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ThistleBond

UNIQUE POLYMER SYSTEMS LIFEBOAT REPAIR APPLICATION INSTRUCTIONS

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INTRODUCTION

The UPS **ThistleBond Lifeboat Repair Kit** incorporates a special epoxy resin system, which will bind effectively to cured polyester resin laminates as well as metals, wood, glass and many synthetic materials. The Kit contents have been developed on the basis of the requirements of the Department of Trade and of the long experience of E. Wood Ltd in the application of epoxy resin systems and related materials.

The UPS **ThistleBond Lifeboat Repair Kit** includes all the materials and accessories necessary to produce a glass reinforced epoxy resin laminate patch with a smooth surface finish of the quality associated with polyester resin laminate lifeboat hulls. These materials can of course be used to repair any polyester or epoxy resin laminate fabrication.

A Department of Trade Surveyor at the earliest opportunity should inspect all repairs to lifeboats carried out with the UPS **ThistleBond Lifeboat Repair Kit**. Attention is also drawn to the dangers of unqualified persons carrying out repairs to lifesaving appliances. Any repairs should be limited to minor, emergency repairs only.

Before attempting to use the UPS **ThistleBond Lifeboat Repair Kit**, familiarisation with these application instructions is essential. Any further questions in connection with the use of the Kit contents should be referred to the E. Wood Ltd Technical Information Centre at Northallerton, North Yorkshire.

The information contained in these application instructions is given in good faith but E. Wood Ltd assume no responsibility for the use made of the products or this information because this is outside the control of the company.

KIT CONTENTS

- 2 Units UPS **ThistleBond Lifeboat Resin and Hardener**
- 1 Piece **Glass Mat** 0.5m²
- 1 Piece **Surface Tissue** 0.35mm²
- 1 Roll **Cellophane**
- 1 **Brush**
- 1 **Stirring Tool**
- 1 Sheet **Emery Cloth**
- 1 Pair Polythene Gloves
- 1 Unit **Barrier Cream**
- 1 Unit **Resin Removing Cream**
- 1 Application Instructions
- 1 Container

Note: The contents of this kit are under constant review and may be adjusted from time to time.

METHOD OF MIXING LIFEBOAT RESIN AND THISTLEBOND LIFEBOAT HARDENER

Each unit consists of one container of **UPS ThistleBond Lifeboat Resin** and one container of **UPS ThistleBond Lifeboat Hardener**. The **Resin** container is slack filled to permit the addition of the complete contents of the **Hardener** container. The quantities supplied in each container of the unit are exactly those required to produce the correct **Lifeboat Resin Mix** and should not be altered.

Immediately after the addition of the **Hardener** the contents of the **Resin** container should be thoroughly mixed using the stirring tool. The resultant **Lifeboat Resin Mix** has a useable life of approximately 1½ hours at an ambient temperature of 25°C (77°F) before it begins to gel. It should be noted that the time to gel is not the time taken for the resin mix to cure. The time to cure is dependent on many factors but it is mainly affected by temperature, in that the higher the temperature, the quicker the cure.

In cold weather conditions or when a reduction in cure time is desirable, the containers of **Resin** and **Hardener** should be pre-warmed by placing them in hot water before mixing. Care must be taken however; to ensure that the contents do not come into contact with water before or during the application and until the resin mix has cured.

METHODS OF APPLICATION OF A UPS THISTLEBOND LIFEBOAT REPAIR

There are two basic repair methods, both of which are dependent on access to both sides of the damaged hull being obtainable.

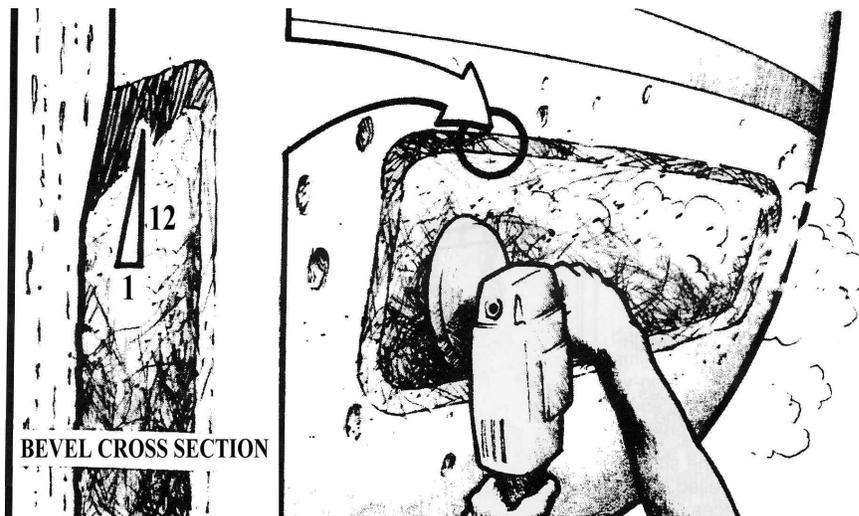
Method 1 describes the approach to be taken when the repair is to be effected from the outside with or without a 'Former' being applied to the inside of the hull.

