



# Safety Data Sheet

Dow Chemical Company Ltd

Product Name: BETASEAL(TM) 1407

Revision Date: 2007/05/24

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Dow Chemical Company Ltd encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

## 1. Identification of the substance/preparation and of the company/undertaking

### Product Name

BETASEAL(TM) 1407

### Use of the substance/preparation

An adhesive -- For use in automotive applications.

### COMPANY IDENTIFICATION

Dow Chemical Company Ltd  
Diamond House, Lotus Park  
Kingsbury Crescent  
TW18 3AG Staines, Middlesex  
United Kingdom

Customer Information Number: 0203 139 4000

### EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: +44 (0) 1553 761 251

Local Emergency Contact: 00 44 155 37 61 251

## 2. Composition/information on ingredients

Component	Amount	Classification:	CAS #	EC #
Diisononyl phthalate	> 15.0 - < 25.0 %	Not classified.	28553-12-0	249-079-5
Methylenediphenyl diisocyanate (MDI)	> 0.1 - < 1.0 %	Xn: R20; Xi: R36/37/38; R42/43	26447-40-5	247-714-0
4,4'-Methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (MDI)	> 0.1 - < 1.0 %	Xn: R20; Xi: R36/37/38; R42/43	101-68-8	202-966-0

See Section 16 for full text of R-phrases.

## 3. Hazards Identification

May cause sensitization by inhalation.

\* Indicates a Trademark

## 4. First-aid measures

**Eye Contact:** Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist.

**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. This may also apply to other isocyanates. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands.

**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.

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

**Notes to Physician:** 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. Maintain adequate ventilation and oxygenation of the patient. If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

**Medical Conditions Aggravated by Exposure:** Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

## 5. Fire Fighting Measures

**Extinguishing Media:** Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective. Water fog, applied gently may be used as a blanket for fire extinguishment.

**Fire Fighting Procedures:** Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. 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. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently may be used as a blanket for fire extinguishment. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

**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.

**Unusual Fire and Explosion Hazards:** Product reacts with water. Reaction may produce heat and/or gases. Container may rupture from gas generation in a fire situation. Violent steam generation or

eruption may occur upon application of direct water stream to hot liquids. Dense smoke is produced when product burns.

**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. Carbon monoxide. Carbon dioxide. Combustion products may include trace amounts of: Hydrogen cyanide.

## 6. Accidental Release Measures

**Steps to be Taken if Material is Released or Spilled:** Absorb with materials such as: Cat litter. If available, use foam to smother or suppress. See Section 13, Disposal Considerations, for additional information.

**Personal Precautions:** Wear suitable protective equipment.

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

## 7. Handling and Storage

### Handling

**General Handling:** Provide adequate ventilation. Avoid contact with eyes, skin, and clothing. Use disposable containers and tools where possible. When using do not eat, drink or smoke.

### Storage

Keep container tightly closed and in a well-ventilated place. Avoid moisture.

**Storage temperature:**

5 - 35 °C

## 8. Exposure Controls / Personal Protection

### Exposure Limits

Component	List	Type	Value
Diisononyl phthalate	Ireland OELV	TWA	5 mg/m <sup>3</sup>
	UK WEL	TWA	5 mg/m <sup>3</sup>
4,4'-Methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (MDI)	Ireland OELV	TWA as NCO	0.02 mg/m <sup>3</sup> SEN
	Ireland OELV	STEL as NCO	0.07 mg/m <sup>3</sup> SEN
	ACGIH	TWA	0.005 ppm
	UK WEL	TWA as NCO	0.02 mg/m <sup>3</sup> SEN
	UK WEL	STEL as NCO	0.07 mg/m <sup>3</sup> SEN

Although some of the fillers used in this product may have exposure guidelines, no exposure would be expected under normal handling conditions because of the physical state of the material.

A "SEN" notation following the exposure guideline refers to the potential to produce sensitization, as confirmed by human or animal data.

### Personal Protection

**Eye/Face Protection:** Use safety glasses. Safety glasses should be consistent with EN 166 or equivalent. Eye wash fountain should be located in immediate work area.

