Product	5175 B
Revision date	17 July 2018
Revision	2

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Safety Data Sheet (SDS)

Section 1: Identification of the substance/preparation and of the company/undertaking

1.1 Product identifier

Product name	**5175 B**
Synonyms, Trade names	No information available.

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

Identified uses	No specific uses identified.
Uses advised against	No uses advised against are identified.

1.3 Details of the supplier of the safety data sheet

Supplier	Renishaw plc Brooms Road Stone Business Park Stone, Staffordshire ST15 0SH United Kingdom Tel: +44 (0) 1785 285000 (during UK office hours 09:00 to 17:00 UTC).
Contact person	msds@renishaw.com

1.4 Emergency telephone number

Emergency telephone	999 / 911 or local emergency number

Section 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (EC 1272/2008)

Physical and chemical hazards	Not classified
Human health	Acute Tox 4 - H332, Skin Irrit.2 - H315, Eye Irrit.2A - H319, Resp. Sens 1 - H334, Skin. Sens 1 - H317, STOT SE 3 - H335
Environment	Not classified

2.2 Label elements

Contains

Hexamethylene diisocyanate, oligomers
4,4'-methylenedi(cyclohexyl isocyanate) dicyclohexylmethane-4,4'-di-isocyanate

Label in accordance with (EC) no. 1272/2008

Signal word

Danger

Hazard statements

H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335 May cause respiratory irritation.

Precautionary statements **Prevention**

P261 Avoid breathing dust/fume/ gas/mist/vapours/spray.
P280 Wear protective gloves/ protective clothing/eye protection/face protection.
P284 Wear respiratory protection.
Response
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P342 + P311 If experiencing respiratory symptoms: Call a POISON CENTRE or doctor/physician.
Storage
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

2.3 Other hazards

None known.

Section 3: Composition/identification of ingredients

3.1 Substance

Not applicable.

3.2 Mixtures

Name	Product identifier	Reg. EU 1272/2008	%
Hexamethylene diisocyanate, oligomers	CAS-No.: 28182-81-2 EC No.: 500-060-2	Skin. Sens 1 - H317, Eye Irrit.2A - H319	60-100%
4,4'-methylenedi(cyclohexyl isocyanate) dicyclohexylmethane-4,4--di-isocyanate	CAS-No.: 5124-30-1 EC No.: 225-863-2	Skin Irrit.2 - H315, Skin. Sens 1 - H317, Eye Irrit.2A - H319, Acute Tox 3 - H331, Resp. Sens 1 - H334, STOT SE 3 - H335	10-30%

The full text for all hazard statements are displayed in section 16.

Composition comments The data shown are in accordance with the latest EC Directives.

Section 4: First aid measures

4.1 Description of first aid measures

General information Provide general first aid, rest, warmth and fresh air. As a general rule, in case of doubt or if symptoms persist, always call a doctor. Seek medical attention for all burns and eye injuries, regardless how minor they may seem. First aid personnel must be aware of own risk during rescue.
Consult a physician. Show this safety data sheet to the doctor in attendance. Likely to cause asthma and should be treated as a sensitiser.

Inhalation If this product is inhaled and symptoms occur, move the exposed person to fresh air promptly. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical attention.
Asthma like symptoms may develop immediately or may be delayed up to several hours. If an allergic respiratory reaction occurs, get immediate medical attention.

Ingestion DO NOT induce vomiting! Never give anything by mouth to an unconscious person. If this product is ingested, remove victim immediately from source of exposure. Provide rest, warmth and fresh air. Rinse mouth thoroughly. Get medical attention immediately.

Skin contact Remove affected person from source of contamination. Remove contaminated clothing. Wash exposed area with soap and water. After washing, cover affected skin with polyethylene glycol and wash again immediately with soap and water to thoroughly remove polyethylene glycol and residual isocyanate. Continue to rinse for at least 15 minutes. Seek medical attention immediately.

Eye contact Do not rub eye. Avoid contaminating unaffected eye. If this product contacts the eyes, gently flush eyes with water for at least fifteen (15) minutes, lifting the upper and lower eyelids occasionally. Remove contact lenses if present and easy to do so. Get prompt medical attention.

4.2 Most important symptoms and effects, both acute and delayed

General information	The severity of the symptoms described will vary dependent on the concentration and the length of exposure. Signs and symptoms of exposure: Cough, shortness of breath, headache, nausea, and vomiting. Symptoms may be delayed. Sensitization can be permanent. Chronic overexposure to diisocyanates has been reported to cause lung damage that may be permanent.
Inhalation	Harmful if inhaled. Causes respiratory tract irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Ingestion	Ingestion may produce gastric discomfort, nausea, vomiting and diarrhoea.
Skin contact	Potential skin sensitizer. May cause an allergic skin reaction. Contact with skin may cause irritation.
Eye contact	Causes serious eye irritation.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to the physician	Treat symptomatically.

