

# SAFETY DATA SHEET

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REVISION DATE: 07/07/1999  
REF: UR5041  
PART A

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

**Product name:** POLYURETHANE RESIN  
**Product code:** UR5041 PART A  
**Supplier:** ELECTROLUBE  
H.K. Wentworth Ltd.,  
Wentworth House, Blakes Road,  
Wargrave, Berkshire, RG10 8AW, United Kingdom.  
**Telephone (UK):** +44 (0) 118 9404031 **Fax No:** +44 (0) 118 9403084  
**Telephone (FR):** +33 (0) 148 15 4363  
**Telephone (DE):** +49 (0) 221 9355350

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

### Identification of the preparation

Chemical Name	CAS-No	EC-No	Class	Weight %
NON HAZARDOUS CONSTITUENTS				100

## 3. HAZARDS IDENTIFICATION

**Most important hazards:** Non hazardous  
**Specific hazards:** May cause slight eye/skin irritation. No hazards deemed to be of major importance. Health injuries are not known or expected under normal use.

## 4. FIRST AID MEASURES

**General advice:** No hazards which require special first aid measures  
**Inhalation:** If fumes from reactions are inhaled, move to fresh air immediately.  
**Skin contact:** Wash off immediately with soap and plenty of water. Wash contaminated clothing before re-use.  
**Eye contact:** Flush eye(s) immediately with plenty of water. If eye irritation persists, consult a specialist  
**Ingestion:** Consult a physician if necessary.

## 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media:** Extinguish with waterspray, dry chemical or alcohol foam  
**Extinguishing media which must not be used for safety reasons:** Not applicable  
**Specific hazards:** Standard procedure for chemical fires  
**Special protective equipment for firefighters:** Not applicable.  
**Specific methods:** Not applicable

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:** not required under normal use  
**Environmental precautions:** No special environmental precautions required  
**Methods for cleaning up:** Scrape-up.

**7. HANDLING AND STORAGE**

**Handling:** When using, do not eat, drink or smoke.  
**Storage:** No special storage conditions required. Keep containers tightly closed in a cool, well-ventilated place.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**Chemical Name:** **National occupational exposure limits:**  
**HSC(EH40)**

NON HAZARDOUS CONSTITUENTS

**Engineering measures:** Ensure adequate ventilation  
**Personal protection equipment:**  
- **Respiratory protection:** No personal respiratory protective equipment normally required  
- **Hand protection:** rubber gloves  
- **Eye protection:** safety glasses / goggles  
- **Skin and body protection:** Lab coat, gloves  
**Hygiene measures:** When using, do not eat, drink or smoke

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Form:** viscous liquid  
**Colour:** black  
**Odour:** aromatic  
**Boiling point/range:** >250 °C  
**Flash point:** > 128 °C  
**Relative density:** >= 1.17  
**Bulk density:** 1170 kg/m<sup>3</sup>  
**Solubility:**  
**Water solubility:** insoluble (g/l)  
**Viscosity:** 96,000 mPa.s

**10. STABILITY AND REACTIVITY**

**Stability:** Stable.  
**Conditions to avoid:** Keep away from open flames / hot surfaces  
**Materials to avoid:** acids, strong oxidizing agents, Isocyanates  
**Hazardous decomposition products:** No decomposition if stored and applied as directed

**11. TOXICOLOGICAL INFORMATION**

**Acute toxicity:** LD50/oral/rat = >2000mg/kg  
**Local effects:** Mild skin irritation  
**Sensitization:** Not applicable  
**Long term toxicity:** Not applicable  
**Chronic toxicity:** Chronic intensive skin contact may cause dermatitis

**12. ECOLOGICAL INFORMATION**

**Mobility:** slightly water contaminating  
**Persistence and degradability:** No data is available on the product itself  
**Bioaccumulation:** Not applicable  
**Ecotoxicity effects:** Not applicable

Product name: **POLYURETHANE RESIN**

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~~PART A~~

### 13. DISPOSAL CONSIDERATIONS

**Waste from residues / unused products:** Dispose of as special waste in compliance with the Control of Pollution (Special Waste) Regulations 1980.

