

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

Creation Date 28-May-2009

Revision Date 04-Oct-2023

**Revision Number** 9

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

## 1.1. Product identifier

Product Description:	tert-Butyl methyl ether
Cat No. :	375210000; 375210010; 375211000
Synonyms	2-Methyl-2-methoxy propane; MTBE; Methyl tert-butyl ether
Index No	603-181-00-X
CAS No	1634-04-4
EC No	216-653-1
Molecular Formula	C5 H12 O
REACH registration number	01-2119452786-27

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

Recommended Use Sector of use	Laboratory chemicals. SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
Product category	PC21 - Laboratory chemicals
Process categories	PROC15 - Use as a laboratory reagent
Environmental release category	ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Uses advised against	No Information available

## 1.3. Details of the supplier of the safety data sheet

Company
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UK entity/business name Fisher Scientific UK Bishop Meadow Road, Loughborough, Leicestershire LE11 5RG, United Kingdom

#### EU entity/business name Thermo Fisher Scientific

Janssen Pharmaceuticalaan 3a, 2440 Geel, Belgium

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

#### tert-Butyl methyl ether

 Flammable liquids
 Category 2 (H225)

 Health hazards
 Category 2 (H315)

 Skin Corrosion/Irritation
 Category 2 (H315)

 Environmental hazards
 Category 2 (H315)

Full text of Hazard Statements: see section 16

Based on available data, the classification criteria are not met

2.2. Label elements



Signal Word

Danger

#### Hazard Statements

H225 - Highly flammable liquid and vapor H315 - Causes skin irritation

## **Precautionary Statements**

P240 - Ground and bond container and receiving equipment P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking P302 + P352 - IF ON SKIN: Wash with plenty of soap and water

## 2.3. Other hazards

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

Contains a known or suspected endocrine disruptor Contains a substance on the National Authorities Endocrine Disruptor Lists

## **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 UK SI 2020/1567
Methyl tert-butyl ether	1634-04-4	EEC No. 216-653-1	>95	Flam. Liq. 2 (H225) Skin Irrit. 2 (H315)

REACH registration number	01-2119452786-27
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Full text of Hazard Statements: see section 16

## **SECTION 4: FIRST AID MEASURES**

### 4.1. Description of first aid measures

Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.				
Skin Contact	Wash off immediately with plenty of water for at least 15 minutes. Get medical attention.				
Ingestion	Do NOT induce vomiting. Get medical attention.				
Inhalation	Remove to fresh air. Get medical attention immediately if symptoms occur. If not breathing, give artificial respiration.				
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	4.2 Most important symptoms and effects, both acute and delayed				

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

Difficulty in breathing. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

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

**Notes to Physician** Treat symptomatically. Symptoms may be delayed.

## **SECTION 5: FIREFIGHTING MEASURES**

## 5.1. Extinguishing media

#### Suitable Extinguishing Media

Water spray, carbon dioxide (CO2), dry chemical, alcohol-resistant foam. Water mist may be used to cool closed containers.

#### Extinguishing media which must not be used for safety reasons

Do not use a solid water stream as it may scatter and spread fire.

#### 5.2. Special hazards arising from the substance or mixture

Flammable. Containers may explode when heated. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back.

#### Hazardous Combustion Products

Carbon monoxide (CO), Carbon dioxide (CO<sub>2</sub>).

## 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

Use personal protective equipment as required. Remove all sources of ignition. Take precautionary measures against static

discharges. Ensure adequate ventilation.

## 6.2. Environmental precautions

Should not be released into the environment. See Section 12 for additional Ecological Information.

## 6.3. Methods and material for containment and cleaning up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharges.

#### 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

Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharges. Use only under a chemical fume hood. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.

#### **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

Flammables area. Keep away from heat, sparks and flame. Keep container tightly closed in a dry and well-ventilated place. May form explosive peroxides on prolonged storage.