Section 5: Fire-fighting measures

5.1 Extinguishing media

Extinguishing media	Carbon dioxide (CO2), dry chemical. Use water spray to cool unopened containers.
Unsuitable extinguishing media	High volume water jet.

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products	Burning releases carbon monoxide, carbon dioxide, oxides of nitrogen, isocyanate vapors and traces of hydrogen cyanide.
Unusual fire & explosion hazards	No unusual fire or explosion hazards noted.
Specific hazards	If heated, harmful vapours may be formed.

5.3 Advice for firefighters

Special fire fighting procedures	If possible, fight fire from protected position. Ventilate closed spaces before entering them. Keep up-wind to avoid fumes. Avoid breathing fire vapours. Containers close to fire should be removed immediately or cooled with water if safe to do so.
Protective equipment for firefighters	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	Wear protective clothing as described in Section 8 of this safety data sheet. Avoid inhalation of vapours and contact with skin and eyes. Provide adequate ventilation. In case of inadequate ventilation, use respiratory protection. Eliminate all sources of ignition. Do not touch or walk through spilled material. If necessary evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Read and follow manufacturer's recommendations.
For emergency responders	Follow safe handling advice and personal protective equipment recommendations for normal use of product.

6.2 Environmental precautions

Environmental precautions	Avoid discharge in to drains and water courses.

6.3 Methods and material for containment and cleaning up

Spill clean up methods	DO NOT touch spilled material! Stop leak if possible without risk. Wear necessary protective equipment. Ventilate and evacuate the area. Eliminate all sources of ignition. Use non-sparking hand tools and explosion proof electrical equipment for clean up. In case of a large scale of spill, dyke area with sand to stop the spill spreading. Recover spilled liquid if possible. After recovery of spilled liquid, do not close container tightly - remove to a safe well ventilated area. Absorb spillage with non-combustible, absorbent material - sand. Ensure that waste and contaminated materials are collected and removed from the work area as soon as possible in

a suitably labelled container.
Neutralization Solution: Mix equal amounts of the following to total two times the estimated spill volume: (1) mineral spirits 80%, VM&P naphtha 15%, and household detergent 5% and (2) a 50/50 mixture of monoethanolamine and water. Carbon dioxide may be generated from wastes when treated with neutralizer.

6.4 Reference to other sections

Reference to other sections — See section 1 for emergency contact. For personal protection, see section 8. For waste disposal, see section 13.

Section 7: Handling and storage

7.1 Precautions for safe handling

Handling — Use personal protective equipment, see Section 8. Avoid inhalation of vapours and contact with skin and eyes. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. If necessary, use local exhaust ventilation.
Keep away from ignition sources. Avoid prolonged or repeated contact. Wash thoroughly after handling. Do not use contact lenses. Remove and wash contaminated clothing before reusing.

7.2 Conditions for safe storage, including any incompatibilities

Storage precautions — Store in cool dry areas away from direct sunlight or sources of ignition. Keep the product in its original container. Keep upright, locked up and out of reach of children. Keep containers tightly closed.
Material will react with water, producing CO2 gas. A hazardous buildup of pressure could result if contamination occurs. Do not reseal contaminated containers. A blanket of dry nitrogen should be applied to NON contaminated containers before resealing. Do not store in containers made of copper, copper alloys or galvanized surfaces. Storage temperature: 25-50 C (77F to 122F).

Storage class — Water reactive storage

7.3 Specific end use(s)

Specific end use(s) — The identified uses for this product are detailed in Section 1.
Usage description — Use only according to directions. Replace and tighten cap after use.

Section 8: Exposure controls/Personal protection

8.1 Control parameters

Component	STD	TWA (8 Hrs)		STEL (15mins)		Notes
4,4'-methylenedi(cyclohexyl isocyanate) dicyclohexylmethane-4,4--di-isocyanate	NIOSH			0,01 (1) ppm	0,11 (1) mg/m^3	
4,4'-methylenedi(cyclohexyl isocyanate) dicyclohexylmethane-4,4--di-isocyanate	WEL		0.02 mg/m^3		0.07 mg/m^3	

Ingredient comments — The National Institute for Occupational Safety and Health (NIOSH).
Workplace Exposure Limits Guidance Note EH40/2005.

