METAL-TECH PR
HIGH-PERFORMANCE, WATER-ACTIVATED REPAIR BANDAGE FOR EMERGENCY LEAK SEALING

METAL-TECH PR is a high-performance, ultra-strong, rapid curing moisture activated (activation within 5 seconds) pipe repair bandage which has been specially engineered to seal leaking pipework instantly with very limited surface preparation (SSPC SP2 Hand Tool Cleaning or SP3 Power Tool Cleaning).

It is a single component polyurethane resin (over 52% resin content) impregnated knitted fiberglass (24-26 stiches per cm^2) bandage which requires no specialist training or equipment to use. It provides instant results to leaking, damage and corroded pipework, and is extremely easy to use.

PRODUCT FEATURES

- Easy to apply, requiring no special tools, training or equipment.
- Specially selected woven fiberglass fabric impregnated with a polyurethane resin, which is activated by immersion in water – Very high stich count and resin content.
- Ideal for repairing pipes operating at pressure between 3.45 bar to 31 bar (31 bar achieved with the use of METAl-TECH SG '*Plug*').
- Designed for use for repairs up to 17.7 inch diameter.
- Can be used on a wide variety of surfaces, including all metals and many types of plastics (PVC, Fiberglass, Concrete, Steel etc.,)
- WRAS approved product (BS6920-1:2000 Approval No. 1512537)
- BV Type Approved Product (Cert. No. 68535/A0 BV)
- Chemically resistant to a wide range of industrial chemicals.
- Outstanding adhesion to manually prepared surfaces (SSPC SP2 Hand Tool Cleaning or SP3 Power Tool Cleaning).
- Instant leak sealing – ready for immediate service which provides long term protection.
- Very moisture tolerant pipe repair bandage – It will even cure underwater.

TYPICAL APPLICATIONS

Suitable for repairing various leaking pipes used within all types industries; Marine, Mining, Agriculture, housing, commercial, facilities, industrial, Oil & Gas, Paper & Pulp etc.,

Below is a list of applications within industry specific sectors:

Water & Wastewater: Used by water companies for repairing leaks in supply networks and treatment plants.

Petrochemical Plants: Efficiently repair gas, oil, and water supply pipes without requiring tools.

Quarries: Address leaks on wash plant pipework.

Power Stations: Maintain ash transfer systems, pulverized fuel tubes, and cooling water lines.

Steelworks: Refurbish steam and water pipes, as well as sludge and slurry lines.

Hospitality & Leisure: Service air conditioning system pipes and heating systems.

Marine: Perform emergency repairs on fuel lines, water pipes, and waste pipes both in dock and at sea.

Domestic: Fix leaks on domestic water pipes in homes and workplaces, including rubber hose repairs.

APPLICATION GUIDE

Phase 1: Surface Preparation

1. All pressure should be removed from the pipe.
    a. IF this is not possible you MUST refer to the THORTEX THISTLEBOND PROFESSIONAL PIPE REPAIR KIT which contains further Thortex Products to enable live leak sealing (when pressure cannot be isolated).
2. All oil and grease, loose rust scale, sealant tape and paint should be removed from the repair area.
3. Rough score a 4-inch patch around the pipe centering on the leak site. This can be carried out with sandpaper, file, wire brush. SSPC SP2 Hand Tool Cleaning or SP3 Power Tool Cleaning is the target level of surface preparation. If you are unable to achieve this standard the repair will still be satisfactory for most applications.

Metal Pipe - If the pipe is pitted with rust, surfaces must be wire brushed to remove the loose scale. If the surface is smooth, as with copper or stainless steel, surfaces should be roughened with a course file, rasp or saw blade.

Plastic Pipe - For plastic pipe, the external mold release must be removed. Abrade surfaces with coarse grit sandpaper. A saw blade may also be used to create a crosshatch pattern. This is particularly useful on polypropylene and PVDF piping.

