

according to Regulation UK SI 2019/758 and UK SI 2020/1577 as amended

Creation Date 22-Sep-2009 Revision Date 10-Feb-2024 Revision Number 3

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

1.1. Product identifier

Product Description: <u>m-Phenylenediamine</u>

Cat No. : A15339

Synonyms 1,3-Diaminobenzene

 Index No
 612-147-00-3

 CAS No
 108-45-2

 EC No
 203-584-7

 Molecular Formula
 C6 H8 N2

REACH registration number -

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

Recommended Use Laboratory chemicals.
Uses advised against No Information available

1.3. Details of the supplier of the safety data sheet

Company

Avocado Research Chemicals Ltd. (Part of Thermo Fisher Scientific)

Shore Road, Heysham Lancashire, LA3 2XY, United Kingdom

Office Tel: +44 (0) 1524 850506 Office Fax: +44 (0) 1524 850608

E-mail address begel.sdsdesk@thermofisher.com

1.4. Emergency telephone number

For information **US** call: 001-800-227-6701 / **Europe** call: +32 14 57 52 11 Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99 **CHEMTREC** Tel. No. **US**:001-800-424-9300 / **Europe**:001-703-527-3887

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

CLP Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567

Physical hazards

Based on available data, the classification criteria are not met

Health hazards

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Acute oral toxicity Category 3 (H301) Acute dermal toxicity Category 3 (H311) Acute Inhalation Toxicity - Dusts and Mists Category 3 (H331) Serious Eye Damage/Eye Irritation Category 2 (H319) Skin Sensitization Category 1 (H317) Germ Cell Mutagenicity Category 2 (H341) **Environmental hazards** Acute aquatic toxicity Category 1 (H400) Chronic aquatic toxicity Category 1 (H410)

Full text of Hazard Statements: see section 16

2.2. Label elements



Signal Word

Danger

Hazard Statements

H317 - May cause an allergic skin reaction

H319 - Causes serious eye irritation

H341 - Suspected of causing genetic defects

H410 - Very toxic to aquatic life with long lasting effects

H301 + H311 + H331 - Toxic if swallowed, in contact with skin or if inhaled

Precautionary Statements

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P312 - Call a POISON CENTER or doctor if you feel unwell

P302 + P350 - IF ON SKIN: Gently wash with plenty of soap and water

P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

P273 - Avoid release to the environment

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

2.3. Other hazards

Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB)

Toxic to terrestrial vertebrates

This product does not contain any known or suspected endocrine disruptors

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Component	CAS No	EC No	Weight %	CLP Classification - According to
				GB-CLP Regulations UK SI 2019/720 and

m-Phenylenediamine

				UK SI 2020/1567
m-Phenylenediamine	108-45-2	EEC No. 203-584-7	99	Acute Tox. 3 (H301)
				Acute Tox. 3 (H311)
				Acute Tox. 3 (H331)
				Eye Irrit. 2 (H319)
				Skin Sens. 1 (H317)
				Muta. 2 (H341)
				Aquatic Acute 1 (H400)
				Aquatic Chronic 1 (H410)

Component	Specific concentration limits (SCL's)	M-Factor	Component notes
m-Phenylenediamine	-	1	-

REACH registration number	-
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Full text of Hazard Statements: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

General Advice Show this safety data sheet to the doctor in attendance. Immediate medical attention is

required.

Eye ContactRinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Immediate medical attention is required.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Immediate medical

attention is required.

Ingestion Do NOT induce vomiting. Call a physician or poison control center immediately.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. Do not use mouth-to-mouth

method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Immediate medical attention is required.

Self-Protection of the First Aider Ensure that medical personnel are aware of the material(s) involved, take precautions to

protect themselves and prevent spread of contamination.

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

None reasonably foreseeable. May cause allergic skin reaction. Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

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

Notes to Physician Treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media

Water spray, carbon dioxide (CO2), dry chemical, alcohol-resistant foam.

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Extinguishing media which must not be used for safety reasons No information available.

5.2. Special hazards arising from the substance or mixture

Dust can form an explosive mixture with air. Do not allow run-off from fire-fighting to enter drains or water courses.

Hazardous Combustion Products

Nitrogen oxides (NOx), Carbon monoxide (CO), Carbon dioxide (CO₂).

5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Use personal protective equipment as required. Avoid dust formation. Keep people away from and upwind of spill/leak. Evacuate personnel to safe areas.

6.2. Environmental precautions

Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained.

6.3. Methods and material for containment and cleaning up

Sweep up and shovel into suitable containers for disposal. Avoid dust formation.

