Technical Data Sheet

ThistleBond

UPS 2006 LPRK
Large Pipe Repair Kit (Formally TRK 2006)




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UPS 2006 LPRK Large Pipe Repair Kit has been designed to put all products required to repair any size pipe.

The *UPS 2006 LPRK* will also protect worn pipes where the wall thickness has been compromised. Can also be used for *Off Shore* protection to immersed legs and support structures.

Product Features

- By utilizing *UPS 19000 RH* in conjunction with *UPS 19009 GT* – immediate and cost effective repairs can be carried out
- Surface preparation is at a minimum due to the surface tolerance of the *UPS 19000 RH*
- The end result can offer long term protection at a working temperature of 170°C (338°F) and at pressures ranging from 35kg/cm^2 (500psi) through to 112kg/cm^2 (1,600psi)
- Simple to apply with minimum surface preparation required.
- Gives long term repair and protection.

UPS 2006 LPRK Large Pipe Repair Kit - Contents

Product	Size	Quantity
UPS 19000 RH Standard Resin & Hardener	10 X 225gms	5
UPS 19003 A&B Cement	4 X 1kg	1
UPS 19009 GT Glass Tape	100mm X 50m	5
Disposable Gloves	Pair	20
Brush	1" Width	5
Applicators	-	10
Detailed Application Booklet	-	1

Quality: All Unique Polymer Systems LTD Products are supplied under the scopes of the company's fully documented quality system.

Warranty: Unique Polymer Systems LTD warrants that the performance of the product supplied will confirm to the typical descriptions quoted within this Technical Data Sheet provided the material is stored correctly and used according to the procedures detailed in the Technical Data Sheet for the material.

Health & Safety: Please ensure good practice is observed at all times during the mixing and application of this product. Protective gloves must be worn during the mixing and application of this product. Before mixing and applying the material please ensure you have read the fully detailed Material Safety Data Sheet.

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UPS 19000 RH Standard Resin & Hardener is a high performance, solvent free epoxy system designed for onsite repairs to metal, wood, glass and synthetic materials.

UPS 19000 is simple to use and when used in conjunction with Unique Polymers range of reinforcement products such as *UPS 19007/9 Glass Tape*, *Glass Cloth* and *Glass Mat* will result in an excellent repair medium having inherent strength and integrity.

Product Features

- **Adhesion** – Excellent to both blast cleaned and mechanically prepared surfaces.
- **Corrosion Resistance –** Excellent even under seawater immersion conditions.
- **Chemical Resistance** – Unaffected by short-term contact with industrial chemicals.
- **Temperature Resistance** – Suitable for use up to 100°C (212°F) dry heat.

Product Applications
Suitable for encapsulating long lengths of large diameter pipework, bonding dissimilar materials and injection into voids and cracks from 1 to 20mm (40 to 788 mil).

Before proceeding please read the following information carefully to ensure that the correct proper application procedure is fully understood.

Surface Preparation
All surfaces must be clean, dry, and free from oil, grease and loose material.

Metal surfaces; All loose material, rust and surface contaminates, including existing coatings, must be removed and the surface roughened by using an angle grinder, needle gun, UPS MiniBlaster or abrasive blasting. Where grinding or needle gunning is used, the surface should be cross-scored to improve adhesion. Care must be taken, when angle grinding, to avoid polishing rather than roughening metal surfaces.

GRP and Wooden Surfaces; All loose or rotten material must be removed to a sound edge. Flaking paint or lacquer scraped clear and sound paintwork thoroughly sanded to provide an effective key.

Where it is not possible to clean the surface thoroughly the application of *UPS 19003 A&B Cement* could possibly improve the bond of the final repair.

Mixing
UPS 19000 RH is a two component material comprising of a Base component and Activator component. The Base component should be poured into a suitable mixing container and the Activator added and thoroughly stirred until a homogeneous mix is obtained.

The mixed material should be used within 30 minutes of mixing at 20°C (68°F). This time will be reduced at higher temperatures and extended at lower temperatures.