8.2 Exposure Controls

Protective equipment

Engineering measures — Provide adequate ventilation, including appropriate local extraction, to ensure that the

	defined occupational exposure limit is not exceeded. Facilities for handling this product should be closed system. Ensure surfaces and floors are made from non-permeable material.
Respiratory equipment	Where risk assessment shows air-purifying respirators are appropriate a full face respirator conforming to EN 143 should be used, and suitable respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Recommended: Respirator with combination filter for vapour /particulate - Type A2B2P3 (EN 141). ABEK (EN 14387). Consult manufacturer for specific advice. Use respirators and components tested and approved under appropriate government standards such as CEN (EU).
Hand protection	Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374) is recommended. Selection of the glove material depends on consideration of the penetration times, rates of diffusion and degradation, and concentration specific to the workplace. Suggested material: Butyl-rubber. Consult manufacturer for specific advice. Gloves must be inspected prior to use. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product.
Eye protection	Wear safety goggles or face shield to prevent any possibility of eye contact. Use equipment for eye protection tested and approved under appropriate government standards such as EN 166(EU).
Other protection	Wear appropriate clothing to prevent any possibility of skin contact. Suggested PPE: chemical resistant full-length overalls and boots. Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist. The selected clothing must satisfy the European norm standard EN 943.
Hygiene measures	DO NOT SMOKE IN WORK AREA! Wash hands at the end of each work shift and before eating, smoking and using the toilet. Keep container tightly closed. Handle in accordance with good industrial hygiene and safety practice. Wash promptly if skin becomes contaminated.
Process conditions	Ensure that eye flushing systems are located close by in the work place.

Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	Liquid.
Colour	Clear.
Odour	No information available.
Odour threshold - lower	No information available.
Odour threshold - upper	No information available.
pH-Value, Conc. Solution	No information available.
pH-Value, Diluted solution	No information available.
Melting point	No information available.
Initial boiling point and boiling range	No information available.
Flash point	197.00 °C
Evaporation rate	No information available.
Flammability state	No information available.
Flammability limit - lower(%)	No information available.
Flammability limit - upper(%)	No information available.
Vapour pressure	No information available.
Vapour density (air=1)	Not applicable.
Relative density	1.13g/cm^3 @ 25.00 °C
Bulk density	No information available.

Solubility	No information available.
Decomposition temperature	No information available.
Partition coefficient; n-Octanol/Water	No information available.
Auto ignition temperature (°C)	No information available.
Viscosity	135 mPas 25.00
Explosive properties	Not classified as explosive.
Oxidising properties	No information available.

9.2 Other information

Molecular weight	No information available.
Volatile organic compound	No information available.
Other information	None noted.

Section 10: Stability and reactivity

10.1 Reactivity

Reactivity	Carbon dioxide is generated when product reacts with water. Exothermic reaction with water, amine, alcohol and other active hydrogen containing chemical compounds.

10.2 Chemical stability

Stability	Stable under normal temperature conditions and recommended use.

10.3 Possibility of hazardous reactions

Hazardous reactions	No information available.
Hazardous polymerisation	Contact with water or excessive temperatures may cause polymerization.
Polymerisation description	Exothermic.

10.4 Conditions to Avoid

Conditions to avoid	Keep away from open flames, hot surfaces and sources of ignition, incompatible products, and exposure to moist air or water.

10.5 Incompatible materials

Materials to avoid	Exothermic reaction with water, amine, alcohol and other active hydrogen containing chemical compounds. Avoid contact with water, oxidizing agents, alcohols, amines, bases and copper alloys. Keep away from strong oxidizing agents, strong caustic materials and metals.

10.6 Hazardous decomposition products

Hazardous decomposition products	Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours. Thermal decomposition may produce carbon and nitrogen oxides, hydrogen cyanide and isocyanic acid.

Section 11: Toxicological information

11.1 Information on toxicological effects

Toxicological information	No toxicological information for the overall finished product.
Acute toxicity (Oral LD50)	Data for Homopolymers of hexamethylene diisocyanate: Rat >5,000 mg/kg. Data for Dicyclohexylmethane-4,4'-Diisocyanate: Rat 9,900 mg/kg.
Acute toxicity (Dermal LD50)	Data for Homopolymers of hexamethylene diisocyanate: Rabbit >2,000 mg/kg. Data for