Technical Rules for Hazardous Substances (TRGS) 510 Class 3 Storage Class (LGK) (Germany)

## 7.3. Specific end use(s)

Use in laboratories

## **SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

#### 8.1. Control parameters

## Exposure limits

List source(s): **EU** - Commission Directive (EU) 2019/1831 of 24 October 2019 establishing a fifth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC and amending Commission Directive 2000/39/EC **UK** - EH40/2005 Work Exposure Limits, Fourth edition. Published 2020. **IRE** - 2021 Code of Practice for the Chemical Agents Regulations, Schedule 1. Published by the Health and Safety Authority

Component	The United Kingdom	European Union	Ireland
Methyl tert-butyl ether	STEL: 100 ppm 15 min	TWA: 50 ppm (8h)	TWA: 50 ppm 8 hr.
	STEL: 367 mg/m <sup>3</sup> 15 min	TWA: 183.5 mg/m <sup>3</sup> (8h)	TWA: 183.5 mg/m <sup>3</sup> 8 hr.
	TWA: 50 ppm 8 hr	STEL: 100 ppm (15min)	STEL: 100 ppm 15 min
	TWA: 183.5 mg/m <sup>3</sup> 8 hr	STEL: 367 mg/m <sup>3</sup> (15min)	STEL: 367 mg/m <sup>3</sup> 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)
Methyl tert-butyl ether 1634-04-4 ( >95 )				DNEL = 5100mg/kg bw/day

Component	Acute effects local (Inhalation)	Acute effects systemic (Inhalation)	Chronic effects local (Inhalation)	Chronic effects systemic (Inhalation)
Methyl tert-butyl ether 1634-04-4 ( >95 )	DNEL = 357mg/m <sup>3</sup>			DNEL = 178.5mg/m <sup>3</sup>

## Predicted No Effect Concentration (PNEC)

See values below.

Component	Fresh water	Fresh water	Water Intermittent	Microorganisms in	Soil (Agriculture)
		sediment		sewage treatment	
Methyl tert-butyl ether	PNEC = 5.1mg/L	PNEC = 23mg/kg	PNEC = 47.2mg/L	PNEC = 71mg/L	PNEC = 1.56mg/kg
1634-04-4 (>95)		sediment dw		-	soil dw

Component	Marine water	Marine water sediment	Marine water intermittent	Food chain	Air
Methyl tert-butyl ether 1634-04-4 ( >95 )	PNEC = 0.26mg/L	PNEC = 1.17mg/kg sediment dw			

## 8.2. Exposure controls

## Engineering Measures

Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting equipment.

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

## Personal protective equipment

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Eye Protection
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Hand Protection

Protective gloves

Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments
Nitrile rubber	< 211 minutes	0.38 mm	Level 4	Permeation rate 1 µg/cm2/min
Viton (R)	< 152 minutes	0.7 mm	Level 4	Permeation rate 17 µg/cm2/min
Neoprene			EN 374	As tested under EN374-3 Determination of
Natural rubber				Resistance to Permeation by Chemicals
PVC				

Skin and body protection

Wear appropriate protective gloves and clothing to prevent skin exposure.

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

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)

## tert-Butyl methyl ether

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	No protective equipment is needed under normal use conditions.
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
Small scale/Laboratory use	Maintain adequate ventilation

Environmental exposure controls

No information available.

## **SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

## 9.1. Information on basic physical and chemical properties

Physical State	Liquid	
Appearance Odor Odor Threshold Melting Point/Range Softening Point Boiling Point/Range Flammability (liquid) Flammability (solid,gas) Explosion Limits	Colorless Petroleum distillates No data available -110 °C / -166 °F No data available 54 - 56 °C / 129.2 - 132.8 °F Highly flammable Not applicable Lower 1.6 vol%	On basis of test data Liquid
Flash Point Autoignition Temperature Decomposition Temperature pH Viscosity Water Solubility Solubility in other solvents Partition Coefficient (n-octanol/wat	Upper 8.4 vol% -28 °C / -18.4 °F 224 °C / 435.2 °F No data available No information available 0.36 mPa.s at 20 °C 51 g/L (20°C) No information available	Method - No information available
Component Methyl tert-butyl ether Vapor Pressure Density / Specific Gravity Bulk Density Vapor Density Particle characteristics	log Pow 1.06 268 mbar @ 20 °C 0.740 Not applicable 0.2 Not applicable (liquid)	Liquid (Air = 1.0)
9.2. Other information		
Molecular Formula Molecular Weight Explosive Properties	C5 H12 O 88.15 Vapors may form explosive mixtures	with air

