SHAIC Corrosion Protection System

HEAT SHRINKABLE PRODUCTS

SHAIC INTERNATIONAL CO.

SHAIC INTERNATIONAL CO. is the leading company manufacturing
the anti-corrosion materials for gas, oil & water pipelines.
We specialize in producing & exporting heat shrinkable sleeve for welded joint of oil,
gas pipes and coating tapes for water pipeline. To meet customers' needs,
we always develop the various corrosion protection materials in onshore & offshore.
Our world wide sales network system provides customers with good quality
services & information in technical support & corrosion protection industry.
With the continuous research & investment, we make all the effort to advance in
technology and develop new products.
Supplying the various products with competitive price, we are expending our
business area abroad.
We promise to be the most trusted company in corrosion protection industry.

SHAIC HT-330

SHAIC HT-330 is a hand wrapped heat shrinkable tape designed for corrosion protection of straight pipes, fittings, bends, elbows and other irregular configurations. It has a crosslinked polyethylene backing coated with butyl rubber based thermoplastic adhesive. When heated the backing layer shrinks and the adhesive flows and forms a reliable corrosion protection seal onto metal and adjacent coating surfaces.
SHAIC HT-330 needs no primer nor patch closure and reduces application time and labour costs.

Long-term Corrosion Protection

After heating, formed corrosion protection seal, and strong backing provides outstanding waterproofing effect and high chemical resistance.
SHAIC HT-330 resists impact, abrasion and ultraviolet light. Excellent resistance against cathodic disbondment, dielectric breakdown.

Simple Application

No Special skills, equipments, patch closure nor primer are needed. Its superior flexibility provides easy and reliable application for irregular configurations of fittings, bends and elbows and small diameter of straight pipes.
Wrap spirally the tape over foreign matters-free and preheated surface, beginning at least 25~50mm (1~2") onto pipe coating.
Wrap the tape with enough tension to obtain conformability and with minimum 50% of overlapping, while removing the release liner.
Warm the end part of the tape and press down firmly.
Using a torch, start at the edge of the tape and heat circumferentially around the coated pipe.
Finish off by heating over the entire tape vertically to ensure a uniform adhesion and by using a roller or gloved hands to remove wrinkle and air.

Physical Properties

Properties			Test Method	Values
Inner Layer	Softening Point		ASTM E28	99℃ (210℉)
	Lap Shear		DIN 30672 (ASTM D1002)	20N/cm² (29psi)
Outer Layer	Tensile Strength		ASTM D638	53N/cm (76psi)
	Elongation		ASTM D638	500%↑
	Hardness		ASTM D2240	40
	Dielectric Breakdown		ASTM D149	23kV
Tape	Penetration Resistance		ASTM G17	Pass holiday detection test with 10kV detector
	Water Absorption		ASTM D570	0.05%↓
	Cathodic Disbondment		ASTM G8	15mm
	Adhesion Strength	To P.E Lining	ASTM D1000	20N/cm
		To Steel Pipe		30N/cm

SHAIC HT-330

Application Table (Length Of Tape Required)

Pipe Size		Tape Width		Tape Length	
DN	Inch	(mm)	(Inch)	(m)	(ft)
25	1	50	2	2.8	9.2
40	1.5	50	2	4.0	13.1
50	2	50	2	5.2	17.1
80	3	50	2	8.5	27.9
100	4	50	2	11.1	36.4
125	5	75	3	12.3	40.4
150	6	75	3	14.3	46.9
200	8	100	4	16.3	53.5
250	10	100	4	23.1	75.8
300	12	100	4	30.4	99.7
〉300	〉12	150	6	formula	-

- Length of tape required is for 3D(90°) With an overlap of 50%, a line coating cutback of 150mm and a 50mm overlapon pipe coating.
- For other sizes, the following formula can be used:
  Length of tape=Pipe Ø×3.14×L/W
  L = length of area to be covered.
  W =1/2 of tape width(50% overlap)

Ordering Information

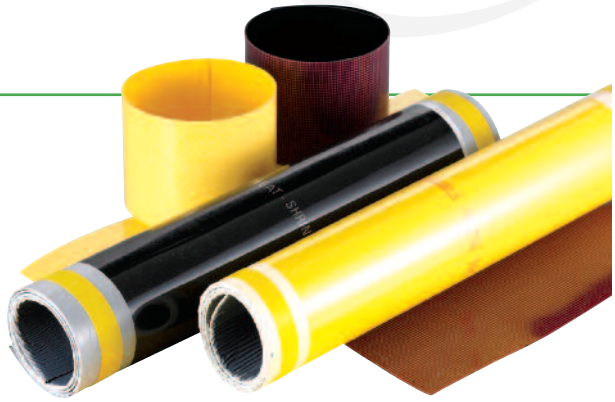
330R-2-33-BL

- Color
- Tape length
- Tape width
- Adhesive thickness
- Backing thickness
- Appearance

Standard Tape Type
Regular Thickness(R)
BL-Black, YE-Yellow
33ft (10m)
2″~ 12″ (50~300mm)
0.7
R-0.5
330-Tape

∗Note: Various width, length and thickness are available for unique project requirements.

SHAIC HS-340



SHAIC HS-340 is a heat-shrinkable wraparound sleeve designed for corrosion protection of field-welded joints of plastic coated steel pipelines. It has a thick crosslinked polyethylene backing coated with butyl rubber based mastic sealant or hot melt adhesive. Hot Melt or Mastic shall depend on project requirements. When heated the backing layer shrinks and the sealant flows and forms a reliable corrosion protection seal onto metal and adjacent coating surfaces.

Cut Sleeve is normally supplied with separate Patch Closure, which is coated with a high shear-strength adhesive; however, there are different types and sizes to comply with individual requirements. It is supplied in bulk rolls as well, and has superheavy
duty, heavy duty and regular thickness.

Long-term Corrosion Protection

After heating, formed corrosion protection seal & strong backing provides outstanding waterproofing effect and high chemical resistance.
SHAIC HS-340 resists impact, abrasion and ultraviolet light. Free from penetrating pinholes due to multi-layered structure. Excellent resistance against cathodic disbondment, dielectric breakdown.

Simple Application

No special skills and equipments are needed. Sleeve is installed in minutes with a propane torch.
Wrap the sleeve around foreign matters-free, preheated surface. Fix the center of preheated patch closure on the overlapped end and start heating the sleeve in the center.
Move the torch around pipe circumferentially to heat the left and the right half of sleeve. Finish off by heating vertically over the entire sleeve to ensure a uniform adhesion and by using a roller or gloved hands to remove wrinkle and air.

Bulk Rolls

SHAIC HS-340 is supplied in bulk rolls, which is cut in the field for any size of pipe. No need to drive to warehouse and just cut customized length in the field in time that reduces inventories and saves the cost & time.