Phase 2: Application

PLEASE NOTE *- Before and during application, lightweight disposable gloves should be worn to protect the hands.*

1. METAL-TECH PR is a single component material, which must be immersed in water and squeezed two or three times for about five seconds prior to use.
    a. Note: If you use warm water this will speed up curing times.
2. Remove bandage from water and wrap quickly and tightly as follows.
3. Centre tape over leak site, wrap from bottom of roll, pulling firmly throughout application. After 5-7 passes, resin foam will come through the tape, which is desirable and aided by pulling tightly. Overlapping of 50% is highly recommended.
4. Continue until entire roll is applied, building to a minimum thickness of 295 mils; use a second roll if necessary.
5. Firmly press and smooth end of roll into wrap in the direction of application. Wet gloves in water, smooth and firmly press the wet resin back into the wrap.
6. Continue rapid hand movement pressing and polishing resin in motions around and parallel to the pipe.
7. Continue process until resins are no longer tacky. The repair should now have a smooth, hard surface and an enamel-like appearance with no fabric protruding though the surface.

KEEP HANDS MOVING QUICKLY AND WET GLOVES FREQUENTLY TO AVOID STICKING

When you have through-wall defect (hole in pipework) - When used in conjunction with a '*plug'* of METAL-TECH SG METAL repair using the above instructions but having first plugged the hole. Knead a bead of METAL-TECH SG SG in a gloved hand and flatten out into a disc placed centrally over the hole pressing gently and feathering the edges. Leave to semi-harden (full cure 20 minutes) before applying the Emergency Pipe Repair Bandage, although the bandage may be applied immediately if necessary.

PLEASE 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.

TECHNICAL DATA & PERFORMANCE

Bandage Sizes

Bandage Size	Pipe Diameter
50mm x 1.8mtr	0.6 – 1.0 inch
50mm x 3.6mtr	1.0 – 2.0 inch
75mm x 3.6mtr	2.0 – 3.0 inch
100mm x 3.6mtr	2.0 – 4.0 inch
100mm x 5mtr	3.0 – 5.0 inch
150mm x 5mtr	4.0 – 6.0 inch
150mm x 10mtr	6.0 – 17.7 inch

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Drying & Cure Times

At 68°C allow the applied materials to harden for the times shown below before subjecting them to the conditions indicated. These times will be doubled at 50°F and halved at 86°F

Useable Life	2-3 mins
Initial Set	5 mins
Full Mechanical Cure	30 mins

Appearance

Single Pack	White

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 30 minutes

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.

Bandage Thickness

0.41mm

Solids Content

100%

Resin Content

Over 52%

Fabric Type

Knitted Fiberglass Tape

Shelf Life

2 years if unopened and store in normal dry conditions (60-86°F)

Pipe Wrapping Calculations

For precise calculations regarding the number of bandages required to effectively seal leaking pipework, please consult Thortex A general guidance chart is also available at the end of this document.

Maximum Service Temperature

The maximum service temperature for the Leak Sealing application varies depending on the products used, each with its own temperature resistance. The overall maximum service temperature will be determined by the lowest temperature resistance among the products employed.

METAL-TECH PR
Continuous – 352°F

METAL-TECH SG
Continuous – 248°F
Intermittent – 302°F

METAL-TECH SFT
-130°F to + 392°F

METAL-TECH SGHT
Continuous – 473°F
Intermittent – 536°F

Maximum Leak Pressure Resistance

Up to 30 bar, depending on the pipe size and severity of the leak. For achieving maximum pressure, sealing of holes with METAL-TECH SG is required (Tested on a 2 inch pipe with a 0.4 inch hole).

For live leak pressure resistance using METAL-TECH SFT, please refer to METAL-TECH SFT Technical Data Sheet.

