Product 8045B **Revision Date** 30/11/2016

Revision 1



Safety Data Sheet (SDS)

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

1.1 Product Identifier

Product Name 8045B

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 AgainstNo 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, Carc. 2 - H351, STOT SE 3 - H335, STOT RE 2 - H373

Environment Not classified

2.2 Label Elements

Contains 4,4'-methylenediphenyl diisocyanate diphenylmethane-4,4'-diisocyanate

4,4'-Methylenediphenyl diisocyanate, oligomers

4,4'-Methylenediphenyl diisocyanate

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.

 ${
m H335~May}$ cause respiratory irritation. ${
m H351~Suspected}$ of causing cancer .

 ${
m H373~May}$ cause damage to organs (respiratory system) through prolonged or repeated exposure by inhalation

Precautionary Statements

Prevention

P202 Do not handle until all safety precautions have been read and understood.

P260 Do not breathe dust/fume/ gas/mist/vapours/spray.

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

P285 In case of inadequate ventilation wear respiratory protection.

Response

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P304 + P341 IF INHALED: If breathing is difficult, 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.

EUH Statements

EUH204 Contains isocyanates. May produce an allergic reaction.

2.3 Other Hazards

None known.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

Not applicable.

3.2 Mixtures

Name	Product Identifier	GHS Classification	%
4,4'-methylenediphenyl diisocyanate diphenylmethane-4,4'-diisocyanate	CAS-No.: 101-68-8 FC No.: 202-966-0	Skin Irrit.2 - H315, Skin. Sens 1 - H317, Eye Irrit.2A - H319, Acute Tox 4 - H332, Resp. Sens 1 - H334, STOT SE 3 - H335, Carc. 2 - H351, STOT RE 2 - H373	30-60%
4,4'-Methylenediphenyl diisocyanate, oligomers		Skin Irrit.2 - H315, Skin. Sens 1 - H317, Eye Irrit.2A - H319, Acute Tox 4 - H332, Resp. Sens 1 - H334, STOT SE 3 - H335, Carc. 2 - H351, STOT RE 2 - H373	10-30%
4,4'-Methylenediphenyl diisocyanate		Skin Irrit.2 - H315, Eye Irrit.2A - H319, Resp. Sens 1 - H334, Skin. Sens 1 - H317, Carc. 2 - H351, STOT SE 3 - H335, STOT RE 2 - H373	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.

Inhalation If this product is inhaled and symptoms occur, move the exposed person to fresh air

promptly. If an allergic respiratory reaction occurs, get immediate medical attention. If necessary, clear the airway. If not breathing, give artificial respiration and get medical

attention. If breathing is difficult, provide oxygen.

IngestionIf this product is ingested get medical attention immediately! Immediately rinse mouth and provide fresh air. If vomiting occurs, the head should be kept low so that stomach content

doesn't enter the lungs, and is not swallowed.

Keep airway clear. Provide fresh air, warmth and rest, preferably in comfortable upright sitting position. Induce vomiting only when directed by medical personnel and person is

conscious. Never give anything by mouth to an unconscious person.

Skin Contact Remove affected person from source of contamination. Remove contaminated clothing. Wash

the skin immediately with soap and water. Get medical attention promptly if symptoms occur

after washing.

Eye Contact Do not rub eye. Avoid contaminating unaffected eye. Immediately flush eyes with plenty of

water for at least 15 minutes, lifting lower and upper eyelids occasionally. Remove contact

lenses if present and easy to do so. Get medical attention immediately.

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. Symptoms of exposure include: Irritation of eyes, nose, throat; respiratory sensitization; cough, pulmonary secretions, chest pain, dyspnea (breathing

difficulty); asthma. Suspected of causing cancer.

Inhalation May cause allergy or asthma symptoms or breathing difficulties if inhaled. Harmful if

inhaled. May cause damage to the respiratory system through prolonged or repeated

exposure by inhalation. Inhalation may cause respiratory irritation.

IngestionMay cause digestive tract irritation, pain or vomiting.Skin ContactCauses skin irritation. May cause an allergic skin reaction.

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

fire extinguishing powder, dry sand.

Unsuitable Extinguishing Media Do not use water jet as an extinguisher.

5.2 Special Hazards Arising From the Substance or Mixture

Hazardous Combustion Products In case of fire, toxic gases (CO, CO2, NOx) may be formed.

Unusual Fire & Explosion Hazards Reacts with water, releasing carbon dioxide which may cause pressure build-up in

containers.

Specific Hazards Floors may become slippery, avoid falls.

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.