	Dicyclohexylmethane-4,4'-Diisocyanate: Rabbit >10,000 mg/kg.
Acute toxicity (Inhalation LD50)	Data for Dicyclohexylmethane-4,4'-Diisocyanate: Rat 434mg/m3 4 Hr.
Serious eye damage/irritation	Causes serious eye irritation.
Skin corrosion/irritation	The product is classified as a skin corrosion/irritation hazard.
Respiratory sensitisation	The product is classified as a repiratory hazard.
Skin sensitisation	The product is classified as a skin sensitisation hazard.
Germ cell mutagenicity	No information available.
Carcinogenicity	No information available.
Specific target organ toxicity - Single exposure:	
STOT - Single exposure	No information available.
Specific target organ toxicity - Repeated exposure:	
STOT - Repeated exposure	May cause damage to organs through prolonged or repeated exposure if inhaled. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
Inhalation	Harmful if inhaled. Causes respiratory tract irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Ingestion	Ingestion may produce gastric discomfort, nausea, vomiting and diarrhoea.
Skin contact	Potential skin sensitizer. May cause an allergic skin reaction. Contact with skin may cause irritation.
Eye contact	Causes serious eye irritation.
Waste management	When handling waste, consideration should be made to the safety precautions applying to handling of the product.
Routes of entry	No information available.
Target organs	Eyes, skin, digestive system, respiratory system.
Aspiration hazards:	No information available.
Reproductive toxicity:	Toxicity to reproduction/fertility: inhalation, 6 hours/day 7 days/week, (rat, male/female) NOAEL (parental): 1:00 mg/m3, NOAEL (f2): 6.00 mg/m3.

Section 12: Ecological information

12.1 Toxicity

Acute toxicity - Fish	Dicyclohexylmethane 4,4'-diisocyanate (Acute and Prolonged Toxicity to Fish): LC50 1.2mg/l (zebra fish, 96 hrs.)
Acute toxicity - Aquatic invertebrates	s Dicyclohexylmethane 4,4'-diisocyanate (Acute Toxicity to Aquatic Invertebrates): ECO >8.3 mg/l (water flea, 48 hrs.)
Acute toxicity - Aquatic plants	Dicyclohexylmethane 4,4'-diisocyanate (Toxicity to Aquatic Plants): EC50 >5 mg/l, end point: growth (green algae, 72 hrs.)
Acute toxicity - Microorganisms	No information available.
Chronic toxicity - Fish	No information available.
Chronic toxicity - Aquatic invertebrates	No information available.
Chronic toxicity - Aquatic plants	No information available.
Chronic toxicity - Microorganisms	No information available.
Ecotoxicity	No Ecological information on the finished product.
Eco toxilogical information	No ecological toxicity available on the overall finished product.

12.2 Persistence and degradability

Degradability	The product is not readily biodegradable.
Biological oxygen demand	Theoretical Biological Oxygen Demand (ThBOD): 2,195 mg/g.
Chemical oxygen demand	No information available.

12.3 Bioaccumulative potential

Bioaccumulative potential	No data available on bioaccumulation.
Bioaccumulation factor	No information available.
Partition coefficient; n-	No information available.

Octanol/Water

12.4 Mobility in soil

Mobility No information available.

12.5 Results of PBT and vPvB assessment

Results of PBT and vPvB assessment No information available.

12.6 Other adverse effects

Other adverse effects No data available.

Section 13: Disposal considerations

Waste management When handling waste, consideration should be made to the safety precautions applying to handling of the product.

13.1 Waste treatment methods

Disposal methods Dispose of waste and residues in accordance with local authority requirements, and in accordance with all local, national and international regulations. For waste disposal, use a licensed industrial waste disposal agent. Waste may be incinerated by a licensed facility.

Section 14: Transport information

14.1 UN number

UN no. (ADR) Not applicable.
UN no. (IMDG) Not applicable.
UN no. (IATA) Not applicable.

14.2 UN proper shipping name

ADR proper shipping name Not applicable.
IMDG proper shipping name Not applicable.
IATA proper shipping name Not applicable.

14.3 Transport hazard class(es)

ADR class Not applicable.
IMDG class Not applicable.
IATA class Not applicable.

Transport labels Not applicable

14.4 Packing group

ADR/RID/ADN packing group Not applicable.
IMDG packing group Not applicable.
IATA packing group Not applicable.

14.5 Environmental hazards

ADR No
IMDG No
IATA No

14.6 Special precautions for user

EMS Not applicable.
Emergency action code Not applicable.
Hazard no. (ADR) Not applicable.
Tunnel restriction code Not applicable.

14.7 Transport in bulk according to annex II of MARPOL73/78 and the IBC code

Not applicable.

Section 15: Regulatory information

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

EU legislation	Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 with amendments. The UN Globally Harmonized System (GHS) Safety Data Sheet format (Annex IV) is implemented as Annex II of REACH EU No 453/2010 of 20th May 2010 amending regulation (EC) No 1907/2006.
Approved code of practice	Workplace Exposure Limits Guidance Note EH40/2005.
Chemical safety assessment	No chemical safety assessment has been carried out.

Section 16: Other information

General information	This Safety Data Sheet is in accordance with Reach Regulation (EC) No 453/2010.
Revision comments	[14]Transport classification updated. This is a second issue.
Revision date	17 July 2018
Supersedes date	14 December 2017
Revision	2
Safety data sheet status	Approved.

Hazard statements in full

H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H331	Toxic if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H332	Harmful if inhaled.

Disclaimer

This 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. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.