6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Do not get in eyes, on skin, or on clothing. Wear personal protective equipment/face protection. Avoid dust formation. Use only under a chemical fume hood. Do not breathe (dust, vapor, mist, gas). Do not ingest. If swallowed then seek immediate medical assistance.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and after work.

7.2. Conditions for safe storage, including any incompatibilities

Keep in a dry, cool and well-ventilated place. Keep container tightly closed. Keep under nitrogen.

Technical Rules for Hazardous Substances (TRGS) 510 Class 6.1C Storage Class (LGK) (Germany)

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7.3. Specific end use(s)

Use in laboratories

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limits

List source(s):

Component	The United Kingdom	European Union	Ireland
m-Phenylenediamine			TWA: 0.1 mg/m ³ 8 hr.
·			STEL: 0.3 mg/m ³ 15 min

Biological limit values

This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies

Derived No Effect Level (DNEL) / Derived Minimum Effect Level (DMEL)

See table for values

Component	Acute effects local (Dermal)	Acute effects systemic (Dermal)	Chronic effects local (Dermal)	Chronic effects systemic (Dermal)
m-Phenylenediamine 108-45-2 (99)	DNEL = 0.49µg/cm2			DNEL = 0.12mg/kg bw/day

Component	Acute effects local (Inhalation)	Acute effects systemic (Inhalation)	Chronic effects local (Inhalation)	Chronic effects systemic (Inhalation)
m-Phenylenediamine 108-45-2 (99)				$DNEL = 0.24 mg/m^3$

Predicted No Effect Concentration (PNEC)

See values below.

	Component	Fresh water		Water Intermittent	•	`
L			sediment		sewage treatment	
Ī	m-Phenylenediamine	PNEC = 0.001mg/L	PNEC =	PNEC = 0.046mg/L	PNEC = 1mg/L	PNEC =
1	108-45-2 (99)		0.0041mg/kg			0.0002mg/kg soil
-			sediment dw			dw

Component	Marine water	Marine water sediment	Marine water intermittent	Food chain	Air
m-Phenylenediamine	PNEC =	PNEC =			
108-45-2 (99)	0.0001mg/L	0.00041mg/kg			
	_	sediment dw			

8.2. Exposure controls

Engineering Measures

Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

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Personal protective equipment

Eye Protection Wear safety glasses with side shields (or goggles) Goggles (European standard - EN 166)

Hand Protection Protective gloves

Glove material Breakthrough time Glove thickness EU standard Glove comments

Natural rubber See manufacturers - EN 374 (minimum requirement)

Nitrile rubber recommendations

Neoprene
PVC

Skin and body protection Long sleeved clothing.

Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)

Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

Remove gloves with care avoiding skin contamination.

Respiratory Protection When workers are facing concentrations above the exposure limit they must use

appropriate certified respirators.

To protect the wearer, respiratory protective equipment must be the correct fit and be used

and maintained properly

Large scale/emergency use Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits

are exceeded or if irritation or other symptoms are experienced **Recommended Filter type:** Particulates filter conforming to EN 143

Small scale/Laboratory use Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure

limits are exceeded or if irritation or other symptoms are experienced.

Recommended half mask:- Valve filtering: EN405; or; Half mask: EN140; plus filter, EN

141

When RPE is used a face piece Fit Test should be conducted

Environmental exposure controls Prevent product from entering drains. Do not allow material to contaminate ground water

system. Local authorities should be advised if significant spillages cannot be contained.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical State Solid

Appearance Beige Odor aromatic

Odor Threshold No data available

Melting Point/Range 63 - 65 °C / 145.4 - 149 °F

Softening Point No data available

Boiling Point/Range 282 - 284 °C / 539.6 - 543.2 °F @ 760 mmHg

Flammability (liquid) Not applicable Solid

Flammability (solid, gas) No information available

Explosion Limits No data available

Flash Point 175 °C / 347 °F Method - No information available

Autoignition Temperature 530 °C / 986 °F

Decomposition Temperature No data available

pH8100 g/l aq. solViscosityNot applicableSolid

Water Solubility 350 g/l (25°C)

Solubility in other solvents No information available

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Partition Coefficient (n-octanol/water)

Component log Pow m-Phenylenediamine -0.3

Vapor Pressure1.3 hPa @ 100 °CDensity / Specific GravityNo data availableBulk DensityNo data availableVapor DensityNot applicable

Particle characteristics No data available

9.2. Other information

Molecular Formula C6 H8 N2 Molecular Weight 108.14

Evaporation Rate Not applicable - Solid

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

None known, based on information available

10.2. Chemical stability

Air sensitive.

