QUANTUM INSULATION

SAFETY DATA SHEET

Insta Stik™ Roofing Adhesive

SECTION 1 Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier
Trade name: Insta Stik™ Roofing Adhesive 13.5kg Tank, 750ml

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

1.3 Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Quantum Insulation Ltd, Holland House, Valley Way, Rockingham Road
Market Harborough Leicestershire LE16 7PS
T: +44 1858 456018, F: +44 (0) 1858410572, sales@quantuminsulation.com

Further information obtainable from: www.quantuminsulation.com

1.4 Emergency telephone number:
During office hours tel: +44 (0) 1858410372. At all other times please contact your national poisoning centre.

SECTION 2 Hazards identification

2.1 Classification of the substance or mixture
Classification according to Regulation (EC) No 1272/2008:
Skin irritation - Category 2 - H315
Eye irritation - Category 2 - H319
Respiratory sensitisation - Category 1 - H334
Skin sensitisation - Category 1 - H317
Carcinogenicity - Category 2 - H351
Specific target organ toxicity - single exposure - Category 3 - H335
Specific target organ toxicity - repeated exposure - Category 2 - H373

Classification according to EU Directives 67/548/EEC or 1999/45/EC:
Carc.Cat.3 - R40
Harmful - R48/20
Irritant - R36/37/38
R42/43
For the full text of the R-phrases mentioned in this Section, see Section 16.

2.2 Label elements
Labelling according to Regulation (EC) No 1272/2008:

Signal word: Danger

SECTION 2 Hazards identification (cont)

Hazard statements

H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
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 (Respiratory Tract) through prolonged or repeated exposure.

Precautionary statements

P201 Obtain special instructions before use.
P260 Do not breathe spray.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing
+ P312 - Call a POISON CENTER or doctor/ physician if you feel unwell.
P501 Dispose of contents/container to hazardous or special waste collection point.

Contains Diphenylmethane Diisocyanate, isomers and homologues

2.3 Other hazards

No information available.

SECTION 3 Composition/Information on Ingredients

CASRN/EC /INDEX NO	REACH REGISTRATION NUMBER	CONCENTRATION	COMPONENT	CLASSIFICATION: REG (EC) NO 1272/2008
CASRN 53862-89-8 **EC-No.** Polymer **Index-No.**	-	50.0 - 70.0	Polymethylenepoly phenyl polyisocyanate, polypropyleneglycol copolymer	Resp. Sens. - 1 - H334 Skin Sens. - 1 - H317
CASRN 9016-87-9 **EC-No.** 618-498-9 **Index-No.**	-	15.0 - < 25.0	Diphenylmethane Di-isocyanate, isomers and homologues	Acute Tox. - 4 - H332 Skin Irrit. - 2 - H315 Eye Irrit. - 2 - H319 Resp. Sens. - 1 - H334 Skin Sens. - 1 - H317 Carc. - 2 - H351 STOT SE - 3 - H335 STOT RE - 2 - H373
CASRN 29118-24-9 **EC-No.** Not determinated yet **Index-No.**	-	5.0 - < 15.0	Trans-1,3,3,3- Tetrafluoro-prop-1- ene	Not classified
CASRN 101-68-8 **EC-No.** 202-966-0 **Index-No.** 615-005-00-9	01-2119457014-47	5.0 - < 15.0	4,4'- methylenediphenyl diisocyanate	Acute Tox. - 4 - H332 Skin Irrit. - 2 - H315 Eye Irrit. - 2 - H319 Resp. Sens. - 1 - H334 Skin Sens. - 1 - H317 Carc. - 2 - H351 STOT SE - 3 - H335 STOT RE - 2 - H373
CASRN 13674-84-5 **EC-No.** 237-158-7 **Index-No.**	01-2119486772-26	5.0 - < 10.0	Tris(1-chloro-2- propyl) phosphate	Acute Tox. - 4 - H302
CASRN 124-38-9 **EC-No.** 204-696-9 **Index-No.**	-	1.0 - < 2.5	Carbon dioxide	Not classified

