Overalls and heavy-duty aprons: Overalls are essential for all operators engaged in continuous or repetitive processes. In some instances heavy-duty plastics or rubber aprons may be required for added protection. Overalls should be changed frequently and regularly, except for laundering, overalls should not be cleaned in the place of work. Laundering should be arranged for by site administration. If overalls or personal clothing become contaminated with the uncured product, the affected garments should be replaced with out delay. Removing the garments needs care to avoid contact with the skin (wear gloves). The contaminated garments must be kept separate from all other clothing pending thorough cleaning (arranged for by site administration).

Eye Protection: Safety spectacles are the minimum standard of eye protection. In work areas where vapours, fumes or splash of skin contact is to occur, operators should wear goggles or a visor that is dust tight. The system should include breathing apparatus, a safety harness and line, and a second main in attendance with a reserve breathing apparatus. Procedures and safeguards are detailed in HSE Guidance Note GS 5. Entry into confined spaces, Skin Irritation risk arising from lack control: Any indication that the handling precautions given above have been neglected. An operator who develops skin rash should not return unless the operator is abnormally sensitive to the product, in which case medical opinion should be sought. HUNSTMAR Material Safety Information. Protection against dust from the uncured adhesive: Use a low-pressure running water - for at least 15 minutes. Seek medical attention promptly. Inhalation: Operators affected by the inhalation of fumes or vapour should be taken immediately into fresh air out in a test while medical attention is called. Clogging: Remove and isolate contaminated overall and clothing. Launder before use.

Ingestion: (entry by mouth & swallowing) Immediately rinse the mouth repeatedly with water. If swallowing has occurred, drink about a pint of water. Seek medical attention promptly. Fires: If an epoxy material catches fire, use a carbon dioxide, dry powder, foam or vaporizing liquid extinguisher - or apply water spray. Do not use water jets. Avoid the products of combustion while putting out the fire. In a serious fire It may be necessary to wear a self-contained breathing apparatus.

The Huntsman 2000 range adhesives

ARALDITE 2005

High Shear & peel strength two-part epoxy paste

Instructions for use and Product Safety Information

Uses
The bonding of metals, ceramics, glass, rubbers, rigid plastics and most other materials in common use.

Features
Easy to mix and apply Gap filling, 20-100°C curing range.
High shear and peel strength.

Negligible shrinkage, heat resistant to 80°C, resistant to water and to a wide range of chemicals.

Adhesive as supplied
Resin AV4076 White opaque paste
Hardener HY4076 Brown opaque paste

Mixing prior to use

<table>
<thead>
<tr>
<th>Parts</th>
<th>By weight</th>
<th>By volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resin</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Hardener</td>
<td>44</td>
<td>50</td>
</tr>
</tbody>
</table>

Mix thoroughly, using a clean spatula, pallel knife or wooden blade.

Note: Araldite 2005 is supplied in 0.5kg and 5.0kg packs. The contents of the 0.5kg pack are pre-weighted so that resin and hardener are in the correct proportion for mixing. If less than 0.3kg of adhesive is required for the work in hand, then the required quantities of resin and hardener must be measured out.

Useable life of mixture 30 minutes at 25°C
Useable life is dependent on temperature and bulk. The 1hr life is reduced if the temperature is above 25°C or if more than 100gms is allowed to stand in one compact mass - e.g. in a mixing cup or similar ‘bulk’ container. Apply the mixed adhesive by spatula (or similar blade) to the prepared clean joint surfaces. A bond-line of medium thickness requires a coverage rate of ca 300 grams/metre².

Curing high for the assembled joint
High strengths are developed by the following minimum cures.

<table>
<thead>
<tr>
<th>Time</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>24hrs</td>
<td>25°C</td>
</tr>
<tr>
<td>3hrs</td>
<td>40°C</td>
</tr>
<tr>
<td>2hrs</td>
<td>60°C</td>
</tr>
<tr>
<td>1hr</td>
<td>80°C</td>
</tr>
<tr>
<td>20mins</td>
<td>100°C</td>
</tr>
</tbody>
</table>

Surface pre-treatment
The surface to be bonded must be clean and dry. They may for example be degreased with a solvent such as acetone. For optimum results specialised chemical treatment or mechanical abrasion is recommended. A good general-purpose method is to degrease, abrasive with medium/fine grit abrasive paper (or grit blast) and degrease again. Further information on mechanical and chemical pre-treatments for a wide range of substrates is available on request.