Mechanical Properties

Flexural Strength Tested to ASTM D790	32Mpa (4,640 psi)
Shore D Hardness Tested to ASTM D2240	82
Tensile Strength Tested to ASTM D6382	19Mpa (2,740 psi)
Adhesion (Bond Strength)	14Mpa (2,000 psi)
Maximum Pressure Tested to ASTM D1599	30 bar – 1 inch thick repair – With METAL-TECH SG '*Plug*'
Elongation (%) Tested to ASTM D638	Over 5 of Length Over 15 of Width
Tensile Modules (kg/cm²) Tested to. ASTM D640	750,000 ± 5,000
Expansion Coefficient (°C -1) Tested to ASTM D696	192 x 10 -5 ± 0.17 x 10 -5

Chemical Resistance

Chemical	Resistance
Diesel Fuel	R
Caustic Soda	R
Ethyl Alcohol	R
Acetone	R
Hydrochloric Acid 30%	R
Sodium Hydroxide 20%	R
Gasoline	R
Toluene	R
Xylene	R
Mineral Spirts	R
Nitric Acid	R
Distilled Water	R
MEK	R
Citric Acid <10%	R
Crude Oil	R
Formic Acid <10%	R
Zinc Chloride	R
Phosphoric Acid < 10-20-75%	R
Potassium Carbonate	R

Key: R – Resistant for continuous immersion.

Part of Chemical Resistance Chart – Full Resistance Chart Available on Request.

Approvals

Approved by **BUREAU VERITAS** for Surface Protection and Cold Repair Products applied to Marine Vessels. Certificate No. 58535 / A0 BV.

Food Contact USDA compliant for incidental food contact

WRAS Approved for potable water applications

Technical Service

Complete technical assistance is available. Please contact Thortex America, INC with your requirements:
1-610-831-0222 I kclarke@thortex.com

The products that we supply are for professional use only, it is your responsibility to read the technical data sheets before you place an order and prior to application of the product

Quality

All THORTEX AMERICA, INC products are manufactured and supplied in accordance with an ISO 9001 registered Quality Management System.

Warranty

All THORTEX AMERICA, INC warrants that the performance of the supplied product will conform to the typical descriptions provided in the Technical Data Sheet.

Health & Safety

Please ensure good practices are followed at all times during the mixing and application of this product. Protective gloves and other recommended personal protective equipment must be worn. Before mixing and applying the material, please ensure you have read and fully understood all relevant information.

Legal Notice

The data provided in this Product Technical Data Sheet is for informational purposes only and is believed to be accurate at the time of issuance. However, we cannot assume responsibility for results obtained by others whose methods are beyond our control. It is the customer's responsibility to assess the suitability of the product for their intended

use. THORTEX AMERICA, INC accepts no liability arising from the use of this information or the product described herein.

Low Pressure Pipe Repairs up to 3.45 bar

Surface Preparation – Hand tools such as wire brush, coarse sandpaper & metal file.

1. All oil and grease must be removed from the surface using MEK CLEANER or similar type material.
2. All surfaces must be cleaned using wire brush, metal file, coarse sandpaper etc.,
3. Once abraded, the surface must be degreased and cleaning using MEK CLEANER or similar type material.

Pipe Diameter (Imperial)	Pressure (PSI)	Use of METAL-TECH SG 'Plug'	Bandage Size	Quantity of Rolls Needed	Minimum Wraps Around Pipework
½"	50	Yes	50mm x 1.8mtr	1 Roll	15
¾"	50	Yes	50mm x 1.8mtr	1 Roll	15
1"	50	Yes	50mm x 1.8mtr	1 Roll	15
1 ½"	50	Yes	50mm x 3.6mtr	2 Rolls	15
2"	50	Yes	50mm x 3.6mtr	1 Roll	15
2 ½"	50	Yes	50mm x 3.6mtr	1 Roll	15
3"	50	Yes	75mm x 3.6mtr	1 Roll	15
4"	50	Yes	100mm x 3.6mtr	1 Roll	15
5"	50	Yes	100mm x 5mtr	1 Roll	15
6"	50	Yes	150mm x 5mtr	2 Rolls	15
8"	50	Yes	150mm x 5mtr	2 Rolls	15
10"	50	Yes	150mm x 5mtr	3 Rolls	15
12"	50	Yes	150mm x 10mtr	4 Rolls	15
14"	50	Yes	200mm x 20mtr	4 Rolls	15
16"	50	Yes	200mm x 20mtr	5 Rolls	15
18"	50	Yes	200mm x 20mtr	5 Rolls	15

Medium Pressure Pipe Repairs up to 10.48 bar

Surface Preparation – Mechanical preparation using handheld grinders with coarse pads.