If present in this product, any not classified components disclosed above for which no country specificOEL value(s) is(are) indicated under Section 8, are being disclosed as voluntarily disclosed components. For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 3 Composition/Information on Ingredients (continued)

CASRN / EC-NO. / INDEX-NO.	CONCENTRATION	COMPONENT	CLASSIFICATION: 67/548/EEC
CASRN 53862-89-8 **EC-No.** Polymer **Index-No.**	50.0 - 70.0	Polymethylenepolyph enyl polyisocyanate, polypropyleneglycol copolymer	R42/43
CASRN 53862-89-8 **EC-No.** 618-498-9 **Index-No.**	15.0 - < 25.0	Diphenylmethane Diisocyanate, isomers and homologues	Carc.Cat.3 - R40 Xn - R20 - R48/20 Xi - R36/37/38 R42/43
CASRN 29118-24-9 **EC-No.** Not determinated yet **Index-No.**	5.0 - < 15.0	Trans-1,3,3,3-Tetrafluoroprop-1-ene	Not classified
CASRN 101-68-8 **EC-No.** 202-966-0 **Index-No.** 615-005-00-9	5.0 - < 15.0	4,4'-methylenediphenyl diisocyanate	Carc.Cat.3 - R40 Xn - R20 - R48/20 Xi - R36/37/38 R42/43
CASRN 13674-84-5 **EC-No.** 237-158-7 **Index-No.**	5.0 - < 10.0	Tris(1-chloro-2-propyl) phosphate	Xn - R22
CASRN 124-38-9 **EC-No.** 204-696-9 **Index-No.**	1.0 - < 2.5	Carbon dioxide	Not classified

If present in this product, any not classified components disclosed above for which no country specific OEL value(s) is(are indicated under Section 8, are being disclosed as voluntarily disclosed components. For the full text of the R-phrases mentioned in this Section, see Section 16. Note Note: CAS 101-68-8 is an MDI isomer that is part of CAS 9016-87-9.

SECTION 4 First Aid Measures

4.1 Description of first aid measures

General information: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

After inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

After skin contact: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. An MDI skin decontamination study demonstrated that cleaning very soon after exposure is important, and that a polyglycol-based skin cleanser or corn oil may be more effective than soap and water. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. Suitable emergency safety shower facility should be available in work area.

After eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist. Suitable emergency eye wash facility should be available in work area.

After ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms/injuries: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

SECTION 4 First Aid Measures (continued)

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

Maintain adequate ventilation and oxygenation of the patient. May cause respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants and antitussives may be of help. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers. Exposure may increase "myocardial irritability". Do not administer sympathomimetic drugs such as epinephrine unless absolutely necessary. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

SECTION 5 Firefighting measures

5.1 Extinguishing media:
Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective. Unsuitable extinguishing media: Do not use direct water stream. May spread fire.

5.2 Special hazards arising from the substance or mixture. Hazardous combustion products:
During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Isocyanates. Hydrogen fluoride. Hydrogen halides. Carbon dioxide.

Unusual Fire and Explosion Hazards: Some components of this product will burn in a fire situation. Container may vent and/or rupture due to fire. Vaporizes quickly at room temperature. Dense smoke is produced when product burns.

5.3 Advice for firefighters
Fire Fighting Procedures: Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Do not use direct water stream. May spread fire. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Move container from fire area if this is possible without hazard. Use water spray to cool fire-exposed containers and fire-affected zone until fire is out.