**Contaminated packaging:** Not applicable.

### 14. TRANSPORT INFORMATION

**Proper shipping name** Not classified as dangerous in the meaning of transport regulations.

### 15. REGULATORY INFORMATION

**Classification according to European directive on classification of hazardous preparations 90/492/EEC**

- Contains:
- Symbol(s):

**R-phrase(s):**

**S-phrase(s):** S2 - Keep out of reach of children. S3 - Keep in a cool place.

### 16. OTHER INFORMATION

**Revision number:** 3

**Further information:** CN no. 39073000

Contact Name: Carolyn Booth

Department: Technical

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process unless specified in the text.

# SAFETY DATA SHEET

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REF: UR5041  
PART B

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

**Product name:** POLYURETHANE RESIN  
**Product code:** UR5041 PART B  
**Supplier:** ELECTROLUBE  
H.K. Wentworth Ltd.,  
Wentworth House, Blakes Road,  
Wargrave, Berkshire, RG10 8AW, United Kingdom.  
**Telephone (UK):** +44 (0) 118 9404031 **Fax No:** +44 (0) 118 9403084  
**Telephone (FR):** +33 (0) 148 15 4363  
**Telephone (DE):** +49 (0) 221 9355350

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

### Identification of the preparation

Chemical Name	CAS-No	EC-No	Class	Weight %
~DIPHENYLMETHANE-4,4'-DI-ISOCYANANTE ~	101-68-8	202-966-0	Xn; R20 Xi; R36/37/38 R42	> 50
NON HAZARDOUS CONSTITUENTS				< 50

## 3. HAZARDS IDENTIFICATION

**Most important hazards:** Harmful.  
**Specific hazards:** Harmful by inhalation. Irritating to eyes, respiratory system and skin. May cause sensitization by inhalation and skin contact. Inhalation of vapours may cause irritation of the respiratory system in very susceptible persons - breathing difficulties / asthma.

## 4. FIRST AID MEASURES

**General advice:** Remove from exposure, lie down.  
**Inhalation:** Move to fresh air. Consult a physician after significant exposure. Watch victim for at least 48 hours because of possible delayed signs of poisoning.  
**Skin contact:** Remove contaminated clothing immediately and wash affected skin with soap and water. If skin irritation persists, call a physician.  
**Eye contact:** Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
**Ingestion:** Do not induce vomiting. Call a physician immediately. Do not give milk / water.

## 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media:** Extinguish with dry chemical or foam.  
**Extinguishing media which must not be used for safety reasons:** high volume water jet  
**Specific hazards:** Burning produces irritant fumes : nitrogen oxides (NOx), hydrogen cyanide (hydrocyanic acid)

**Special protective equipment for firefighters:** In the event of fire, wear self-contained breathing apparatus.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:** Avoid contact with skin, eyes and clothing.  
**Environmental precautions:** Do not flush into surface water or sanitary sewer system.  
**Methods for cleaning up:** Absorb in earth or sand and remove to a safe place. Shovel into suitable container for disposal.

## 7. HANDLING AND STORAGE

**Handling:** Avoid contact with the skin and the eyes. When using, do not eat, drink or smoke. Do not breath vapours or spray mist.  
**Storage:** Store in original container.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Chemical Name:** ~DIPHENYLMETHANE-4,4'-DI-ISOCYANANTE ~  
**National occupational exposure limits:**  
**HSC(EH40)**  
(MEL) Isocyanates: Long term (8 hrs) = 0.02 mgm<sup>-3</sup>  
Short term (15 min) = 0.07 mgm<sup>-3</sup>

