6 hours)
	dermal	(mouse)	LD50 > 3500 mg/kg
Aluminum oxide	oral	(rat)	LD50 > 10000 mg/kg [OECD 401]
	inhalation	(rat)	LC50 > 2.3 mg/L (4 hours) [OECD 403]
Product	oral	(-)	ATE_{MIX} = 1250 mg/kg

No bibliographic information was found about acute toxicity effects resulting from exposure to the product by oral, dermal or inhalation route. The product contains ethane-1,2-diol. Ingestion of this substance is considered harmful for humans, even though tests with animals showed a lower degree of toxicity. An acute toxicity value between 300 and 2000 mg/kg is estimated for the product, based on available data for product constituents. Therefore, the product must be classified in category 4 for "acute oral toxicity."

b) Skin corrosion/irritation

No bibliographic information was found about corrosion/irritation effects due to skin contact with the product. Based on available data for product constituents, the classification criteria are not met.

c) Serious eye damage/irritation

No bibliographic information was found about corrosion/irritation effects due to eye contact with the product. Based on available data for product constituents, the classification criteria are not met.

d) Respiratory or skin sensitization

No bibliographic information was found about respiratory or skin sensitization effects resulting from exposure to the product. Based on available data for product constituents, the classification criteria are not met.

e) Germ cell mutagenicity

No bibliographic information was found about germ cell mutagenicity effects resulting from exposure to the product. Based on available data for product constituents, the classification criteria are not met.

f) Carcinogenicity

No bibliographic information was found about carcinogenicity effects resulting from exposure to the product. Based on available data for product constituents, the classification criteria are not met.

g) Reproductive toxicity

No bibliographic information was found about reproductive toxicity effects resulting from exposure to the product. Based on available data for product constituents, the classification criteria are not met.

h) STOT-single exposure

No bibliographic information was found about STOT effects resulting from single exposure to the product. Based on available data for productconstituents, the classification criteria are not met.

i) STOT-repeated exposure

No bibliographic information was found about STOT effects resulting from repeated exposure to the product. The product contains ethane-1,2-diol (> 10%). Chronic ingestion of this substance showed effect on organs (mainly the kidney) during animal testing. Therefore, the product must be classified in category 2 for "specific target organ toxicity — repeated exposure."

j) Aspiration hazard

No bibliographic information was found about hazard resulting from aspiration of the product. Based on available data for product constituents, the classification criteria are not met.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ethane-1,2-diol	fish (Pimephales promelas)	LC50 > 72860 mg/L (96 hours)
	invertebrates (Daphnia magna)	EC50 > 100 mg/L (48 hours) [OECD 202]
	microorganisms (activated sludge)	EC20 > 1995 mg/L (30 minutes) [ISO 8192]
Aluminum oxide	fish (Salmo trutta)	LC50 > 100 mg/L (96 hours) [OECD 203]
	invertebrates (Daphnia magna)	EC50 > 100 mg/L (48 hours) [OECD 202]
	algae (Pseudokirchneriella subcapitata)	EC50 > 100 mg/L (72 hours) [OECD 201]

No bibliographic information was found about environmental effects of the product. Based on available data for product constituents, the classification criteria are not met.

12.2. Persistence and degradability

Ethane-1,2-diol	degradation (DOC removal) > 80% (10 days) [OECD 301 A]
Aluminum oxide	not relevant for the substance (inorganic substance).

The organic component of the product is readily biodegradable.

12.3. Bioaccumulative potential

Ethane-1,2-diol	log Kow = -1.36
Aluminum oxide	no biomagnification aluminum across trophic levels both in aquatic and terrestrial food chains

Based on the information available for its constituents, the product is not expected to be bioaccumulative.

12.4. Mobility in soil

Ethane-1,2-diol	Koc < 1 (calculated)
Aluminum oxide	not mobile under normal conditions (may be leached from the ground at pH< 5.5 or > 8.5)

The organic component of the product has high mobility in soil while the inorganic component is not mobile.

12.5. Results of PBT and vPvB assessment

Product constituents do not satisfy the criteria for PBT or vPvB classification according to Annex XIII of Regulation (EC) 1907/2006 (REACH).

12.6. Other adverse effects

Product constituents do not have effects on the ozone layer.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Product:	Dispose of in accordance with local/regional/national regulations. Do not discharge into sewer. European Waste Code - CER 161002
Packaging:	Empty containers may contain residues and must be cleaned up according to appropriate methods and then re-used or disposed of in accordance with applicable legislation.

SECTION 14. TRANSPORT INFORMATION

The product is not subject to the provisions of existing legislation governing the transport of dangerous goods by road, rail, sea and air.

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

Not applicable.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Not applicable.

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable.

SECTION 15. REGULATORY INFORMATION

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

Regulation (EC) 1907/2006 (REACH):

Substances of very high concern included in the candidate list for Authorisation:	none
Substances subjected to Authorisation procedure (Annex XIV):	none
Substances subjected to Restriction procedure (Annex XVII):	none

Directive 2012/18/EU:

Substances included in the categories covered by the Seveso III Directive:	none

15.2. Chemical safety assessment

A chemical safety assessment has not been performed for the product.

SECTION 16. OTHER INFORMATION

Evaluation method:

The classification of the product is based on the calculation methods defined in Regulation (EC) 1272/2008 (CLP).	
Acute toxicity (oral), Hazard Category 4; H302	calculation method
Specific target organ toxicity — Repeated exposure, Hazard Category 2; H373o	calculation method

Key references and data sources:

- Regulation (EC) 1272/2008 (CLP) (and its subsequent modifications and amendments)
- Regulation (EC) 1907/2006 (REACH) (and its subsequent modifications and amendments)
- SDS of raw materials suppliers

Advice on any training appropriate for workers:

The staff responsible for handling the product should be informed about its hazards and potential risks related to its use and be instructed on the precautions to be taken in order to avoid or limit exposure.

Acronyms:

ACGIH:	American conference of governmental industrial hygienists
ATE:	acute toxicity estimation
CLP:	classification labelling and packaging
DNEL:	derived no effect level
EC:	effective concentration
LC:	lethal concentration
LD:	lethal dose
NOEC:	no observed effect concentration
OSHA:	occupational safety and health administration
PBT:	persistent, bioaccumulative and toxic
PNEC:	predicted no effect concentration
REACH:	registration, evaluation and authorization of chemicals
TLV:	threshold limit value
TWA:	time weighted average
vPvB:	very persistent and very bioaccumulative

Notes:

The indications provided in this safety data sheet are correct to the best of our knowledge at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation and disposal and is not to be considered a warranty, expressed or implied, or quality specification of any kind. HT Materials Science assumes no responsibility for injury to the user or third persons caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. The user must verify its suitability and completeness in accordance with each specific use of the product.

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