Special Protective Equipment for Firefighters:
Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

SECTION 6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Isolate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep personnel out of low areas. Keep personnel out of confined or poorly ventilated areas. Keep upwind of spill. Ventilate area of leak or spill. Keep unnecessary and unprotected personnel from entering the area. If available, use foam to smother or suppress. Confined space entry procedures must be followed before entering the area. Refer to section 7, Handling, for additional precautionary measures. See Section 10 for more specific information. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

6.2 Environmental precautions:
Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

SECTION 6 Accidental release measures (cont)

6.3 Methods and materials for containment and cleaning up:
Contain spilled material if possible. Absorb with materials such as: Sawdust. Dirt. Vermiculite. Sand. Clay. Cob grit. Milsorb®. Do NOT use absorbent materials such as: Cement powder (Note: may generate heat). Collect in suitable and properly labeled open containers. Do not place in sealed containers. Suitable containers include: Metal drums. Plastic drums. Polylined fiber pacs. Wash the spill site with large quantities of water. Attempt to neutralize by adding suitable decontaminant solution: Formulation 1: sodium carbonate 5 - 10%; liquid detergent 0.2 - 2%; water to make up to 100%, OR Formulation 2: concentrated ammonia solution 3 - 8%; liquid detergent 0.2 - 2%; water to make up to 100%. If ammonia is used, use good ventilation to prevent vapor exposure. Contact your supplier for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

6.4 Reference to other sections:
References to other sections, if applicable, have been provided in the previous sub-sections.

SECTION 7 Handling and storage

7.1 Precautions for safe handling
Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Do not swallow. Avoid breathing vapor. Use with adequate ventilation. Wash thoroughly after handling. Keep container tightly closed. Contents under pressure. Do not puncture or incinerate container. Do not enter confined spaces unless adequately ventilated. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.

7.2 Conditions for safe storage, including any incompatibilities
Store in a dry place. Protect from atmospheric moisture. Maintain a nitrogen atmosphere. Do not store product contaminated with water to prevent potential hazardous reaction. Avoid temperatures above 50°C (122°F) See Section 10 for more specific information. Additional storage and handling information on this product may be obtained by calling your sales or customer service contact.

Storage stability

Storage temperature	Storage Period
5 - 30 °C	18 Month

7.3 Specific end use(s):
See the technical data sheet on this product for further information.

SECTION 8: Exposure Controls, Personal Protection

8.1. Control parameters Exposure limits are listed below, if they exist.

COMPONENT	REGULATION	TYPE OF LISTING	VALUE/NOTATION
Diphenylmethane	GB EH40	TWA	SEN
Diisocyanate, Isomers and Homologues	GB EH40	STEL	SEN
-	GB EH40	TWA	0.02 mg/m3 , as -NCO
-	GB EH40	STEL	0.07 mg/m3 , as -NCO
4,4'-methylenediphenyl	ACGIH	TWA	0.005 ppm
diisocyanate	GB EH40	TWA	SEN
-	GB EH40	STEL	SEN
-	GB EH40	TWA	0.02 mg/m3 , as -NCO
-	GB EH40	STEL	0.07 mg/m3 , as -NCO
Carbon dioxide	ACGIH	TWA	5,000 ppm
-	ACGIH	STEL	30,000 ppm
-	2006/15/EC	TWA	9,000 mg/m3 5,000 ppm
-	GB EH40	STEL	27,400 mg/m3 15,000 ppm
-	GB EH40	TWA	9,150 mg/m3 5,000 ppm

This material contains a simple asphyxiant which may displace oxygen. Insure adequate ventilation to prevent an oxygen deficient atmosphere., The minimum requirement of 19.5% oxygen at sea leve (148 torr O2, dry air) provides an adequate amount of oxygen for most work assignments.

8.2 Exposure controls
Engineering controls: Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Provide general and/or local exhaust ventilationto control airborne levels below the exposure guidelines. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. The odor and irritancy of this material are inadequate to warn of excessive exposure.

Individual protection measures Eye/face protection
Use chemical goggles. Chemical goggles should be consistent with EN 166 or equivalent.

Skin protection Hand protection
Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. Examples of preferred glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier. Other protection: Use protective clothing chemically resistant to this material.

Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

SECTION 8: Exposure Controls, Personal Protection (continued)

Respiratory protection
Atmospheric levels should be maintained below the exposureguideline. When atmospheric levels may exceed the exposure guideline, use an approved airpurifying respirator equipped with an organic vapor sorbent and a particle filter. For situations where the atmospheric levels may exceed the level for which an air-purifying respirator is effective, use a positive-pressure air-supplying respirator (air line or self-contained breathing apparatus). For emergency response or for situations where the atmospheric level is unknown, use an approved positive-pressure self-contained breathing apparatus or positivepressure air line with auxiliary self-contained air supply. Use the following CE approved air-purifying respirator: Organic vapor cartridge with a particulate pre-filter, type AP2.

Environmental exposure controls
See SECTION 7: Handling and storage and SECTION 13: Disposal considerations for measures to prevent excessive environmental exposure during use and waste disposal.

SECTION 9: Physical And Chemical Properties

9.1 Information on basic physical and chemical properties

Information on basic physical and chemical properties	
Appearance Physical state	liquid
Colour	Yellow
Odour	Musty
Odour threshold	n.a.
pH	n.a
Melting point	n.a
Freezing point	n.a
Boiling point (760 mmHg)	n.a
Flash point	closed cup No test data available
Evaporation Rate (Butyl Acetate = 1)	n.a
Flammability (solid, gas)	n.a
Upper/lower flammability or explosive limits	n.a
Vapour pressure	Container is under pressure
Relative Vapor Density (air = 1)	n.a
Relative Density (water = 1)	1.1 - 1.2 at 25 °C / 25 °C Supplier
Water solubility	insoluble, reacts, evolution of CO2
Partition coefficient: noctanol/ water	n.a
Auto-ignition temperature	n.a
Decomposition Temperature	n.a
Kinematic Viscosity	n.a
Explosive properties	Not explosive
Oxidising properties	No

9.2 Other Information
Molecular weight Not applicable NOTE: The physical data presented above are typical values and should not be construed as a specification.

SECTION 10 Stability and reactivity

10.1 Reactivity
No data available.

10.2 Chemical stability
Stable under recommended storage conditions. See Storage, Section 7. Unstable at elevated temperatures.

10.3 Possibility of hazardous reactions
Can occur. Elevated temperatures can cause hazardous polymerization.

10.4 Conditions to avoid
Avoid temperatures above 50°C (122°F) Elevated temperatures can cause container to vent and/or rupture. Exposure to elevated temperatures can cause product to decompose.

10.5 Incompatible materials
Avoid contact with: Acids. Alcohols. Amines. Ammonia. Bases. Metal compounds. Strong oxidizers. Products based on diisocyanates like TDI and MDI react with many materials to release heat. The reaction rate increases with temperature as well as with increased contact; these reactions can become violent. Contact is increased by stirring or if the other material acts as a solvent. Products based on diisocyanates such as TDI and MDI are not soluble in water and will sink to the bottom, but react slowly at the interface. The reaction forms carbon dioxide gas and a layer of solid polyurea. Reaction with water will generate carbon dioxide and heat.

10.6 Hazardous decomposition products
Decomposition products depend upon temperature, air supply and the presence of other materials. Toxic gases are released during decomposition.

SECTION 11 Toxicological information

11.1 Information on toxicological effects

Information on toxicological effects Acute toxicity	
Acute oral toxicity	Low toxicity if swallowed. Small amounts swallowed incidentally as a result of norma handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. Observations in animals include: Gastrointestinal irritation.
As product	Single dose oral LD50 has not been determined.
Based on information for component(s)	LD50, Rat, > 5,000 mg/kg Estimated.
Acute dermal toxicity	Prolonged skin contact is unlikely to result in absorption of harmful amounts.
As product	The dermal LD50 has not been determined.
Based on information for component(s)	LD50, Rabbit, > 2,000 mg/kg Estimated.
Acute inhalation toxicity	In confined or poorly ventilated areas, vapor can easily accumulate and can cause unconsciousness and death due to displacement of oxygen. Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs. May cause pulmonary edema (fluid in the lungs.) Effects may be delayed. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. Excessive exposure may increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeats). Decreased lung function has been associated with overexposure to isocyanates. As product: The LC50 has not been determined.

