HT MATERIALS SCIENCE

SMARTER
HEAT
TRANSFER
FLUIDS™

MAXWELL™ PG | SAFETY DATA

MAXWELL™ PG

SAFETY DATA

According to Annex II of
Regulation (EC) 1907/2006 (REACH)
Version 03, 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™ PG
Chemical description:	Submicron aluminum oxide particles dispersed in water and propylene glycol solution
Chemical type:	Mixture

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

Improve the heat transfer capacity of existing system fluids (water/glycol) in order to reduce the energy consumed by mechanical equipment.

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)
The product is not classified as hazardous according to Regulation (EC) 1272/2008 (CLP).

2.2. Label elements

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

Hazard pictograms:	none
Signal word:	none
Hazard statements:	none
Precautionary statements:	none

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 mild irritation. High concentrations of dust/mist/vapours may be irritant to the upper respiratory tract.

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
Propane-1,2-diol	57-55-6	200-338-0	-	01-2119456809-23-xxxx	not hazardous	35 - 45
Aluminum oxide	1344-28-1	215-691-6	-	17-2120071875-46-xxxx	not hazardous	15 - 20

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

General information:	Call a doctor if you feel unwell or in case of any 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. Call a doctor if experiencing respiratory symptoms.
Ingestion:	Rinse mouth with water. Do not induce vomiting. Never give anything by mouth if the person is not conscious. Call a doctor if significant amounts are ingested.

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.

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 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

Propane-1,2-diol	DNEL worker - long term exposure - inhalation - systemic effects	= 168 mg/m³
	DNEL worker - long term exposure - inhalation - local effects	= 10 mg/m³
	DNEL general population - long term exposure - inhalation - systemic effects	= 50 mg/m³
	DNEL general population - long term exposure - inhalation - local effects	= 10 mg/m³
	PNEC fresh water	= 260 mg/L
	PNEC intermittent releases (fresh water)	= 183 mg/L
	PNEC marine water	= 26 mg/L
	PNEC sediment (fresh water)	= 572 mg/kg dw
	PNEC sediment (marine water)	= 57.2 mg/kg dw
	PNEC sewage treatment plant	= 20000 mg/L
	PNEC soil	= 50 mg/kg dw
	IRELAND Limit value - 8 hours	= 150 ppm; 470 mg/m³ [total vapour & particulates]
		= 10 mg/m³ [particulates]
	UK Limit value - 8 hours	= 150 ppm; 474 mg/m³ [total vapour & particulates]
		= 10 mg/m³ [particulates]
Aluminum oxide	DNEL worker - long term exposure - inhalation - systemic effects	= 15.63 mg/m³
	DNEL worker - long term exposure - inhalation - local effects	= 15.63 mg/m³
	DNEL general population - long term exposure - oral - systemic effects	= 6.58 mg/kg bw/day
	IRELAND Limit value - 8 hours	= 10 mg/m³ [inhalable fraction]
		= 4 mg/m³ [respirable fraction]
	UK Limit value - 8 hours	= 10 mg/m³ [inhalable aerosol]
		= 4 mg/m³ [respirable aerosol]
	USA OSHA	= 15 mg/m³ [total dust]
		= 5 mg/m³ [inhalable dust]
	ACGIH TLV - TWA	= 1 mg/m³ [Al, metal and insoluble compounds]

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

Appearance:	white dispersion
Odour:	odourless
Odour threshold:	not relevant for product classification purposes

pH:	9.5 - 10.5 [data on products with similar composition]
Melting/freezing point:	approx. 2030 °C [data on aluminum oxide, melting point]
	< -20 °C [data on products with similar composition, freezing point]
Initial boiling point and boiling range:	100 - 105 °C [data on products with similar composition]
Flash point:	104 °C [data on propylene glycol]
Evaporation rate:	< 0.5 [calculated]
Flammability (solid, gas):	not flammable [based on the information on product constituents]
Upper/lower flammability or explosive limits:	lower flammability limit = 2.6 % vol [data on propylene glycol]
	upper flammability limit = 12.5 % vol [data on propylene glycol]
Vapour pressure:	15 - 20 mmHg @ 20 °C [data on products with similar composition]
Vapour density:	> 1 [data on products with similar composition]
Relative density:	3.99 @ 20 °C [data on aluminum oxide]
	1.03 @ 20 ˚C [data on propylene glycol]
Solubility:	dispersible in water
Partition coefficient: n-octanol/water:	log Kow = -1.07 @ 20 ˚C [data on propylene glycol]
Auto-ignition temperature:	not self-igniting [based on the information on product constituents]
Decomposition temperature:	not relevant for product classification purposes
Viscosity:	not relevant for product classification purposes
Explosive properties:	not explosive [based on the information on product constituents]
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

Propane-1,2-diol	oral	(rat)	LD50 = 22000 mg/kg
	dermal	(rabbit)	LD50 > 2000 mg/kg
Aluminum oxide	oral	(rat)	LD50 > 10000 mg/kg [OECD 401]
	inhalation	(rat)	LC50 > 2.3 mg/L (4 hours) [OECD 403]

No bibliographic information was found about acute toxicity effects resulting from exposure to the product by oral, dermal or inhalation route. Based on available data for product constituents, the classification criteria are not met.

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. Based on available data for product constituents, the classification criteria are not met.

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

Propane-1,2-diol	fish (Oncorhynchus mykiss)	LC50 = 40613 mg/L (96 hours)
	invertebrates (Ceriodaphnia dubia)	EC50 = 18340 mg/L (48 hours) [EPA 600/4-90/0-27]
	invertebrates (Americamysis bahia)	LC50 = 18800 mg/L (96 hours) [EPA FIFRA 72-3]
	invertebrates (Ceriodaphnia sp.)	NOEC = 13020 mg/L (7 days) [EPA 600/4-89/001]
	algae (Pseudokirchneriella subcapitata)	EC50 = 19000 mg/L (96 hours) [OECD 201]
	algae (Skeletonema costatum)	EC50 = 19100 mg/L (96 hours) [OECD 201]
	microorganisms (Pseudomonas putida)	NOEC > 20000 mg/L (16 hours)
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

Propane-1,2-diol	degradation (CO2 evolution) = 81.7% (28 days) [OECD 301 F]
Aluminum oxide	not relevant for the substance (inorganic substance).

The organic component of the product is readily biodegradable.

12.3. Bioaccumulative potential

Propane-1,2-diol	log Kow = -1.07 and BCF (calculated)= 0.09
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

Propane-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).

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
BCF:	bioconcentration factor
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 a warranty or quality specification. The user must verify its suitability and completeness in accordance with each specific use of the product.

For more information, visit our website:
www.HTMaterialsScience.com

HTMS (Ireland)
Alexandra House
3 Ballsbridge Park
Dublin D04 C7H2
Ireland
tel:+353868571828

HTMS (Italy)
Strada Provinciale SP7
Lecce-Arnesano
73010 - Z.A. Arnesano
Lecce, Italy
tel:+390832407997

HTMS (U.S.)
95 Brightside Ave, Unit B
Central Islip,
NY 11722
USA
tel:+17164464171