## **SECTION 10: STABILITY AND REACTIVITY**

10.1. Reactivity

None known, based on information available

10.2. Chemical stability	Stable under normal conditions.
10.3. Possibility of hazardous reacti	ons_
Hazardous Polymerization Hazardous Reactions	Hazardous polymerization does not occur. None under normal processing.
10.4. Conditions to avoid	Incompatible products. Excess heat. Keep away from open flames, hot surfaces and sources of ignition.
10.5. Incompatible materials	Strong oxidizing agents.

## 10.6. Hazardous decomposition products

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Carbon monoxide (CO). Carbon dioxide (CO<sub>2</sub>).

## **SECTION 11: TOXICOLOGICAL INFORMATION**

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

## **Product Information**

(a) acute toxicity;

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OralBased on available data, the classification criteria are not metDermalBased on available data, the classification criteria are not metInhalationBased on available data, the classification criteria are not met

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Methyl tert-butyl ether	LD50 = 2963 mg/kg (Rat)	LD50 = 10000 mg/kg (Rabbit)	LC50 = 85 mg/L (Rat)4 h

(b) skin corrosion/irritation;	Category 2
(c) serious eye damage/irritation;	Based on available data, the classification criteria are not met
(d) respiratory or skin sensitization; Respiratory Skin	Based on available data, the classification criteria are not met Based on available data, the classification criteria are not met
(e) germ cell mutagenicity;	Based on available data, the classification criteria are not met
	Mutagenic effects have occurred in experimental animals
(f) carcinogenicity;	Based on available data, the classification criteria are not met
	The table below indicates whether each agency has listed any ingredient as a carcinogen Limited evidence of a carcinogenic effect
(g) reproductive toxicity;	Based on available data, the classification criteria are not met
(h) STOT-single exposure;	Based on available data, the classification criteria are not met

(i) STOT-repeated exposure;	Based on available data, the classification criteria are not met
Target Organs	None known.
(j) aspiration hazard;	Based on available data, the classification criteria are not met
Other Adverse Effects	Tumorigenic effects have been reported in experimental animals.
Symptoms / effects,both acute and delayed	<b>d</b> Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting.

## 11.2. Information on other hazards

Endocrine Disrupting Properties	
Assess endocrine disrupting	Contains a substance on the National Authorities Endocrine Disruptor Lists
properties for human health	

## **SECTION 12: ECOLOGICAL INFORMATION**

## 12.1. Toxicity Ecotoxicity effects

Do not empty into drains. .

Component	Freshwater Fish	Water Flea	Freshwater Algae
Methyl tert-butyl ether	887 mg/L LC50 96 h 100 mg/L LC50 96 h 929 mg/L LC50 96 h	EC50: = 542 mg/L, 48h (Daphnia magna)	800 mg/L EC50 > 72 h 184 mg/L EC50 = 96 h
	672 mg/L LC50 96 h		

Component	Microtox	M-Factor
Methyl tert-butyl ether	EC50 = 11.4 mg/L 30 min	
	EC50 = 8.23 mg/L 5 min EC50 = 9.67 mg/L 15 min	

## 12.2. Persistence and degradability

Persistence

Persistence is unlikely, based on information available.