SECTION 11 Toxicological information (continued)

Skin corrosion/irritation	Prolonged contact may cause moderate skin irritation with local redness. Material may stick to skin causing irritation upon removal. May stain skin.
Serious eye damage/eye irritation	May cause eye irritation. May cause slight temporary corneal injury.
Sensitization	Skin contact may cause an allergic skin reaction. Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization. May cause allergic respiratory reaction. MDI concentrations below the exposure guidelines may cause allergic respiratory reactions in individuals already sensitized. Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest. Occasionally, breathing difficulties may be life threatening.
Specific Target Organ Systemic Toxicity (Single Exposure)	May cause respiratory irritation. Route of Exposure: Inhalation.
Specific Target Organ Systemic Toxicity (Repeated Exposure)	Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols.
Carcinogenicity	Lung tumors have been observed in laboratory animals exposed to respirable aerosol droplets of MDI/Polymeric MDI (6 mg/m3) for their lifetime. Tumors occurred concurrently with respiratory irritation and lung injury. Current exposure guidelines are expected to protect against these effects reported for MDI.
Teratogenicity	In laboratory animals, MDI/polymeric MDI did not cause birth defects; other fetal effects occurred only at high doses which were toxic to the mother.
Mutagenicity	In vitro genetic toxicity studies were negative for component(s) tested. Genetic toxicity data on MDI are inconclusive. MDI was weakly positive in some in vitro studies; other in vitro studies were negative. Animal mutagenicity studies were predominantly negative.
Aspiration Hazard	Based on physical properties, not likely to be an aspiration hazard.

COMPONENTS INFLUENCING TOXICOLOGY

Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer

Acute inhalation toxicity	The LC50 has not been determined.

Diphenylmethane Diisocyanate, isomers and homologues

Acute inhalation toxicity	LC50, Rat, 4 Hour, dust/mist, 0.49 mg/l
For similar material(s)	2,4'-Diphenylmethane diisocyanate (CAS 5873-54-1). LC50, Rat, 4 Hour, Aerosol, 0.31 mg/l
For similar material(s)	4,4'-Methylenediphenyl diisocyanate (CAS 101-68-8). LC50, Rat, 1 Hour, Aerosol, 2.24 mg/l

SECTION 11 Toxicological information (continued)

Trans-1,3,3,3-Tetrafluoroprop-1-ene

Acute inhalation toxicity	Prolonged excessive exposure may cause adverse effects. In confined or poorly ventilated areas, vapor can easily accumulate and can cause unconsciousness and death due to displacement of oxygen. May cause respiratory irritation and central nervous system depression. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. Excessive exposure may increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeats).
-	LC50, Rat, 4 Hour, vapour, > 207000 ppm

4,4'-methylenediphenyl diisocyanate

Acute inhalation toxicity	LC50, Rat, 1 Hour, dust/mist, 2.24 mg/l
-	LC50, Rat, 4 Hour, vapour, > 207000 ppm

Tris(1-chloro-2-propyl) phosphate

Acute inhalation toxicity	LC50, Rat, 1 Hour, dust/mist, 2.24 mg/l
-	LC50, Rat, 4 Hour, dust/mist, > 7 mg/l

Carbon dioxide

Acute inhalation toxicity	In confined or poorly ventilated areas, vapor can easily accumulate and can cause unconsciousness and death due to displacement of oxygen. May cause central nervous system effects. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.
-	The LC50 has not been determined.

SECTION 12 Ecological information

12.1 Toxicity

Ecotoxicological information on this product or its components appear in this section when such data is available.

