

Chapter 6 – Repair Kits

REPAIR DON'T REPLACE

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Marine Coatings & Repair
Systems

A & C Repair Kit And Sealing Compound

REPAIR DON'T REPLACE

Unique Polymer Systems Ltd
Unit 1 Bankside Industrial Estate
Little Marcle Road
Herefordshire
HR8 2DR
United Kingdom

+44(0) 1531 636300
sales@thistlebond.info
www.uniquepolymersystems.com

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Description Of The Components For The A & C Engineers Kit

TRK19000 \ UPS 19000 Standard Resin and Hardener

A solvent free epoxy based **Resin** and **Hardener**, produces an extraordinarily strong resinous mass, having exceptional adhesive properties when applied to metals, wood, glass and synthetic materials.

ThistleBond A & B Cement \ UPS 19003

A specially developed epoxide compound supplied in two separate packs marked A and B. When mixed together in equal portions by volume the Cement will cure to an extremely strong mass with a better adhesive bond than that produced by the **ThistleBond Resin** mix. Apart from its use as an adhesive for repairs it can be applied, prior to carrying out a ThistleBond repair, where difficult adhesion conditions exist.

TRK19010 \ UPS 19010 Glass Cloth

A woven cloth 2.75 metres squared, 0.007" thick, which can be used for large repairs to tanks and pipework, specially developed for use with the **Standard Resin** and **Hardener**.

TRK 19020 \ UPS 19020 Glass Mat

A random collection of glass fibres which will absorb a considerable amount of the **Resin** and **Hardener** and which, when set will give an extremely strong inflexible mass for backing up repairs.

TRK19031 \ UPS 19031 Linen Scrim

An open woven linen fabric which is used as a backing to **Glass Mat** to make it easier to handle when being applied to a repair.

TRK19007/9 \ UPS 19007/9 Glass Tape

A square woven glass tape 0.007" thick which when combined with the **Standard Resin** and **Hardener** will give maximum hoop strength for the mending of pipes. This tape has been specially treated for use with **ThistleBond Standard Resin** and **Hardener**.

TRK19042 \ UPS 19042 Fairing Compound

Individual strands of glass fibre ideal for mixing with **Standard Resin** and **Hardener**.

TRK19043 \ UPS 19043 Sealer Filler

Strands of fibrous silicate, which, when mixed with the **Standard Resin** and **Hardener**, becomes a putty ideal for repairing cracked pipes.

Mixing And Preparation

Mixing the Resins

It will be found that the containers in which the resin is packed are not filled to the top. This is to allow space for the introduction of the activator. Sufficient activator is included in each container to set the resin in each pack and this should be poured into the resin container shortly before it is required for use and stirred for at least 1½ minutes using one of the stirring tools.

Mixing A & B Cement

Equal quantities of the cement are to be taken from either the tins or tubes (depending on which size product bought) and mixed together using the spatula provided. When using the **A & B Cement** for repairs to a leaking pipe, it is advisable to allow the cement to harden, before applying it to the cracked pipe.

Effects of Temperature on the Standard Resin and Hardener

Once the **Resin** and **Hardener** have been mixed, the rate of cure is dependent on the temperature to which it is allowed to rise. The hardness, strength and rapidity is increased the higher the temperature. In cold conditions it is advisable when possible, to apply some external source of heat to a mend to make sure that the cure reaction is complete and so reach it's maximum strength.

Cleaning the Surface

It must be appreciated that the strength of a repair with the **ThistleBond Engineers Repair Kit** depends chiefly upon the strength of the adhesive bond between the **Standard Resin and Hardener** and the surface to which it is applied. The **Standard Resin and Hardener** will adhere best to a clean, grease free surface and it is therefore essential that before applying a repair to a surface it should be cleaned using **ThistleBond Degreaser** and **Universal Cleaner**. In areas where it is impossible to clean the surface thoroughly, it is recommended that a layer of **ThistleBond A & B Cement** is smeared on the surface to be repaired and for a distance of 2" around.

