

ERODED AND CORRODED RUDDERS AND PROPELLERS

UPS Marine Polymers have been re – branded to Unique Polymer Systems engineering marine and Industrial Repair and Coating

The following UPS section is concerned with the repair of erosion damage and for the application of erosion/ corrosion resistant coatings for:

Rebuilding and protection of rudders, propeller strut assemblies, propellers, kort nozzles, bow and stern thruster tubes, hovercraft fan blades and pylons, jet propulsion systems and propeller shaft flanges.

COMMON DEFECTS

Damage to surfaces due to erosion/ corrosion or mechanical damage

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. Product selection and application technique should be made on the basis of the predominant problem and the operational environment of the equipment. Where damage is confined to surface pitting of the component, this may be rebuilt by applying the UPS product directly to the surface of the component. Where thin sections or lost edges are to be rebuilt, these will need a framework or support the UPS material. Frameworks can be achieved any number of ways including:

- Bolting on of Steel plates
- Screwing or bonding steel gauze/ expanded metal

SURFACE PREPARATION

The surface of the component to be rebuilt should be washed down with UPS Universal Cleaners to remove all dirt and grease. If the repair is to be left exposed and not protected by a surface coating than a shallow groove must be machined around the perimeter of the repair area in order to rebate the repair materials and avoid feather edging. This groove can be machined or cut by the use of a small mechanical grinder fitted with a cutting disc.

The whole of the repair area and framework, where applicable is to be grit blasted to Swedish Std Sa 2 1/2 ensuring a profile of 75 microns minimum. On completion of all preparation and before the application of any UPS material all repair must be re washed with UPS Universal Cleaners.

APPLICATION TECHNIQUE

Select the appropriate UPS product and apply a thin, even film over the area to be re-profiled, using a stiff short bristled brush to ensure maximum penetration of the prepared surfaces and minimal air entrapment.

a). Re-profiling Surface Pitting

Apply further layers of product using a brush or suitable flexible applicator, until all pitted and eroded areas are completely filled, take care to avoid air entrapment. Finally, use a suitably sharp rigid former or template to fair off excess product in order to restore the original profiles.

b). Rebuilding with frameworks

Further material should than be applied to provide a depth of approximately 1/8” over the entire framework and surrounding area, which should then be contoured to the original component profile using suitably shaped rigid formers or templates, to fair off excess product.

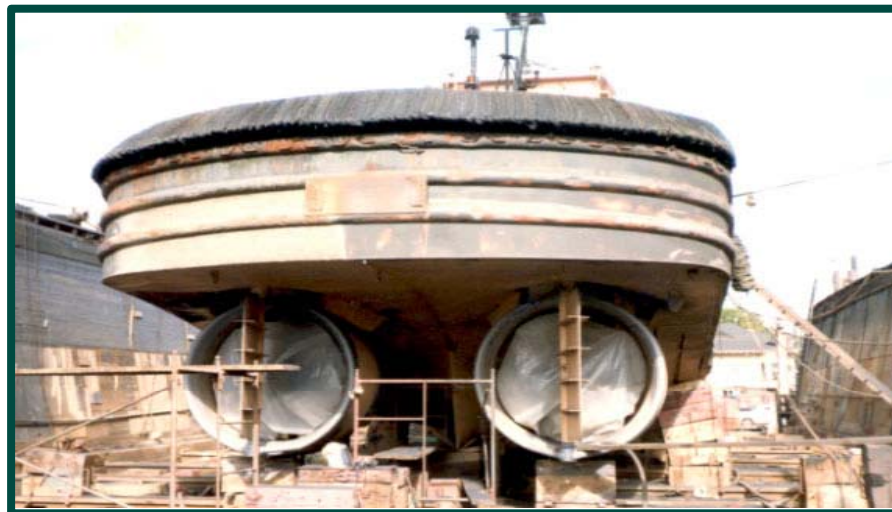
TECHNICAL SUMMARY

PRODUCT	CONSISTENCY	EROSION RESISTANCE	WORKING LIFE (20°C)	FULL CURE (20°C)
SUPER METAL REBUILDING SYSTEM	PASTE	MEDIUM	25 MINUTES	72 HOURS
EXTENDED LIFE SUPER METAL REBUILDING SYSTEM	PASTE	MEDIUM	60 MINTUES	5 DAYS
CERAMIC CARBIDE WEARING COMPUND	PASTE	MEDIUM	25 MINTUES	5 DAYS

MAIN SYSTEM SELECTION

General Repairs where machining Is requires	SUPER METAL REBUILDING SYSTEM
Repairs where machining and or Longer working time is needed	EXTENDED LIFE SUPER METAL REBUILDING SYSTEM
For repairs where erosion resistance Is required	CERAMIC CARBIDE WEARING COMPOUND
For infilling of Cavitated areas	SUPER METAL REBUILDING SYSTEM

**CAVITATION DAMAGE
REPAIRED ON SHIPS PROPELLER – GERMANY
(COST SAVING: £3450)**



During a complete refit and overhaul of a German Vessel, the UPS Distributor was asked to find a solution to repairing the badly corroded propeller blades.

UPS Distr. was awarded the contract to provide our **Ceramic Carbide repair Compounds** and Coatings.

UPS30 Ceramic Carbide Wearing Compound and **UPS235 Abrasion Resistant Ceramic Carbide Fluid** were used to rebuild and protect the ships propellers. Our Solvent Free, two part Epoxy, **Ceramic Carbide repair systems** were seen to offer the best abrasion and corrosion resistance and were chosen ahead of many other rival suppliers.

CAVITATION DAMAGE REPAIRED ON SHIP PROPELLER – UK (COST SAVING: £5,500)

A ship repair and conversion yard in the UK approached UPS and asked the company to provide a cost effective, high performance repair system.

The blades of the propeller were badly eroded and corroded and needed to be rebuilt and then coated with an advanced protection coating.



The surface area was blasted and then cleaned using the **UPS universal cleaner**. The pitted and eroded areas were then rebuilt using **UPS230 Ceramic Carbide Wearing Compound**, once the compound had become touch dry, the entire propeller was coated with **UPS235 Abrasion Resistant Ceramic Carbide Fluid**, giving the propeller blades added protection.

REBUILDING OVERSIZED PINTLES/ PINTLE HOUSINGS

The following UPS section is concerned with the rebuilding of oversized pintles/ pintle housings.

COMMON DEFECTS

Misalignment due to oversized housing caused by either: Electrolytic corrosion, abrasion or impact damage.

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. Product selection and application technique should be made based on the nature of the damage and the amount of time available for the repair. Due consideration must be given to protect the working area from inclement weather conditions in order to comply with the requirements set out in the technical data sheets. Specific consideration should be given to achieving correct alignment and centralisation of the pintle in the oversized housing, this will necessitate the prefabrication of a suitable jig. It is recommended that a new pintle be used, since an old, damaged pintle could be mechanically locked into the housing, making removal very difficult or even impossible.

SURFACE PREPARATION

The surface of the new pintle should be washed down with UPS Universal Cleaners to remove all dirt and grease. A coat of Release Agent should then be applied in accordance with the relevant data sheet. Grit blast the entire internal area of the pintle housing using an angular abrasive to give a surface finish of Swedish Std Sa 2 1/2 ensuring a profile of 75 microns minimum. During this process due consideration should be given to the possibility of salt contamination of the pintle housing. It is therefore recommended that the substrate is allowed to sweat for 24 hours, then re-blasted and re-washed with UPS Universal Cleaners.

APPLICATION TECHNIQUE

Select the appropriate UPS product and apply a thin to the prepared inside surface of the pintle housing, ensuring that the product is pushed into the prepared profile. Apply further material to the surface of the new pintle, which has previously been coated with UPS Release Agent. The pintle should then be jacked into position in the housing and aligned by suitable means. Any excess product extruded during the assembly should be removed prior to it curing. Once the product has set, the pintle may be removed for inspection of the rebuild housing if required.

TECHNICAL SUMMARY

PRODUCT	CONSISTENCY	EROSION RESISTANCE	WORKING LIFE (20°C)	FULL CURE (20°C)
SUPER METAL REBUILDING SYSTEM	PASTE	MEDIUM	25 MINUTES	72 HOURS
EXTENDED LIFE SUPER METAL REBUILDING SYSTEM	PASTE	MEDIUM	60 MINTUES	5 DAYS

MAIN SYSTEM SELECTION

For carrying out general repairs

SUPER METAL REBUILDING SYSTEM

For large applications
Or longer usable life

EXTENDED LIFE SUPER METAL REBUILDING SYSTEM

RECOMMENDED EQUIPMENT

Mixing and application tools are included in each pack of UPS Product. Prior to carrying out the repair however, it is important that all necessary tools and equipment are available on site. These could include the following – *Grit Blasting equipment, UPS Universal Cleaners, UPS Release Agent, Protective Clothing, Polyethylene Tenting, Suitable centralising Jig or Template New Pintle*

BONDING OF PINTLE SLEEVES

The following UPS section is concerned with the Bonding of pintle sleeves.

COMMON DEFECTS

Problems experienced during traditional shrink fit methods. Bi Metallic corrosion causing vibration and wear.