Method 2 describes the approach to be taken when the repair is to be effected from the inside with a 'Former' being applied on the outer side of the hull.

The following is the sequence of steps to be taken in these two repair methods:

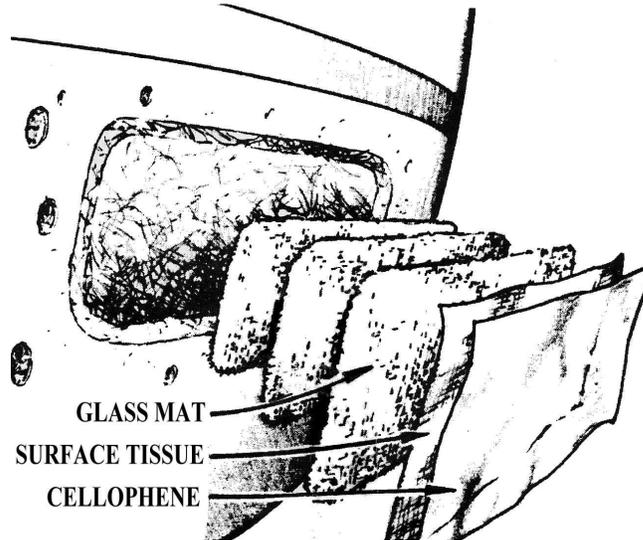
METHOD 1

1. Read through the whole of this procedure and ensure that all the Kit contents together with any additional items required are available at the location of the repair and are clean and serviceable.
2. Read through the section in these Instructions entitled 'Instructions for the Safe Handling of ThistleBond Repair System Materials'.
3. Clean up the damaged areas both internally and externally. Extend the cleaned areas approximately 100 - 150mm (4" – 6") all around onto the undamaged hull. The Gel coat on the outside of the hull should be thoroughly roughened using the **Emery Paper** over the cleaned areas. The edges of the hole should be bevelled to a minimum 12 to 1 to improve the bonding surface for the repair patch.



4. Cut three or four pieces of **Glass Mat** suitably sized to fit the hole(s) being repaired.
5. Cut one piece of **Glass Mat** 100 – 150mm (4" – 6") larger all round than the size of the damage to cover the inside cleaned area.
6. Cut two pieces of **Surface Tissue** 100 – 150mm (4" – 6") larger around than the size of the damage. One piece to cover the inside cleaned area and the other piece to cover the outside cleaned area.
7. A 'former' to suit the inside contour of the hull should be made to be used as a backing for the repair. This 'former' will be removed when the repair is completed so the surface in contact with the repair must be covered with **Cellophane** in order that a release is obtained. The 'former' can be constructed of hardboard or thin ply.
8. Mix one unit of **UPS ThistleBond Lifeboat Resin** and **ThistleBond Lifeboat Hardener** together until it is completely homogenous.
9. The large piece of **Glass Mat** should be thoroughly impregnated with the mixed resin using the brush supplied.
10. Coat the inner cleaned surface of the hull with the mixed resin and then immediately apply the large piece of impregnated **Glass Mat** to the coated surface
11. Apply the appropriate piece of **Surface Tissue** to the inboard surface of the **Glass Mat** and brush in the mixed resin.
12. Apply a piece of **Cellophane** to the inboard surface of the repair and firmly secure the 'former' in place.
13. Impregnate the 3 or 4 cut pieces of **Glass Mat** with the mixed resin and apply these from the outboard side. Each piece should be carefully inserted into the hole with special care to eliminate any trapped pockets of air. This will ensure that a solid **Glass Mat** resin laminate is produced. If necessary, further pieces of
- 14.
15. **Glass Mat** should be cut, impregnated with the mixed resin and applied in order to fill the hole to the outer surface of the hull.
16. Apply a coat of mixed resin over the outer repaired surface then apply the other piece of **Surface Tissue**. Brush in further mixed resin and ensure that it permeates through making a homogeneous repair, following the outer contour of the hull.