Evenness of Lay Up

The principle strength of a repair lies in the tape or glass cloth layers which are either wound or laid on the surface of the metal. When using tape it is customary to wind this with a half overlap and care should be taken to see that there are no kinks in the tape, as this will leave a path of weakness in the final mend, which the pressure from inside will attack and may cause a breakdown. It will sometimes be found to be difficult to keep the winding smooth and free from kinks, especially when the mend is over a bend section of a pipe. In these cases it is preferable to cut short lengths of tape and lap them one on the other, while winding over the bend.

Even Application of the Standard Resin and Hardener

It is obviously necessary that a continuous film of resin must be applied to each layer of the tape wound round the repair.

Thorough Saturation of the Glass Mat

The purpose of the **Glass Mat** is to provide a rigid backing to the tape mend and also to enclose a considerable volume of **Standard Resin and Hardener**, which will heat up during cure and thereby

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make the adhesion to the metal considerably stronger. This object will never be attained unless the **Glass Mat** is thoroughly saturated. This can be achieved by working the resin up through the mat with the fingers, particular attention should be paid to the edges of the mat strip.

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Simple Repair For Low Pressures

1. Thoroughly clean the surface to which the repair patch is to be applied, using **ThistleBond Degreaser** and **Universal Cleaner**.
2. Measure the extent of the repair to be effected. As a rough guide the patch should extend 2" on either side of the damaged portion of the pipe.
3. When **Glass Tape** is to be used and the repair is in a confined position or close to a flange, it is advisable to cut the tape into suitable lengths and roll it up into small rolls. In this manner it will be much easier to roll the tape on to the pipe.
4. Cut the **Glass Mat** to such a size that it will form two layers over the repair, with 1" or 2" overlaps covering the whole extent of the repair area.
5. When a hole in a pipe is being repaired cut a piece of **Contour Cloth** of adequate size to bridge the gap.
6. When it has not been possible to remove the final traces of rust or paint from the pipe, mix a quantity of **A & B Cement** in accordance with the instructions and smear this over the area of damage and for a distance of 2" all around.
7. Mix the **Standard Resin** and **Hardener**, mixing thoroughly for 1½ minutes.
8. When the temperature of the mix has become sufficiently high, paint the **Resin** and **Hardener** mix onto the surface where the repair patch is being applied. When the contour cloth is being used, this should be coated with **ThistleBond A & B Cement** and placed in the position over the hole.
9. When **Glass Tape** is being used a layer of this is now wound over the resin surface, allowing the resin to squeeze through the interstices in the **Glass Tape**. The **Glass Tape** should be wound as tightly as possible with one half overlap.
10. When **Glass Cloth** is being used, a layer of **Glass Cloth** is laid on the resin surface and the **Standard Resin** and **Hardener** stippled through by means of the paint brush.
11. In the case of further layers of the **Glass Tape** or **Cloth** being used, then the **Standard Resin** and **Hardener** should be painted on after each layer. In the case of **Glass Tape**, the winding of any additional layer should be in the reverse direction to the previous layer.

Reinforced Repair For Higher Pressures And More Rapid Setting

In cases where it is necessary to give additional strength to a repair to withstand higher pressures within the pipe or where it is desired that a rapid setting of the resin be achieved, it is suggested that a layer of saturated Glass Mat should be applied to the outside of the simple repair in accordance with the following procedure:-