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. Large shafts or sleeves should be pre heated to ensure a substrate temperature minimum of 50 Deg F or 10C, in order that the product will flow evenly through the annular space between the components. There may be, therefore a requirement for space heating equipment. Pre fabricate a suitable sleeve ensuring an inner diameter of 1/2" – 1/6"

Larger than the pintle diameter. Then pre drill the sleeve and tap at a minimum of three locations around the circumference at each end, to allow 1/4" in diameter and spaced at no more than 24" centres equidistant around the circumference of the sleeve.

SURFACE PREPARATION

a). Wash all surfaces to be treated with UPS Universal Cleaner in order to remove all dirt and grease. Grit Blast all surface to be treated using an angular abrasive to give a surface finish of Swedish Std Sa2½ ensuring a profile of 75 microns minimum.

b). Alternatively, machine the outer surface of the pintle and the inner surface of the sleeve to produce a rough thread profile. On completion of all preparation and before the application of the product wash down all surfaces with Universal Cleaners.

APPLICATION TECHNIQUE

Place the sleeve on the pintle and use the jacking screw, pre coated with UPS Release Agent to prevent bonding, to correctly locate and centralise the assembly.

Mix appropriate amount of UPS Rapid Setting Super Metal and apply a fillet of this material to seal the annular gap at each end of the sleeve. As soon as this sealing material is dimensionally stable, mix the UPS Abrasion Resistant Ceramic Fluid product and load it into the disposable injection cartridges. Using suitable pneumatic Equipment, immediately inject the material starting from the lowest point and working towards the highest in order to ensure that the annular space is completely filled.

As general rule, material should be injected at one point until material appears at the surrounding ports. The first port should then be sealed with a suitable bung and injection recommenced at one of the surrounding ports. This process is then continued until all voids are filled and material is seen to exude from the highest ports.

Following the relevant cure time, remove all jacking screws and mix a suitable grade of UPS105 Super Metal Rebuilding System and fill the jacking screws. If necessary the sleeve can now be machined to final dimensions.

TECHNICAL SUMMARY

PRODUCT	CONSISTENCY	EROSION RESISTANCE	WORKING LIFE (20°C)	FULL CURE (20°C)
RAPID SETTING SUPER METAL SYSTEM	PASTE	MEDIUM	2-3 MINUTES	30 MINUTES
ABRASION RESISTANT CERAMIC CARBIDE FLUID	LIQUID	HIGH	25 MINUTES	5 DAYS

UPS Ceramic Carbide Abrasion Resistant Fluid has a fluid consistency with a compressive strength of 13,000 psi (ASTM D 965) and a tensile strength of 2800 psi (ASTM D 1002).

RECOMMENDED EQUIPMENT

Mixing and application tools are included in each pack of UPS Product. Prior to carrying out the repair however, it is important that all necessary tools and equipment are available on site. These could include the following – *Grit Blasting equipment, UPS Universal Cleaners, UPS Release Agent, Protective Clothing, Polyethylene Tenting, Suitable centralising Jig or Template. New Pintle*

REINFORCING CARGO TANK HOLD DECKING

The following UPS section is concerned with the Reinforcing of Cargo tank bottoms and should be read in conjunction with the Technical Data sheets of the following UPS Products: Super Metal Rebuilding System, Extended life Super Metal Rebuilding System, Ceramic Carbide Wearing Compound, Abrasion Resistant Ceramic Carbide Fluid.

COMMON DEFECTS

Erosion of Cargo Tank bottom plating by: Abrasion, due to entrained solids or liquid cargoes, Corrosion, due to water contamination in liquid cargoes, Cavitation damage.

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. The actual product selection should be based upon the nature and severity of the damage and the application technique utilised. Should there be a requirement to add strength to the area, then suitable steel doubler plates should be pre fabricated.

SURFACE PREPARATION

All surfaces should be washed with UPS Universal Cleaner in order to remove all dirt and grease. Grit Blast all surfaces to be treated using an angular abrasive to give a surface finish of Swedish Std SA 2 1/2 ensuring a profile of 75 microns minimum. However for small areas, rough grinding using a hand held mechanical grinding machine, fitted with a cutting disc, is acceptable. The underside of reinforcing plates, if being used, should also be prepared. Such plates should be of sufficient size to extend at least 1” beyond the damage. Following Preparation, rewash all areas using Universal Cleaners.

APPLICATION TECHNIQUE

a). Where reinforcement is not required

Mix the selected UPS Product and using the flexible applicators provided, apply a thin film to wet out the prepared area, taking care to push the product well into the prepared area. Apply further mixed material until all pitted and eroded areas are completely filled, taking care to avoid air entrapment. For further information on Erosion and Corrosion Resistant Coatings please see the section UPS Marine Coatings part Cargo Holds.

b). Where reinforcement is required

Apply a thin film of the selected UPS product to wet out both surfaces to be bonded, pushing the material well into the prepared surface. Apply further product to the reinforcement plate or reinforcing tape, forming the material into a slight peak in the centre. Press the reinforcement plate or tape firmly into position ensuring that any excess material is exuded in order to avoid air entrapment. Any product exuded should be used to fair around the reinforcement plate or tape.

TECHNICAL SUMMARY

PRODUCT	CONSISTENCY	EROSION RESISTANCE	WORKING LIFE (20°C)	FULL CURE (20°C)
RAPID SETTING SUPER METAL SYSTEM	PASTE	MEDIUM	2-3 MINUTES	30 MINUTES
SUPER METAL REBUILDING SYSTEM	PASTE	MEDIUM	25 MINUTES	72 HOURS
EXTENDED LIFE SUPER METAL REBUILDING SYSTEM	PASTE	MEDIUM	60 MINUTES	5 DAYS
CERAMIC CARBIDE WEARING COMPOUND	PASTE	EXCELLENT	25 MINUTES	5 DAYS
ABRASION RESISTANT CERAMIC CARBIDE FLUID	FLUID	EXCELLENT	25 MINUTES	5 DAYS
FLEXIBLISED CERAMIC CARBIDE COMPUND	PASTE	EXCELLENT	20 MINUTES	7 DAYS
FLEXIBLISED CERAMIC CARBIDE FLUID	FLUID	EXCELLENT	20 MINUTES	7 DAYS

MAIN SYSTEM SELECTION

For General Bonding and Filling	SUPER METAL REBUILDING SYSTEM
For General Bonding and Filling with a Longer working life	EXTENDED LIFE SUPER METAL REBUILDING SYSTEM
For Filling in cavitations where erosion resistance is specifically required	CERAMIC CARBIDE WEARING COMPOUND ABRASION RESISTANT CERAMIC
For filling in small cavitations where erosion resistance and smooth finishing is required	FLEXIBLISED CERAMIC CARBIDE FLUID AND COMPOUND

RECOMMENDED EQUIPMENT

Mixing and application tools are included in each pack of UPS Product. Prior to carrying out the repair however, it is important that all necessary tools and equipment are available on site. These could include the following – *Grit Blasting equipment, UPS Universal Cleaners, UPS Release Agent, Protective Clothing, Polyethylene Tenting, Suitable centralising Jig or Template. New Pintle.*

REBUILDING AND PROTECTION OF PROPELLER SHAFTS

The following UPS section is concerned with the rebuilding and Reinforcing of Propeller Shafts and should be read in conjunction with the Technical Data sheets of the following UPS Products: Flexiblised Ceramic Carbide Compound and Flexiblised Ceramic Carbide Fluid.

COMMON DEFECTS

Corrosion and Abrasion

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. For in situ applications, a tented working area must be constructed in order to protect the shaft from inclement weather conditions. It may also be necessary to control the temperature within the work area in order to reduce the possibility of humidity and thus prevent condensation.

SURFACE PREPARATION

All surfaces should be washed with UPS Universal Cleaner in order to remove all dirt and grease. Grit Blast all surface to be treated using an angular abrasive to give a surface finish of **Swedish Std Sa 2½ ensuring a profile of 75 microns minimum.**

APPLICATION TECHNIQUE

Mix the selected UPS Product and using a stiff bristled brush, or applicator provided apply a thin layer of the material to wet out the prepared surface. Immediately wrap the treated are with UPS Reinforcement tape ensuring a minimum of ¼ “ overlap between consecutive turns. Apply a further coat of fluid grade product ensuring complete encapsulation of the reinforcement tape.

TECHNICAL SUMMARY

PRODUCT	CONSISTENCY	EROSION RESISTANCE	WORKING LIFE (20°C)	FULL CURE (20°C)
FLEXIBLISED CERAMIC CARBIDE COMPOUND	PASTE	EXCELLENT	20 MINUTES	7 DAYS
FLEXIBLISED CERAMIC CARBIDE FLUID	FLUID	EXCELLENT	20 MINUTES	7 DAYS

RECOMMENDED EQUIPMENT

Mixing and application tools are included in each pack of UPS Product. Prior to carrying out the repair however, it is important that all necessary tools and equipment are available on site. These could include the following – *Grit Blasting equipment, UPS Universal Cleaners, UPS Release Agent, Protective Clothing, Polyethylene Tenting, Suitable centralising Jig or Template. New Pintle.*

CREATING IRREGULAR SHIMS

The following UPS section is concerned with the creation of irregular shims and should be read in conjunction with the Technical Data sheets of the following UPS Products: Super Metal Rebuilding System, Extended Life Super Metal Rebuilding System, Abrasion Resistant Ceramic Carbide Fluid, Flexiblised Ceramic Carbide Compound

COMMON DEFECTS

Incorrect lead transition due to misalignment or distortion of mating faces. Damage caused by abrasion due to differential movement between mating faces.