Toxicity-Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer

Acute toxicity to fish	Not expected to be acutely toxic to aquatic organisms.

Diphenylmethane Diisocyanate, isomers and homologues

Acute toxicity to fish	The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species. Material is not classified as dangerous to aquatic organisms (LC50/EC50/IC50/LL50/EL50 greater than 100 mg/L in most sensitive species). Based on information for a similar material: LC50, Danio rerio (zebra fish), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent.
Acute toxicity to aquatic invertebrates	Based on information for a similar material: EC50, Daphnia magna (Water flea), static test, 24 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent.
Acute toxicity to algae/ aquatic plants	Based on information for a similar material: NOEC, Desmodesmus subspicatus (green algae), static test, 72 Hour, Growth rate inhibition, 1,640 mg/l, OECD Test Guideline 201 or Equivalent.
Toxicity to bacteria	Based on information for a similar material: EC50, activated sludge, static test, 3 Hour, Respiration rates., > 100 mg/l
Toxicity to soil-dwelling organisms	EC50, Eisenia fetida (earthworms), Based on information for a similar material:, 14 d, > 1,000 mg/ kg
Toxicity to terrestrial plants	EC50, Avena sativa (oats), Growth inhibition, 1,000 mg/l EC50, Lactuca sativa (lettuce), Growth inhibition, 1,000 mg/l

SECTION 12 Ecological information (continued)

4,4'-methylenediphenyl diisocyanate

Acute toxicity to fish	The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species. Material is not classified as dangerous to aquatic organisms (LC50/EC50/IC50/LL50/EL50 greater than 100 mg/L in most sensitive species). Based on information for a similar material: LC50, Danio rerio (zebra fish), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent.
Acute toxicity to aquatic invertebrates	Based on information for a similar material: EC50, Daphnia magna (Water flea), static test, 24 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent.
Acute toxicity to algae/aquatic plants	Based on information for a similar material: NOEC, Desmodesmus subspicatus (green algae), static test, 72 Hour, Growth rate inhibition, 1,640 mg/l, OECD Test Guideline 201 or Equivalent.
Toxicity to bacteria	Based on information for a similar material: EC50, activated sludge, static test, 3 Hour, Respiration rates., > 100 mg/l
Toxicity to soil-dwelling organisms	EC50, Eisenia fetida (earthworms), Based on information for a similar material:, 14 d, > 1,000 mg/kg
Toxicity to terrestrial plants	EC50, Avena sativa (oats), Growth inhibition, 1,000 mg/l EC50, Lactuca sativa (lettuce), Growth inhibition, 1,000 mg/l

Tris(1-chloro-2-propyl) phosphate

Acute toxicity to fish	Material is not classified as dangerous to aquatic organisms. LC50, Lepomis macrochirus (Bluegill sunfish), static test, 96 Hour, 84 mg/l, OECD Test Guideline 203 or Equivalent.
Acute toxicity to aquatic invertebrates	ErC50, Pseudokirchneriella subcapitata (green algae), static test, 96 Hour, Growth rate inhibition, 82 mg/l, OECD Test Guideline 201 or Equivalent.
Toxicity to bacteria	EC50, activated sludge, Respiration inhibition, 3 Hour, 784 mg/l, OECD 209 Test.
Chronic toxicity to aquatic invertebrates	NOEC, Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, 32 mg/l LOEC, Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, > 32 mg/l

Carbon dioxide

Acute toxicity to fish	May decrease pH of aquatic systems to < pH 5 which may be toxic to aquatic organisms. LC0, Oncorhynchus mykiss (rainbow trout), 1 Hour, 240 mg/l, Method Not Specified.

Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer

Biodegradability	Expected to degrade slowly in the environment.

Diphenylmethane Diisocyanate, isomers and homologues

Biodegradability	In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates. 10-day Window: Not applicable Biodegradation: 0 % Exposure time: 28 d Method: OECD Test Guideline 302C or Equivalent.