1. All oil and grease must be removed from the surface using MEK CLEANER or similar type material.
2. All surfaces must be cleaned using handheld mechanical grinders with a coarse pad.
3. Once abraded, the surface must be degreased and cleaning using MEK CLEANER or similar type material.

Pipe Diameter (Imperial)	Pressure (PSI)	Use of METAL-TECH SG 'Plug'	Bandage Size	Quantity Needed	Minimum Wraps Around Pipework
½"	152	Yes	50mm x 3.6mtr	1 Roll	20
¾"	152	Yes	50mm x 3.6mtr	1 Roll	20
1"	152	Yes	50mm x 1.8mtr	1 Roll	20
1 ½"	152	Yes	50mm x 3.6mtr	2 Rolls	20
2"	152	Yes	50mm x 3.6mtr	1 Roll	20
2 ½"	152	Yes	50mm x 3.6mtr	1 Roll	20
3"	152	Yes	75mm x 3.6mtr	2 Roll	20
4"	152	Yes	100mm x 3.6mtr	2 Roll	20
5"	152	Yes	100mm x 5mtr	2 Roll	20
6"	152	Yes	150mm x 5mtr	2 Rolls	20
8"	152	Yes	150mm x 5mtr	3 Rolls	20
10"	152	Yes	150mm x 5mtr	4 Rolls	20
12"	152	Yes	150mm x 10mtr	5 Rolls	20
14"	152	Yes	200mm x 20mtr	6 Rolls	20
16"	152	Yes	200mm x 20mtr	7 Rolls	20
18"	152	Yes	200mm x 20mtr	8 Rolls	20

High Pressure Pipe Repairs up to 31 bar

Surface Preparation – Mechanical preparation using handheld grinders with coarse pads.

1. All oil and grease must be removed from the surface using MEK CLEANER or similar type material.
2. All surfaces must be cleaned using handheld mechanical grinders with a coarse pad.
3. Once abraded, the surface must be degreased and cleaning using MEK CLEANER or similar type material.

Pipe Diameter (Imperial)	Pressure (PSI)	Use of METAL-TECH SG 'Plug'	Bandage Size	Quantity Needed	Minimum Wraps Around Pipework
½"	450	Yes	50mm x 3.6mtr	1 Roll	25
¾"	450	Yes	50mm x 3.6mtr	1 Roll	25
1"	450	Yes	50mm x 1.8mtr	1 Roll	25
1 ½"	450	Yes	50mm x 3.6mtr	2 Rolls	25
2"	450	Yes	50mm x 3.6mtr	1 Roll	25
2 ½"	450	Yes	50mm x 3.6mtr	2 Roll	25
3"	450	Yes	75mm x 3.6mtr	2 Roll	25
4"	450	Yes	100mm x 3.6mtr	2 Roll	25
5"	450	Yes	100mm x 5mtr	2 Roll	25
6"	450	Yes	150mm x 5mtr	3 Rolls	25
8"	450	Yes	150mm x 5mtr	3 Rolls	25
10"	450	Yes	150mm x 5mtr	5 Rolls	25
12"	450	Yes	150mm x 10mtr	6 Rolls	25
14"	450	Yes	200mm x 20mtr	7 Rolls	25
16"	450	Yes	200mm x 20mtr	9 Rolls	25
18"	450	Yes	200mm x 20mtr	9 Rolls	25