

MATERIAL SAFETY DATA SHEET
GLOBAL RESIN PU200
RESIN

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: PU200 RESIN
PART NUMBER: RL200
SUPPLIER: Global Resins
Unit 6. Corsham Commercial Center
Potley Road
Corsham, Wiltshire, England

TELEPHONE: 01225 812201
FAX: 01225 812202
CONTACT: Mr. Mark Hempleman

2. COMPOSITION/INFORMATION ON INGREDIENTS:

COMPOSITION COMMENTS:
Any hazardous components, both singularly and accumulatively are below the concentrations at which they need to be declared or classified.

3. HAZARDOUS IDENTIFICATION

Not regarded as a health or environmental hazard under current legislation

4. FIRST AID MEASURE:

GENERAL: Using appropriate personnel protective equipment, immediately remove the effected person from the source of contamination.

INHALATION: Provide rest, warmth and fresh air. Get medical attention if any discomfort continues

INGESTION: DO NOT INDUCE VOMITING!
NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS!
Get Medical Attention.

SKIN: Skin contact is relatively harmless, although prolong exposure may lead to reddening. Wash the product off with soap or detergent and warm water. Contact physician if irritation continues.

EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:
USE: Water spray, fog or mist. Carbon dioxide (CO2), dry chemicals, sand, dolomite etc., foam.

SPECIAL FIRE FIGHTING PROCEDURES:
Keep run off water out of sewers and water sources. Dike for water control. Retain expended liquids from fire fighting for later disposal.

UNUSUAL FIRE & EXPLOSION HAZARDS:

Fire causes formation of toxic gases

HAZARDOUS DECOMP. PRODUCTS:

Fire or high temperatures create: Carbon monoxide (CO). Carbon Dioxide (CO₂)

PROTECTIVE MEASURES IN FIRE:

Wear self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES:

PERSONAL PRECAUTION IN SPILL:

No special provisions are required or personal protective equipment, although wear sensible industrial clothing and launder as soon as possible.

PRECAUTIONS TO PROTECT ENVIRONMENT:

Prevent the product from entering drains, surface and ground water. This product has no long term environmental effect.

SPILL CLEANUP METHODS:

Absorb in vermiculite, dry sand or earth and place into containers.

7. HANDLING AND STORAGE:

USAGE PRECAUTION:

No Specific usage precautions noted.

STORAGE PRECAUTIONS:

Chemical storage

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:

INGREDIENT COMMENTS:

No exposure limits noted for ingredient(s).

PROTECTIVE EQUIPMENT:

Eye glasses and rubber gloves

PROCESS CONDITIONS:

Provide eyewash station

VENTILATION: Provide adequate general and local exhaust ventilation

RESPIRATORS: No specific recommendations made, but respiratory protection may still be required under exceptional circumstances when excessive air contamination exists. If the product is to be machined then an appropriate dust respirator must be worn.

PROTECTIVE GLOVES: Rubber or plastic

EYE PROTECTION: Wear approved chemical safety goggles where eye exposure is reasonably probable.

OTHER PROTECTION:

Wear sensible overalls. If handling hot product the use of a non absorbent apron may be advisable.

HYGIENIC WORK PRACTICES:

Wash at the end of each work shift and before eating, smoking and using the toilet. Promptly remove any clothing that becomes contaminated. Use appropriate skin cream to prevent drying skin. No eating or drinking while working with this material. **DO NOT SMOKE IN THE WORK AREA!**

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	High viscosity liquid blend
COLOR:	Concrete or Black
ODOR/TASTE:	Odorless or no characteristic odor
SOLUBILITY DESCRIPTION:	Slightly soluble in water
VOLATILITY DESCRIPTION:	Emits vapors during heating

10. STABILITY AND REACTIVITY:

STABILITY: No particular stability concerns

CONDITIONS TO AVOID:
Exothermic reaction with isocyanate

HAZARDOUS POLYMERIZATION:
Will not polymerize

MATERIALS TO AVOID:
Acids, Alkalies, Isocyanate

HAZARDOUS DECOMP. PRODUCTS:
Fire or high temperatures create: Carbon monoxide (CO) Carbon dioxide (CO₂)

11. TOXICOLOGICAL INFORMATION:

INHALATION: No data concerning acute health effects via inhalation have been identified

INGESTION: The acute and chronic effects to humans of this product via ingestion are not known.