For initial fire, use dry chemical, carbon dioxide or dry sand. In case of a massive fire, use

foam extinguisher. After fire is extinguished, neutralize wet isocyanate.

Take measures to avoid the spill of the products or chemicals to rivers or drains due to

water-discharge from fire fighting.

For neutralizing agent: see section 6.3.

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. Eliminate all

sources of ignition. Avoid inhalation of vapours and contact with skin and eyes. Provide adequate ventilation. In case of inadequate ventilation, use respiratory protection. Do not smoke, eat or drink while using this product. Read and follow manufacturer's recommendations. Do not touch or walk through spilled material. Keep unnecessary and

unprotected personnel from entering. Avoid prolonged or repeated exposure.

For Emergency Responders Follow safe handling advice and personal protective equipment recommendations for normal

use of product.

6.2 Environmental Precautions

Environmental Precautions Do not discharge into drains, water courses or onto the ground.

6.3 Methods and Material for Containment and Cleaning Up

Spill Clean Up Methods Stop leak if possible without risk. Wear respirator if ventilation is not adequate. Eliminate all

sources of ignition. Ventilate and evacuate the area. Wear necessary protective equipment.

DO NOT touch spilled material!

Use non sparking tools or equipment for clean up. Absorb spillage with non-combustible, absorbent material - sand. In case of a large scale of spill, dyke area with sand to stop the spill spreading. Neutralize by dispersing neutralizing agent and absorb with sand. Wash work area with water. Ensure that waste and contaminated materials are collected and removed from the work area as soon as possible in a suitably labelled container. Example of neutralizing agent: water/sodium carbonate/liquid detergent (parts by weight)=90-95 / 5-10 / 0.2-0.5. Wash thoroughly after dealing with a spillage.

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 proper personal protection when handling (refer to Section 8). Provide good ventilation.

Wear appropriate respirator when ventilation is inadequate. Keep away from heat, sparks and open flame. Static electricity and formation of sparks must be prevented. Do not eat,

drink or smoke when using the product. Avoid inhalation of vapours.

Avoid contact with skin and eyes. Do not use contact lenses. Avoid prolonged or repeated contact. Read and follow manufacturer's recommendations. Do not mix with other chemicals.

7.2 Conditions for Safe Storage, Including Any Incompatibilities

Storage Precautions Keep locked up and out of reach of children. Keep away from heat, sparks, direct sunlight

and open flames. Avoid contact with water, amine compounds and polyol reacting with

isocyanate.

Store in tightly closed original container in a dry, cool and well-ventilated place. After opening containers, replace with dry nitrogen or dry air and tightly seal the container to

prevent leaks. To avoid static electricity, ground equipment.

Storage Class Hazardous material 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. Avoid static build up by

suitable earthing arrangements.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control Parameters

Component	STD	TWA (8 Hrs)		STEL (15mins)		Notes
4,4'-methylenediphenyl diisocyanate diphenylmethane-4,4'-diisocyanate	NIOSH					NIOSH
4,4'-methylenediphenyl diisocyanate diphenylmethane-4,4'-diisocyanate	WEL		0.02mg/m3		0.07mg/m3	Sen.
4,4'-Methylenediphenyl diisocyanate, oligomers	WEL		0.02mg/m3		0.07mg/m3	Sen.
4,4'-Methylenediphenyl diisocyanate	WEL		0.02mg/m3		0.07mg/m3	Sen.

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

Respiratory Equipment

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. Where risk assessment shows air-purifying respirators are appropriate a full face respirator conforming to EN143 should be used, and suitable respirator cartridges as a backup to

engineering controls. Recommended: Respirator with combination filter for vapour/particulate (EN 141). Consult manufacturer for specific advice.

If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as CEN (EU).

sucn as

Hand Protection

Selection of the glove material depends on consideration of the penetration times, rates of diffusion and degradation, and concentration specific to the workplace. Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe:

EN374) is recommended. Gloves must be inspected prior to use.

Use suitable organic solvent resistant gloves if there is a risk of skin contact. Suggested material: Chloroprene. Nitrile rubber. Consult manufacturer for specific advice.

Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with

applicable laws and good laboratory practices.

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. Chemical resistant anti-

static work clothes and safety shoes are recommended. Select appropriate protective clothing based on chemical resistance data and an assessment of local exposure potential. 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 before handing this

product.

Hygiene Measures Wash promptly if skin becomes contaminated. Handle in accordance with good industrial

hygiene and safety practice. DO NOT SMOKE IN WORK AREA! Wash hands at the end of

each work shift and before eating, smoking and using the toilet.