NON HAZARDOUS CONSTITUENTS

**Engineering measures:** Ensure adequate ventilation, especially in confined areas.  
**Personal protection equipment:**  
- **Respiratory protection:** not required under normal use.  
- **Hand protection:** solvent-resistant gloves (butylrubber)  
- **Eye protection:** safety glasses with side-shields / goggles  
- **Skin and body protection:** Lab coat / lightweight protective clothing.  
**Hygiene measures:** Wash hands before breaks and immediately after handling the product.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Form:** liquid  
**Colour:** amber  
**Odour:** musty  
**Melting point/range:** < 15 °C  
**Flash point:** >200 °C  
**Autoignition temperature:** >530 °C  
**Vapour pressure:** ( 25 °C) 1.3 x 10<sup>-4</sup> hPa  
**Relative density:** ( 25 °C) >= 1.23  
**Bulk density:** 1230 kg/m3  
**Solubility:**  
**Water solubility** insoluble (g/l)  
**Viscosity:** 500 mPa.s

## 10. STABILITY AND REACTIVITY

**Stability:** Stable. Exothermic reaction with strong acids, bases, ammonia, amines, water, alcohols.  
**Conditions to avoid:** Keep away from heat.  
**Materials to avoid:** acids, alcohols, bases, amines, copper / copper alloys.  
**Hazardous decomposition products:** No decomposition if stored and applied as directed.

Product name: **POLYURETHANE RESIN****11. TOXICOLOGICAL INFORMATION**

<b>Acute toxicity:</b>	LD50/oral/rat = >2000mg/kg LC50/inhalation/4h/rat = 490mg / m <sup>3</sup>
<b>Local effects:</b>	May cause skin irritation and/or dermatitis
<b>Sensitization:</b>	May cause sensitization of susceptible persons by skin contact
<b>Long term toxicity:</b>	No hazards deemed to be of major importance
<b>Chronic toxicity:</b>	Not applicable

**12. ECOLOGICAL INFORMATION**

<b>Mobility:</b>	not significant
<b>Persistence and degradability:</b>	Not readily biodegradable.
<b>Bioaccumulation:</b>	not significant
<b>Ecotoxicity effects:</b>	Aquatic toxicity is unlikely due to low solubility.

**13. DISPOSAL CONSIDERATIONS**

<b>Waste from residues / unused products:</b>	Contact waste disposal services. Can be incinerated, when in compliance with the Environment Protection Act 1990 (Process Guidance Note IPR5/1).
<b>Contaminated packaging:</b>	In accordance with local and national regulations.

**14. TRANSPORT INFORMATION**

**Proper shipping name** Not classified as dangerous in the meaning of transport regulations

**15. REGULATORY INFORMATION**

**Classification according to European directive on classification of hazardous preparations 90/492/EEC**

- **Contains:** Diphenylmethane-4,4-diisocyanate
- **Symbol(s):**



Harmful

**R-phrases:** R20 - Harmful by inhalation. R36/37/38 - Irritating to eyes, respiratory system and skin.. R42 - May cause sensitization by inhalation.

**S-phrases:** S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.. S28 - After contact with skin, wash immediately with plenty of water. S38 - In case of insufficient ventilation, wear suitable respiratory equipment. S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)..

**16. OTHER INFORMATION**

<b>Revision number:</b>	3
<b>Further information:</b>	CN no. 39095090 Contact Name: Carolyn Booth Department: Technical

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# Technical Data Sheet



<b>PRODUCT DESCRIPTION:</b>	<b>UR5041 Polyurethane Resin</b>	<b>DATE:</b>	<b>02/96</b>
<b>PRODUCT CODE:</b>	<b>UR5041</b>	<b>PAGES:</b>	<b>2</b>

## PRODUCT DESCRIPTION

**UR5041** is an ultra-high performance resin system based on urethane technology but using a polybutadiene polyol.

## MAIN FEATURES

- \* High Toughness and Tear Resistance
- \* Excellent Oxidation Resistance
- \* Low Moisture Sensitivity during Cure
- \* Low Water Absorption and High Resistance to Sea Water
- \* Good Adhesion to most Substrates
- \* Above Properties Retained at Low Temperatures (Down to -60°C)

The combination of properties make the **UR5041** system ideally suited for use in harsh marine environments both for coating and other applications.