Trans-1,3,3,3-Tetrafluoroprop-1-ene

Biodegradability	Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

SECTION 12 Ecological information (continued)

4,4'-methylenediphenyl diisocyanate

Biodegradability	In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates. 10-day Window: Not applicable Biodegradation: 0 % Exposure time: 28 d Method: OECD Test Guideline 302C or Equivalent.

Tris(1-chloro-2-propyl) phosphate

Biodegradability	Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability. 10-day Window: Fail Biodegradation: 14 % Exposure time: 28 d Method: OECD Test Guideline 301E or Equivalent 10-day Window: Not applicable Biodegradation: 95 % Exposure time: 64 d Method: OECD Test Guideline 302A or Equivalent.

Bioaccumulative potential

Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer
Bioaccumulation: In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Diphenylmethane Diisocyanate, isomers and homologues
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Reacts with water. In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas. Bioconcentration factor (BCF): 92 Cyprinus carpio (Carp) 28 d.

Trans-1,3,3,3-Tetrafluoroprop-1-ene
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Partition coefficient: n-octanol/water(log Pow): 1.6 Measured.

4,4'-methylenediphenyl diisocyanate
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Reacts with water. In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas. Bioconcentration factor (BCF): 92 Cyprinus carpio (Carp) 28 d.

Tris(1-chloro-2-propyl) phosphate
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).v Partition coefficient: n-octanol/water(log Pow): 2.59 Measured Bioconcentration factor (BCF): 0.8 - 4.6 Cyprinus carpio (Carp) 42 d Measured.

Carbon dioxide
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Partition coefficient: n-octanol/water(log Pow): 0.83 Measured.

Mobility in soil

Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer
In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Diphenylmethane Diisocyanate, isomers and homologues
In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Trans-1,3,3,3-Tetrafluoroprop-1-ene
Potential for mobility in soil is medium (Koc between 150 and 500) Partition coefficient(Koc): 180 Estimated.

SECTION 12 Ecological information (continued)

4,4'-methylenediphenyl diisocyanate
In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Tris(1-chloro-2-propyl) phosphate
Potential for mobility in soil is slight (Koc between 2000 and 5000).

Partition coefficient(Koc)
1300 Estimated.

Carbon dioxide
No relevant data found.

12.5 Results of PBT and vPvB assessment

Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer
This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Diphenylmethane Diisocyanate, isomers and homologues
This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

Trans-1,3,3,3-Tetrafluoroprop-1-ene
This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

4,4'-methylenediphenyl diisocyanate
This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

Tris(1-chloro-2-propyl) phosphate
This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Carbon dioxide
This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Other adverse effects
Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

Diphenylmethane Diisocyanate, isomers and homologues
This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

Trans-1,3,3,3-Tetrafluoroprop-1-ene
This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

4,4'-methylenediphenyl diisocyanate
This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

Tris(1-chloro-2-propyl) phosphate
This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

Carbon dioxide
This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

SECTION 13 Disposal considerations

13.1 Waste treatment methods
This product, when being disposed of in its unused and uncontaminated state should be treated as a hazardous waste according to EC Directive 2008/98/EC. Any disposal practices must be in compliance with all national and provincial laws and any municipal or local by-laws governing hazardous waste. For used, contaminated and residual materials additional evaluations may be required. Do not dump into any sewers, on the ground, or into any body of water. Incineration under approved, controlled conditions using incinerators suitable or designed for the disposal of hazardous chemical wastes, is the preferred method for disposal. Small quantities of waste may be pretreated for example with polyol, to neutralise prior to disposal. Empty drums should be decontaminated (see Section 6) and either punctured and scrapped or given to an approved drum reconditioner. The definitive assignment of this material to the appropriate EWC group and thus its proper EWC code will depend on the use that is made of this material. Contact the authorized waste disposal services.

