SWancor®

Energy Saving & Environmental Protection

Epoxy Systems for Composite Solutions

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About Us

Swancor is a professional manufacturer of specialty chemicals. Our products have been widely used in a variety of industries including petrochemical, power generation, electronics, marine and pulp and paper etc. In the recent years, Swancor has broadened its product lines to materials for energy and energy-saving applications. Form corrosion resistance to weight lightening to high performance applications. The progress in new business sectors significantly demonstrates Swancor's unique capability in research and development.

Swancor have been well recognized as symbol of quality, innovation and integrity. We have been supplying our product into over thirty countries and SWANCOR brand has become well-known identity. We have been developing our own technology and we consider Innovation is the key issue. We are able to provide tailor-made product and service and enhance customers' competitiveness. We hope to establish partnership with customers in long-term basis, which reduces customers' operating cost and risk and meanwhile increase customers' profit and therefore mutual benefits can be achieved through the collaboration.

Product Introduction

Epoxy Systems for Composite Solutions

Hand-Lay Up Epoxy Resin System

RTM & Infusion Epoxy Resin System

Filament Winding Epoxy Resin System

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Adhesive Epoxy Resin System

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Hand-Lay Up Epoxy Resin System

SWANCOR 2503-A/BS is designed for the process of hand lay-up which is composed of particular epoxy resin and hardener. It's main characters are as follows:

- ✓ Superior Tg
- ✓ Short pot life
- ✓ Proper viscosity
- ✓ Excellent mechanical property
- ✓ Good wetting out property to both glass fiber and carbon fiber

Typical Properties of Liquid Resin

Items	SW2503-A	SW2503-BS
Appearance	Light	Light Green
Viscosity (25°C/77°F, cps)	1,100~1,500	10~30
Density (25°C/77°F, g/cm^3)	1.1~1.2	0.9~1.0
A/B Ratio(weight)	100:25	
Initial Mix Viscosity (25°C/77°F, cps)	400~600	
Exothermic Peak Time (30°C/86°F, 100g, min)	140~200	
Shelf-Life (month)	24	

Typical property of 3.2mm clear casting

Items	SW2503-A/BS	Test Method
Tensile Strength (Mpa)	75~95	ASTM D638
Tensile Modulus (GPa)	3,000~3,900	ASTM D638
Elongation of Break (%)	>4%	ASTM D638
Flexural Strength (Mpa)	130~160	ASTM D790
Flexural Modulus (GPa)	3,200~4,000	ASTM D790
Tg (°C/°F)	100~110/212~230	DSC test, 10°C/50°F, min
HDT (°C/°F)	95~110/203~230	ASTM D648

*Curing condition: 4 hours at room temperature at 28°C/82°F + 8 hours at 80°C/176°F.

Hand-Lay Up Epoxy Resin System

SWANCOR 2713-A/BS is designed for the process of hand lay-up which is composed of particular epoxy resin and hardener. It's main characters are as follows:

- ✓ Suitable Tg
- ✓ Short pot life
- ✓ Proper viscosity
- ✓ Excellent mechanical property
- ✓ Good wetting out property to both glass fiber and carbon fiber

Typical Properties of Liquid Resin

Items	SW2713-A	SW2713-BS
Appearance	Clear Liquid	Light Yellow Liquid
Viscosity (25°C/77°F, cps)	2,300~3,200	20~60
Density (25°C/77°F, g/cm^3)	1.1~1.2	1.0~1.1
A/B Ratio(weight)	100:30	
Initial Mix Viscosity (25°C/77°F, cps)	400~600	
Exothermic Peak Time (25°C/86°F, 100g, min)	35~55	
Shelf-Life (month)	24	

Typical property of 3.2mm clear casting

Items	SW2713-A/BS	Test Method
Tensile Strength (Mpa)	70~85	ASTM D638
Tensile Modulus (GPa)	2,800~3,700	ASTM D638
Elongation of Break (%)	>5.0	ASTM D638
Flexural Strength (Mpa)	128~146	ASTM D790
Flexural Modulus (GPa)	2,950~3,700	ASTM D790
Tg (°C/°F)	80~95/176~203	DSC test, 10°C/50°F, min
HDT (°C/°F)	78~88/172~190	ASTM D648

*Curing condition: 4 hours at room temperature at 28°C/82°F + 8 hours at 80°C/176°F.