10.3. Possibility of hazardous reactions

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

10.4. Conditions to avoid

Exposure to air. Incompatible products.

10.5. Incompatible materials

Acids. Strong oxidizing agents. Acid anhydrides. Acid chlorides. Chloroformates.

Solid

10.6. Hazardous decomposition products

Nitrogen oxides (NOx). Carbon monoxide (CO). Carbon dioxide (CO₂).

SECTION 11: TOXICOLOGICAL INFORMATION

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

Product Information

(a) acute toxicity;

OralCategory 3DermalCategory 3InhalationCategory 3

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
m-Phenylenediamine	LD50 = 204 mg/kg (Rat)	LD50 = 1100 mg/kg (Rat)	LC50 = 3.2 mg/L (Rat) 4 h

(b) skin corrosion/irritation; No data available

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(c) serious eye damage/irritation; Category 2

(d) respiratory or skin sensitization;

Respiratory No data available

Skin Category 1

May cause sensitization by skin contact

(e) germ cell mutagenicity; Category 2

Contains a known or suspected mutagen

(f) carcinogenicity; No data available

The table below indicates whether each agency has listed any ingredient as a carcinogen

No data available (g) reproductive toxicity;

(h) STOT-single exposure; No data available

No data available (i) STOT-repeated exposure;

Target Organs No information available.

Not applicable (j) aspiration hazard;

Solid

delayed

Symptoms / effects, both acute and Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing.

11.2. Information on other hazards

Endocrine Disrupting Properties Assess endocrine disrupting properties for human health. This product does not contain any

known or suspected endocrine disruptors.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecotoxicity effects The product contains following substances which are hazardous for the environment. Very

toxic to aquatic organisms, may cause long-term adverse effects in the aquatic

environment.

Component	Freshwater Fish	Water Flea	Freshwater Algae
m-Phenylenediamine	LC50: = 1600 mg/L, 96h (Pimephales promelas)	EC50: = 5.9 mg/L, 48h (Daphnia magna)	EC50: = 2.4 mg/L, 96h (Pseudokirchneriella subcapitata)

Component	Microtox	M-Factor
m-Phenylenediamine		1

12.2. Persistence and degradability

Soluble in water, Persistence is unlikely, based on information available. **Persistence**

Degradation in sewage Contains substances known to be hazardous to the environment or not degradable in waste

treatment plant water treatment plants.

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12.3. Bioaccumulative potential Bioaccumulation is unlikely

Componentlog PowBioconcentration factor (BCF)m-Phenylenediamine-0.3No data available

12.4. Mobility in soil The product is water soluble, and may spread in water systems . Will likely be mobile in the

environment due to its water solubility. Highly mobile in soils

12.5. Results of PBT and vPvB

assessment

Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent

and very bioaccumulative (vPvB).

12.6. Endocrine disrupting

properties

Endocrine Disruptor Information This product does

This product does not contain any known or suspected endocrine disruptors

12.7. Other adverse effects

Persistent Organic Pollutant Ozone Depletion Potential

This product does not contain any known or suspected substance This product does not contain any known or suspected substance

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from Residues/Unused

Products

Should not be released into the environment. Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in

accordance with local regulations.

Contaminated Packaging Dispose of this container to hazardous or special waste collection point.

European Waste Catalogue (EWC) According to the European Waste Catalog, Waste Codes are not product specific, but

application specific.

Other Information Do not flush to sewer. Waste codes should be assigned by the user based on the

application for which the product was used. Do not empty into drains. Do not let this

chemical enter the environment.

SECTION 14: TRANSPORT INFORMATION

IMDG/IMO

14.1. UN number UN1673

14.2. UN proper shipping name PHENYLENEDIAMINES

14.3. Transport hazard class(es) 6.1 **14.4. Packing group** III

<u>ADR</u>

14.1. UN number UN1673

14.2. UN proper shipping name PHENYLENEDIAMINES

14.3. Transport hazard class(es) 6.1 14.4. Packing group III

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IATA

14.1. UN number UN1673

PHENYLENEDIAMINES 14.2. UN proper shipping name

14.3. Transport hazard class(es) 6.1 14.4. Packing group Ш

Dangerous for the environment 14.5. Environmental hazards

Product is a marine pollutant according to the criteria set by IMDG/IMO

14.6. Special precautions for user No special precautions required.

14.7. Maritime transport in bulk according to IMO instruments

Not applicable, packaged goods

SECTION 15: REGULATORY INFORMATION

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

International Inventories

Europe (EINECS/ELINCS/NLP), China (IECSC), Taiwan (TCSI), Korea (KECL), Japan (ENCS), Japan (ISHL), Canada (DSL/NDSL), Australia (AICS), New Zealand (NZIoC), Philippines (PICCS). US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