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. The product selection and application techniques should be based on the nature of the equipment, the environment and the time available to carry out the work. Specific consideration should be given to achieving correct leveling and alignment of the equipment.

SURFACE PREPARATION

All mating surfaces should be washed with UPS Universal Cleaner in order to remove all dirt and grease, loose paint flakes and scale. The irregular shim maybe bonded to either face and therefore should be Grit Blasted using an angular abrasive to give a surface finish of Swedish Std Sa2½ ensuring a profile of 75 microns minimum. Any surfaces to which the material should not be bonded must be treated with UPS Release Agent. Alignment and leveling of the equipment should be achieved using either jacking bolts or shims. Wherever possible a minimum clearance between mating faces of 1/16" should be achieved.

APPLICATION TECHNIQUE

The edges of the mating faces should be sealed using a paste grade of the UPS Material. Injection holes should be carefully positioned, together with the vent holes to prevent the formation of air traps. Ideally injection points should be spaced no more than 24" apart. The selected material should be loaded into disposable injection cartridges and injected using pneumatic equipment. The application should progress along until it is exuded from the next injection point. When the first hole should be sealed with a suitable bung and injection commenced at the next hole. Continue until all the voids have been filled. The product should then be left undisturbed to fully cure before the equipment is returned to service. Where equipment can be readily maneuvered and realigned, a paste grade UPS material may be used. This should be applied to both mating surfaces ensuring that an excess of product is applied and that it is in a peak towards the centre, so that when the faces are brought together the product is exuded out, preventing any air entrapment. Check that the equipment is accurately located. Ant material exuded out should then be removed and the product allowed to cure before returning to service.

TECHNICAL SUMMARY

PRODUCT	COMPRESSIVE STRENGTH	WORKING LIFE (20°C)	FULL CURE (20°C)
SUPER METAL REBUILDING SYSTEM	15,500 PSI (ASTM D 965)	20 MINUTES	72 HOURS
ABRASION RESISTANT CERAMIC CARBIDE FLUID	13,000 PSI (ASTM D 965)	25 MINUTES	5 DAYS
EXTENDED LIFE SUPER METAL REBUILDING SYSTEM	10,000 PSI (ASTM D 965)	60 MINUTES	5 DAYS
FLEXIBLISED CERAMIC CARBIDE FLUID	2,800 PSI ELONGATION 35%	30 MINUTES	7 DAYS

RECOMMENDED EQUIPMENT

Mixing and application tools are included in each pack of UPS Product. Prior to carrying out the repair however, it is important that all necessary tools and equipment are available on site. These could include the following – *Grit Blasting equipment, UPS Universal Cleaners, UPS Release Agent, Protective Clothing, Polyethylene Tenting.*

RESEATING / ISOLATING BEARING BUSHES

The following UPS section is concerned with the Reseating and Isolating of Bearing Bushes and should be read in conjunction with the Technical Data sheets of the following UPS Products: Super Metal Rebuilding System, Extended Life Super Metal Rebuilding System, Abrasion Resistant Ceramic Carbide Fluid, Flexiblised Ceramic Carbide Compound

COMMON DEFECTS

Excessive movement of bush within housing caused by – electrolytic corrosion or impact wear.

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. The product selection and application techniques should be based on the nature and severity of the damage and the application technique. For in situ repairs a work area must be created in order to protect the repair area from the weather conditions. It may also be necessary to control the temperature within the work area in order to reduce humidity and prevent condensation. Specific attention should be given to the method used to align and centralise the bearing bush within the damaged housing and consequently jacking bolts, shims, jig or mandrel must be prefabricated. The techniques described below can be used to rebuild, realign and electrically isolate types of bearing bush housing, including,
Rudder Bush Housing, Internal Stern Tube Bush Housings, A Frame Bracket, bush Housings, Stabilizer in Shaft Bearing Bush Housings, Oversized Cutlass Bearing Housings.

SURFACE PREPARATION

Wash down all components to be treated with UPS Universal Cleaner to remove all dirt, grease and other surface contamination. Coat the entire surface of a new bearing bush or cutlass bearing and all centralising and aligning equipment with a minimum of 2 coats of UPS Release Agent to prevent bonding.

Grit Blast the internal surfaces of the damaged Housing to give a surface finish of Swedish Std Sa2½ ensuring a profile of 75 microns minimum using angular abrasive. On completion of all preparation, rewash all blasted surfaces with UPS Universal Cleaners.

APPLICATION TECHNIQUE

There are two techniques available for rebuilding Housings.

1. SLIP METHOD

Mix the selected UPS Product and using the flexible applicator provided apply a thin, even film to the prepared inside surface of the housing and also to the outside surface of the liner or bush. Ensure the product is pushed well into the prepared surface of the housing. Apply further material, in excess to the internal surface of the housing. The liner or bush must then be jacked into position in the housing and correctly aligned. Any excess product extruded during the assembly should be removed immediately.

2. INJECTION METHOD

The liner or bush should be aligned with the housing. Seal the annular space between the bush and the housing where required, to prevent loss of product during the injection process. This may be done by mechanical means or by the use of a fast curing grade of UPS Product. Injections holes should be carefully positioned together with the vent holes to prevent formation of the air

traps ideally, injection points should be spaced no more than 24” apart. The selected product should be loaded into disposable injection cartridges and injected using pneumatic equipment. The application should progress from the lowest injection point to the highest injection point. Material is injected until it is exuded from the next highest injection point. This process should be continued until the annular space between the bush and the housing has been completely filled with the product indicated by leakage of the product through small vent holed drilled at the highest point available.

TECHNICAL SUMMARY

PRODUCT	COMPRESSIVE STRENGTH	WORKING LIFE (20°C)	FULL CURE (20°C)
EXTENDED LIFE SUPER METAL REBUILDING SYSTEM	10,000 PSI (ASTM D 965)	60 MINUTES	5 DAYS
FLEXIBLISED CERAMIC CARBIDE COMPOUND	2,800 PSI ELONGATION 35% (ASTM D412)	30 MINUTES	7 DAYS

MAIN SELECTION SYSTEM

For general applications	SUPER METAL REBUILDING SYSTEM
Application requiring extended work times	EXTENDED LIFE SUPER METAL
Applications on equipment subject to differential movement	FLEXIBLISED CERAMIC CARBIDE COMPOUND
For applications by injection methods	ABRASION RESISTANT CERAMIC CARBIDE FLUID

CREATING SEALS AROUND DECK MOUNTED MACHINERY:

The following UPS section is concerned with the sealing of deck mounted machinery and should be read in conjunction with the Technical Data sheets of the following UPS products: Seal Tech AW.

COMMON DEFECTS

Corrosion due to water penetration between machinery and the deck, causing:

- Wasting of mounting bolts
- Excessive Vibration due to loss of surface contact
- Incorrect load transmission due to loss of surfaces

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet.

SURFACE PREPARATION

Thoroughly wire brush all surfaces to be sealed, to remove all loose coatings and other surface contaminants. Remove any loose oxidation from metal surfaces. Remove all oil and grease from the surface by using UPS Universal Cleaners.

APPLICATION TECHNIQUE

Place masking tape just within the prepared area, so as to prevent application onto an unprepared surface and to provide a neat finish. Using a soft bristled brush, apply Seal tech AW directly onto the prepared surface up to the masking tape. Remove the masking tape after the application. As soon as the first application has become stable, re-apply the masking tape and apply a second layers of Seal tech AW, ensuring all pinholes and any areas not wetted out previously are fully covered with this second layer. Before the coating has fully cured, remove the masking tape. Where differential movement is expected the joint areas may be strengthened by the incorporation of a reinforcing tape between the two layers of product.

TECHNICAL SUMMARY

PRODUCT	COMPRESSIVE STRENGTH	WORKING LIFE (20°C)	FULL CURE (20°C)
SEAL TECH AW		30 MINUTES	24 HOURS

DECK CAULKING AND SEALING DECK JOINTS

The following UPS section is concerned with the sealing of deck joints and should be read in conjunction with the Technical Data sheets of the following UPS Products: 60 Durometer Elastomer Fluid and 80 Durometer Elastomer Fluid.

COMMON DEFECTS

Penetration of decking joints by fluids causing corrosion in steel and rotting wooden planking. The degrading of silicone based caulking compounds

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. Product selection and application should be based upon the joint configuration, the operating environment and the maximum anticipated joint movement.

SURFACE PREPARATION

a). Wooden Decking

Wooden decking should be laid in the conventional manner and sanded level. Each joint should then be cut using a milling machine to give a joint cross with a sectional profile width 3/8" and a depth of 3/16". In all cases, the width of the joint must be twice the depth. Remove all cutting debris and vacuum joint clean.

b). Metal Decking

Grit blast to give a surface finish of **Swedish Standard Sa 21/2 ensuring a minimum of 75 microns profile** using an angular abrasive.