SKIN: Usually there is little effect, prolonged contact may lead to reddening, especially on sensitive skin

EYES: No long term damage is envisaged, although any eye contact should be flushed away immediately

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:
Not regarded as dangerous to the environment

DEGRADABILITY:
Not readily biodegradable.

13. DISPOSAL CONSIDERATIONS:

Resin Page 4 of 11

GENERAL/CLEANING: Small amounts of product can be cleaned up using hot water and detergent.

DISPOSAL METHODS: Dispose of in accordance with local authority requirements.

14. TRANSPORT INFORMATION:

LABEL FOR CONVEYANCE

General: Not classified as hazardous under transport regulations. Keep separate from foods.

ROAD TRANSPORT: N/A

RAIL TRANSPORT:

SEA TRANSPORT:

AIR TRANSPORT:

15. REGULATORY INFORMATION:

RISK PHRASES: Not Classified

SAFETY PHRASES: S-2 Keep out of reach of children, S-45 in case of accident or if you feel unwell seek medical attention immediately (show the label where possible).

UK REGULATORY REFERENCES: Chemicals (Hazard Information & Packing) Regulations 1993. Health and Safety at Work Act 1974. The Control of Substances Hazardous to Health Regulations 1988.

EU DIRECTIVES: Dangerous Preparations Directive 88\379. System of specific information relating to dangerous preparations 91\155.

STATUTORY INSTRUMENTS: Chemicals (Hazard Information & Packing) Regulations. Control of Substances hazardous to health.

APPROVED CODE OF PRACTICE: Safety data sheets for substances and preparations L37. Classification and labeling of substances and preparations dangerous for supply

GUIDANCE NOTES: Occupational Exposure limits EH40. Introduction to local exhaust ventilation HS(G)37. CHIP for everyone HSG(108).

16. OTHER INFORMATION:

USER NOTES: IT SHOULD BE NOTED THAT THIS PRODUCT IS INTENDED FOR USE WITH A HARDENER DESIGNATED BY GLOBAL RESINS. THE CORRESPONDING SAFETY DATA FOR THAT HARDENER MUST BE STUDIED ALONG WITH THE DATA ON THE SHEET PRIOR TO USE. USING HARDENERS WHICH HAVE NOT BEEN SUPPLIED AND OR RECOMMENDED BY GLOBAL RESINS FOR USE WITH THIS PRODUCT IS POTENTIALLY HAZARDOUS AND SHOULD NOT BE CONTEMPLATED.

Safety instructions and operating procedures for specified tasks must be written, communicated and enforced. These will include:

**Provisions of hazard information and training of personnel based on operating procedures and safety data sheets, together with instructions on how to avoid exposure.

**Assessment of the risk of exposure and contact after all reasonable practical steps have been taken to avoid exposure. Selection and provision of suitable personnel protective equipment and implementation of an appropriate program.

**Provisions of facilities for washing, storage of clothing and skin care and promotion of their use.

**Close supervision to identify failure in the performance of process controls or in following operating instructions. The occurrence of irritations and inadequate use of personal protective equipment. Assessment should also be made of the need for industrial hygiene and medical surveillance and provision of appropriate service.

This Safety Data Sheet was compiled using information gathered concerning its individual components. No synergistic effects are known to us but we cannot exclude the existence of such effects.

If this product is to be machined in any way then the toxicological information in section 11 and the information concerning respiratory protection in section 8 should be noted.

REVISION COMMENTS: This safety data sheet supersedes all previous sheets before March 1997

REVISION DATE: 5/29/97, Reprint 11/12/99

SDS NO: KL/RL200BK/001

All information given here is based on current knowledge and experience and is believed to be accurate. It is given without acceptance for loss or damage attributable to reliance upon this information as conditions of use lie outside our control. The purpose of this safety data sheet is to describe the product in terms of its safety requirements. The data does not signify any warranty with regard to the products properties. No statements shall be understood as to recommending the use of any product in conflict of any patent.