RTM & Infusion Epoxy Resin System

SWANCOR 2502-A/B is special designed for mega structure manufacture with RTM & infusion process, which is composed of particular epoxy resin and hardener. That is especially suitable for tooling and auto parts. Their main characters are as follows:

- ✓ Superior Tg
- ✓ Low viscosity
- ✓ Low post-cure temperature
- ✓ Low exothermic temperature
- ✓ Excellent mechanical properties
- ✓ Perfect immersion with carbon fiber
- ✓ Long pot-life under higher mold temperature

Typical Properties of Liquid Resin

Items	SW2502-A	SW2502-B
Appearance	Light	Light Blue
Viscosity (25°C/77°F, cps)	500~900	10~30
Density (25°C/77°F, g/cm^3)	1.1~1.2	0.9~1.0
A/B Ratio(weight)	100:27	
Initial Mix Viscosity (25°C/77°F, cps)	250~330	
Exothermic Peak Time (25°C/77°F, 100g, min)	90~150	
Shelf-Life (month)	24	

Typical property of 3.2mm clear casting

Items	SW2502-A/B	Test Method
Tensile Strength (Mpa)	77~91	ASTM D638
Tensile Modulus (GPa)	2.7~3.3	ASTM D638
Elongation of Break (%)	>5	ASTM D638
Flexural Strength (Mpa)	135~165	ASTM D790
Flexural Modulus (GPa)	3.1~3.5	ASTM D790
Tg (°C/°F)	105~120/221~248	DSC test, 10°C/50°F, min
HDT (°C/°F)	90~105/194~221	ASTM D648

*Curing condition: 4 hours at room temperature at 60°C/82°F + 10 hours at 80°C/176°F.

RTM & Infusion Epoxy Resin System

SWANCOR 2515-A/B is special designed for mega structure manufacture with RTM & infusion process, which is composed of particular epoxy resin and hardener. That is especially suitable for wind blades, mega yachts or all large parts manufacturer's use. Their main characters are as follows:

- ✓ Low viscosity
- ✓ Low post-cure temperature
- ✓ Low exothermic temperature
- ✓ Excellent mechanical properties
- ✓ Perfect immersion with carbon fiber
- ✓ Long pot-life under higher mold temperature
- ✓ Good wetting out property to carbon fiber

Typical Properties of Liquid Resin

Items	SW2515-A	SW2515-B
Appearance	Clear Liquid	Green Liquid
Viscosity (25°C/77°F, cps)	300~700	80~160
Density (25°C/77°F, g/cm^3)	1.1~1.2	1.1~1.2
A/B Ratio(weight)	100:110	
Initial Mix Viscosity (25°C/77°F, cps)	200~320	
Exothermic Peak Time (40 °C/104°F, 1000g, mins)	250~400	
Shelf-Life (month)	12	

Typical property of 3.2mm clear casting

Items	SW2515-A/B	Test Method
Tensile Strength (Mpa)	77~91	ASTM D638
Tensile Modulus (GPa)	3.0~3.5	ASTM D638
Elongation of Break (%)	>5.0	ASTM D638
Flexural Strength (Mpa)	120~150	ASTM D790
Flexural Modulus (GPa)	3.1~3.6	ASTM D790
Tg (°C/°F)	91~106/196~223	DSC test, 10°C/50°F, min
HDT (°C/°F)	89~104/192~219	ASTM D648

*Curing condition: 4 hours at room temperature at 60°C/82°F + 10 hours at 80°C/176°F.

RTM & Infusion Epoxy Resin System

SWANCOR 2711-A/BT/BM/BF/BS/BL is designed for the process of vacuum infusion (SCRIMP or RTM) which is composed of particular epoxy resin and hardener. That is especially suitable for yachts or large parts manufacturer's use. Their main characters are as follows:

- ✓ High HDT
- ✓ Low viscosity
- ✓ Suitable pot life
- ✓ Superior immersed effect with glass fiber and carbon fiber