Note: Acetone and its vapours are highly flammable - due precaution must be taken against all fire risks. Good ventilation is consequently necessary where the solvent is in use. Furthermore, the solvent removes the natural grease from the skin. Contact with the hands should be avoided as far as possible. Measures to prevent contact are given under Safe Handling of Araldite 2005.
Shear strengths
Average shear strengths of lap joints cured for 1hr @ 100°C and tested at 23°C to BS5350: PartC5: 1976.
Pre-treatment: degrease with acetone, abrade with medium grit abrasive paper, degrease again with acetone.

<table>
<thead>
<tr>
<th>Joint Material</th>
<th>Average shear strength</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MPa</td>
</tr>
<tr>
<td>Aluminium alloy</td>
<td>29</td>
</tr>
<tr>
<td>Mild steel</td>
<td>27</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>26</td>
</tr>
<tr>
<td>Galvanised mild steel * Copper</td>
<td>30</td>
</tr>
<tr>
<td>Brass</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>21</td>
</tr>
</tbody>
</table>

Degreased only (not abraded)

Treatments to break down fully cured joints
Heat the joint to ca 180°C and prise it apart. Where heating is not possible, commercially available paint strippers will soften the adhesive with time.

Storage
Araldite 2005 A/B has a storage life of at least three years provided that it is kept in a cool dry place. The hardener is hygroscopic. It deteriorates if allowed to absorb moisture. The containers of both resin and hardener should be kept securely closed when not in use.
Araldite A and Hardener 2005B are also available in bulk quantities against product references Araldite AV4076-1GB and Hardener HV4076GB.

Also available in the 2000 range
Araldite 2001 Multi - purpose two-pack Epoxy paste
Araldite 2002 Fast setting multi-purpose two-pack epoxy paste
Araldite 2003 Easy to spread two-pack epoxy liquid
Araldite 2004 High shear and peel strength, two-pack epoxy paste
Araldite 2007 High shear and peel strength, heat curing, one-pack epoxy paste

Trade distributors, in addition to the Huntsman Customer Service Centre at Duxford, will be pleased to assist users of 2000 range adhesives with any information required.

Handling Precautions
The safe handling of Araldite 2005 Components A and B, and the uncured Araldite 2005A/B adhesive, requires taking certain precautions normal for the handling of chemicals. Provided that direct contact is avoided and good ventilation maintained, people working with the Araldite materials should remain free of any skin, eye or respiratory irritation. The precautionary measures given overleaf are designed to ensure maximum safety in handling. They need to be observed conscientiously.

Statutory requirements
Araldite 2005 Component A and Component B are regulated by The Control of Substances Hazardous to Health Regulations 1988 by virtue of their classification under The Classification, Packaging and Labelling of Dangerous Substances regulations 1994. Classification requirements under the CPL Regulations

<table>
<thead>
<tr>
<th>Product Ref.</th>
<th>Classification as supplied</th>
<th>Classification for Conveyance by road</th>
<th>Identification no.</th>
<th>For conveyance by road</th>
</tr>
</thead>
<tbody>
<tr>
<td>Araldite 2005A</td>
<td>Environmentally hazardous</td>
<td>3082</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Araldite 2005B</td>
<td>Toxic</td>
<td>2922</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Irritant
Toxic

Control measures requirement under the COSHH Regulations
The COSHH Regulations require that, where dangerous substances are in use, control measures are set up which will secure as far as possible the prevention of exposure. The information given in this sheet is intended to assist employers to establish such control. First importance must be given to sources such as remote handling systems, local exhaust ventilation, the reduction of the number of people who might be at risk of exposure. Personal protective equipment should be used to reinforce such measures where otherwise they may fail to achieve adequate control.
Where the control measures are adequate, it is nevertheless good practice to use personal protective equipment - such as overalls, safety spectacles, and rubber or plastic gloves - as an additional precaution.