Physical Properties

Properties				Test Method	Values	
					Mastic	Hot Melt
Inner Layer	Softening Point			ASTM E28	110℃ (230℉)	85℃ (185℉)
	Lap Shear			DIN30672(ASTM1002)	24N/cm² (35psi)	28N/cm² (40psi)
Outer Layer	Tensile Strength			ASTM D638	22Mpa (3200psi)	22Mpa (3200psi)
	Elongation			ASTM D638	400%↑	400%↑
	Hardness			ASTM D2240	50↑	50↑
	Heat Aging	Elongation	After 70 days	ASTM D638 (DIN 30672)	400%	400%
			After 100 days		390%	390%
		Tensile Strength	After 70 days		18Mpa (2700psi)	18Mpa (2700psi)
			After 100 days		17Mpa (2500psi)	17Mpa (2500psi)
	Volume Resistivity			ASTM D257	10^{15}↑	10^{15}↑
	Dielectric Breakdown			ASTM D149	28kV	28kV
Sleeve	Impact Resistance			ASTM G14	Pass holiday detection test with 20kV detector	Pass holiday detection test with 20kV detector
	Penetration Resistance			ASTM G17		
	Water Absorption			ASTM D570	0.05%↓	0.05%↓
	Cathodic Disbondment			ASTM G8	15mm	7.9mm
	Adhesion Strength		To P.E	ASTM D1000	25N/cm	40N/cm
			To Steel		40N/cm	68N/cm

SHAIC HS-3401

SHAIC HS-3401 three-layer heat shrinkable wraparound sleeve is designed for welded joint protection with epoxy primer of plastic coated steel pipelines. It has a thick crosslinked polyethylene backing coated with heat sensitive adhesive and two part of liquid epoxy primer.
Apply epoxy primer to the pipe surface and then adhesive flows and forms a reliable corrosion protection seal onto epoxy and adjacent coating surfaces.

Long-term Corrosion Protection

After heating, formed corrosion protection seal and strong backing provides outstanding waterproofing effect and high chemical resistance.
SHAIC HS-3401 3-layer corrosion protection system resists impact, abrasion and ultraviolet light as well as excellent resistance against cathodic disbondment, dielectric breakdown.

Bulk Rolls

SHAIC HS-3401 is supplied in bulk rolls, which is cut in the field for any size of pipe.
No need to drive to warehouse and just cut customized length in the field in time that reduces inventories and saves the cost & time

Flexible Installation

SHAIC Heat Shrinkable sleeve can be used 3-layer or 2-layer installation upon your specific project requirement.
Please contact with our representative for appropriate installation. Apply epoxy primer over foreign matter-free and preheated surface. Wrap the sleeve around the pipes.
Fix the center of preheated patch closure on the overlapped end and start to heat sleeve in the center.
Move the torch around pipe circumferentially to heat the left and the right of sleeve. Finish off by heating vertically over the entire sleeve to ensure a uniform adhesion and by using a roller or gloved hands to remove wrinkle and air.

Physical Properties

Properties				Test Method	Values
Inner Layer	Softening Point			ASTM E28	100℃ (212℉)
	Lap Shear @23℃			DIN 30672	40N/cm² (57psi)
Outer Layer	Tensile Strength			ASTM D638	22Mpa↑(3200psi)
	Elongation			ASTM D638	400%↑
	Hardness			ASTM D2240	50
	Heat Aging	Elongation	After 70days	ASTM D638(DIN 30672)	400%
			After 100days		400%
		Tensile Strength	After 70days		18 Mpa (2700psi)
			After 100days		17 Mpa (2500psi)
	Volume Resistivity			ASTM D257	10^{15}↑
	Dielectric Breakdown			ASTM D149	32kV
Sleeve	Impact Resistance			EN 12068	15J ↑
	Penetration Resistance			ASTM G17	No holiday at 15kV
	Water Absorption			ASTM D570	0.05%↓
	Cathodic Disbondment		at 23℃	ASTM G8	7.5mm
			at 60℃	ASTM G42	15mm
	Adhesion Strength		To. P/E	ASTM D1000	40 N/cm
			To. Steel		70 N/cm
	Operating Temperature				-20℃ to 60℃

SHAIC HS-3401HT

SHAIC HS-3401HT is designed for welded joint protection for high temperature up to 80℃(176℉) of plastic coated steel pipelines such as PVC, polypropylene, polyethylene, or fusion bonded epoxy. It has a thick irradiated cross-linked polyethylene backing coated with heat sensitive adhesive and two parts of liquid epoxy primer. Apply epoxy primer to the pipe surface and then adhesive flows and forms a reliable corrosion protection seal onto epoxy and adjacent coating surface. SHAIC HS-3401HT is complied with EN 12068-C HT 80 UV.

Long-Term Corrosion Protection

After heating, formed corrosion protection seal and strong backing provides outstanding waterproofing effect and high chemical resistance.

SHAIC HS-3401HT 3-layer corrosion protection system resists impact, abrasion and ultraviolet light as well as excellent resistance against cathodic disbondment, dielectric breakdown.

Bulk Rolls

SHAIC HS-3401HT is supplied in bulk rolls, which is cut in the field for any size of pipe.

No need to drive to warehouse and just cut customized length in the field in time that reduces inventories and saves the cost & time

Installation

SHAIC HS-3401HT is used for 3 layer coating system upon customers'specific project requirement.

Please contact with our representative for appropriate installation. Apply epoxy primer over foreign matter-free and preheated surface. Wrap the sleeve around the pipes.

Fix the center of preheated patch closure on the overlapped end and start to heat sleeve in the center.

Move the torch around pipe circumferentially to heat the left and the right of sleeve. Finish off by heating vertically over the entire sleeve to ensure a uniform adhesion and by using a roller or gloved hands to remove wrinkle and air.