MATERIAL SAFETY DATA SHEET
GLOBAL RESIN PU200
HARDENER

Hardener Page 6 of 11

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: PU200 RESIN
PART NUMBER: HL200- Hardener
SUPPLIER: Global Resins
Unit 6, Corsham Commercial Center
Potley Road
Corsham, Wiltshire, England

TELEPHONE: 01225 812201
FAX: 01225 812202
CONTACT: Mr. Mark Hempleman

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME:	CAS No:	CONTENT:	HEALTH:	RISK:
Diphenylmethanediisocyanate - Isomers & Homologues	9016-87-9	60-100%	Xn	20,36/37/38.42

3. HAZARDOUS IDENTIFICATION:

Harmful by inhalation. Irritating to eyes, respiratory system and skin. May cause sensitization by inhalation

4. FIRST AID MEASURE:

GENERAL: Using appropriate personal protective equipment, immediately remove the effected person from the source of contamination.

INHALATION: Move the exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Keep the affected person warm and at rest. Get prompt medical attention.

INGESTION: Get Medical Attention. immediately! Drink plenty of water and if possible active carbon (carbon suspension) DO NOT INDUCE VOMITING!
NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS!

SKIN: Immediately remove contaminated clothing. Wash skin thoroughly with soap and water. Contact Physician if irritation continues.

EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:
Dry chemicals, sand, dolomite, etc. Alcohol resistant foam.
Carbon Dioxide (CO2)
Do not use high volume water jet.

SPECIAL FIRE FIGHTING PROCEDURES:

Keep run off water out of sewers and water sources. Dike for water control. Move container from fire area if it can be done without risk. If risk of water pollution occurs, notify appropriate authorities. Keep up wind to avoid fumes.

UNUSUAL FIRE & EXPLOSION HAZARDS:

May develop highly toxic or corrosive fumes if heated.

HAZARDOUS DECOMP. PRODUCTS:

Toxic gases/vapors/fumes/of: Ammonia or amines. Carbon monoxide (CO). Hydrogen cyanide (HCN) Nitrous gases (Nox). Carbon Dioxide (CO2) isocyanates

6. ACCIDENTAL RELEASE MEASURES:

SPILL CLEANUP METHODS:

Extinguish all ignition sources. Avoid sparks, flames heat and smoking. Ventilate. Runoff release to sewer, waterway or ground is forbidden. Inform Authorities if large amounts are involved. Cleanup personnel should use respiratory and or liquid contact protection. Absorb in vermiculite, dry sand or earth and place into containers. Containers with collected spillage must be properly labeled with correct contents and hazard symbol. Wash thoroughly after dealing with spillage.

7. HANDLING AND STORAGE:

USAGE PRECAUTION:

Avoid spilling, skin and eye contact. Keep away from heat, sparks and open flame. Ventilate well, avoid breathing vapors. Use approved respirator if air contamination is above accepted level. Wear full protective clothing for prolonged exposure and or high concentrations. Do not use contact lenses. Avoid contact with water, alcohols, amines, other materials that may react with isocyanates.

STORAGE PRECAUTIONS:

May attack some plastics, rubber and coatings. Store in locked, well ventilated room and isolated from acids. Store between 15°C and 25°C

STORAGE CRITERIA:

Misc. hazardous material storage.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:

INGREDIENT NAME:	CAS No:	STD:	LT EXP. 8HRS:	ST EXP. 15 MIN:
Diphenylmethanediisocyanate - Isomers & Homologues	9016-87-9	MEL	0.02 mg/m3	0.08 mg/m3

INGREDIENT COMMENTS:

MEL = Maximum Exposure Limit

VENTILATION: Provide adequate general and local exhaust ventilation

RESPIRATORS: No specific recommendations made, but respiratory protection must be used if the general level exceeds the Occupational Exposure Level (OEL)

PROTECTIVE GLOVES: Use protective gloves made of: Rubber or plastic

EYE PROTECTION: Wear splash-proof eye goggles to prevent any possibility of eye contact. Contact lenses should not be worn when working with this chemical!

OTHER PROTECTION:

Use engineering controls to reduce air contamination to permissible exposure level. Provide eyewash station & safety shower. Wear appropriate clothing to prevent any possibility of skin contact.