Process ConditionsUse only according to directions. Keep container tightly sealed when not in use. 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

AppearanceNo information available.ColourNo information available.OdourNo information available.

Odour Threshold - Lower No information available.

Odour Threshold - Upper No information available.

pH-Value, Conc. Solution No information available.

 ${\bf pH\text{-}Value,\ Diluted\ Solution}\qquad \qquad \text{No information available}.$

Melting Point No information available.

Initial Boiling Point and Boiling

Range

No information available.

Flash Point No information available.

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) No information available.

Relative Density No information available.

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 No information available.

Explosive Properties No information available.

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 Stable under recommended transport and storage conditions and under recommended use.

10.2 Chemical Stability

Stability Relatively stable when stored in a cool and dark place.

10.3 Possibility of Hazardous Reactions

Hazardous Reactions Reacts with active hydrogen compounds such as water, alcohol and amine and generates

heat. If mixed with water, carbon dioxide is generated which may cause containers to rupture or explode. Contact with basic substances or organic metallic compounds, may

generate heat due to polymerization.

Hazardous PolymerisationContact with basic substances or organic metallic compounds, may generate heat due to

polymerization.

Polymerisation Description Unknown.

10.4 Conditions to Avoid

Conditions to Avoid Fire and high temperature.

10.5 Incompatible Materials

Materials to Avoid Avoid contact with water, alcohol, amines, basic substance or organic metallic compounds.

10.6 Hazardous Decomposition Products

Hazardous Decomposition Products When heated, vapours/gases hazardous to health may be formed. Combustion produces toxic

gases such as carbon monoxide.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological Effects

Toxicological Information No toxicological information for the overall finished product.

Acute Toxicity (Oral LD50)No information available.Acute Toxicity (Dermal LD50)No information available.Acute Toxicity (Inhalation LD50)No information available.

Serious Eye Damage/Irritation Causes serious eye irritation.

Skin Corrosion/Irritation No information available.

Respiratory SensitisationNo information available.Skin SensitisationNo information available.

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 No information available.

Inhalation May cause allergy or asthma symptoms or breathing difficulties if inhaled. Harmful if

inhaled. May cause damage to the respiratory system through prolonged or repeated

exposure by inhalation. Inhalation may cause respiratory irritation.

IngestionMay cause digestive tract irritation, pain or vomiting.Skin ContactCauses skin irritation. May cause an allergic skin reaction.

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

Curing in large quantities or under improper conditions may cause fire. Dispose of without curing and mixing with other materials. Do not discharge wastewater used for washing of

container and equipment into ground or drain without treatment.

Routes of Entry No information available.

Target Organs Eyes, skin, digestive system, respiratory system.

Aspiration Hazards:

Reproductive Toxicity: No information available.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Acute Toxicity - Fish No information available.
Acute Toxicity - Aquatic No information available.

Invertebrates

Acute Toxicity - Aquatic Plants
Acute Toxicity - Microorganisms
Chronic Toxicity - Fish
Chronic Toxicity - Aquatic

No information available.
No information available.
No information available.

Invertebrates

Chronic Toxicity - Aquatic Plants
Chronic Toxicity - Microorganisms
No information available.
No information available.

Ecotoxicity No Ecological information on the finished product.

Eco Toxilogical Information Not classified as dangerous for the environment according to the criteria of Regulation (EC)

No 1272/2008.

12.2 Persistence and Degradability

Degradability No information available.

Biological Oxygen Demand Chemical Oxygen Demand No information available. No information available.

12.3 Bioaccumulative Potential

Bioaccumulative Potential Bioacculmation Factor Partition Coefficient; nNo data available on bioaccumulation.

No information available. 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 information available.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Management When handling waste, consideration should be made to the safety precautions applying to

handling of the product

Curing in large quantities or under improper conditions may cause fire. Dispose of without curing and mixing with other materials. Do not discharge wastewater used for washing of container and equipment into ground or drain without treatment.

13.1 Waste Treatment Methods

Disposal Methods Dispose of in accordance with national and local regulations for special waste via an

appropriately licensed waste contractor.

SECTION 14: TRANSPORT INFORMATION

14.1 UN Number

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

14.2 UN Proper Shipping Name

ADR Proper Shipping Name
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

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 CommentsThis is a first issue.Revision Date30/11/2016Revision1

Safety Data Sheet Status Approved.

Hazard Statements In Full

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.
H351 Suspected of causing cancer [*].

H373 May cause damage to organs [*] through prolonged or repeated exposure [*].

EUH204 Contains isocyanates. May produce an allergic reaction.

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.