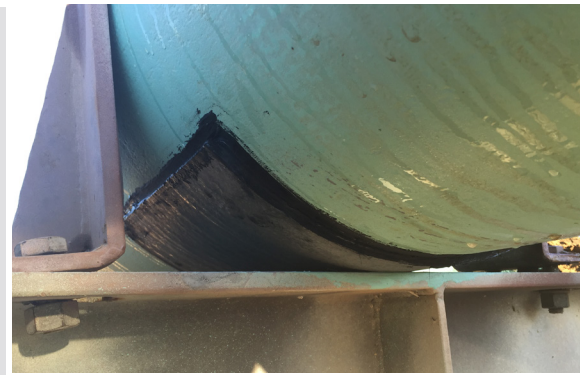


Milliken Infrastructure

Pipe Sock™

Crevice Corrosion Mitigation System

Patent #US08087431 B2

 OIL, GAS + INDUSTRIAL


The **Pipe Sock system**, a patented technology (Patent #US08087431 B2), is superior in performance to similar products, through its ability to resolve problems associated with crevice corrosion resulting from coating failure due to direct metal-to-metal contact. It consists of pre-formed size specific fiberglass wear pad and a protective modified syl polymer adhesive coating system (Black Magic™) resulting in a high strength crevice corrosion solution. The Pipe Sock system offers a complete non-intrusive piping remediation with the flexibility of accommodating various temperature requirements.

Mechanical Properties - Wear Pad

PROPERTIES	UNITS	METHOD	VALUES
Pad Color			Gray
Pad Thickness	Inches		0.25
Tensile Strength	PSI	D3039	54,000
Tensile Modulus	PSI	D3039	3.08 x 10 ⁶
Interlaminar Shear Strength	PSI	D3165-07	8,200
Compressive Strength	PSI	D695	28,500
Barcol Hardness		D-2583	53
Glass Transition		ISO 11357-2	302°F

Physical Properties - Adhesive

PHYSICAL PROPERTIES	UNITS	METHOD	VALUES
Color			Black
Elongation	%	DIN 53505	225
Tensile Strength	PSI	DIN 53504	420
Hardness	Shore D	DIN 53505	65
Volume Resistivity	OHM inch	DIN 53482	>398

General Properties - Adhesive

Maximum Temperature Resistance	250°F
Shelf Life	18 months if stored between 40°F - 80°F
Application Conditions	Temperatures between 41°F-95°F

Typical Uses

The system is ideal for all pipe support applications where metal-to-metal contact and crevice corrosion can occur:

- Wear Pads
- Pipe Supports
- Clamps
- Pipe Isolators
- Pipe Protectors
- Sleepers

Benefits

- Stop crevice corrosion due to coating failures
- Easy to install with minimal surface prep
- No mixing or special equipment
- Prevents metal-to-metal contact
- Compatible with cathodic protection

Storage

18 month shelf life when stored at 80°F. Shelf life may be extended when stored at lower temperatures, but above 40°F.



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Determining the Length of Pipe Sock™ Required for Application

To determine the Length of Pipe Sock™ = Width of Support + 4 inches per 100 ft of continuous free-span of pipe between supports.

Example:

Support width = 4 inches, free-span of pipe = 200

Suggested Length of Pipe Sock™ = 4" + (4")(2) = 12 inch long

Standard Available Sizes - Custom Sizes are Made to Order

Pipe Size	Radius	Length of Pipe Sock				
		6"	12"	18"	24"	36"
Nominal	Degrees					
1/2"	90	X	X	---	---	---
3/4"	90	X	X	---	---	---
1"	90	X	X	---	---	---
1 1/4"	90	X	X	---	---	---
1 1/2"	90	X	X	---	---	---
2"	90	X	X	---	---	---
2 1/2"	90	X	X	---	---	---
3"	90	X	X	---	---	---
3 1/2"	90	X	X	---	---	---
4"	90	X	X	---	---	---
4 1/2"	90	X	X	---	---	---
5"	90	X	X	---	---	---
6"	90	X	X	X	X	X
8"	90	X	X	X	X	X
10"	90	X	X	X	X	X
12"	90	X	X	X	X	X
14"	90	X	X	X	X	X
16"	90	X	X	X	X	X
18"	90	X	X	X	X	X
20"	90	X	X	X	X	X
22"	60	X	X	X	X	X
24"	60	X	X	X	X	X
26"	60	X	X	X	X	X
28"	60	X	X	X	X	X
30"	60	X	X	X	X	X
36"	60	X	X	X	X	X

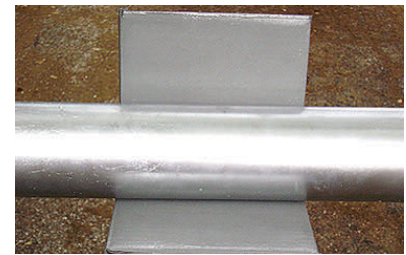
Technical/Performance Data

Application of Pipe Sock™ requires no special tools and can be applied in minutes once the surface preparation is complete. Proper evaluation of the corrosion anomaly may require the use of a filler putty to restore the pipe to its natural geometry.

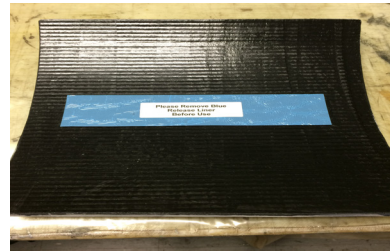
The material's inherent physical characteristics offer high adhesive strength, a complete fit-up integrity and conformity between the Pipe Sock™ and the pipe.

Bonds to All Types of Piping

- Galvanized
- Steel
- Stainless Steel
- Cast-iron
- Lead
- Concrete
- Carbon Steel
- Aluminum
- Copper



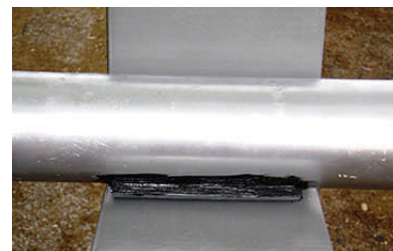
Bare pipe on support stand ready to install Pipe Sock™



Remove release liner and apply Black Magic



Pipe Sock™ "Black Magic" configuration ready for installation



Close up of Pipe Sock™ installed with Black Magic Adhesive



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