Apply the UPS Universal primer provided to the entire joint surface in a thin film using a stiff bristled brush. Allow the primer to fully cure (1 hour at 20C) before proceeding further.

APPLICATION TECHNIQUE

Once the primer is dry, adhesive polyethylene bond breaker tape should be placed in the bottom of the joint. Mix the selected UPS Elastomer product and using a stiff bristled brush, apply a thin film onto the sides of the joint in order to ensure proper contact with the substrate. Pour or pipe in the remaining material in a thin film to fill the joint, leaving the surface slightly concave.

TECHNICAL SUMMARY

PRODUCT	TENSILE STRENGTH	HARDNESS	WORKING LIFE (20°C)	FULL CURE (20°C)
SEAL TECH CC	700 PSI (ASTM D 412)	45	40 MINTUES	72 HOURS
60 DUROMETER	1000 PSI (ASTM D 412)	60	25 MINUTES	72 HOURS
80 DUROMETER ELASTOMER FLUID	1800PSI (ASTM D 412)	80	25 MINUTES	2 HOURS

MAIN SYSTEM SELECTION

HORIZONTAL JOINTS	60 OR 80 DUROMETER ELASTOMER FLUID
HIGH MOVEMENT	60 DUROMETER ELASTOMER FLUID
CHEMICAL SPILLAGE AREAS	80 DUROMETER ELASTOMER FLUID
RAPID LOCALISED AREAS	80 DUROMETER ELASTOMER FLUID

REPAIRING FENDERS AND FLOATING HOSES

The following UPS section is concerned with the repairing of Fenders and Floating Hoses and should be read in conjunction with the Technical Data sheets of the following UPS Products: 60 Durometer Elastomer Paste and 80 Durometer Elastomer Paste.

COMMON DEFECTS

Mechanical damage or wear.

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. Product selection and application should be based upon the nature and severity of the damage, the time available for work the system pressure and operating temperatures.

N.B. Repairs must not be attempted if damage to reinforcement layers is evident.

SURFACE PREPARATION

All loosely adhered material should be cut away and the repair area cut back using a sharp knife, this leaves a sound edge terminated square or undercut. Where exposed reinforcement fabric has become wet, it should be allowed to dry out. The complete area of damage and an area at least 3" around the damage should then be abraded to produce a woolly finish. This can be accomplished by using a rotary wire brush, or by the use of a roughing brush. Where metallic reinforcements are exposed, this should be thoroughly roughened and then washed with UPS Universal Cleaner in order to remove all dirt, grease and other surface contaminants.

PRIMING SYSTEM

Apply the UPS Primer supplied with the product in a thin film to the entire prepared area, be sure to use a stiff bristled brush.

APPLICATION TECHNIQUE

Mix the selected product and apply a thin layer to the prepared area. Ensure this layer of product is kept within the prepared area and is pushed will into the prepared profile. Wet out an appropriate length of UPS reinforcement tape with the mixed product and apply this to the repair area. Where more then one length of reinforcement tape is required, ensure an overlap of a minimum of ¼" between lengths. Finally, apply further product to totally encapsulate the reinforcement tape and in fill the repair area using a correctly contoured rigid applicator to re-profile the surface. If required a suitable rotary grinding tool can be used to finally contour the surface, after a full mechanical cure of the product has taken place.

TECHNICAL SUMMARY

PRODUCT	HARDNESS	WORKING LIFE (20°C)	FULL CURE (20°C)
60 DUROMETER ELASTOMER PASTE	60	25 MINUTES	72 HOURS
80 DUROMETER ELASTOMER PASTE	80	25 MINUTES	72 HOURS

MAIN SYSTEM SELECTION

REQUIRED FOR HIGH
ABRASION RESISTANCE

80 DUROMETER ELASTOMER PASTE

GENERAL REPAIR WORK

60 DUROMETER ELASTOMER PASTE

APPLICATION OF SAFETY GRIP SYSTEMS

The following UPS section is concerned with the application of a non slip system for wood, metal or GRP surfaces and should be read in conjunction with the Technical Data sheets of the following UPS Products: Fluid Super Metal System and Grip Tech.

COMMON DEFECTS

- A). Slipping by operatives on smooth, sloping, greasy or chemically contaminated surfaces
- B). Identification of approved access surfaces
- C). Provision of safety surfacing around machinery and in hazardous environments.

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. Product selection and application should be based on the type of substrate and the environment. UPS non slip systems can be modified to give varying degrees of slip resistance, in order to accommodate a wide range of needs. In particular partial coverage can be advantageous in heavily contaminated areas.

SURFACE PREPARATION

Wash down all areas with UPS Universal Cleaners in order to remove all dirt, grease and surface contaminants. Prior to application of the selected product, all surfaces to be treated should be thoroughly abraded using one of the following recommended methods:

- a). Metal surfaces should ideally be blasted to *Swedish Standard SA 21/2 ensuring a minimum profile of 75 microns, using an angular abrasive*. On small areas of metal, needle gunning or grinding may be suitable.
- b). Glass Fiber surfaces should be thoroughly abraded using mechanical sanding equipment.
- c). Wooden surfaces are to be prepared by outing grooves 1.5” wide and 0.04” deep, down the centre of each strake.

Remove all preparation debris and thoroughly dry the deck with the aid of a gas torch if necessary. On Completion of all preparation, re wash areas to be treated with UPS Universal Cleaner.

CREATING A NON SLIP SYSTEM

After Preparation is complete, masking tape should be laid firmly onto the surface to give the outline of the pattern desired, this pattern can be varied to suit the location. Stripes should be laid out across the traffic flow rather than in line with it. Chevrons are ideal on sloping surfaces as they allow for additional drainage.

APPLICATION TECHNIQUE

Apply the selected UPS product to the prepared surface, using either a stiff bristled brush or the plastic applicator provided, ensuring the material is pushed well into the prepared surface. Ensure the product has been applied at the correct thickness for a non slip system (see technical data sheets). Immediately after application of the product, sprinkle the chosen aggregate evenly onto the wet surface, ensure that all areas are thoroughly covered and press down the aggregate into the wet product using a wooden float or similar tool. Remove all masking tape.

TECHNICAL SUMMARY

PRODUCT	ABRASION RESISTANCE	WORKING LIFE (20°C)	FULL CURE (20°C)
FLUID SUPER METAL RESURFACING SYSTEM	GOOD	35 MINUTES	5 DAYS
GRIP TECH	EXCELLENT	25 MINUTES	16 HOURS

MAIN SYSTEM SELECTION

REQUIRED FOR HIGH ABRASION RESISTANCE- METALLIC SURFACE	FLUID SUPER METAL RESURFACING SYSTEM WITH HEAVY DUTY AGGREGATE
MEDIUM ABRASION ON A METALLIC SURFACE	FLUID SUPER METAL RESURFACING SYSTEM WITH MEDIUM DUTY AGGREGATE
LOW WEAR RESISTANCE ON A METALLIC SURFACE	FLUID SUPER METAL RESURFACING SYSTEM WITH LOW DUTY AGGREGATE
NON METALLIC SURFACES	GRIP TECH
SAFETY COLOUR REQUIRED YELLOW OR RED	GRIP TECH

THE CASTING OF CUTLASS BEARINGS

The following UPS section is concerned with the casting of Cutlass Bearings and should be read in conjunction with the Technical Data sheets of the following UPS Products: Abrasion Resistant Ceramic Carbide Fluid, Flexiblised Ceramic Carbide Fluid, 60 Durometer Elastomer Fluid and 80 Durometer Elastomer Fluid.

COMMON DEFECTS

- A). Damage due to dry running.
- B). Loss of clearances due to damage from abrasive particles.
- C). Damage caused by shaft misalignment or vibration.

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. Product selection and application should be based on the nature of the damage and the amount of time available for the repair to be carried out.

SURFACE PREPARATION

A suitable mould must be manufactured, this can be done by using one of the two techniques outlined below:

- a). Produce a centralising jig for the existing outer sleeve of the bearing and machine a suitable metal insert to the configuration of the internal dimensions of the bearing. This should then be centralised within the outer sleeve to produce a mould.
- b). Alternatively, UPS Abrasion Resistant Ceramic Carbide Fluid and Flexiblised Ceramic Carbide Fluid can be used to cast an inner mould. This can be done by coating the internal surface of a new bearing/ bush with two coats of UPS Release Agent. Once allowed to dry, the bearing can be centralised in a jig and one of the UPS Ceramic Carbide coatings can be poured in a thin stream to fill the centre cavity. When the material has cured the original bearing may be removed leaving the cured core adhered and centralised in the jig.

Produce a new outer sleeve from suitable materials or alternatively, remove all existing rubber from the existing sleeve and prepare the internal surfaces by grit blasting to *Swedish Standard SA 21/2 ensuring a minimum profile of 75 microns, using an angular abrasive*. Clean the component thoroughly with UPS Universal Cleaners and treat the surface of the former with a minimum of two coats of UPS Release Agent and allow to dry.

PRIMING SYSTEM

Apply the UPS Primer supplied with the 60 or 80 Durometer Elastomer product in a thin film using a stiff bristled brush to the entire prepared area. All surfaces to which the material is to bond to must be treated.