Scope of the safety procedure given in this sheet
A statement of the products’ use to which the information set out overleaf relates is a requirement of Section 6(10) *(as amended) of The Health and Safety at Work etc Act 1974*.
Araldite 2005 Component A and Araldite 2005 Component B are manufactured for use with each other as an adhesive for structural materials. The applicability of the safety procedures to other uses should be referred to the Divisional Products Safety Department, Huntsman, Duxford.

Transport
Keep the containers securely closed. Store the containers away from food, food containers and clothing.

Storage
Store the containers securely closed in a cool dry place.

Store away from food and food containers. If leakage or spillage occurs: Clean up with absorbent material (sand, sawdust, cotton waste, paper towels, etc.). Remove the contaminated cleaning material to a safe place pending disposal.

The contaminated material should be disposed of in accordance with DISPOSAL below. The affected area should be washed with detergent solution, preferably hot. Rinse with water.

Handling
The products as supplied are necessarily uncured and by their nature are reactive. Handling techniques must ensure that they are used safely. This means the avoidance of direct exposure either by skin contact, inhalation or ingestion.

General
Handling techniques must ensure that no uncured epoxy material comes in contact with the eyes or skin. Operators should wear gloves, overalls and eye protection. If the eyes or skin, immediate treatment should be carried out as detailed under FIRST-AID PROCEDURES at the end of this sheet. The work area must be adequately ventilated. Eating, drinks, and smoking must be prohibited. Cleanness and tidiness in working are of the utmost importance. Adequate facilities for washing are essential. They should be provided at or very near the place of work so that accidental contamination can at once be removed from the skin. Washing and accommodation should be kept clean and be provided with plentiful supply of clean running water, soap, skin creams and disposable towels. Ideally taps should be foot operated. Benches should have impervious surfaces, and, whenever practical, be projected by a disposable cover – e.g. Paper, aluminium, foil or plastics – for replacement when contaminated. Waste bins should be equipped with lids and replaceable liners. The bins should be freely available and all waste materials should be disposed of in accordance with DISPOSAL below. Mixing and application equipment must be cleaned before the epoxy materials have hardened. The handles of tools and machine controls should likewise be kept clean. Acetone cellulose thinners, and 1-methoxy-2-propanol, are suitable cleaning solvents. Contaminated solvents should be disposed of in accordance with DISPOSAL below. To minimise cleaning requirements, covered disposable containers should, whenever practical, be used for mixing and delivery. To avoid congestion, containers of epoxy materials should be kept, as far as practicable, in a clearly designated area. Particular care should be paid to good housekeeping in order to minimise the incidence of spillage and contamination. If contamination does occur, the affected area must be cleaned up immediately. Any spillage of an epoxy material must be taken up and the area decontaminated as required under STORAGE above. Container lids should always be replaced after use. Careful pouring is needed to ensure that drips do not obscure any instructions on the container.

“Those solvents and their vapours are inflammable - due precautions must be taken against possible fire risks. The use of methoxypropanol as an alternative to acetone and cellulose thinners significantly reduces the flammability hazard. Adequate ventilation is essential where solvents of this type listed here are in use. Furthermore, such solvents must not be allowed to come in contact with the skin. Measures to prevent contact are given under Protective clothing below.

The solvents listed here are available from BP Chemicals Ltd. ICI Chemicals and Polymers Ltd, Shed Chemicals UK Ltd and from most paint companies. Suppliers’ safe handling precautions should be observed.

Protective clothing
Operators should be provided with protective clothing and equipment to minimize personal contact with the uncured products. Operators should wear gloves. The following types of gloves are in standard use with epoxy materials: nitrile rubber, natural rubber (medium to heavy weight), surgical rubber (for fine work only), or polyethylene disposable. The nature of the work in hand will determine the choice of gloves. The insides of gloves must be kept scrupulously clean. Damaged gloves must be replaced. Care is needed to keep cuffs free from contamination and when necessary, protection should be provided for the sleeves and upper arms. This may be by disposable sleeves or by disposable arm covers. For operators commencing a long work period, it is advisable to wear cotton gloves under the protective gloves. The inner cotton gloves will reduce the risk of skin irritation due to sweating. The cotton gloves should be changed regularly at the end of each work period and should always be laundered before re-use. Before removal, the protective gloves should be cleaned with soap and warm water. Gloves should be stored where they can neither become contaminated or be a source of contamination.