## 12.3. Bioaccumulative potential Bioaccumulation is unlikely

Component	log Pow	Bioconcentration factor (BCF)
Methyl tert-butyl ether	1.06	No data available

<u>12.4. Mobility in soil</u>	The product contains volatile organic compounds (VOC) which will evaporate easily from all surfaces Will likely be mobile in the environment due to its volatility. Disperses rapidly in air
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 Assess endocrine disrupting properties for the environment	Contains a substance on the National Authorities Endocrine Disruptor Lists.
Component	EU - Endocrine Disrupters Candidate List EU - Endocrine Disruptors - Evaluated

## Revision Date 04-Oct-2023

## tert-Butyl methyl ether

		Substances
Methyl tert-butyl ether	Group III Chemical	

## <u>12.7. Other adverse effects</u> 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	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. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep product and empty container away from heat and sources of ignition.
European Waste Catalogue (EWC)	According to the European Waste Catalog, Waste Codes are not product specific, but application specific.
Other Information	Waste codes should be assigned by the user based on the application for which the product was used. Do not flush to sewer. Can be landfilled or incinerated, when in compliance with local regulations.

## **SECTION 14: TRANSPORT INFORMATION**

## IMDG/IMO

<u>14.1. UN number</u> <u>14.2. UN proper shipping name</u> <u>14.3. Transport hazard class(es)</u> <u>14.4. Packing group</u>	UN2398 METHYL tert-BUTYL ETHER 3 II
ADR	
<u>14.1. UN number</u> <u>14.2. UN proper shipping name</u> <u>14.3. Transport hazard class(es)</u> <u>14.4. Packing group</u>	UN2398 METHYL tert-BUTYL ETHER 3 II
IATA	
14.1. UN number 14.2. UN proper shipping name 14.3. Transport hazard class(es) 14.4. Packing group	UN2398 METHYL tert-BUTYL ETHER 3 II
14.5. Environmental hazards	No hazards identified
14.6. Special precautions for user	No special precautions required.
14.7. Maritime transport in bulk	Not applicable, packaged goods

## according to IMO instruments

## **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
Methyl tert-butyl ether	1634-04-4	216-653-1	-	-	Х	Х	KE-23648	Х	Х
Component	CAS No	TSCA	TSCA In	ventory	DSL	NDSL	AICS	NZIoC	PICCS
-			notific	ation -					
			Active-	nactive					
Methyl tert-butyl ether	1634-04-4	Х	ACT	IVE	Х	-	Х	Х	Х

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 Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Methyl tert-butyl ether	1634-04-4	-	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) - Qualifying Quantities for Major Accident	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report
		Notification	Requirements
Methyl tert-butyl ether	1634-04-4	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

## 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 .

Take note of Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values

#### 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
Methyl tert-butyl ether	WGK1	
, ,		

Component	France - INRS (Tables of occupational diseases)
Methyl tert-butyl ether	Tableaux des maladies professionnelles (TMP) - RG 84

#### 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

H225 - Highly flammable liquid and vapor

H315 - Causes skin irritation

## Legend

<b>TSCA</b> - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic
Substances List
ENCS - Japanese Existing and New Chemical Substances
AICS - Australian Inventory of Chemical Substances
NZIOC - New Zealand Inventory of Chemicals
TWA - Time Weighted Average
IARC - International Agency for Research on Cancer
Predicted No Effect Concentration (PNEC)
LD50 - Lethal Dose 50%
EC50 - Effective Concentration 50%
<b>POW</b> - Partition coefficient Octanol:Water
<b>vPvB</b> - very Persistent, very Bioaccumulative
ICAO/IATA - International Civil Aviation Organization/International Air
Transport Association
MARPOL - International Convention for the Prevention of Pollution from
Ships
ATE - Acute Toxicity Estimate
VOC - (Volatile Organic Compound)

## 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.

Fire prevention and fighting, identifying hazards and risks, static electricity, explosive atmospheres posed by vapours and dusts. Chemical incident response training.

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.

Creation Date Revision Date Revision Summary 28-May-2009 04-Oct-2023 Not applicable.

# 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