APPLICATION TECHNIQUE

Mix the selected UPS product in accordance with the Technical Data Sheet. Using a short Bristled Brush, wet out the internal surfaces of the former and the internal diameter of the outer sleeve. Position the former and outer sleeve into the mould and centralise. Immediately pour the remainder of the pre mixed material in a thin stream in order to prevent excessive air entrapment. Continue to pour until the material fills the mould to the desired level and allow to cure in accordance with the data sheet, after which, the bearing can be removed and any excess material removed using a sharp knife.

TECHNICAL SUMMARY

PRODUCT	ABRASION RESISTANCE	WORKING LIFE (20°C)	FULL CURE (20°C)
60 DUROMETER ELASTOMER FLUID	GOOD	15 MINUTES	72 HOURS
80 DUROMETER ELASTOMER FLUID	EXCELLENT	20 MINUTES	72 HOURS

MAIN SYSTEM SELECTION

HIGH VOLUME SOLIDS
CONTAMINATION OF THE FLUID

80 DUROMETER ELASTOMER FLUID

GENERAL USAGE AND
OR LIGHT DUTY APPLICATIONS

60 DUROMETER ELASTOMER FLUID

REBUILDING OF POWER BLOCKS

The following UPS section is concerned with the rebuilding of power blocks and should be read in conjunction with the Technical Data sheets of the following UPS Products: 80 Durometer Elastomer Paste.

COMMON DEFECTS

Mechanical damage to lining material caused by wear and abrasion.

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. Repairs to the power block can be carried out in situ, but it may be necessary to construct a suitable tented work space in order to protect the power block and working engineer from adverse weather conditions. To obtain optimum results, it will be necessary to pre form a suitably rigid template, shaped to give the desired final contour of the power block.

SURFACE PREPARATION

Thoroughly fry the repair area and cut away all loosely adhered material using a sharp knife. Undercut existing rubber covering at the extremity of the repair area. Roughen the exposed power block carcass using an angular grinder, fitted with a cutting wheel, or a similar tool capable of roughening the surface. The surrounding rubber coating should also be roughened using a roughing brush to produce a woolly surface. If an entire new coating is to be applied, then the metallic carcass of the power block should be roughed by grit blasting to *Swedish Standard Sa2½ ensuring a minimum profile of 75 microns, using an angular abrasive.*

PRIMING SYSTEM

Apply the UPS Primer supplied with the 80 Durometer Elastomer product in a thin film using a stiff bristled brush to the entire prepared area. All surfaces to which the material is to bond to must be treated.

APPLICATION TECHNIQUE

Mix the selected UPS product in accordance with the Technical Data Sheet. Using a short Bristled Brush or the flexible applicator provided, apply a thin layer of product to wet out the prepared surface. Ensure that this material is pushed well into the prepared profile. Using a suitably shaped rigid template, apply further product whilst the power block is slowly rotating, until the original profile has been restored.

TECHNICAL SUMMARY

PRODUCT	ABRASION RESISTANCE	WORKING LIFE (20°C)	FULL CURE (20°C)
80 DUROMETER ELASTOMER PASTE	EXCELLENT	15 MINUTES	72 HOURS

EMERGENCY PIPE REPAIRS

The following UPS section is concerned with the emergency repair of pipework and tank seams and should be read in conjunction with the Technical Data sheets of the following UPS Product: Standard Resin and Hardener.

COMMON DEFECTS

Holes and cracks in sections of pipework and leaking tank seams.

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. The product selection should be based on the type of repair to be carried out.

SURFACE PREPARATION

The pressure within the system to be repaired must be turned off and all product allowed to drain away, leaving a dry surface around the damaged area. Using a wire brush or coarse sandpaper the area to be repaired must be cleared of any loose material and rust. Once abraded the damaged area must be cleaned using UPS Universal Cleaners.

APPLICATION TECHNIQUE

Repair to pipe work – UPS Standard Resin and Hardener can be used on any diameter pipe work. Mix the tin of resin thoroughly and brush onto the damaged surface, ensure the Resin exceeds the damaged area by a minimum of 3". Wind the Glass Tape roll around the pipe work, overlapping the tape by 50%, once you have reached the end of the repair do not cut the tape. Brush more resin over the glass tape and begin to wind the glass tape of the first layer of glass tape. Repeat this application up to 4 times depending on the pressure tolerance required.

Repair to leaking tank seam- Before applying the Resin and Hardener measure the surface are to be repaired and cut three areas of Glass Mat for the repair, ensure that the Glass Mat exceeds the surface of the repair by 3" in all directions. Mix the UPS Standard Resin and Hardener thoroughly and brush onto the surface of the damaged area, Lay one layer of the Glass Mat onto the applied Resin and hardener, then using a stiff bristled brush, apply more of the mixed product to the surface of the Glass Mat. Ensure the Matting is thoroughly soaked with Resin. Repeat this application three times and then allow the product to fully cure.

EMERGENCY PIPE REPAIRS UP TO 8” DIAMETER

The following UPS section is concerned with the emergency repair of pipework up to 8” diameter and should be read in conjunction with the Technical Data sheets of the following UPS Product: ThistleWrap Pipe Repair Tape

COMMON DEFECTS

Holes and cracks in sections of pipework, couplings, threads and welding seams.

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. The product selection and application techniques should be based on the diameter of the pipework being repaired.

SURFACE PREPARATION

The pressure within the system to be repaired must be turned off and all product allowed to drain away, leaving a dry surface around the damaged area. Using a wire brush or coarse sandpaper the area to be repaired must be cleared of any loose material and rust. Once abraded the damaged area must be cleaned using UPS Universal Cleaners.

APPLICATION TECHNIQUE

Choose a ThistleWrap Pipe Repair Tape relevant to the diameter of the pipe. Dip the Bandage into a container of COLD water for 20 seconds, remember to squeeze the bandage 4-5 times to expell any air. Over the damaged area wrap the bandage over the pipework, overlapping each pass and covering at least 2” on either side of the damaged area. As you wrap the bandage tight, resin should bubble to the surface and must be massaged smooth, using a gloved hand. If the bandage feels dry, pour cold water over the bandage after each pass, remembering massage the resin thoroughly. Once the bandage has come to an end, smooth off the resin and leave the bandage to set hard.

TECHNICAL SUMMARY

PRODUCT	DIAMETER PIPEWORK	WORKING LIFE (20°C)	FULL CURE (20°C)
THISTLEWRAP 50MM X 1.5MTR	MAX 2.0”	2-3 MINUTES	25 MINUTES
THISTLEWRAP 50MM X 3.6 MTR	MAX 3.5”	2-3 MINUTES	25 MINUTES
THISTLEWRAP 75MM X 3.6 MTR	MAX 5.5”	2-3 MINUTES	25 MINUTES
THISTLEWRAP 100MM X 3.6MTR	MAX 8.0”	2-3 MINUTES	25 MINUTES

EMERGENCY PIPE REPAIRS

The following UPS section is concerned with the emergency repair of pipework upto 8” diameter and should be read in conjunction with the Technical Data Sheets of the following UPS Product: ThistleWrap Pipe Repair Tape

COMMON DEFECTS

Holes and cracks in sections of pipework, couplings, threads and welding seams.

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. The product selection and application techniques should be based on the diameter of the pipework being repaired.

SURFACE PREPARATION

The pressure within the system to be repaired must be turned off and all product allowed to drain away, leaving a dry surface around the damaged area. Using a wire brush or coarse sandpaper the area to be repaired must be cleared of any loose material and rust. Once abraded the damaged area must be cleaned using UPS Universal Cleaners.

APPLICATION TECHNIQUE

Choose a ThistleWrap Pipe Repair Tape relevant to the diameter of the pipe. Dip the Bandage into a container of COLD water for 20 seconds, remember to squeeze the bandage 4-5 times to expel any air. Over the damaged area wrap the bandage over the pipework, overlapping each pass and covering at least 2” on either side of the damaged area. As you wrap the bandage tight, resin should bubble to the surface and must be massaged smooth, using a gloved hand. If the bandage feels dry, pour cold water over the bandage after each pass, remembering massage the resin thoroughly. Once the bandage has come to an end, smooth off the resin and leave the bandage to set hard.

TECHNICAL SUMMARY

PRODUCT	DIAMETER PIPEWORK	WORKING LIFE (20°C)	FULL CURE (20°C)
THISTLEWRAP 50MM X 1.5MTR	MAX 2.0”	2-3 MINUTES	25 MINUTES
THISTLEWRAP 50MM X 3.6 MTR	MAX 3.5”	2-3 MINUTES	25 MINUTES
THISTLEWRAP 75MM X 3.6 MTR	MAX 5.5”	2-3 MINUTES	25 MINUTES
THISTLEWRAP 100MM X 3.6MTR	MAX 8.0”	2-3 MINUTES	25 MINUTES

EMERGENCY PIPE REPAIRS

The following UPS section is concerned with the emergency repair of pipework and tank seams and should be read in conjunction with the Technical Data sheets of the following UPS Product: Standard Resin and Hardener

COMMON DEFECTS

Holes and cracks in sections of pipework and leaking tank seams.

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. The product selection should be based on the type of repair to be carried out.

SURFACE PREPARATION

The pressure within the system to be repaired must be turned off and all product allowed to drain away, leaving a dry surface around the damaged area. Using a wire brush or coarse sandpaper the area to be repaired must be cleared of any loose material and rust. Once abraded the damaged area must be cleaned using UPS Universal Cleaners.

APPLICATION TECHNIQUE

Repair to pipe work – UPS Standard Resin and Hardener can be used on any diameter pipe work. Mix the tin of resin thoroughly and brush onto the damaged surface, ensure the Resin exceeds the damaged area by a minimum of 3". Wind the Glass Tape roll around the pipe work, overlapping the tape by 50%, once you have reached the end of the repair do not cut the tape. Brush more resin over the glass tape and begin to wind the glass tape of the first layer of glass tape. Repeat this application up to 4 times depending on the pressure tolerance required.

Repair to leaking tank seam- Before applying the Resin and Hardener measure the surface are to be repaired and cut three areas of Glass Mat for the repair, ensure that the Glass Mat exceeds the surface of the repair by 3" in all directions. Mix the UPS Standard Resin and Hardener thoroughly and brush onto the surface of the damaged area. Lay one layer of the Glass Mat onto the applied Resin and hardener, then using a stiff bristled brush, apply more of the mixed product to the surface of the Glass Mat. Ensure the Matting is thoroughly soaked with Resin. Repeat this application three times and then allow the product to fully cure.

THISTLEWRAP PIPE REPAIR TAPE

MIXING INSTRUCTIONS

ThistleWrap is a specially treated woven glass fabric impregnated with a polyurethane resin, which is activated by immersion in water. ThistleWrap is ideal for pipe repairs to low pressure systems. As a general guide, a repair build up to a thickness of approximately 12 mm (½”) over the leak can withstand a maximum service pressure of 10 bar (150 psi). Higher pressures, up to 50 bar (725 psi), can be achieved by first applying over the leak, a ‘plug’ of UPS twist-stick grade metal-filled epoxy putty (TRK No. 19060)

The above products are included in the **ThistleWrap Pipe Repair Kit (TRK No. 19500)**

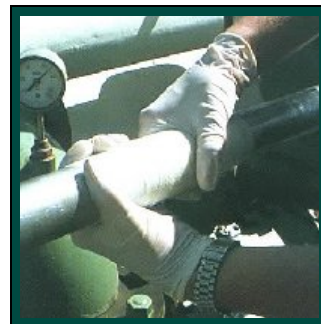
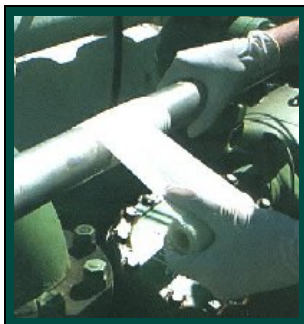
Comprises: 5 units ‘ThistleWrap’ packaged in a robust plastic container (which serves as a water bucket) with 1 unit PlasSteel (125g), 5 pairs disposable gloves, mixing and application instructions.

Instructions for use:

1. Prepare pipe surface around repair area by wire brushing loose rust, paint etc. or if smooth, abrade with coarse emery cloth or similar.
2. Wearing protective gloves, remove roll from the foil bag and immerse in water (preferably fresh) for approx. 10 to 20 seconds, squeezing two or three time.



3. Remove roll from water and wrap quickly and tightly as follows: Centre tape over leak site, wrap from bottom of roll, putting firmly throughout application.



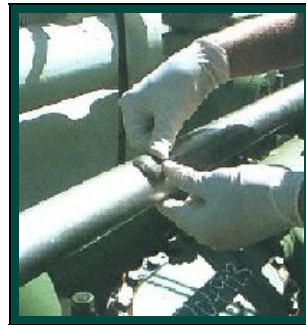
After several windings of tape, which should extend 1.5 to 2 pipe diameters each side of the hole, resin foam will come through the tape which is desirable and aided by pulling tightly. The tape should be wound on with a half width of tape overlap keeping it flat and even, maintaining tightness. Apply one or more rolls, as the repair dictates. Firmly press and smooth end of rolls into wrap in the direction of application. Wet gloves in water, smooth and firmly press the wet resin back into the wrap.

Keep hands moving quickly and wet gloves frequently to avoid sticking. As the repair cures it will warm up very slightly, which is normal.

4. Continue rapid hand movement pressing and polishing resin in motions around and parallel to the pipe. Continue process until resins are no longer tacky. The repair should now have a smooth, hard surface and an enamel like appearance with no fiberglass substrate showing through the resins.

Note: If a thicker application is needed, spend a little less time finishing the first roll and immediately begin the application of the next. Finish the final roll as if a single roll application.

Note 2: If the hole in the damaged pipe is larger than 3mm, you can use UPS TRK19060 Metal Repair Stick to first “plug the hole”. After curing you can then processed as in step 1.



Drying/Cure times at 20°C/68°F

Usable life	2-3 mins
Initial set	5 mins
Full mechanical strength	30 mins

Cleaning

After application dispose of gloves

Health and Safety

As long as normal good practices are observed, ThistleWrap can be safely used. Keep skin contact to a minimum. Use disposable gloves. Wash off areas of contact with soap and water.

THISTLEWRAP PIPE REPAIR USER CHART

Pipe nb	Pipe circum	8 circum	50 x 1.5m	75 x 3.60m	100 x 3.60m
15	47	424	One	-	-
20	63	566	One	-	-
25	79	707	One	-	-
32	101	90	One	-	-
40	126	1131	One	-	-
50	157	1414	One	-	-
80	251	2262	Two	-	-
100	314	2828	Two	One	One
125	393	3535	-	One	One
150	471	4242	-	Two	Two
200	628	5656	-	Two	Two
250	786	7070	-	Two	Two
300	943	8483	-	Three	three
mm	mm	mm	-	-	-

Hydrostatic tests based on 9 wraps around circumference procedure in accordance with API 6 and a.s.m.e. 8.
 Chemical resistance
 Resists most chemicals (see separate detailed list)

2-4mm holes on 20mm centres
 First leak @ avr 14 bar over three tests
 Temp Resistance (when cured) 150c
 Tensile strength of bandage 2051 newtons
 Dielectric test Max 16,000 volts @ breakdown

THISTLEWRAP PIPE REPAIR – CHEMICAL RESISTANCE GUIDE

KEY R - Resistant for continuous immersion
 LR - Suitable for occasional splashes/short term contact
 NR - Not recommended for any form of contact

ACETALDEHYDE	LR	HYDROCHLORIC ACID less than	R
ACETIC ACID greater than 20 %	NR	HYDROGEN PEROXIDE LESS	R
ACETONE	LR	KEROSENE	R
ANILINE	LR	LACTIC ACID LESS THAN 20%	R
AVIATION FUEL	R	LINSEED OIL	R
BENZENE	R	LUBRICATING OIL	R
BUTYL ALCOHOL	LR	METHYL ALCOHOL	NR
BUTYL ACETATE	LR	METHYL ETHYL KETONE	LR
CALCIUM CARBONATE	R	METHYLENE CHLORIDE	NR
CARBONIC ACID	R	MOLASSES	R
CARBON TETRACHLORIDE	NR	NAPHTHA	R
CASTER OIL	R	NITRIC ACID less than 10 %	R
CHLOROFORM	LR	PARAFFIN WAX	R
CITRIC ACID LESS THAN 10%	R	PENTANE	R
CREOSOTE	LR	PHENOL	LR
CRUDE OIL	R	PHOSPHORIC ACID less than 10	R
CYCLOHEXANONE	LR	PHOSPHORIC ACID less than 20	R
DIACETONE ALCOHOL	LR	PHOSPHORIC ACID less than	R
DIBUTYL PHTHALATE	R	POTASSIUM CARBONATE	R
DIESEL OIL	R	POTASSIUM HYDROXIDE 10%	R
DIETHYLENE GLYCOL	R	PYRIDINE	LR
DIETHYLENE TRIAMINE	LR	SODIUM CHLORIDE	R
DISTILLED WATER	R	SODIUM HYDROXIDE	R
ETHYL ALCOHOL	LR	STYRENE	LR
ETHYL ACETATE	LR	SULPHURIC ACID less than 10 %	R
ETHYLENE GLYCOL	R	TOLUENE	LR
FERRIC CHLORIDE	R	TRICHLOROETHYLENE	LR
FORMALDEHYDE	LR	TURPENTINE	R
FORMIC ACID less than 10 %	R	VEGETABLE OIL	R
GASOLINE	R	WHITE SPIRIT	R
GLYCEROL	R	WHISKY	R
HEPTANE	R	WINE	R
HEXANOL	R	XYLENE	LR
		ZINC CHLORIDE	R

Note 1: This table is for guidance purposes only.

Note 2: All products are resistant to aqueous solutions of most chemical salts of inorganic acids

Confirmation of suitability should be checked with E. Wood Ltd prior to any application.

REBUILD OF ERODED AND CORRODED PUMP HOUSINGS

The following UPS section is concerned with the rebuilding of eroded and corroded pump housings and should be read in conjunction with the Technical Data sheets of the following UPS Products: Super Metal Rebuilding System, Extended Life Super Metal Rebuilding System, Rapid Setting Super Metal, PlasSteel Twist Stick, Ceramic Carbide Wearing Compound.

COMMON DEFECTS

Pitting and Scarring on external surfaces produced by prolonged periods of exposure to highly abrasive products, leading to a reduction in performance and efficiency and ultimately holes in the outer surface of the pump housing. Without preventative maintenance or repair this can lead to scrapping of components.

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. The product selection and application techniques should be based on the nature of the repair and the product being pumped.

SURFACE PREPARATION

There two types of repair that can be carried out by the UPS product range.

1. If the pump housing cannot be taken out of service, but the system pressure can be turned off for 1-4 hours, thus stopping any product passing through the pump. The outer surface of the pump housing should be abraded using a grinding disc to remove any surface rust or surface contaminants. The area to be repaired should then be cleaned using UPS Universal Cleaner.
2. If the pump can be taken out of service, then blast clean the damaged area to Swedish Std Sa2½ ensuring a profile of 75 microns minimum using an angular grit. This method of surface preparation will ensure a longer lasting repair. After blasting, all damaged areas must be cleaned using UPS Universal Cleaner.

APPLICATION TECHNIQUE

In situ repair and out of service repair– Using the chosen UPS product, apply the material, using the applicator provided, in to the hole or crack. Ensure that the product applied has been pushed sufficiently into the surface of the pump housing and covers al of the effected area. Once this has been achieved apply the UPS material onto the surrounding area to the repair, approximately 2” in all directions. The product should then be left undisturbed to fully cure before the equipment is returned to service.

TECHNICAL SUMMARY

PRODUCT	ABRASION RESISTANCE	WORKING LIFE (20°C)	FULL CURE (20°C)
SUPER METAL REBUILDING SYSTEM	GOOD	20 MINUTES	72 HOURS
RAPID SETTING SUPER METAL	GOOD	2-3 MINUTES	2 HOURS
PLASSTEEL TWIST STICK	FAIR	2-3 MINUTES	2 HOURS
CERAMIC CARBIDE WEARING COMPOUND	EXCELLENT	25 MINUTES	24 HOURS

REBUILD OF VOLLUTE AND IMPELLERS

The Following UPS section is concerned with the rebuilding of eroded and corroded Vollute and Impellers and should be read in conjunction with the Technical Data sheets of the following UPS Products: Super Metal Rebuilding System, Extended Life Super Metal Rebuilding System, Ceramic Carbide Wearing Compound, Abrasion Resistant Ceramic Carbide Fluid.

COMMON DEFECTS

Pitting and Scarring on internal surfaces produced by prolonged periods of exposure to highly abrasive products, leading to a reduction in performance and efficiency. Without preventative maintenance or repair this can lead to scrapping of components.

PREPARATION

All work should be carried out in strict accordance with the relevant UPS Technical Data Sheet. The product selection and application techniques should be based on the nature of the repair and the product being pumped.

SURFACE PREPARATION

The damaged components should be taken out of service and blast cleaned to Swedish Std SA 2 1/2 ensuring a profile of 75 microns minimum using an angular grit. This method of surface preparation will ensure a long lasting repair. After blasting, all damaged areas must be cleaned using UPS Universal Cleaners.

APPLICATION TECHNIQUE

Impellers – Depending on the damage sustained by the impeller the user may have to rebuild entire areas of the component. This can be achieved by building layers of the UPS repair paste onto the damaged area. In some cases steel plate may have to be welded onto the surface of the impeller prior to repair. Once the damaged impeller has been filled, allow the UPS repair material to set. Please ensure to have read the correct technical data sheet to obtain the minimum and maximum overcoating times for repair material chosen. Once the UPS product has set, apply to two coats of UPS Abrasion resistant Ceramic Carbide Fluid over the entire surface of the impeller. The component should be left to fully cure before being put back into service.

Vollute – Any areas of pitting and scarring must be filled in using the chosen UPS repair material. For large damaged areas the product should be applied in thin layers, so to avoid any air entrapment. Once the product has reached its minimum overcoating time, apply two coats of UPS Abrasion Resistant Ceramic Carbide Fluid onto the entire surface of the Vollute to ensure maximum protection. The product should be left to fully cure before being put back into service.

TECHNICAL SUMMARY

PRODUCT	MACHINABLE	ABRASION RESISTANCE	WORKING LIFE (20°C)	FULL CURE (20°C)
SUPER METAL REBUILDING SYSTEM	YES	GOOD	20 MINUTES	72 HOURS
EXTENDED LIFE SUPER METAL REBUILDING SYSTEM	YES	GOOD	20 MINUTES	72 HOURS
ABRASION RESISTANT CERAMIC FLUID	NO	EXCELLENT	30 MINUTES	5 DAYS
CERAMIC CARBIDE WEARING COMPOUND	NO	EXCELLENT	25 MINUTES	5 DAYS

REPAIR TO CORRODED KORT NOZZLES – TURKEY COST SAVING: £3750



A Ship Repair yard in Turkey approached the UPS Distributor asking for a proven repair system to rebuild and protect a badly corroded area of the ships hull.



UPS recommended the use of **TR200 Ceramic Carbide Wearing Compound** and **TR205 Abrasion Resistant Ceramic Carbide Fluid**.

The corroded areas were blasted and cleaned using the **UPS Universal Cleaner**. The corroded areas were rebuilt using the **TR200 Ceramic Carbide Wearing Compound**, once it became touch dry, the repaired area was then coated with **TR205 Abrasion Resistant Ceramic Carbide Fluid**.

These products were selected for their excellent mechanical and physical strengths, combined with optimum corrosion and abrasion resistance.



SUPER METAL REPAIR SYSTEMS- CHARACTERISTIC CHART

Product Code	Product Name	Pack Size	Mixing Ratio	Usable Life (20C)	Initial Set	Machine Time	Coverage Rate per unit	Applied By	Max Pipe Width	Max Temp Dry - Continuous	Max Temp Wet - Continuous	Surface Prep - Degreased	- Manual	- Blasted		
TRK19065	Rapid Setting Super Metal	2 x 175gm	1:1	3 mins	10 mins	30 mins	N/A	Spatula	N/A	250	120	120	70	*	*	*
TR105	Super Metal Rebuild System	1 kg	3:1	25 mins	60 mins	2 hours	N/A	Spatula	N/A	250	120	120	70	*		*
TR110	Fluid Super Metal System	2 x 1kg	3:1	40 mins	4 hours	8 hours	2 sqm	Brush	N/A	250	120	120	70	*		*
TR115	Extended Life Super Metal	3 kg	3:1	60 mins	4 hrs	12 hours	N/A	Spatula	N/A	250	120	120	70	*		*
TRK19060	PlasSteel Twist Stick	125gm	1:1	6 mins	15 mins	30 mins	N/A	Hand	N/A	250	120	120	70	*	*	
TRK19062	PlasBronze Twist Stick	125gm	1:1	6 mins	15 mins	30 mins	N/A	Hand	N/A	250	120	120	70	*	*	
TRK19601	ThistleWrap Pipe Repair Tape	50mm x 1.5mtr	N/A	2-3 mins	15 mins	30 mins	N/A	Hand	60 mm	260	260	260	260	*	*	
TRK19603	ThistleWrap Pipe Repair Tape	50mm x 3.6mtr	N/A	2-3 mins	15 mins	30 mins	N/A	Hand	100mm	260	260	260	260	*	*	
TRK19604	ThistleWrap Pipe Repair Tape	75mm x 3.6mtr	N/A	2-3 mins	15 mins	30 mins	N/A	Hand	180mm	260	260	260	260	*	*	
TRK19605	ThistleWrap Pipe Repair Tape	100mm x 3.6m	N/A	2-3 mins	15 mins	30 mins	N/A	Hand	250mm	260	260	260	260	*	*	
TRK19063	Plastic Steel	500gm	3:1	30 mins	60 mins	2 hours	N/A	Spatula	N/A	250	120	120	70	*	*	*

Max Temp Dry – maximum temperature when in contact with dry products ie – powders

Max Temp Wet – maximum temperature when in contact with wet products ie – water, sewage, chemicals

SUPER METAL REPAIR SYSTEMS

Use the table below to choose the right product for the application, then look at the following page for general characteristics on the product chosen. **NOTE** the table below is only a guide, if in doubt please contact our technical department for confirmation of the choice made.

Product Name	Batteries - Leaking	Base Plate - Cracked	Bearing Housing - Worn	Bearing Support - Worn	Brake Test Rollers - Worn +	Corrosion Spots	Drive Rollers - Worn	Flange Face - Damaged	Heat Exchanger - Damaged End Plates	Hydraulic Rams - Scored	Keyways - Sloppy	Pipes - Leaking	Pipes - Leaking Couplings	Pipes - Repair Stripped Threads	Pipes - Sealing Leaking Threads	Pumps - Cracked Casing (Outside)	Pumps - Damaged Shroud	Pumps - Worn Backplate	Pumps - Worn Shaft	Sump - Cracked	Tanks Seams - Leaking	Non Slip Coating - Steel +	Repair Copper/Bronze Fittings
TRK19065 Rapid Setting Super Metal						*		*	*		*		*	*	*	*					*		
TR105 Super Metal Rebuilding System	*	*	*	*			*	*	*	*	*		*	*	*	*	*	*	*	*	*		
TR110 Extended Life Super Metal	*	*	*	*			*	*		*	*		*	*		*	*	*	*	*	*		
TR115 Fluid Super Metal+					*																*		
TRK19060 PlasSteel Twist Stick						*		*					*										
TRK 19062 PlasBronze Twist Stick																							*
TRK19601/3/4/5/ ThistleWrap Pipe Repair Tape											*		*		*								
TRK19063 Plastic Steel	*	*				*		*	*	*	*		*	*	*	*	*	*	*	*	*		
*Ideal for use for this particular application.																							