Application Procedures
UPS 19000 RH should be applied to the prepared surface by stiff brush or roller to give a uniformly even coating, taking care to avoid excessive build up and ponding. On rough, pitted surfaces the product should be worked into the surface to ensure complete wetting of the substrate. To maximize the strength of the repair, it is essential that a complete coating of the resin mix is applied prior to the laying up of each layer of glass fabric. By doing so, a homogeneous glass fibre resin laminate will be achieved.

Laying up of Glass Fabrics: The principal strength of the glass fibre resin laminates lies in the Tape or Cloth layers which are either wound or laid on the surface of the repair. When using Tape, this should be wound with a 50% overlap and care must be taken to ensure that it is applied evenly and flatly. This will eliminate a possible cause of weakness in the laminate. When applying multiple layers of Tape each subsequent layer should be applied in the reverse direction and the Tape should not be cut at the end of each pass.

It will sometimes be difficult to keep the winding smooth, e.g. when the repair is on a bend in a pipe. In these instances, it is better to cut short lengths of Tape and lap them one on the other. The same comments generally apply when Glass Cloth is being used.

Application of Sealer Filler Resin Mix; Sealer Filler is a non-asbestos powder supplied with sufficient material to add to one unit of *UPS 19000 RH*. Mix the *UPS 19000 RH* then transfer to a clean mixing vessel. The Sealer Filler should be added to the resin mix and stirred until the Sealer Filler is thoroughly dispersed. The resultant paste should be applied to the repair, as required, using a troweling tool. The mix can be applied to operate at temperatures up to approximately 180°C (356°F). When it is applied as a pre-coat, prior to carrying out a repair, it will help insulate the resin laminate from the operating temperatures of the parent body.

Application of Fairing Compound Resin Mix; Fairing Compound is a filler which consists of glass fibre strands supplied with sufficient material to add to one unit of *UPS 19000 RH*. The methods of mixing application are similar to the Sealer Filler Resin Mix. The main purpose of this mix is to fill in undulations prior to the application of repair.

Injection Applications
Once the material has been mixed, dispense the product into a one component cartridge up to 1lt volume (0.25 US Gallon). Using a single component injection pump, air fed, the material can be injected into gaps to bond concrete to metal, metal to metal, plastic to concrete, plastic to metal.

Encapsulation Using Technical Fabrics
The mixed product can be used in conjunction with Glass Tape, Glass Cloth, Chop Stand Matting and Linen Scrim. The use of a technical fabric is dependent on the type of repair to be performed. Typically the following repairs are performed with these materials;

3 Layer Pipe Wrapping

1. Apply *UPS 19000 RH* at 1mm (40mil) WFT.
2. Wrap 50/100mm Glass Tape around pipe with 50% overlap.
3. Apply *UPS 19000 RH* at 1mm (40mil) WFT.
4. Wrap 50/100mm Glass Tape around pipe with 50% overlap.
5. Repeat Step 2, and finish with a 500 microns (20mil) coat of *UPS 19000 RH*.

3 Layer Pipe T-Joint

1. Apply *UPS 19000 RH* at 1mm (40mil) WFT.
2. Cut the Glass Tape into strips and lay over the surface where the 2 pipe meet.
3. Ensure there are at least 3 layers of *UPS 19000 RH* and Glass Tape around the joint area.
4. Once all the T-Joint area has been coated, apply *UPS 19000 RH* at 1mm (40mil) WFT to all the repair area.
5. Wrap 50/100mm Glass Tape around the pipe with a 50% overlap.
6. Repeat Step 2, and finish with a 500 microns (20mil) coat of *UPS 19000 RH*.

Leaking Tank Seams

1. Apply *UPS 19000 RH* at 1mm (40mil) WFT, ensure the repair area is oversized by 300mm (8") in all directions.
2. Cut a section of Glass Fibre Matting to cover the leaking seam.
3. Apply *UPS 19000 RH* at 1mm (40mil) onto the Glass Fibre Matting.
4. Apply a 2nd layer of Glass Fibre Matting.
5. Seal the repair with a final coat of *UPS 19000 RH* at 500 microns (20mil).

Technical Data & Performance

Characteristics

Coverage Rates

225GM (0.5LB) of fully mixed product will give the following coverage rates -	
0.50m^2 at 500 microns	5.3ft^2 at 20mil
0.25m^2 at 1mm	2.7ft^2 at 40mil
Please note that the coverage rates quoted are theoretical and do not take into consideration the profile or condition of the surface being repaired.	