**UR5041** can be supplied in both bulk or Resinpack form. Resinpacks are especially useful for resin applications which involve use on site. **UR5041** is a slower cure, longer usable life version of **UR5000**.

## PRODUCT USE

**UR5041** has been formulated to give little or no sedimentation if stored correctly (i.e. between 20 - 30°C). If sedimentation occurs then the material should be rolled or the sediment re-mixed with the use of a spatula or other similar instrument. On no account should any material be removed if sedimentation has occurred and not been re-mixed. In Resinpack form sedimentation offers no problem since the sediment is re-mixed when the pack is mixed.

In bulk form the Resin (Part A) should be mixed with the Hardener (Part B) in the ratio:

3.62 : 1 by weight  
3.78 : 1 by volume

Automatic mixing equipment is available from **Electrolube Design Resins** which will accurately mix resin and hardener in the correct proportions without introducing air.

Bulk material or Resinpacks must be thoroughly mixed before use - incomplete mixing will result in erratic or even partially incomplete cure.

If in Resinpack form do not remove the aluminium laminate outer wrap until immediately before use. Cut the aluminium outer being very careful not to damage the inner pack. Remove the clip from the inner pack (grip each end of the pack and pull gently) and move the contents around inside the pack until thoroughly mixed. Take special care to push unmixed material from the corners. Mixing normally takes from two to four minutes depending on the skill of the operator. Resin and hardener are evacuated prior to packing so the system is ready for use immediately after mixing. The corner may be cut from the pack so that it may be used as a simple dispenser.

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**UR5041**

**TYPICAL PROPERTIES OF SYSTEM**

Density of Resin	1.17 g/ml
Colour of Resin	Black
Density of Hardener	1.22 g/ml
Colour of Hardener	Orange
Density of Mixed System	1.18 g/ml
Colour of Mixed System	Black
Viscosity of Resin	93 poise
Viscosity of Hardener	0.55 poise
Viscosity of Mixed System	25 poise
Usable Life*	~20 minutes
Gel Time*	~60 minutes
Tack Free Cure Time*	~8 hours
Cure Time (minimum)	36 hours

\*Dependant upon quantity and temperature. These figures are typical of 150g mass @ 23°C.

**TYPICAL CURED PROPERTIES**

Shore A Hardness	~85
Elongation at Break	200%
Tensile Strength	10 MPa
Tear Strength	35 MPa
Volume Resistivity	$4 \times 10^{15}$
Dielectric Strength	20 kV/mm
Permittivity (20°C @ 50 Hz)	3.1
Loss Tangent 20°C @ 50 Hz)	0.015

**HEALTH & SAFETY NOTES**

Machines, containers etc. are more easily cleaned before the resin has been allowed to harden. **Electrolube Design Resins OP9004** is a relatively safe non-flammable Cleaner for this purpose. Cured resin may be slowly softened and removed by soaking in **OP9003** Resin Stripper.

Resinpacks stored in a cool dry place have a shelf life of at least 12 months providing the aluminium laminate outers have not been removed or damaged. Bulk material stored in original unopened containers will also have a shelf life of at least 12 months. The material should be stored as close to 25° C as possible to minimise crystallisation of the hardener. Serious deterioration of the hardener will rapidly occur at temperatures below 15°C.

The main hazard of the **UR5041** system is associated with the Part B (Isocyanate Hardener). This is based on diphenylmethane diisocyanate (MDI) which is much less toxic than most other isocyanates. Avoid skin and eye contact by use of gloves, overalls and safety glasses or goggles. Wash any contamination from the skin immediately. Take care not to contaminate food-stuffs. MDI has low volatility and the TLV for the material is only likely to be approached if the material is sprayed or heated. **DO NOT HEAT THE ISOCYANATE** (Part B) or do anything likely to introduce a large number of fine droplets into the atmosphere.

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