HYGIENIC WORK PRACTICES:

DO NOT SMOKE IN THE WORK AREA! No eating or drinking while working with this material. Wash at the end of each work shift, before eating, smoking and using the toilet. Wash promptly if skin becomes contaminated. Change work clothing daily if contamination is reasonably probable. Promptly remove any clothing that becomes contaminated. Contaminated clothing to be placed in closed container until disposal or decontamination. Warn cleaning personnel of hardeners properties.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Liquid
COLOR:	Amber
ODOR/TASTE:	Odorless or no characteristic odor
SOLUBILITY DESCRIPTION:	Slightly soluble in water
VOLATILITY DESCRIPTION:	Emits vapors, especially during heating

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable, Avoid: Heat, sparks and flames.

CONDITIONS TO AVOID:

Avoid heat. Take necessary action to avoid static electric discharge.

MATERIALS TO AVOID:

Acids, oxidizing. Acids, non oxidizing. Acids-organic. Bases, Alkalies (inorganic), Alcohols, glycols.

HAZARDOUS DECOMP. PRODUCTS:

Toxic gases/vapors/fumes/of: Ammonia or amines. Carbon monoxide (CO). Hydrogen cyanide (HCN) Nitrous gases (Nox). Carbon Dioxide (CO2) isocyanates

11. TOXICOLOGICAL INFORMATION:

HEALTH HAZARDS, GENERAL: Symptoms can be delayed e.g. coughing, shortness of breath, tightness in the chest

INHALATION: Occupational Asthma (of which isocyanates can be cause) is a reportable disease listed in the RIDDOR regulations (UK)

HEALTH WARNINGS:

Hardener can be hazardous when inhaled and or touched. This chemical may cause skin/eye irritation and burns (corrosive). Pulmonary sensitizer. Severe pulmonary irritant. Recognized allergen.

It is advisable to follow a careful selection procedure for personnel working with products which are or contain respiratory sensitizers. The following criteria should be seriously considered:

** People with chronic lung disease, a history of bronchial problems, a history of allergy problems associated with asthma should not be allowed to work with this product unless a doctors permission has been obtained.

**It is important that employees receive basic information about the materials they are working with and understand the nature of their hazards and the reason for the recommended handling precautions and procedures.

Repeated exposure may cause chronic upper respiratory irritation, asthma, pulmonary sensitization. Acute eczematous dermatitis, contact type erythema, edema, papules, vesicles, bullae, crusts, desquamation.

Hardener Page 9 of 11

ROUTE OF ENTRY:

Inhalation, ingestion, skin and or eye contact

TARGET ORGANS:

Eyes, respiratory system, lungs, skin

MEDICAL SYMPTOMS:

Extreme irritation of eyes and mucous membranes, including burning and tearing. Rhinitis (inflammation of the nasal mucous membranes), Epistaxis (nose bleeding) Pharyngitis (inflammation of the back of the mouth), Severe pulmonary irritation, general respiratory distress, unproductive cough, severe skin irritation, nausea, vomiting, severe abdominal pain.

MEDICAL CONSIDERATIONS:

Skin disorders and allergies. Asthma or any condition giving rise to impaired lung function. If employees develop chronic respiratory irritation, unproductive cough or asthma symptoms they should be removed from all work involving this and analogous products. Continuous medical attention is advised until a complete cure is confirmed. Resumption of duties should not be permitted without a Doctors permission. Employees who do not respond to medical treatment or who have recurring respiratory problems should be transferred to other work.

If respiratory irritation occurs despite precautions, sensitization may have developed. The employee should be removed from all further exposure to this and analogous products & not allowed to resume usual duties without medical permission. It may be necessary to transfer the person to another job.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:

Do not allow to escape into waters, wastewater or soil. This product reacts with water at the interface forming carbon dioxide and a solid insoluble product with a high melting point (polyurea). This reaction is accelerated by surfactant or by water-soluble solvents.

DEGRADABILITY:

Not readily biodegradable.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS: Incinerate with provision for removal of effluent gases by scrubber. Dispose of in accordance with local authority requirements.

14. TRANSPORT INFORMATION:

LABEL FOR CONVEYANCE

GENERAL: Not classified as hazardous under transport regulations. Irritating to skin and mucous membranes. Keep separate from foods.