Component	CAS No	EINECS	ELINCS	NLP	IECSC	TCSI	KECL	ENCS	ISHL
m-Phenylenediamine	108-45-2	203-584-7	ı	-	X	X	KE-02175	X	X
Component	CAS No	TSCA		ventory	DSL	NDSL	AICS	NZIoC	PICCS

Active-Inactive 108-45-2 ACTIVE m-Phenylenediamine

Legend: X - Listed '-' - Not Listed **KECL** - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

Authorisation/Restrictions according to EU REACH

Component	CAS No	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous	REACH Regulation (EC 1907/2006) article 59 - Candidate List of
		oubject to Authorization		Substances of Very High
			Cabatanoca	Concern (SVHC)
m-Phenylenediamine	108-45-2	-	Use restricted. See item	-
			75.	
			(see link for restriction	
			details)	

REACH links

https://echa.europa.eu/substances-restricted-under-reach

Seveso III Directive (2012/18/EC)

Component	CAS No	Seveso III Directive (2012/18/EC) -	Seveso III Directive (2012/18/EC) -	
-		Qualifying Quantities for Major Accident	Qualifying Quantities for Safety Repo	
		Notification	Requirements	
m-Phenylenediamine	108-45-2	Not applicable	Not applicable	

Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals

Not applicable

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Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?

Not applicable

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work .

National Regulations

UK - Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment

WGK Classification See table for values

Component	Germany - Water Classification (AwSV)	Germany - TA-Luft Class
m-Phenylenediamine	WGK3	

Component	France - INRS (Tables of occupational diseases)			
m-Phenylenediamine	Tableaux des maladies professionnelles (TMP) - RG 15,RG 15bis			

Component	Component Switzerland - Ordinance on the Reduction of Risk from handling of hazardous substances preparation (SR 814.81)		Switzerland - Ordinance of the Rotterdam Convention on the Prior Informed Consent Procedure
m-Phenylenediamine 108-45-2 (99)	Prohibited and Restricted Substances		

15.2. Chemical safety assessment

A Chemical Safety Assessment/Report (CSA/CSR) has not been conducted

SECTION 16: OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3

H301 - Toxic if swallowed

H311 - Toxic in contact with skin

H317 - May cause an allergic skin reaction

H319 - Causes serious eye irritation

H331 - Toxic if inhaled

H341 - Suspected of causing genetic defects

H400 - Very toxic to aquatic life

CAS - Chemical Abstracts Service

H410 - Very toxic to aquatic life with long lasting effects

Legend

Inventory

EINECS/ELINCS - European Inventory of Existing Commercial Chemical DSL/NDSL - Canadian Domestic Substances List/Non-Domestic

Substances/EU List of Notified Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

IECSC - Chinese Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

TSCA - United States Toxic Substances Control Act Section 8(b)

Substances List

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ENCS - Japanese Existing and New Chemical Substances **AICS** - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

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TWA - Time Weighted Average

EC50 - Effective Concentration 50% **POW** - Partition coefficient Octanol:Water

LD50 - Lethal Dose 50%

Transport Association

ATE - Acute Toxicity Estimate

VOC - (Volatile Organic Compound)

IARC - International Agency for Research on Cancer

ICAO/IATA - International Civil Aviation Organization/International Air

MARPOL - International Convention for the Prevention of Pollution from

Predicted No Effect Concentration (PNEC)

vPvB - very Persistent, very Bioaccumulative

WEL - Workplace Exposure Limit

ACGIH - American Conference of Governmental Industrial Hygienists

DNEL - Derived No Effect Level

RPE - Respiratory Protective Equipment LC50 - Lethal Concentration 50%

NOEC - No Observed Effect Concentration **PBT** - Persistent, Bioaccumulative, Toxic

ADR - European Agreement Concerning the International Carriage of

Dangerous Goods by Road

IMO/IMDG - International Maritime Organization/International Maritime

Dangerous Goods Code

OECD - Organisation for Economic Co-operation and Development

BCF - Bioconcentration factor

Key literature references and sources for data

https://echa.europa.eu/information-on-chemicals

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Training Advice

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

Ships

Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.

First aid for chemical exposure, including the use of eye wash and safety showers.

Chemical incident response training.

Prepared By Health, Safety and Environmental Department

Creation Date 22-Sep-2009 Revision Date 22-Sep-2009

Revision Summary New emergency telephone response service provider.

This safety data sheet complies with Regulation UK SI 2019/758 and UK SI 2020/1577 as amended.

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet