SAFETY DATA SHEET

Version: 3.0 Revision date: 3rd June 2024 Date of First Issue: 3rd June 2021

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878

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

1.1 Product identifier

Product name	H13 Metal Powder <15 µm GMP H13
Unique Formula Identifier (UFI)	Not assigned
Nanoform	Not assigned

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

Identified Use(s)	Additive manufacturing, hot isostatic pressing, thermal spray, metal injection moulding, binder jetting.
Uses advised against	Any other use.

1.3 Details of the supplier of the safety data sheet

Company Identification	Globus Metal Powders Ltd. Materials Processing Institute, Eston Road, Middlesbrough, TS6 6US
Telephone	+44(0)164 238 2000
E-mail (competent person)	gmp@globusmetalpowders.com

1.4 Emergency telephone number

Emergency Phone No.	999 / 111 (or local emergency number)
Languages spoken	English (or local language)

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

2.1.1 Regulation (EC) No. 1272/2008 (CLP)

This product does not meet the criteria for classification in any hazard class according to Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures.

2.2 Label elements

According to Regulation (EC) No. 1272/2008 (CLP)

Product name	H13 <15µm
Contains:	None assigned.
Hazard Pictogram(s)	None assigned.
Signal Word(s)	None assigned.
Hazard Statement(s)	None assigned.
Precautionary Statement(s)	None assigned.
Supplemental information	None assigned.

2.3 Other hazards

May form combustible dust concentrations in air. Handling of this material may generate a dust which can cause mechanical irritation of the eyes, skin nose and throat.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

No component of this mixture is included above the relevant concentration levels detailed within section 3.2.1 of SDS regulation 2015/830.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

Self-protection of the first aider	Obtain special instructions before use. No action should be taken involving personal risk. Use personal protective equipment as required. Wear appropriate personal protective equipment, avoid direct contact. Ensure adequate ventilation. Avoid breathing dust. Avoid contact with skin and eyes.
Inhalation	IF INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing.
Skin contact	IF ON SKIN: Wash with plenty of water. If skin irritation occurs: Get medical advice/attention.
Eye contact	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If irritation develops and persists, get medical attention.
Ingestion	IF SWALLOWED: Rinse mouth. Give plenty of water to drink. Do NOT induce vomiting. Seek medical treatment.

4.2 Most important symptoms and effects, both acute and delayed — None known.

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

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media	As appropriate for surrounding fire. Use CO_2, dry chemical, or foam.
Unsuitable extinguishing media	Do not use water jet. Direct water jet may spread the fire.

5.2 Special hazards arising from the substance or mixture — Explosion: May form combustible dust concentrations in air. Avoid dust generation. Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Combustion products:, Carbon monoxide, Carbon dioxide. Oxides of: Manganese and Iron.

5.3 Advice for firefighters — Fight fire with normal precautions from a reasonable distance. Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Keep containers cool by spraying with water if exposed to fire. Avoid run off to waterways and sewers.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures — Caution - spillages may be slippery. Ensure operatives are trained to minimise exposures. No action should be taken involving personal risk. Wear appropriate personal protective equipment, avoid direct contact. Avoid breathing dust. Ensure adequate ventilation. Remove contaminated clothing and wash all affected areas with plenty of water. Avoid dust generation. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration.

6.2 Environmental precautions — Avoid release to the environment. Do not allow to enter drains, sewers or water courses.

6.3 Methods and material for containment and cleaning up — Provided it is safe to do so, isolate the source of the leak. Sweep spilled substances into containers if appropriate moisten first to prevent dusting. Use non-sparking equipment when picking up flammable spill. Collect mechanically and dispose of according to Section 13. Use non-sparking tools. Ventilate the area and wash spill site after material pick-up is complete.

6.4	**Reference to other sections**	See Section: 8,13.

SECTION 7: HANDLING AND STORAGE

7.1	**Precautions for safe handling**	When using do not eat or drink. Provide adequate ventilation when using the material and follow the principles of good occupational hygiene to control personal exposures. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not eat, drink or smoke when using this product. Remove contaminated clothing and wash clothing before reuse.
7.2	**Conditions for safe storage, including any incompatibilities**	Keep only in original packaging. Keep in a well ventilated place. Keep container closed.
	Storage temperature	Store in a cool/low-temperature, well-ventilated (dry) place away from heat and ignition sources.
	Incompatible materials	Keep away from acids and strong oxidising agents.
7.3	**Specific end use(s)**	See Section: 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Occupational exposure limits

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note
Manganese	7439-96-5	- -	0.2 0.05	- -	- -	UK WEL Inhalable fraction Respirable fraction

Source: UK WEL: Workplace Exposure Limit (UK HSE EH40)

8.1.2	**Biological limit value**	Not established.
8.1.3	**PNECs and DNELs**	Not established.

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Provide adequate ventilation, including appropriate local extraction if dusts, fumes or vapours are likely to be evolved. Do not breathe dust. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).

8.2.2 Individual protection measures, such as personal protective equipment

Keep good industrial hygiene. Wear appropriate personal protective equipment, avoid direct contact. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke at the work place. Do not breathe dust.

Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.

Eye/ face protection

Wear eye protection with side protection (EN166). Eyewash bottles should be available.

Skin protection

Hand protection: Wear impervious gloves (EN374). Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer. Protective index 6, corresponding > 480 minutes of permeation time according to EN 374.

Body protection: Wear dust-resistant protective clothing.

Respiratory protection 	Not normally required. Wear suitable respiratory protective equipment if processing involves working in areas where dusts or vapours are likely to be evolved. In case of inadequate ventilation wear respiratory protection. Recommended: EN 149:2001, FFP3S
Thermal hazards	Not applicable.

8.2.3 Environmental exposure controls — Avoid release to the environment.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state	Fine Powder
Colour	grey
Odour	Odourless.
Melting point/freezing point	1427-1477 °C
Initial boiling point and boiling range	No information available.
Flammability (solid, gas)	Explosion: May form combustible dust concentrations in air. Maximum explosion pressure rise (Pmax) = 4.3 bar (BS EN 14034) Coefficient of pressure rise (Kst) = 31 bar.m.s^{-1} (BS EN 14034) Maximum Rate of Pressure Rise (dP/dt)max = 12 bar.s-1 (BS EN 14034) St Class =1 (BS EN 14034)
Upper/lower flammability or explosive limits	Layer ignition temperature = >400°C (BS EN 50281-2-1) LIT Value (> 400°C), minus 75°C Safety Factor = 325 °C MIT Value (960°C), minus 1/3 Safety Factor = 860 °C Capacitive & Inductive MIE = > 1000 mJ
Flash point	No information available.
Auto-ignition temperature	No information available.
Decomposition temperature	No information available.
pH	No information available.
Viscosity	No information available.
Solubility(ies)	No information available.
Partition coefficient: n-octanol/water	No information available.
Vapour pressure	No information available.
Vapour density	No information available.
Relative density	7.80 g/cm^3
Particle characteristics	<15 µm

9.2 Other information

Explosive properties	May form combustible dust concentrations in air.
Oxidising properties	Not oxidising.
Loss on Drying	No information available.
Moisture Content	0.0 % w/w

SECTION 10: STABILITY AND REACTIVITY

10.1	**Reactivity**	Stable under normal conditions.
10.2	**Chemical stability**	Stable under normal conditions.
10.3	**Possibility of hazardous reactions**	Hazardous polymerisation will not occur. May form combustible dust concentrations in air.
10.4	**Conditions to avoid**	None known
10.5	**Incompatible materials**	Keep away from: acids and strong oxidising agents.
10.6	**Hazardous decomposition products**	Combustion products:, Carbon monoxide, Carbon dioxide. Oxides of: Manganese and Iron.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute Toxicity - Ingestion	Mixture: Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) >2,000 mg/kg.
Acute Toxicity - Inhalation	Mixture: Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) > 5 mg/L (Dust)
Acute Toxicity - Skin contact	Mixture: Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) >2,000 mg/kg.
Skin corrosion/irritation	Mixture: Based upon the available data, the classification criteria are not met.
Serious eye damage/irritation	Mixture: Based upon the available data, the classification criteria are not met.
Respiratory or skin sensitisation	Mixture: Based upon the available data, the classification criteria are not met.
Germ cell mutagenicity	Mixture: Based upon the available data, the classification criteria are not met.
Carcinogenicity	Mixture: Based upon the available data, the classification criteria are not met.
Reproductive toxicity	Mixture: Based upon the available data, the classification criteria are not met.
STOT - single exposure	Mixture: Based upon the available data, the classification criteria are not met.
STOT - repeated exposure	Mixture: Based upon the available data, the classification criteria are not met.
Aspiration hazard	Mixture: Based upon the available data, the classification criteria are not met.