Drying & Cure Times at 20°C (68°F)

Useable Life	25 minutes
Movement Without Load or Immersion	2 hours

Light Loading	16 hours
Full Loading	5 days
At 20°C (68°F) the applied materials should be allowed to harden for the times indicated below before being subjected to the conditions indicated. These times will be extended at lower temperatures and reduced at higher temperatures.	

Appearance

Mixed Material Colour	Opaque
Base Component Colour	White Gel
Activator Component	Light Yellow Gel

Over Coating Times

Minimum	The applied material can be over coated as soon as it is touch dry
Maximum	The over coating time should not exceed 8 hours
Where the maximum over coating time is exceeded, the material should be allowed to harden before being abraded or flash blasted to remove surface contamination.	

Shelf Life

5 years if unopened and store in normal dry conditions (15-30°C / 60-86°F)

Mixing Ratio

Component	Base	Activator
By Weight	2	1
By Volume	2	1

Density

Base	1.15
Activator	1.15
Mixed	1.15

Volume Capacity

869cc/Kg

Solids Content

100%

Slump Resistance

Nill at 3mm

Pack Sizes

This product is available in the following pack sizes;
225GM (0.5LB), 6KG (13.2LB)

Mechanical Properties

Compressive Strength ASTM D695	1034kg/cm^2 (14,700 psi)
Tensile Shear Adhesion ASTM D1002 (Abrasive Blasted Mild Steel with 75 micron profile)	148kg/cm^2 (2,100 psi)
Flexural Strength ASTM D790	912kg/cm^2 (13,000 psi)
Hardness Rockwell R ASTM D785	85
Corrosion Resistance ASTM B117	Minimum 5000 hours
Heat Distortion ASTM D648 At 264psi Fibre Stress	20°C (68°F) Cure – 70°C (158°F)

Maximum Operating Temperatures

Dry Heat	100°C (212°F)
Sealer Filler Resin	180°C (356°F)
Mix	
In Conjunction with Glass Tape	170°C (338°F)

Operating Pressures

Operating Pressures	
Low Pressure Repair	35kg/cm^2 (500 psi)
High Pressure Repair	112kg/cm^2 (1600 psi)
See application manual for full details	

Corrosion Resistance

Excellent even under seawater immersion conditions

Chemical Resistance

The product resists attack by a wide variety of inorganic acids, alkalis', salts and organic media. Refer to the Unique Polymer Systems LTD Technical Centre for advice.

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UPS 19003 A&B Epoxy Cement is a high performance, two pack, solvent free epoxy repair system for use on metallic surfaces. *UPS 19003 A&B* is ideal for application where only minimal surface preparation can be carried out and is usually used in conjunction with *UPS 19000 Standard Resin & Hardener*.

Suitable for rebuilding corrosion pitting on metallic structures and in particular, as a fairing compound on pipework prior to wrapping with the *UPS 19000 Pipe Repair System*.

Product Features

- Can be used on any surface.
- Is suitable for use as a filler as well as an adhesive.
- Developed for repairs where difficult adhesion conditions exist.

Product Applications

Typically the material is used in conjunction with *UPS Composite Repair Systems* as a cost effective surface filler prior to application of *UPS 1900 RH* and *UPS 19007/9 GT*. The material can be used for filling of pitting and scarring on badly corroded or eroded metallic surfaces.

Before proceeding please read the following information carefully to ensure that the correct proper application procedure is fully understood.

Surface Preparation

Ideal surface preparation for this material is abrasive blasted to ***ISO 8501/4 Standard SA2.5 (SSPC SP10 / NACE 2***) and a minimum blast profile of 75 microns using an angular abrasive.

However this product has been designed for surfaces with less than ideal surface preparation.

Hand Tools – Use a wire brush or coarse sand paper to abrade the surface. Ensure all loose material and as much surface contamination is cleaned from the surface and ensure the surface is wiped with *UPS CLEANER MEK* prior to, and after abrading the surface.