Physical Properties

Properties			Test Method	Values
Inner Layer	Softening Point		ASTM E28	115℃ (239℉)
	Lap Shear	at 23℃	EN 12068	352 N/cm² (500 psi)
		at 80℃	EN 12068	35 N/cm² (50 psi)
Outer Layer	Tensile Strength		ASTM D638	25 Mpa (3650 psi) ↑
	Elongation at break		ASTM D638	400%↑
	Hardness		ASTM D2240	55 ↑
Sleeve	Impact resistance		EN 12068	15J ↑
	Penetration resistance		ASTM G17	No holiday at 15 kV
	Peel strength To steel	at 23℃	EN 12068	75 N/cm
		at 80℃	EN 12068	10 N/cm
	Peel strength To PE	at 23℃	EN 12068	40 N/cm
		at 80℃	EN 12068	10 N/cm
	Dielectric breakdown		ASTM D149	32 kV
	Cathodic disbondment	at 23℃	ASTM G8	10mm
		at 80℃	ASTM G42	15mm
	Water absorption		ASTM D570	0.05% ↓
	Ultraviolet resistance		EN 12068	Pass
	Max operating temperature		-	85℃

SHAIC HS-340 Series

Pipe Size & Overlap Length

Pipe Size		Pipe Circumference (mm)	SHAIC HS-340		
DN	Inch		Length (mm)	Overlap (mm)	Width (mm)
50	2	190	290	100	450mm
65	2.5	240	340	100	
80	3	280	380	100	
100	4	359	470	111	
125	5	439	560	121	
150	6	519	640	121	
200	8	679	800	121	
250	10	840	970	130	
300	12	1,000	1,130	130	
350	14	1,117	1,250	133	
400	16	1,276	1,420	144	
450	18	1,436	1,590	154	600mm
500	20	1,595	1,750	155	
550	22	1,755	1,920	165	
600	24	1,914	2,100	186	
650	26	2,074	2,260	186	
700	28	2,233	2,440	207	
750	30	2,393	2,600	207	
800	32	2,552	2,760	208	
900	36	2,871	3,100	229	
1000	40	3,190	3,430	240	

Physical Properties

CHA-16-18-BL

- Color
- Sleeve Width
- Pipe Size
- Adhesive Type
- Backing & Adhesive
- Appearance

Standard Cut Sleeve		
Super Heavy Duty Thick.(S)	Heavy Duty Thick.(H)	Regular Thick.(R1)
BL-Black, YE-Yellow		
12″, 18″, 24″(300, 450, 600mm)		
2″~ 60″(DN50-1500)	2″~ 60″(DN50-1500)	2″~ 16″(DN50-400)
A type : Hot Melt		B type : Mastic
B : 1.2mm, A : 1.8mm	B : 1.0mm, A : 1.6mm	B : 0.75mm, A : 1.25mm
C-Cut Sleeve with Patch Closure		

RHA-100-18-BL

- Color
- Sleeve / Patch Width
- Bulk Roll Length
- Adhesive Thickness
- Backing & Adhesive
- Appearance

Bulk Roll		
Super Heavy Duty Thick.(S)	Heavy Duty Thick.(H)	Regular Thick.(R1)
BL-Black, YE-Yellow		
12″, 18″, 24″(300, 450, 600mm)		
100ft (30m)		
A type : Hot Melt		B type : Mastic
B : 1.2mm, A : 1.8mm	B : 1.0mm, A : 1.6mm	B : 0.75mm, A : 1.25mm
R-Bulk Roll		

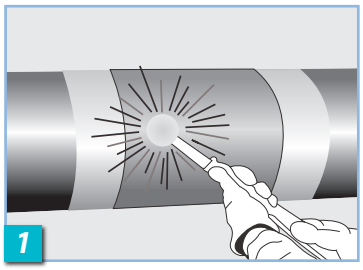
RPBA-50-12-BL

- Color
- Patch Width
- Bulk Roll Length
- Thickness
- Appearance

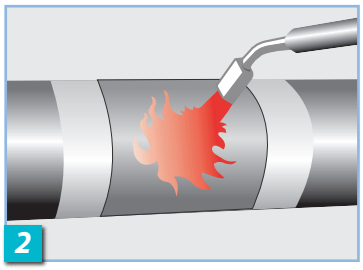
Bulk Roll Patch Closure
Regular Thickness
BL-Black, YE-Yellow
12″(300mm), 18″(450mm)
50ft(15m)
1.2mm
RP-Bulk Roll Patch Closure

∗Note: 1. Min. Sleeve Width=Bare Steel Width +2″(50mm) min. on each side of the pipe joint.
2. Various width, length and thickness are available for project requirements.

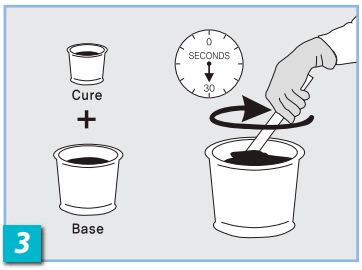
Series Installation Guide



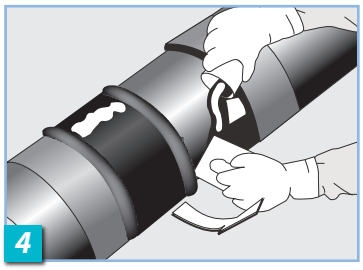
Prepare the suface tobe coated, according to SSPC-SP1, SP3 or SP6.



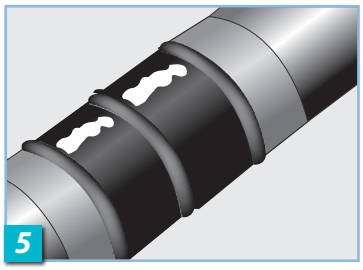
Using a propane torch, pre-heat the welded joints and adjacent coating to about +60℃.



Mix the epoxy primer cure with the base by 1 to 3.
Stir at least 30 seconds assure uniform mixture.

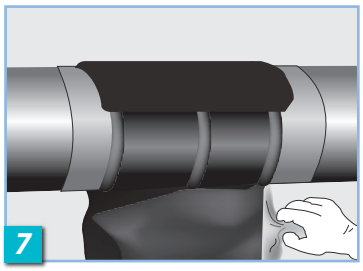


Apply mixed epoxy to a minimum uniform thickness of 0.1mm on exposed bare metal plus 10mm onto the adjacent pipe coating.

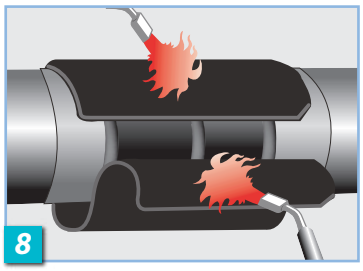


Ensure that the epoxy primer is still sticky, not dry completely.

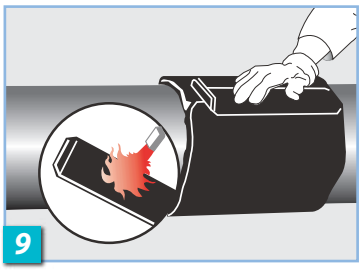
Cut corners at one sleeve end (15×50mm). Remove the releses liner at cut-off corners by 150~200mm and gently heat exposed adhesive.



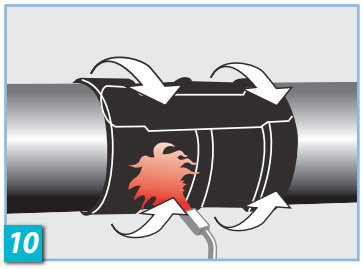
Center heated adhesive over the joints so that the sleeve overlaps at 1o'clock position and then press down firmly. Remove the remained releae liner.