11.2	**Information on other hazards**	
11.2.1	Endocrine disrupting properties	None known
11.2.2	Other information	None known

SECTION 12: ECOLOGICAL INFORMATION

12.1	**Toxicity**	Mixture: Based upon the available data, the classification criteria are not met. Estimated LC50 (Mixture): >100 mg/l
12.2	**Persistence and degradability**	No data for the mixture as a whole.
12.3	**Bioaccumulative potential**	No data for the mixture as a whole.
12.4	**Mobility in soil**	No data for the mixture as a whole.
12.5	**Results of PBT and vPvB assessment**	Not classified as PBT or vPvB.
12.6	**Endocrine disrupting properties**	None known.
12.7	**Other adverse effects**	None known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1	**Waste treatment methods**	Do not allow to enter drains, sewers or watercourses. Dispose of this material and its container as hazardous waste. Disposal should be in accordance with local, state or national legislation.
13.2	**Additional information**	Avoid release to the environment.

SECTION 14: TRANSPORT INFORMATION

Not classified according to the United Nations 'Recommendations on the Transport of Dangerous Goods'.

		ADR/RID	**IMDG**	**IATA/ICAO**
14.1	**UN number or ID number**	None assigned.	None assigned.	None assigned.
14.2	**UN proper shipping name**	None assigned.	None assigned.	None assigned.
14.3	**Transport hazard class(es)**	None assigned.	None assigned.	None assigned.
14.4	**Packing group**	None assigned.	None assigned.	None assigned.
14.5	**Environmental hazards**	Not classified	Not classified as a Marine Pollutant.	Not classified
14.6	**Special precautions for user**	See Section: 2		
14.7	**Maritime transport in bulk according to IMO instruments**	No information available.	No information available.	No information available.

SECTION 15: REGULATORY INFORMATION

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

15.1.1 EU regulations

Authorisations and/or restrictions on use: Not restricted

15.1.2 National regulations

Germany: Water hazard class: 2

15.2 Chemical Safety Assessment

A REACH chemical safety assessment has not been carried out. Exposure scenarios for substances in this preparation are not available.

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: New SDS Regulation 2020/878 format, all sections have been updated to include new information. Please review SDS with care.

References:

Test Result, Report Number: R001913R3V1GR, Sigma-HSE (UK) Ltd (2021).

EU Classification: This Safety Data Sheet was prepared in accordance with EC Regulation (EC) 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878

Classification of the substance or mixture According to Regulation (EC) No. 1272/2008 (CLP)	Classification procedure
Not classified	ATEmix Calculation(s) using Acute Toxicity data presented in Section 11

LEGEND

ADR	ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS	Chemical Abstracts Service
DNEL	Derived No Effect Level
EC	European Community
EN	European Standard
EU	European Union
IATA	International Air Transport Association
ICAO/IATA	ICAO: International Civil Aviation Organization / IATA: International Air Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Lethal concentration 50
LD50	Lethal dose 50
LTEL	Long Term Exposure Limit
NOEC	No Observed Effect Concentration
NOAEL	No Observed Adverse Effect Level
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
UN	United Nations
vPvB	Very Persistent and very Bioaccumulative
WGK	Wassergefährdungsklasse (Germany) / Water hazard class

Training advice: Consideration should be given to the work procedures involved and the potential extent of exposure as they may determine whether a higher level of protection is required.

Disclaimers

Information contained in this publication or as otherwise supplied to Users is believed to be accurate and is given in good faith, but it is for the Users to satisfy themselves of the suitability of the product for their own particular purpose. Globus Metal Powders Ltd. gives no warranty as to the fitness of the product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that exclusion is

prevented by law. Globus Metal Powders Ltd. accepts no liability for loss or damage (other than that arising from death or personal injury caused by defective product, if proved), resulting from reliance on this information. Freedom under Patents, Copyright and Designs cannot be assumed.

Annex to the extended Safety Data Sheet (eSDS)
Exposure Scenarios are not applicable