**Skin 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. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly. Items which cannot be decontaminated, such as shoes, belts and watchbands, should be removed and disposed of properly.

**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: Natural rubber ("latex"). 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.

**Respiratory Protection:** Atmospheric levels should be maintained below the exposure guideline. When atmospheric levels may exceed the exposure guideline, use an approved air-purifying 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 positive-pressure 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.

**Ingestion:** Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

### Engineering Controls

**Ventilation:** Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Provide general and/or local exhaust ventilation to 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.

## 9. Physical and Chemical Properties

<b>Physical State</b>	Paste
<b>Color</b>	Black
<b>Odor</b>	Sweet
<b>Flash Point - Closed Cup</b>	> 200 °C <i>Vendor</i>
<b>Flammable Limits In Air</b>	<b>Lower:</b> No test data available <b>Upper:</b> No test data available
<b>Autoignition Temperature</b>	No test data available
<b>Vapor Pressure</b>	No test data available
<b>Boiling Point (760 mmHg)</b>	Not applicable.
<b>Vapor Density (air = 1)</b>	No test data available
<b>Specific Gravity (H<sub>2</sub>O = 1)</b>	1.356 <i>Vendor</i>
<b>Freezing Point</b>	No test data available
<b>Melting Point</b>	Not applicable
<b>Solubility in Water (by weight)</b>	No test data available
<b>pH</b>	Not applicable
<b>Dynamic Viscosity</b>	<i>Vendor</i> No test data available

## 10. Stability and Reactivity

### Stability/Instability

Stable under recommended storage conditions. See Storage, Section 7.

**Conditions to Avoid:** Some components of this product can decompose at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems. Avoid moisture. Material reacts slowly with water, releasing carbon dioxide which can cause pressure buildup and rupture of closed containers. Elevated temperatures accelerate this reaction.

**Incompatible Materials:** Reaction with water will generate heat. Avoid contact with: Acids. Alcohols. Amines. Water. Ammonia. Bases. Metal compounds. Moist air. Strong oxidizers. Reaction with water will generate carbon dioxide.

### Hazardous Polymerization

Will not occur.

### Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials. Gases are released during decomposition.

## 11. Toxicological Information

### Acute Toxicity

#### Ingestion

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. May cause abdominal discomfort or diarrhea. May cause nausea and vomiting. Single dose oral LD50 has not been determined.

#### Eye Contact

May cause eye irritation.

#### Skin Contact

Prolonged contact may cause slight skin irritation with local redness. Material may stick to skin causing irritation upon removal. May stain skin.

#### Skin Absorption

Prolonged skin contact is unlikely to result in absorption of harmful amounts. The dermal LD50 has not been determined.

#### Inhalation

At room temperature, exposure to vapor is minimal due to low volatility; vapor from heated material may cause respiratory irritation. For the minor component(s): MDI. Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs. May cause pulmonary edema (fluid in the lungs.) Decreased lung function has been associated with overexposure to isocyanates. Effects may be delayed. This material contains mineral and/or inorganic fillers. There is essentially no potential for inhalation exposure to these fillers incidental to industrial handling due to the physical state.

#### Sensitization

##### Skin

Skin contact may cause an allergic skin reaction. Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization.

##### Respiratory

A component in this mixture may cause an allergic respiratory response. 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.

#### Repeated Dose Toxicity

Contains component(s) which have been reported to cause effects on the following organs in animals: Kidney. Liver. Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols.

#### Chronic Toxicity and Carcinogenicity

Lung tumors have been observed in laboratory animals exposed to aerosol droplets of MDI/Polymeric MDI (6 mg/m<sup>3</sup>) 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. For the phthalate ester(s): Kidney effects and/or tumors have been observed in male rats. These effects are believed to be species specific and unlikely to occur in humans. Liver effects and/or tumors have been observed in rats. These effects are believed to be species specific and unlikely to occur in humans.

#### Developmental Toxicity

Contains component(s) which did not cause birth defects in animals; other fetal effects occurred only at doses toxic to the mother.