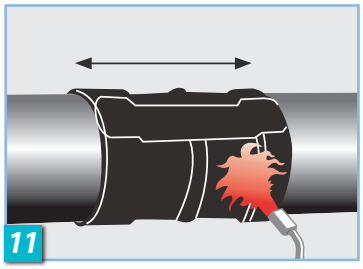
Gently heat the backing of the underlay and the adhesive side of overlap.
Press the overlap into place.



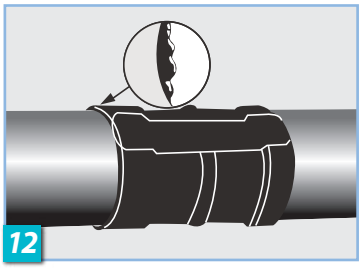
Fix the center of pre-heated patch closure on the overlapped end to form a complete seal. Uniformly heat over the patch closure. With a gloved hand, press and smooth it down firmly.



Maintaining a blue flame, start to heat the sleeve in the center and then around the pipe circumferentially.



Finish off by heating over the entire sleeve vertically to ensure a uniform adhesion.
While the sleeve is still soft, use a roller or gloved hand to remove wrinkles and air.

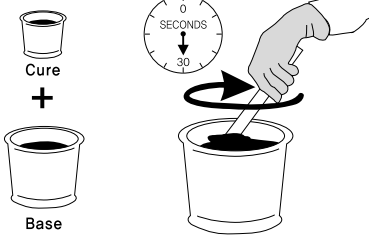


Visually inspect to ensure that adhesive flow is at overlaps around the whole circumference of the sleeve edges and no crack or hole is the sleeve backing.

∗The application for SHAIC HS-340 is same as the pictures above, except picture 3,4,5

EPOXY PRIMER

SHAIC EPOXY PRIMER is designed for 3 layer coating system for superior corrosion protection of field joints of steel pipelines. Epoxy primer corrosion protection resists impact, abrasion as well as cathodic disbondment, dielectric breakdown.



Application Procedure

1. Prepare the pipe surface as recommended in the produst application.
2. Pour cure into base as 3 parts base to 1 part of cure. Stir the mixture for a minimum of 30 seconds to ensure homogeneous mixture.
3. Apply mixed epoxy primer as indicated in the product application.
4. Epoxy Primer covers 20 sq.m/gallon (215 sq./gallon) or 5.3 sq.m/liter (57 sq.m/liter).
   This coverage is based on 4 to 6 mils of thickness & assuming 20% waste.

Data

- Specific gravity • Base: 1.65 (ASTM D 1475)
  • Cure: 1.00 (ASTM D 1475)
- Pot life: 25minutes in condition of 23℃ (73℉)
- Shelf life: 2 years in condition of out of sunlight (between 10℃ (with 20℃))
- Flash point • Base: 200℃ (392℉)
  • Cure: 130℃ (266℉)
- Mixing curing temperature: 10℃ (50℉)

Epoxy Conversion Table

Assuming 300mm/12″ cutback				
pipe O.D.		Required quantity		Joint / US gallon
mm	inch	Base(ml)	Cure(ml)	
115	4 1/2	15	5	186
170	6.6	22.5	7.5	126
230	8.6	30	10	93
280	10 3/4	37.5	12.5	76
315	12 3/4	39	13	68
355	14	48.9	16.3	60
400	16	52.5	17.5	53
450	18	60	20	47
500	20	67.5	22.5	43
610	24	82.5	27.5	35
760	30	87.9	29.3	28
915	36	123.9	41.3	23
1060	42	142.5	47.5	20
1220	48	161.4	53.8	17
1420	56	187.5	62.5	15
1520	60	202.5	67.5	14

Assuming 450mm/18″ cutback				
pipe O.D.		Required quantity		Joint / US gallon
mm	inch	Base(ml)	Cure(ml)	
115	4 1/2	23.7	7.9	120
170	6.6	29.4	9.8	76
230	8.6	45.6	15.2	62
280	10 3/4	58.8	19.6	48
315	12 3/4	69.3	23.1	41
355	14	75.6	25.2	37
400	16	81.6	27.2	34
450	18	96.6	32.2	29
500	20	106.8	35.6	26
610	24	129.6	43.2	21
760	30	156.3	52.1	18
915	36	187.8	62.6	15
1060	42	226.8	75.6	12
1220	48	247.2	82.4	11
1420	56	296.1	98.7	9
1520	60	304.5	101.5	9

Assuming 600mm/24″ cutback				
pipe O.D.		Required quantity		Joint / US gallon
mm	inch	Base(ml)	Cure(ml)	
115	4 1/2	30.6	10.2	93
170	6.6	45.3	15.1	63
230	8.6	61.2	20.4	46
280	10 3/4	74.7	24.9	38
315	12 3/4	84	28	34
355	14	94.5	31.5	30
400	16	106.5	35.5	27
450	18	119.7	39.9	24
500	20	133.2	44.4	21
610	24	162.3	54.1	17
760	30	202.2	67.4	14
915	36	243.3	81.1	12
1060	42	261.9	87.3	10
1220	48	324.6	108.2	9
1420	56	377.7	125.9	8
1520	60	405.9	135.3	7

∗Note: before using, please consult SHAIC material safety data sheets and follow your local or national safety regulations.

SHAIC HT-350

SHAIC HT-350 is a heat shrinkable tube designed for corrosion protection of field-welded joints of plastic coated steel pipelines. It has a thick crosslinked polyethylene backing coated with butyl rubber based mastic sealant or hot melt adhesive. When heated the backing layer shrinks and the sealant flows and forms a reliable corrosion protection seal onto metal and adjacent coating surfaces.

Tubular Configuration

SHAIC HT-350 needs no patch closure and should be slid over the pipe prior to welding the joint. Its unique design reduces time for handling, positioning and installation of Patch Closure. This minimizes application time and labour costs.

Long-term Corrosion Protection

After heating, formed corrosion protection seal & strong backing provides outstanding waterproofing effect and high chemical resistance.

SHAIC HT-350 resists impact, abrasion and ultraviolet light. Free from penetrating pinholes due to multi-layered structure. Excellent resistance against cathodic disbondment, dielectric breakdown.

Simple Application

No special skills, equipments, patch closure nor primer are needed. Slide the tube over the pipe before welding the joint. Position the tube over welded, foreign matters-free and preheated joint. Remove the release liner and temporarily insert'spacing pads'between the pipe and the tube at both upper edges of the tube to keep it away from the pipe and to facilitate the application. Remove "spacing pad" when the tube is shrunk at the center, and then move torch circumferentially to heat the left and the right half of the tube. Finish off by heating over the entire tube vertically to ensure a uniform adhesion and by using a roller or gloved hands to remove wrinkle and air.