1. Proceed with the instructions of the low pressure repair 1-11.
2. Cut a piece of **Linen Scrim** the same size as the **Glass Mat**.
3. A square of **Kraft Paper** (paper coated in plastic on one side) 3" larger in each direction than the strip of **Glass Mat**, it is cut and laid on a flat surface.
4. The **Linen Scrim** is laid on the paper.
5. A pool of mixed **Standard Resin** and **Hardener** is poured into the centre of the **Linen Scrim** and is brushed out so that it evenly coats the **Linen Scrim**.
6. The **Glass Mat** is laid on top of the first layer of the **Linen Scrim**.
7. The **Standard Resin** and **Hardener** is stippled through the **Glass Mat** with the fingers.
8. The **Glass Mat** and **Linen Scrim** are now carefully removed from the coated paper and applied over the surface of the tape or cloth. With the **Linen Scrim** being the outer layer of the repair.
9. In the case of a pipe they are covered with a sheet of cellophane, which is cut 4" longer than the area of the repair (2" overlap each end).
10. The **cellophane** is moulded down on to the surface of the **linen scrim** with the hands, to squeeze out as much air as possible and is then secured in position by means of masking tape at each end.
11. The repair can now be left to cure, taking any time from half an hour to two hours depending on the air temperature.

Other Repairs Performed By UPS Engineering Kits

Plugging of Large Holes

Large cavities can be filled by using the **ThistleBond Fairing Compound**.

Method of Use

1. The bag of fairing compound is emptied into the tin of mixed standard Resin and Hardener.
2. The two components should be mixed for 3 minutes, when sufficient heat has been produced by the mix, the **Fairing Compound** mix can be applied to the split or crack that needs to be filled, approximate cure time ranges from ½ hour to 2 hours depending on air temperature, When the mix has set, **Glass Tape** or **Mat** can be wound over the repair.

Uneven Surfaces

Where the surface of a repair is extremely uneven, it is normally advantageous to use the Sealer Filler to smooth the surface, thus making the winding of the **Glass Tape** or **Cloth** more easily accomplished.

Cracked Plates, Bulkheads, castings, Pipes etc

Fill the crack with **ThistleBond A & B Cement**. Paint mixed **Standard Resin** and **Hardener** over the surface of the plate and apply two layers of **Glass Cloth**. Where a certain amount of flexibility is required, apply **ThistleBond Rapid Setting Super Metal Repair Paste** in the crack or split. This will allow a certain amount of flexibility in the repair and will prevent the patch being torn off during movement of the plate.

Storage Tanks, Leaks at Rivets, Welded Seams etc

This type of repair is best carried out by means of the **ThistleBond Sealing Compound**, a special resin composition which, when mixed in conjunction with the fibrous filler, will set to an extremely hard tenacious mass, ideal for the plugging of holes and the filling of leaks in pipe threads etc. **Sealing Compound** is also useful for repairing pipes where the welded flange is leaking. The **Standard Resin** and **Hardener** and **Sealing Compound** when thoroughly mixed together, should be trowelled onto the problem area.

Contents Of The UPS A and C Engineering Kits

Product Description	A Kit Quantity	C Kit Quantity
Standard Resin and Hardener 225gm Unit	20	5
UPS 19003 A & B Cement 1 X 1kg	1	1
UPS 19060 PlasSteel Twist Stick 0.125kg	1	1
UPS 19060 PlasSteel Underwater Twist Stick 0.125kg	1	1
UPS 19065 Rapid Setting Super Metal Repair Paste 0.175kg tubes	2	2
Roll Glass Tape 38mm X 50m	2	1
Glass Cloth 1m ²	3	1
Glass Mat 0.5m ²	2	1
Roll of Contour Cloth 250mm x 250mm	1	1
Linen Scrim 0.5m ²	3	1
Plastic Coated Paper 2m ²	1	0
Roll of Cellophane 250mm x 2.5 metres	1	1
Roll of Masking Tape	1	1
Unit of Fairing Compound 50g Bag	1	1
Unit of Sealer Filler 50g Bag	2	1
UPS 19601 Pipe Repair Bandage 50mm X 1.7m	1	1
Disposable Gloves (Pair)	10	1
Pair of Scissors	1	0
Brush	3	1
Stirring Tool	10	2
Trowelling Tool	1	1
Barrier Cream 110gm unit	1	1
Resin Removing Cream 110gm unit	1	1