Mechanical Tools – Use a handheld mechanical grinder with a coarse grinding pad or rotary wire brush. Ensure all loose material and as much surface contamination is cleaned from the surface. DO NOT POLISH THE SURFACE, ENSURE THAT THE SURFACE HAS A CROSS HATCH PATTERN. Ensure the surface is wiped with *UPS CLEANER MEK*, prior to and after abrading the surface.

UPS MiniBlaster – For the best mechanical surface preparation results, use the UPS MiniBlaster. Ensure all loose material and as much surface contamination is cleaned from the surface. Ensure the surface is wiped with *UPS CLEANER MEK* prior to, and after abrading the surface.

For salt contaminated surfaces the area must be abrasive blast cleaned as mentioned above and left for 24 hours to allow any ingrained salts to come to the surface. After this 24-hour period the surface must be washed with *UPS CLEANER MEK* prior to brush blasting to remove the surface salts. This process must be repeated until all ingrained contaminates have been sweated out of the surface.

Mixing & Application

Warm the Base component to 15 – 25°C (60 – 77°F) before mixing and do not apply when the ambient or substrate temperature is below 5°C (40°F) or less than 3°C (37°F) above the dew point.

Mixing of the product can be in full units or by part mixing. If mixing the whole unit please ensure as much of the Base and Activator is dispensed from the plastic container onto a clean plastic mixing surface and mix using a spatula until a uniform material free of any streakiness is achieved, whilst ensuring no unmixed material is left on the spatula or the mixing surface. From the commencement of mixing, the whole of the material should be used within 30 minutes at 20°C (68°F).

For part mixing, using a spatula, place equal measures of the Base and Activator onto a clean plastic mixing surface, cleaning the spatula thoroughly between the taking of each measure. Mix as above.

Using a spatula or applicator tool, or for larger areas, a float, apply the material to the prepared surface, ensuring the material is pressed into any pitting or other defects and profile the repair to a smooth finish.

Where the material is to be over coated, this can be done as soon as it is touch dry and at any time up to 24 hours. Where the maximum over coating time is exceeded, the material should be allowed to harden before being abraded or flash blasted to remove surface contamination.

When *UPS 19003 A&B* is being used to bond two surfaces together, both surfaces should be coated with the material. The two pieces should then be pressed firmly together and clamped in position into the product has set, any excess material squeezed out should be scraped away before the *UPS 19003 A&B* begins to cure.

Where a repair is to be carried out on a cracked pipe then *UPS 19003 A&B* should be troweled into the crack before proceeding with the repair. Where the crack is still leaking a little, then it is recommended that *UPS 19003 A&B* should be left to cure partially before being re-troweled into the crack.

Once *UPS 19003 A&B* has cured for a minimum of 2 hours at 20°C (68°F), sanding, grinding and machining etc., can be carried out.

Technical Data & Performance

Characteristics

Coverage Rates

1KG (2.2LB) of fully mixed product will give the following coverage rates -	
0.625m^2 at 1mm	6.7ft^2 at 40mil
0.313m^2 at 2mm	3.3ft^2 at 80mil
0.208m^2 at 3mm	2.2ft^2 at 1/8”
Please note that the coverage rates quoted are theoretical and do not take into consideration the profile or condition of the surface being repaired.	

Drying & Cure Times at 20°C (68°F)

Useable Life	30 minutes
Movement Without Load or Immersion	2 hours
Light Loading	6 hours
Full Loading	2 days
Immersion	3 days
Once hardener, the material should be left for the following periods of time at 20°C (68°F) before being subjected to the conditions indicated. These times will be doubled at 10°C (50°F) and halved at 30°C (86°F)	

Appearance

Mixed Material Colour	Dark Brown
Base Component Colour	Dark Grey
Activator Component	Light Brown

Over Coating Times

Minimum	The applied material can be over coated as soon as it is touch dry
Maximum	The over coating time should not exceed 24 hours
Where the maximum over coating time is exceeded, the material should be allowed to harden before being abraded or flash blasted to remove surface contamination.	