Physical Properties

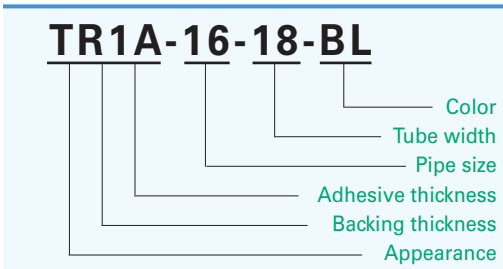
Properties				Test Method	Values	
					Mastic	Hot Melt
Inner Layer	Softening Point			ASTM E28	110℃ (230℉)	85℃ (185℉)
	Lap Shear			DIN30672(ASTM1002)	24N/cm^2 (35psi)	28N/cm^2 (40psi)
Outer Layer	Tensile Strength			ASTM D638	17Mpa (2500psi)	17Mpa (2500psi)
	Elongation			ASTM D638	500%↑	500%↑
	Hardness			ASTM D2240	45↑	45↑
	Heat Aging	Elongation	After 70 days	ASTM D638 (DIN 30672)	500%	500%
			After 100 days		480%	480%
		Tensile Strength	After 70 days		16Mpa (2340psi)	16Mpa (2340psi)
			After 100 days		15Mpa (2200psi)	15Mpa (2200psi)
	Volume Resistivity			ASTM D257	10^{15}↑	10^{15}↑
	Dielectric Breakdown			ASTM D149	28kV	28kV
Tube	Impact Resistance			ASTM G14	Pass holiday detection test with 15kV detector	Pass holiday detection test with 15kV detector
	Penetration Resistance			ASTM G17		
	Water Absorption			ASTM D570	0.05%↓	0.05%↓
	Cathodic Disbondment			ASTM G8	10mm	7.9mm
	Adhesion Strength		To P.E	ASTM D1000	30N/cm	40N/cm
			To Steel		37N/cm	65N/cm

SHAIC HT-350

Pipe Size & Tube Size

Pipe Size		Pipe O.D (mm)	Pipe Circum-ference (mm)	SHAIC HT-350			
				Length (mm)	Thickness(mm)		Width (mm)
DN	Inch				Outer	Inner	
50	2	60.5	190	280	0.75	1.25	450
80	3	89.1	280	350			
100	4	114.3	359	440			
125	5	139.8	439	520			
150	6	165.2	519	600			
200	8	216.3	679	810			
250	10	267.4	840	970			
300	12	318.6	1,000	1,130			
350	14	355.6	1,117	1,260			
400	16	406.4	1,276	1,420			
450	18	457.2	1,436	1,590			
500	20	508.0	1,595	1,750			
550	22	558.8	1,755	1,910			
600	24	609.6	1,914	2,060			

Ordering Information



Standard Tape Type
Regular Thickness(R1)
BL-Black, YE-Yellow
18″ (450mm)
2″~ 24″ (DN50-600)
1.25
R1-0.75
T-TUBE

∗Note: 1. Min. Sleeve Width=Bare Steel Width +2″(50mm) min. on each side of the pipe joint.
2. Various length is available for unique project requirements.

Pipeline Coating Repair Products

SHAIC pipeline coating repair products are widely used from the field in which is the pipe coaing damaged for a continuous stipendiary prevention effect.
The Repair Patch, Mastic Filler and Melt Stick are the product.
It will be able to repair the damage which occurs from pipe transportation and load process effectively.

Repair Patch

Repair Patch is composed of fiber inserted cross-linked polyolefin backing and heat sensitive adhesive.
This product has superior adhesion and sealing up effect as well. It will be able to expect reliable corrosion prevention and shear forces and abrasionresistance.
It can be used installed quick with no special tools and skills required.

- Size : 1.6mm×150mm×10m (up to 450mm width)
- Code : RPR2-33-6-BL

Mastic Filler

Mastic Filler is used to fill larger voids and deep damaged coatings prior to the application of Repair Patch.

- Size : 3.0mm×40mm×6m
- Code : MF-100-4-BL

Melt Stick

Melt Stick is composed of heat-activated with a stick form. This product is used the place where the pipe surface it repairs a small damage. It could be used as a filler material with Repair Patch.

- Size : 10mm diameter×270mm length
- Supply : 3kg/box

Product Selection Method

Max. Operating Temperature		Compatible Line Coating	Product
Small damage or Scratch	114℉(80℃)	PE, FBE, CTE	Only Melt Stick or With Repair Patches
Damage		PE, FBE, CTE	Melt Stick with Repair Patch or Mastic Filler with Repair Patch
Large damage	Heat Shrinkable Sleeve is recommended.		

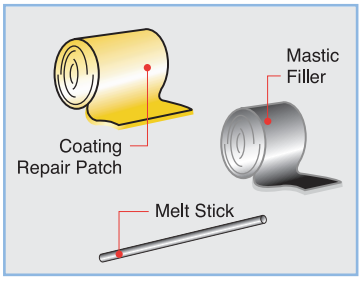
∗Note: Before ordering the product, for the selection of the product that is appropriate inquire surely in SHAIC representative.

Physical Properties

Properties		Test Method	Values
Inner Layer	Softening Point	ASTM E28	110℃ (230℉)
	Lap Shear	ASTM D1002	24N/cm² (35psi)
Outer Layer	Tensile Strength	ASTM D638	20Mpa↑(2840psi)
	Elongation	ASTM D638	450%↑
	Abrasion Resistance	ASTM D1044	38mg
	Hardness	ASTM D2240	45
	Volume Resistivity	ASTM D257	10^{17}↑
	Dielectric Breakdown	ASTM D149	28kV
Patch	Impact Resistance	ASTM E14	Pass (Class C)
	Peel Strength to Steel	ASTM D1000	25N/cm
	Water Absorption	ASTM D570	0.05% ↓
	Cathodic Disbondment	ASTM G8	12mm

Installation Guide

★ Pipeline Repair Porducts



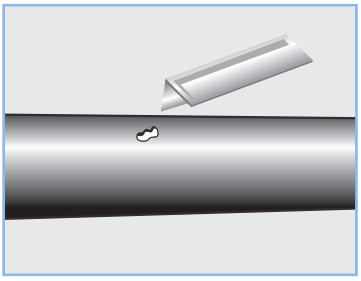
Repair Patch is typically shipped in bulk rolls and field cut to size. Melt Sticks and Mastic Fillers are used to repair holidays fill voids.

★ Storage & Safety Guidelines

To ensure maximum performance, store SHAIC products in a dry, ventilated area. Keep products sealed in original cartons and avoid exposure to direct sunlight, rain, snow, dust or other adverse environmental elements. Avoid prolonged storage at temperatures above 35℃ (95℉) or below -20℃ (-4℉). Product installation should be done in accordance with local health and safety regulations.