ROAD TRANSPORT: N/A

RAIL TRANSPORT:

SEA TRANSPORT:

AIR TRANSPORT:

15. REGULATORY INFORMATION:

UK REGULATORY REFERENCES:	Chemicals (Hazard Information & Packing) Regulations 1993. Health and Safety at Work Act 1974. The Control of Substances Hazardous to Health Regulations 1988.
EU DIRECTIVES:	Diphenylmethane diisocyanate is a substance covered by the EC-directive 82\501\EEC of 24/6/82, including subsequent amendments, concerning the risks of major accidents in certain industrial activities. Dangerous Preparations Directive 88\379. System of specific information relating to dangerous preparations 91\155.
STATUTORY INSTRUMENTS:	Chemicals (Hazard Information & Packing) Regulations. Control of Substances hazardous to health.
APPROVED CODE OF PRACTICE:	Safety data sheets for substances and preparations L37. Classification and labeling of substances and preparations dangerous for supply
GUIDANCE NOTES:	Occupational Exposure limits EH40. Introduction to local exhaust ventilation HS(G)37. CHIP for everyone HSG(108). Isocyanates toxic hazards and precautions EH16.

16. OTHER INFORMATION:

USER NOTES: IT SHOULD BE NOTED THAT THIS PRODUCT IS INTENDED FOR USE WITH A HARDENER DESIGNATED BY GLOBAL RESINS. THE CORRESPONDING SAFETY DATA FOR THAT HARDENER MUST BE STUDIED ALONG WITH THE DATA ON THE SHEET PRIOR TO USE. USING HARDENERS WHICH HAVE NOT BEEN SUPPLIED AND OR RECOMMENDED BY GLOBAL RESINS FOR USE WITH THIS PRODUCT IS POTENTIALLY HAZARDOUS AND SHOULD NOT BE CONTEMPLATED.

Safety instructions and operating procedures for specified tasks must be written., communicated and enforced. These will include:

**Provisions of hazard information and training of personnel based on operating procedures and safety data sheets, together with instructions on how to avoid exposure.

**Assessment of the risk of exposure and contact after all reasonable practical steps have been taken to avoid exposure. Selection and provision of suitable personnel protective equipment and implementation of an appropriate program.

**Provisions of facilities for washing, storage of clothing and skin care and promotion of their use.

**Close supervision to identify failure in the performance of process controls or in following operating instructions. The occurrence of irritations and inadequate use of personal protective equipment. Assessment should also be made of the need for industrial hygiene and medical surveillance and provision of appropriate service.

It is statutory requirement that medical supervision is carried out when using products which can cause an unidentifiable disease. There is a reasonable likelihood that the disease may occur under the particular condition of work and there are valid techniques for detecting indications of the disease.

In all area's where MDI aerosols and or vapor concentrations are produced exhaust ventilation must be provided in such a way the OEL is not exceeded. Industrial experience has shown that, in general, MDI

polymers produce very low concentrations of airborne isocyanate if the product is stored, handled and used in accordance with good industrial hygiene practices.

Hardener Page 11 of 11

Di-isocyanate processes may have to be registered with the local authority or HMIF as laid down in the Environmental Protection Regulations 1991 (UK).

This Safety Data Sheet was compiled using information gathered concerning its individual components. No synergistic effects are known to us but we cannot exclude the existence of such effects.

INFORMATION SOURCES:

Dangerous Properties of Industrial Materials Report N.Sax et.al. Crooner's: Emergency Spillage Guide. Crooner's: Emergency First Aid. Crooner's: Dangerous Substances. OSHA Air Contaminates - Permissible Exposure Limits (Title 29) Hazardous Materials. Emergency Response Guidebook. DOT-P5800.3. 1984. NIOSH/OSHA Pocket Guide to Chemical Hazards. 1978. Threshold Limit Values and Biological Exposure Indices for 1985-86. Chemical Safety Data Guide. Bureau of National Affairs. 1985.

REVISION COMMENTS: This safety data sheet supersedes all previous sheets before March 1997

REVISION DATE: 5/27/97, Reprint 11/12/99

SDS NO: KL/HL200NC/001

All information given here is based on current knowledge and experience and is believed to be accurate. It is given without acceptance for loss or damage attributable to reliance upon this information as conditions of use lie outside our control. The purpose of this safety data sheet is to describe the product in terms of its safety requirements. The data does not signify any warranty with regard to the products properties. No statements shall be understood as recommending the use of any product in conflict of any patent.