#### Reproductive Toxicity

For the phthalate ester(s): In laboratory animals, excessive doses toxic to the parent animals caused decreased weight and survival of offspring. There were no effects on fertility at any dose.

#### Genetic Toxicology

Contains a component(s) which was negative in In Vitro genetic toxicity studies. Contains component(s) which was negative in animal genetic toxicity studies. 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.

## 12. Ecological Information

### CHEMICAL FATE

Data for Component: **Diisononyl phthalate**

#### Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7). Expected to be relatively immobile in soil (Koc > 5000).

**Henry's Law Constant (H):** 1.49E-06 atm\*m<sup>3</sup>/mole; 25 °C Estimated

**Partition coefficient, n-octanol/water (log Pow):** 9.37 Estimated

**Partition coefficient, soil organic carbon/water (Koc):** > 5,000 Estimated

#### Persistence and Degradability

Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

#### OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
>= 68 %	24 h	OECD 302A Test
> 90 %	5.5 d	OECD 302B Test

Data for Component: **Methylenediphenyl diisocyanate (MDI)**

#### Movement & Partitioning

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

#### Persistence and Degradability

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.

Data for Component: **4,4'-Methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (MDI)**

#### Movement & Partitioning

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

#### Persistence and Degradability

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.

#### ECOTOXICITY

##### Data for Component: Diisononyl phthalate

Not expected to be acutely toxic to aquatic organisms.

##### Data for Component: Methylenediphenyl diisocyanate (MDI)

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 greater than 100 mg/L in most sensitive species).

##### **Toxicity to Soil Dwelling Organisms**

LC50, Earthworm Eisenia foetida, adult, 14 d: > 1,000 mg/kg

##### Data for Component: 4,4'-Methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (MDI)

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 greater than 100 mg/L in most sensitive species).

##### **Toxicity to Soil Dwelling Organisms**

LC50, Earthworm Eisenia foetida, adult, 14 d: > 1,000 mg/kg

### 13. Disposal Considerations

All disposal methods must be in compliance with the EU framework Directives 91/156/EEC, 91/689/EEC and their subsequent adaptations, as implemented in National Laws and Regulations, as well as EU Directives dealing with priority waste streams. Transboundary shipment of wastes must be in compliance with EU Regulation 259/93 and subsequent modifications.

**Treatment and disposal methods of used packaging:** Empty containers should be recycled or otherwise disposed of by an approved waste management facility. **CONTAMINATED PACKAGING:** Any disposal of contaminated packaging and washings must be in accordance with State, Territory and/or Local government regulations. After container has been cleaned and labelling has been removed, empty containers can be sent for recycling or disposal. If the container is to be reconditioned, the reconditioning company should be made aware of the nature of the original contents.

### 14. Transport Information

#### ROAD & RAIL

NOT REGULATED

#### OCEAN

NOT REGULATED

#### AIR

NOT REGULATED

#### INLAND WATERWAYS

NOT REGULATED

## 15. Regulatory Information

### European Inventory of Existing Commercial Chemical Substances (EINECS)

The components of this product are on the EINECS inventory or are exempt from inventory requirements.

### EC Classification and User Label Information

#### Hazard Symbol :

Xn - Harmful.

#### Risk Phrases :

R42 - May cause sensitization by inhalation.

#### Safety Phrases :

S23 - Do not breathe vapour/spray.

S36 - Wear suitable protective clothing.

S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S60 - This material and its container must be disposed of as hazardous waste.

**Contains:** 4,4'-Methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (MDI)  
Methylenediphenyl diisocyanate (MDI)

Contains isocyanates. See information supplied by the manufacturer.

## 16. Other Information

### Risk-phrases in Section 2

R20	Harmful by inhalation.
R36/37/38	Irritating to eyes, respiratory system and skin.
R42/43	May cause sensitization by inhalation and skin contact.

### Revision

Identification Number: 1009117 / 3005 / Issue Date 2007/05/24 / Version: 2.0

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

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