+ When used in conjunction with LD/HD/XHD Grip

CERAMIC CARBIDE REPAIR SYSTEMS- *CHARACTERISTIC CHART*

Product Code	Product Name	Pack Size	Mixing Ratio	Usable Life (20C)	Cure Time	Grinding Time	Coverage Rate per unit	Applied By					Surface Prep - Degreased	- Manual	- Blasted
									Max Temp Dry	- Continuous	Max Temp Wet	- Continuous			
TR200	Ceramic Carbide Compound	2 kg	3:1	25 mins	60 mins	2 hours	N/A	Spatula	200	120	120	70	*		*
TR205	Abrasion Resistant Ceramic Carbide Fluid	1 kg	3:1	25 mins	3 hours	6 hours	1.6 sqm at 250µ	Brush	250	120	120	70	*		*
TR210	Super Low Friction Efficiency Coating	1 kg	3:1	45 mins	6 hours	8 hours	2.7 sqm at 250µ	Brush	150	120	80	60	*		*
TR220	High Temp Ceramic Carbide Compound	3 kg	3:1	60 mins	6 hours	8 hours	0.8sqm at 250µ	Spatula	250	170	180	150	*		*
TR225	Ceramic Carbide 88	3 kg	3:1	30 mins	1 hour	6 hours	3.7 sqm at 125µ	Spray	120	100	100	60	*		*
TR230	Flexiblised Ceramic Carbide Compound	3 kg	3:1	20 mins	2 hours	3 hours	N/A	Spatula	150	80	80	50	*		*
TR235	Flexiblised Ceramic Carbide Fluid	3 kg	3:1	20 mins	2 hours	3 hours	N/A	Brush	150	80	80	50	*		*
TR240	Heavy Duty Ceramic Carbide Compound	5 kg	3:1	60 mins	3 hours	8 hours	N/A	Spatula	200	120	120	70	*		*

Max Temp Dry – maximum temperature when in contact with dry products ie – powders

Max Temp Wet – maximum temperature when in contact with wet products ie – water, sewage, chemicals

CERAMIC CARBIDE REPAIR SYSTEMS

Use the table below to choose the right product for the application, then look at the following page for general characteristics on the product chosen. **NOTE** the table below is only a guide, if in doubt please contact our technical department for confirmation of the choice made.

Product Name	Cavitation Attack -	Cavitation Attack - Coating	Chutes - Damaged (Liquids and Fine Powders)	Chutes - Damaged (Solids - high impact abrasion resistance)	Hopper - Worn	High Temperature Resistance 250C	Pipework - Liquids and fine powders	Propeller - Rebuild	Propeller - Coating	Pump Impeller - Rebuild	Pump Impeller - Coating - Water	Pump Impeller - Coating - Low Viscosity Liquids	Pump Impeller - Coating - Abrasive to High Viscosity Product	Sprayable Coating	Volute - Rebuild	Volute Coating - Water	Volute Coating - Low Viscosity Liquids	Volute Coating - Abrasive to High Viscosity Product	Volute - Rebuild & Coating - High impact/ abrasion resist	Valve Rebuild	Valve Coating - Water	Valve Coating - Low Viscosity Liquid	Valve Coating - Abrasive to High Viscosity Product	Valve Rebuild & Coating - high impact/ abrasion
TR200 Ceramic Carbide Wearing Compound			*		*		*	*		*					*					*				
TR205 Abrasion Resistant Ceramic Carbide			*		*		*	*			*	*	*				*	*			*	*	*	
TR210 Super Low Friction Coating											*	*				*	*				*	*		
TR220 Ceramic Carbide 88														*										
TR225 High Temp Ceramic Carbide						*																		
TR230 Flexible Ceramic Carbide Paste	*																							
TR235 Flexible Ceramic Carbide Fluid		*																						
TR240 Heavy Duty Ceramic Carbide				*															*					*

ELASTOMERIC REPAIR SYSTEMS - CHARACTERISTIC CHART

Product Code	Product Name	Pack Size	Mixing Ratio	Usable Life (20C)	Cure Time	Machine Time	Coverage Rate per unit	Applied By	Max Temp Dry	- Continuous	Max Temp Wet	- Continuous	Surface Prep Degreased	Manual	Blasted
TR300	60 Durometer Elastomer Fluid	2 x 600gm	2:1	25 mins	3 hours	16 hours	N/A	Brush	120	80	80	50	*		*
TR305	60 Durometer Elastomer Paste	2 x 600gm	2:1	25 mins	3 hours	16 hours	N/A	Spatula	120	80	80	50	*		*
TR310	60 Durometer Elastomer Rapid Grade	10 x 125gm	2:1	10 mins	30 mins	1 hour	N/A	Spatula	120	80	80	50	*		*
TR315	80 Durometer Elastomer Fluid	2 x 600gm	13:2	15 mins	4 hours	16 hours	N/A	Brush	120	80	80	50	*		*
TR320	80 Durometer Elastomer Paste	2 x 600gm	3:2	15 mins	4 hours	16 hours	N/A	Spatula	120	80	80	50	*		*
TR325	80 Durometer Elastomer Brush Grade	1 x 3kg	13:2	15 mins	4 hours	16 hours	1.9sqm at 500 microns	Brush	120	80	80	50	*		*

Max Temp Dry – maximum temperature when in contact with dry products ie – powders

Max Temp Wet – maximum temperature when in contact with wet products ie – water, sewage, chemicals

ELASTOMERIC REPAIR SYSTEMS

Use the table below to choose the right product for the application, then look at the following page for general characteristics on the product chosen. **NOTE** the table below is only a guide, if in doubt please contact our technical department for confirmation of the choice made

Product Name	Cables	Castings	Conveyor Rebuild	Conveyor Coating	Gaskets	Hosing - Low Pressure Repair ++	Moulds	Pump - Impeller	Tyre Repair - Off Road	Rapid Repairs	Conveyor	Hosing	Tyres
TR300 60 Durometer Paste	*		*			*			*				
TR305 60 Elastomer Fluid				*					*				
TR310 60 Durometer Rapid Grade Paste											*	*	*
TR315 80 Durometer Paste		*			*		*						
TR320 80 Durometer Fluid		*			*		*						
TR325 80 Durometer Brushing Grade								*					

PROTECTIVE COATINGS

Use the table below to choose the right product for the application, then look at the following page for general characteristics on the product chosen. **NOTE** the table below is only a guide, if in doubt please contact our technical department for confirmation of the choice made

Product Name	Description	Aluminium	Asbestos	Bitumen	Cast Iron	Ceramic Tiles	Concrete	Felt	GRP	Steel	Steel - Galvanised	Timber	existing Coatings	Primer Required	Self Priming	Mat Finish	Semi Gloss	Gloss	Ballast Tank	Bund Areas	Containment Dykes	Corridor	Factories	Flat Roofs	Garages	Gutters	Heavy Eng	Light Eng	Lintels	Load Bays	Mach Area	Machinery	Pipe work	Pitched Roof	Ramps	Reception	Showroom	Steps	Steelwork	Tanks	Tank Tops					
TL505 Low Viscosity Primer	PRIMER					*	*		*			*			*	*					*													*					*							
TL501/500 152 SFE	ANTI CORRO COATING	*			*				*	*	*		*		*	*			*	*					*								*	*					*	*	*					
TL515 Anti Corro Alumin	ANTI CORRO COATING	*			*					*	*		*		*	*																*						*								
TL535 Poly Finish	ANTI GRAFFITI						*		*					*			*					*	*		*	*	*	*	*	*							*	*								
TPC605 Grip Tech	ANTI SLIP COATING						*		*	*	*				*	*						*	*		*	*	*	*	*	*												*				
TPC610 Concrete Patch Repair	CONCRETE REPAIR						*						*			*	*					*	*		*	*	*	*	*	*																
TPC615 Hycote EA9 WB XB	FLOOR COATING						*						*		*		*					*	*		*	*	*	*	*	*																
TPC620 Floor Seal HS	FLOOR COATING						*								*		*					*	*		*	*	*	*	*	*																
TPC635 Hycote 700WT	ROOF COATING		*	*		*	*							*		*						*	*		*	*	*	*	*	*				*												
TPC662 Hycote 162	CHEMICAL COATING						*			*	*				*		*			*	*						*	*				*	*							*	*					
TPC670 Hycote 670GT	CONCRETE REPAIR						*							*		*				*	*						*	*	*	*	*								*							
TPC675 Hycote 175	CHEMICAL COATING						*			*	*				*		*			*	*						*	*					*	*						*	*					