14 Transport information

14.1 UN number
UN 3500

14.2 Proper shipping name
CHEMICAL UNDER PRESSURE, N.O.S.(Trans-1,3,3,3- Tetrafluoroprop-1-ene)

14.3 Class
2

14.4 Packing group
Not applicable
1

4.5 Environmental hazards
Not considered environmentally hazardous based on available data.

14.6 Special precautions for user
Hazard identification No: 20

Classification for SEA transport (IMO-IMDG):
1

4.1 UN number
UN 3500

14.2 Proper shipping name
CHEMICAL UNDER PRESSURE, N.O.S.(Trans-1,3,3,3- Tetrafluoroprop-1-ene)

14.3 Class
2.2

14.4 Packing group
Not applicable

14.5 Environmental hazards
Not considered as marine pollutant based on available data.

14.6 Special precautions for user
EmS: F-C, S-V

14.7 Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code
Consult IMO regulations before transporting ocean bulk.

14 Transport information (continued)

Classification for AIR transport (IATA/ICAO):

14.1 UN number
UN 3500

14.2 Proper shipping name
Chemical under pressure, n.o.s.(Trans-1,3,3,3-Tetrafluoroprop-1-ene).

14.3 Class
2.2

14.4 Packing group
Not applicable

14.5 Environmental hazards
Not applicable

14.6 Special precautions for user
No data available.

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15 Regulatory information

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

REACH Regulation (EC) No 1907/2006
This product contains only components that have been either pre-registered, registered, are exempt from registration or are regarded as registered according to Regulation (EC) No. 1907/2006 (REACH)., The aforementioned indications of the REACH registration status are provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. It is the buyer´s/user´s responsibility to ensure that his/her understanding of the regulatory status of this product is correct.

Restrictions on the manufacture, placing on the market and use
The following substance/s contained in this product is/are subject through Annex XVII of REACH regulation to restrictions on the manufacture, placing on the market and use when present in certain dangerous substances, mixtures and articles. Users of this product have to comply with the restrictions placed upon it by the aforementioned provision.

CAS-No.: 9016-87-9	Name: Diphenylmethane Diisocyanate, isomers and homologues

Restriction status: listed in REACH Annex XVII Restricted uses: See Annex XVII to Regulation (EC) no 1907/2006 for Conditions of restriction.

CAS-No.: 101-68-8	Name: 4,4'-methylenediphenyl diisocyanate

Restriction status: listed in REACH Annex XVII Restricted uses: See Annex XVII to Regulation (EC) no 1907/2006 for Conditions of restriction.

15.2 Chemical Safety Assessment
Not applicable.

SECTION 16 Other Information

Full text of H-Statements referred to under sections 2 and 3.
H302 Harmful if swallowed.
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.

Full text of R-phrases referred to under sections 2 and 3
R20 Harmful by inhalation.
R22 Harmful if swallowed.
R36/37/38 Irritating to eyes, respiratory system and skin.
R40 Limited evidence of a carcinogenic effect.
R42/43 May cause sensitisation by inhalation and skin contact.
R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) No 1272/2008
Skin Irrit. - 2 - H315 - Calculation method.
Eye Irrit. - 2 - H319 - Calculation method.
Resp. Sens. - 1 - H334 - Calculation method.
Skin Sens. - 1 - H317 - Calculation method.
Carc. - 2 - H351 - Calculation method.
STOT SE - 3 - H335 - On basis of test data.
STOT RE - 2 - H373 - Calculation method.

Product Literature
Additional information on this product may be obtained by calling your sales or customer service contact.

Legend
2006/15/ECEurope. Indicative occupational exposure limit values
ACGIHUSA. ACGIH Threshold Limit Values (TLV)
GB EH40UK. EH40 WEL - Workplace Exposure Limits
SEN Sensitizer
STEL Short-term exposure limit
TWA 8-hour, time-weighted average

Information Source and References
This SDS is prepared by Quantum Insulation Ltd from information supplied by DUPONT CHEMICAL COMPANY LIMITED. We urge each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.