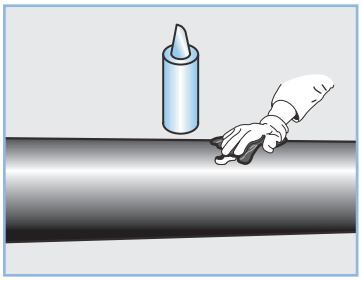
These installation instruction are intended as a guide for standard products.

1 Removal of Damaged Coating



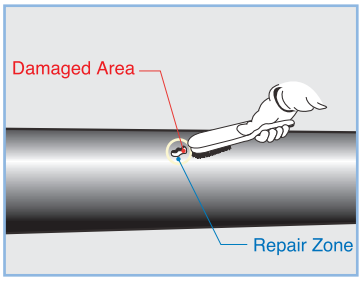
Remove damaged coating with a knife or hand grinder to prevent crack propagation in the coating.

2 Solvent Cleaning



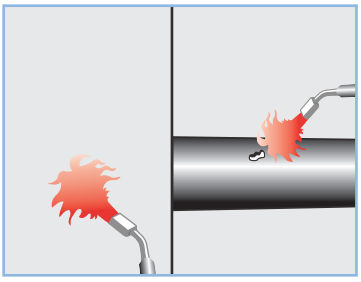
Clean exposed steel and adjacent pipe coating with an approved cleaner (as per SSPC-SP-1) to remove the presence of oil, grease and other contaminants.

3 Surface Preparation



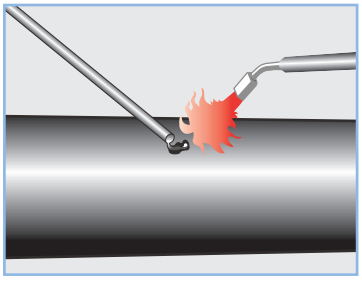
Remove adhering rust, coating chalk, dirt and roughen the mill applied coating in the repair zone using an abrasive paper/ cloth or wire brush.

4-1 Melt Stick Application



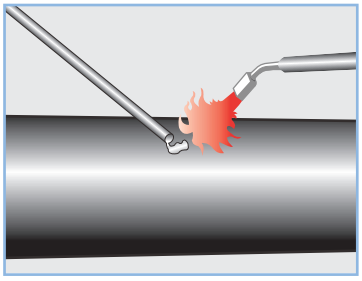
Use a low intensity yellow flame for preheating the coating and applying the repair products. With quick back and forth stokes, pre-heat the repair zone sufficiently to remove moisture and assist in adhesion.

4-2 Melt Stick Application



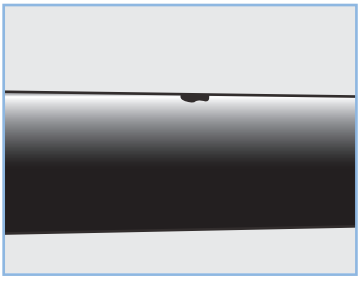
Heat the Melt Stick and the repair zone simultaneously with the torch and spread the Melt Stick over the damaged area.
Keep the flame moving to prevent damaged to the coating. Some ignition of the Melt Stick is acceptable.

4-3 Melt Stick Application



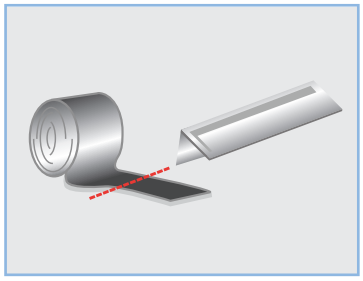
Continue spreading the Melt Stick over the repair zone until the entire area is covered.
After sufficient melt stick material is on the surface, apply additional heat in quick back-and-forth strokes to create a smooth surface.

4-4 Melt Stick Application



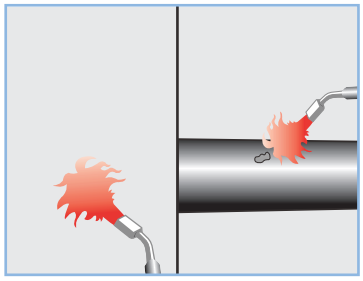
Ensure that the Melt Stick material completely covers the repair zone.
The Melt Stick material should be spread liberally so that the material is raised above the coating surface.

4-A ▶ Mastic Filler Installation



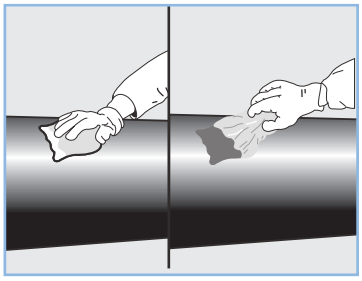
Fill deeper crevices with Mastic Filler (MF).
Unroll the filler material and cut off the required amount. Leaving the release paper in place.

4-B ▶ Mastic Filler Installation



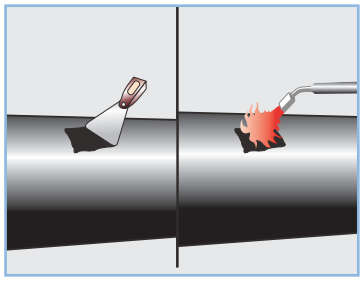
Use a low intensity yellow flame for pre-heating the coating and applying the repair products. With quick back and forth strokes, pre-heat the repair zone sufficiently to remove moisture and assist in adhesion.

4-C ▶ Mastic Filler Installation



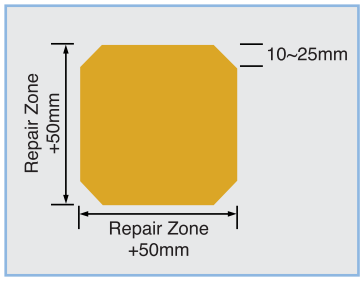
Place the filler material onto the damaged area with the release paper facing up.
Firmly press the material into the damaged area by hand and remove the release paper.

4-D ▶ Mastic Filler Installation



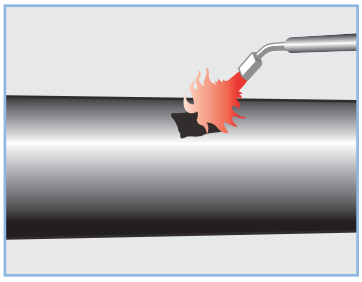
After filling the damaged area, remove the excess filler to create a smooth surface.
As an option, use a low intensity yellow flame to warm the material and assist in smoothing it out.