Shelf Life

5 years if unopened and store in normal dry conditions (15-30°C / 60-86°F)

Mixing Ratio

Component	Base	Activator
By Weight	1	1
By Volume	1	1

Density

Base	1.60
Activator	1.60
Mixed	1.60

Volume Capacity

625cc/Kg

Solids Content

100%

Slump Resistance

Nill at 2.0cm

Pack Sizes

This product is available in the following pack sizes;
200GM, (0.44LB), 1KG (2.2LB), 3KG (6.6LB)

Useable Life

10°C (50°F)	50 – 60 minutes
20°C (68°F)	25 – 30 minutes
30°C (86°F)	15 – 20 minutes

Mechanical Properties

Tensile Shear Adhesion ASTM D1002 (Abrasive Blasted Mild Steel with 75 micron profile)	185kg/cm^2 (2,630 psi) 129kg/cm^2 (1,834 psi) Manually Prepared

Compressive Strength ASTM D695	735kg/cm^2 (10.4500 psi)

Corrosion Resistance ASTM B117	Minimum 5000 hours

Flexural Strength ASTM D790	298kg/cm^2 (4,250 psi)

Hardness Rockwell R ASTM D785	100

Heat Distortion ASTM D648 At 264psi Fibre Stress	20°C (68°F) Cure – 58°C (136°F) 100°C (212°F) Cure – 98°C (208°F)

Heat Resistance
Suitable for long-term water immersion at temperatures up to 70°C (158°F).

Resistant to dry heat in excess of 150°C (302°F) dependent on load.

Chemical Resistance
The product resists attack by a wide variety of inorganic acids, alkalis', salts and organic media. Refer to the Unique Polymer Systems LTD Technical Centre for advice.

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UPS 19007/9 Glass Tape is a high performance unique braided Glass Fibre Tape that, when used in conjunction with the *UPS 19000 RH* offers the ultimate in both Leak Sealing and Pipe Protection.

Applications
Ranging from the sealing of leaks on any size pipe, to the protection of lagging to prevent under lagging corrosion that can lead to hidden pipe defects that can leak at any moment, to the wrapping of pipes that are old and damaged and can lead to extending their operating life by many years.

Other uses of the *Unique* system is the protection of off-shore facilities that suffer from corrosion – erosion and salt water damage through either constant immersion or periodic immersion coupled with the aggressive nature of wave power.

Before proceeding please read the following information carefully to ensure that the correct proper application procedure is fully understood.

Tape Specifications

- Glass tape is made to DIN 61854
- Material of WARP and WEFT is woven from poly-glass yarn to EC 9-34 tex PPG 1383 / Vetrotex TD22, which will blend with the Resin and Hardener to provide extreme strength and physical properties.
- This glass tape has better rating against ageing from contact with high UV exposure compare with other tapes.
- The tape supplied is woven to a WARP of 20 yards/cm and WEFT 10 x 2 yarns/cm.
- WEFT > 300 N/cm ±20%
- Yarn Number Capture; 1 yarn.at.edge, polyester 76 dtex
- Surface Weight; approx. 140 gm/m^2 (±5%)
- Thickness; Approx 0.12mm (±0.02mm)
- Weave Pattern; 1/1 plain weave
- Weave Tolerance; ±1mm
- Tensile Strength; Wrap >200 N/cm (±20%)

Technical Data & Performance

Characteristics

Coverage Rates

UPS 19007 GT 50mm x 50m	1.25m^2 per Roll with 50% overlap	13.45ft^2 per Roll with 50% overlap
UPS 19009 GT 100mm x 50m	2.5m^2 per Roll with 50% overlap	27ft^2 per Roll with 50% overlap
Please note that the coverage rates quoted are theoretical and do not take into consideration the profile or condition of the surface being repaired.		

Maximum Operating Temperatures

Dry Heat	100°C (212°F)
Sealer Filler Resin Mix	180°C (356°F)
In Conjunction with Glass Tape	170°C (338°F)

Operating Pressures

Low Pressure Repair	35kg/cm^2 (500 psi)
High Pressure Repair	112kg/cm^2 (1600 psi)
See application manual for full details	

Mechanical Properties

Compressive Strength ASTM D695	1019kg/cm^2 (14,500 psi)

Flexural Strength ASTM D790	956kg/cm^2 (13,600 psi)

Tensile Strength ASTM D4060	644kg/cm^2 (900 psi)

Corrosion Resistance – Excellent even under seawater immersion conditions

Chemical Resistance – Unaffected by short-term contact with industrial chemicals.

Full chemical resistance chart available on request.

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