17. Apply a piece of **Cellophane** to the outer surface of the repair and leave the completed repair to cure before removing the 'former'.
18. If after curing, it is necessary to smooth off the completed repair, this can be accomplished using 80 grit sandpaper. Any exposed glass fabric should be sealed with a thin coating of



mixed resin.

NOTE: The above repair can be effected without using a 'former'. In this situation however, extreme care must be exercised when applying the **Glass Mat** from the outside so as not to disturb the earlier applied **Glass Mat** and **Surface Tissue**.

METHOD 2

1. Proceed as steps 1 to 8 in Method 1 above. Note that in step 7, the 'former' should now suit the outside contour of the hull.
9. Coat the repair area on the outside of the hull with the mixed resin.
10. Apply a piece of **Surface Tissue** to the outside surface of the hull to cover the repair area. Thoroughly brush in mixed resin to ensure that the **Surface Tissue** will bond to the hull and that it is fully permeated with the mixed resin.
11. Apply a piece of **Cellophane** to the outside surface of the hull to fully cover the **Surface Tissue** and then firmly fix the 'former' in place over the repair.
12. Mixed resin should now be brushed into the 3 or 4 pieces of **Glass Mat**. These pieces should now be inserted into the repair from the inside side of the hull, taking care to eliminate any trapped air pockets. The number of pieces of **Glass Mat** required will depend upon the hull thickness. The repair should be built up to the inner surface of the hull.
13. Impregnate the large piece of **Glass Mat** with mixed resin. Coat the inside surface of the repair area with mixed resin then apply the **Glass Mat** to this coated surface.
14. Apply a piece of **Surface Tissue** to the inside surface of the repair and thoroughly brush in a final coat of mixed resin. Leave the completed repair to cure before removing the 'former'.
15. If, after curing, it is necessary to smooth off the completed repair, this can be accomplished using 80 grit sandpaper. Any exposed glass fabric should be sealed with a thin coating of mixed resin.

INSTRUCTIONS FOR THE SAFE HANDLING OF UPS THISTLEBOND REPAIR SYSTEM MATERIALS

UPS ThistleBond epoxy resins and hardeners are like other active chemicals, capable of irritating unprotected skin. None of the materials included in the UPS ThistleBond Kits have high irritation of unprotected skin. None of the materials included in the UPS ThistleBond Kits have high irritancy ratings (Reference: Draize Index of Primary Irritation).

It is the case however, that the ability of any material to set up irritation will vary, not only with the chemical nature of the material but also with physical conditions such as ambient temperatures and with the individual susceptibility of the person using the materials.

It is therefore strongly recommended that before any of the Repair System Materials are handled, the person who is carrying out the repair should protect himself or herself by using the **Barrier Cream** supplied to all areas of skin likely to come into contact with the materials. Subsequent to this, the person involved should wear the gloves provided.

Care should be taken when opening containers of **Hardener**, especially if they have been subjected to high ambient temperatures during storage.

The quantities of **UPS ThistleBond Resin and UPS ThistleBond Hardener** mixed at any one time are normally so small that problems in relation to the fumes released do not need to be considered.

All **UPS ThistleBond Lifeboat Repair** products have flash points well above 65°C and therefore do not normally present a fire hazard.

DO NOT SMOKE when handling epoxy resins and hardeners since tobacco can become contaminated. By products of combustion can be harmful if inhaled.

It should be noted that some people handling glass fibre materials may experience skin irritation with glass fibre materials included in the Kit. This is normally a temporary effect that clears up as the skin hardens with exposure. The precautions given under Epoxy Resins and Hardeners, should virtually eliminate skin contact, therefore prevent problems.

EPOXY RESINS AND HARDENERS

Any contamination of the skin with UPS ThistleBond epoxy resins or hardeners can be effectively dealt with as follows:

- Remove surplus material immediately with a clean cloth.
- Apply the **Resin Removing Cream** supplied in the Kit.
- Wash thoroughly with soap and water.
- If eyes are contaminated, irrigate with clean water and consult a physician.
- **DO NOT USE SOLVENTS.**
- Any irritation resulting from the contamination of the skin with glass fibres can be minimised by rinsing under running water before applying soap when washing. This will avoid the fibres being rubbed into the skin.