5 ▶ Patch Preparation



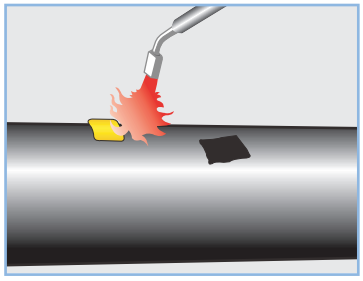
Cut a patch large enough to extend a mimimum of 50mm(2") beyond the edge of the repair zone.
Trim each corner of the patch about 10 ~ 25mm(1/2"~1") at a 45° angle.

6 ▶ Pre-Heat



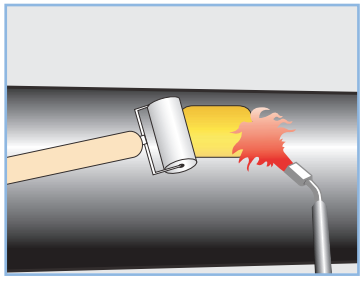
Warm the damaged area (repair zone + 50mm (2") overlap) to remove moisture and assist in adhesion.

7 ▶ Patch Installation



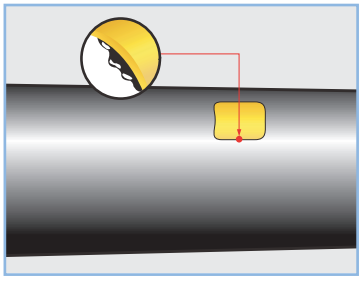
After removing the release liner from the cut patch, place the patch with the adhesive side up on a gloved hand. Or on top of the pipe, and heat gently. Heat until the adhesive softens and the surface becomes glossy.
Also, reheat the damaged area to keep it warm.

8 ▶ Patch Installation



Apply the softened adhesive side of the patch to the damaged area and press down firmly. Heat the patch with a low intensity flame, and usign a roller or a gloved hand, pat down and remove wrinkles. Roll to ensure a good bond.

9 ▶ Inspection



Visually inspect the installed patch for the following :
1. Patch is in full contact with the pipe coating.
2. There are no loose edges.
3. A successful patch has adhesive flow on the edges.
4. The patch has fully conformed to the coating.
5. No cracks or holes in patch backing.

*4-1, 4-2, 4-3, 4-4: Melt Stick Installation
4-A, 4-B, 4-C, 4-D: Mastic Filler Installation

SHAIC AC-700

SHAIC AC-700 SERIES are designed for providing reliable corrosion protection and mechanical resistance to metal pipes, underground steel pipes, and bare bends and girth weled joints of PE, Epoxy & PP coated pipes by hand or machine application. The main material used is a stabilized polyethylene backing and butyl rubber based synthetic elastomer adhesive, especially in case of joint wrap, bitumen based synthetic elastomer adhesive available.

SHAIC AC-700 SERIES are used Inner wrap, Outer wrap and Joint wrap by customers' requirements with various sizes.

Features

- Long term corrosion protection and mechanical resistance
- Outstanding electric property and permanent adhesion
- Excellent weather & cold resistance
- High chemical resistance under bad condition of soil
  Excellent working efficiency by hand or machine
- Wide range of application and service temperature
- Manufactured at ISO certified facility
- Complies with AWWA C-209 & C-214 Standard

Sub-Materials

- **SHAIC AC-700 PRIMER**
  : Anti-Corrosion Primer of synthetic resin & rubber blended with solvent, 20 liter per can or 200 liter per drum.
  - 160g/m^2 of Coverage.
- **MASTIC FILLER**
  : Filler for uneven areas. 3.0mm×40mm×6.0m per roll

Simple Application

Remove rust, dirt, moisture, burr grease, knurl & all foreign matters completely by dry cloth, scrapping, wire brushing, disc grinding, sand or grit blasting.

Stir Primer container well and apply it on the surface evenly by brush or roller. Allow curing for about 10min.

Apply spirally **SHAIC AC-700** P.E.Anti-Corrosion Tape and tension should be enough to obtain conformability to surface being applied. Minimum 25mm overlap, but 50% overlap(equal to two layers) recommended for optimum performance. According to specification of the project, inner and outer tape can be applied.

In case of welded joints, apply Primer on all surface to be wrapped and then Mastic Filler Tape along with weld beads and press firmly. Beginning at a point 25~50mm backward from end of left bare pipe, apply **SHAIC AC-700** P.E.Anti-Corrosion Tape spirally to a point 25~50mm forward from end of right bare pipe.

Typical Physical Properties

Properties		Unit	Test Method	Values					
				738	751	764	775	7100	7100B
Total Thickness		mm	ASTM D1000	0.38	0.51	0.64	0.75	1.00	1.00
Backing Thickness		mm	ASTM D1000	0.25	0.25	0.25	0.31	0.25	0.25
Adhesive Thickness		mm	ASTM D1000	0.13	0.26	0.39	0.44	0.75	0.75
Tensile Strength		N/cm	ASTM D1000	60	60	60	60	60	60
Elongation		%	ASTM D1000	550	550	550	550	550	550
Adhesion Strength	To P.E Lining	N/cm	ASTM D1000	10	10	10	10	10	10
	To Steel Pipe	N/cm	ASTM D1000	20	23	27	28	30	30
Dielectric Breakdown		Kv	ASTM D1000	27	27	27	27	27	27
Insulation Resistance		M · Ω	ASTM D257	10^7	10^7	10^7	10^7	10^7	10^7
Water Vapor Transmission		perms	ASTM E96	0.13↓	0.13↓	0.13↓	0.13↓	0.13↓	0.13↓
Water Absorption		%	ASTM D570	0.05↓	0.05↓	0.05↓	0.05↓	0.05↓	0.05↓

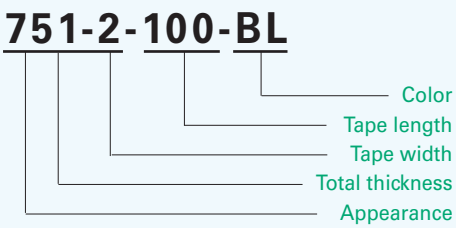
∗Note: Various sizes are available by customers' requirement and the customized products values may be different from the table.

SHAIC AC-700

Application Table (Length Of Tape Required)

Pipe Size		Tape Width		SHAIC AC-700 Series		
				25% overlap	50% overlap	Primer(160g/m²)
DN	Inch	(mm)	(Inch)	(m)	(m)	(g)
25	1	50	2	-	4.7	17.0
50	2	100	4	2.8	4.2	30.4
80	3	100	4	4.1	6.2	44.7
100	4	100	4	5.2	7.9	57.4
125	5	150	6	3.8	6.4	70.2
150	6	150	6	4.5	7.6	83.0
200	8	200	8	4.2	7.5	108.6
250	10	200	8	5.2	9.2	134.3
300	12	200	8	6.2	11.0	160.0
350	14	250	10	5.4	9.82	178.6
400	16	250	10	6.2	11.2	204.1
500	20	300	12	6.3	11.7	255.2
600	24	300	12	7.6	14.0	306.2
700	28	300	12	8.9	16.3	357.3
800	32	450	18	6.6	12.4	408.3
900	36	450	18	7.4	14.0	459.6
1000	40	450	18	8.2	15.5	510.4
1200	48	450	18	9.9	18.7	611.8

Ordering Information



Standard Tape Type
BL-Black, WH-White
50~100ft (15~30m)
2″~18″ (50 ~ 450mm)
0.3 8~ 1.50mm (15 ~ 38 mils)
700-Tape

*Note: Various width, length and thickness are available for unique project requirements.

Product Selection

Coating Thickness Required	Inner Wrap	Outer Wrap	Remarks
2.0mm	751-4-100-BL	751-4-100-WH	50% Overlap Recommanded
2.5mm	751-4-100-BL	775-4-100-WH	
3.0mm	751-4-100-BL	775-4-100-WH	
Joint Wrap			
2.0mm	7100-4-50-BL		
3.0mm	7150-4-33-BL		

*Note: The above product selection can be changeable according to project requirements.

SHAIC AC-700

This primer is designed to increase adhesion and anti-corrosion property of **SHAIC AC-700**.

Composition

Synthetic resin and rubber blended with solvent

Physical Characteristics

- Dry Film Thickness: 55 microns
- Flash Point: -1 ~ 2°C
- Temperature Range: -30 ~ 70°C
- Coverage: Approx. 160g/m^2

Properties	Test Method	P23	P27	P30
Solid Content	ASTM D 2697	23%	27%	30%
Viscosity (23°C)	ASTM D 1200	20 ± 5sec	22 ± 5sec	30 ± 5sec
Specific Gravity (23°C)	-	0.83	0.84	0.85
Drying Time	ASTM D 1640	5~10 minutes	5~10 minutes	7~15 minutes

Features

- Shake primer containers well and stir contents thoroughly
- Primer can be easily and evenly applied by brush or roller
- A careful caution must be paid not to create air bubbling
- Allow primer to dry for a minimum of 5~10 minutes

Storage Guidelines

To ensure maximum performance,
Store SHAIC products in a dry or ventilated area,
Keep products sealed in original containers and
Avoid exposure to direct sunlight, rain, snow, dust or other adverse envirommental elements.
Avoid prolonged storage at temperatures above 35℃(95℉) or below -20℃(-4℉).

∗Note: Before using, please consult SHAIC Material Safety Data Sheet and follow your local or national safety regulations.

SHAIC PT-310

PETRO TAPE is composed mainly of petrolatum, tannin, inert silica and special anti-corrosive agents, it will never evaporate, harden and its viscosity will never change. It will never crack or peel off.
Since it can perfectly adhere to any material and any complicated shape, the viscosity film formed on the applied surface prevents the penetration of moisture or air into the applied surface, it prevents all physical factors of corrosion.
Because the composition of **PETRO TAPE** is chemically stable, it will resist acids, alkali and salts. The anti-corrosive effect never changes with climate or temperature.

Features

- Outstanding water and chemical resistance
- Great efficiency with easy application
- Non-cracking, non-hardening, non-hazardous, non-toxic
- No changes in quality under extremely low temperature (-15°C)
- Adheres well to rusty or slightly moist steel
- Requires only hand or power-tool cleaning
- Encapsulates lead paints

Sub-Materials

- **PETRO PASTE**
  : Primer for increasing adhesion and first layer for anti-corrosion which is applied before petro tape wrapping without sub-merged parts.
  - Supply: 4 kg/can or 20 kg/can
  - Coverage: 300g/m^2

- **PETRO MASTIC**
  : Filler for uneven surface such as flanges or valves which is applied before petro tape wrapping without sub-merged parts.
  - Supply: 500 g/each

- **PVC FIRM TAPE**
  : Protection tape for wrapped Petro Tape from mechanical damages and for discrimination of oil, gas and water pipelines by different colors such as red, yellow, gray or blue, etc.
  - Size: 0.2mm Thickness × 50mm Width × 30m Length (Various Color & Width is available)

- **MARINE PILING TAPE**
  : Corrosion protection tape on steel piles of the marine structure which can be applied without Petro Paste.
  - Size: 1.25mm Thickness × 50mm Width × 30m Length (Various Color & Width is available)

Physical Properties

Properties	Result	Test Method
SHAIC PETRO TAPE		
Thickness	1.1mm	ASTM D1000
Breaking Strength	285N/50mm	ASTM D1000
Elongation	25%	ASTM D1000
Breakdown Voltage	16KV	ASTM D149
Cathodic Disbondment	< 500m²	ASTM G8
Resistance to Acids, Alkalies and Salts	Excellent	-
Temperature Range	-20℃ ~ 80°C	-
SHAIC MARINE PILING TAPE		
Thickness	1.25mm	ASTM D1000
Breaking Strength	285N/50mm	ASTM D1000
Elongation	25%	ASTM D1000
Cathodic Disbondment	< 500m²	ASTM G8
Resistance to Acids, Alkalies and Salts	Excellent	-
Temperature Range	-20℃ ~ 80°C	-
SHAIC PETRO PASTE		
Solid Content	100%	-
Flash Point	180℃	ASTM D92
Specific Gravity	1.25	ASTM D70
Temperature Range	-25°C ~ 50°C	-
SHAIC P.V.C FIRM TAPE		
Thickness	0.2mm	ASTM D1000
Breaking Strength	39N/cm	ASTM D1000
Elongation	290%	ASTM D1000
Adhesion to Steel	2.6N/cm	ASTM D1000
Adhesion to Self	2.1N/cm	ASTM D1000
Vapor Transmission	0.19perms↓	ASTM E96
Dielectric Strength	12KV	ASTM D149
Insulation Resistance (MΩ·cm)	10^{6}↑	ASTM D257

Simple Application

- Remove rust with wire – brush and wipe soil with rags.
- Apply a uniform & thin layer of **Petro Paste** by gloved hand to displace any moisture if remained. Drying or curing time is not required and application of **Petro Tape** may begin immediately.
- Apply **Petro Mastic** on complicated and uneven surface such as valve and flange to fill or smooth the voids, if needed.
- Wrap **Petro Tape** spirally around surface or apply precut pieces over irregular surfaces with a minimum 25mm overlap or with a 50% overlap for optimum results. Conform and seal edges of tape using hands with rubber gloves to give monolithic appearance.
- **PVC Firm Tape** is used in place where finishing. Wrap **PVC Firm Tape** spirally or precut as needed. 25mm minimum overlap is required.

Global Anti-Corrosion System

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