Typical Properties of Liquid Resin

Items	SW2711-A	SW2711-BT	SW2711-BM	SW2711-BF	SW2711-BS	SW2711-BL
Appearance	Clear Liquid	Light Blue Liquid	Light Blue Liquid	Light Blue Liquid	Light Blue Liquid	Light Blue Liquid
Viscosity (25°C/77°F, cps)	900~1,400	10~25	5~20	5~20	5~20	5~20
Density (25°C/77°F, g/cm^3)	1.1~1.2	0.9~1.0	0.9~1.0	0.9~1.0	0.9~1.0	0.9~1.0
A/B Ratio(weight)	100:30					
Initial Mix Viscosity (25°C/77°F, cps)	-	250~350	200~300	200~280	190~280	180~250
Exothermic Peak Time (30°C/86°F, 100g, min)	-	85~125	170~250	220~300	280~360	330~430
Shelf-Life (month)	24					

Typical property of 3.2mm clear casting

Items	SW2711-A/BT	SW2711-A/BM	SW2711-A/BF	SW2711-A/BS	SW2711-A/BL	Test Method
Tensile Strength (MPa)	75~87	73~84	70~80	67~80	67~80	ASTM D638
Tensile Modulus (GPa)	2.8~3.5	2.9~3.6	2.9~3.6	2.7~3.5	2.7~3.5	ASTM D638
Elongation Break (%)	5~8	5~8	5~8	4.5~8.5	4.5~8.5	ASTM D638
Flexural Strength (MPa)	125~155	110~130	110~140	110~140	110~140	ASTM D790
Flexural Modulus (GPa)	2.8~3.6	2.9~3.4	3.0~3.5	2.8~3.6	2.8~3.6	ASTM D790
Tg (°C/°F)	85~95/ 185~203	85~95/ 185~203	85~95/ 185~203	80~90/ 176~194	80~90/ 176~194	DSC test, 10°C/50°F, min
HDT (°C/°F)	90~99/ 176~210	76~88/ 169~190	76~88/ 169~190	72~82/ 162~180	72~82/ 162~180	ASTM D648

*Curing condition: 24 hours at room temperature at 28°C/82°F + 8 hours at 80°C/176°F.

Filament Winding Epoxy Resin System

SWANCOR 2204-A/B is designed for filament winding process and can be cured under ambient temperature and medium-high temperature which is composed of particular epoxy resin and hardener. Their main characters are as follows:

- ✓ Low viscosity
- ✓ High Tg temperature
- ✓ Excellent mechanical property
- ✓ Long pot life under room temperature
- ✓ Short pot life under medium-high temperature
- ✓ Good wetting out property to both glass fiber and carbon fiber

Typical Properties of Liquid Resin

Items	SW2204-A	SW2204-B
Appearance	Clear Liquid	Light Yellow Liquid
Viscosity (25°C/77°F, cps)	900~1,400	5~20
Density (25°C/77°F, g/cm^3)	1.1~1.2	0.9~1.0
A/B Ratio(weight)	100:25	
Initial Mix Viscosity (25°C/77°F, cps)	350~450	
Exothermic Peak Time (25°C/77°F, 1000g, mins)	100~145	
Shelf-Life (month)	12	

Typical property of 3.2mm clear casting

Items	SW2204-A/B	Test Method
Tensile Strength (Mpa)	75~95	ASTM D638
Tensile Modulus (GPa)	3.3~3.6	ASTM D638
Elongation of Break (%)	>3.5	ASTM D638
Flexural Strength (Mpa)	150~185	ASTM D790
Flexural Modulus (GPa)	3.6~4.0	ASTM D790
Tg (°C/°F)	110~130/230~266	DSC test, 10°C/50°F, min
HDT (°C/°F)	80~100/176~212	ASTM D648

*Curing condition: 4 hours at room temperature at 60°C/82°F + 10 hours at 80°C/176°F.

Filament Winding Epoxy Resin System

SWANCOR 2214-A/B is designed for filament winding process that cured with medium-high temperature which is composed of particular epoxy resin and hardener. Their main characters are as follows:

- ✓ Low viscosity
- ✓ High Tg temperature
- ✓ Excellent mechanical property
- ✓ Longer pot life under room temperature
- ✓ Short pot life under medium-high temperature
- ✓ Good wetting out property to both glass fiber and carbon fiber

Typical Properties of Liquid Resin

Items	SW2214-A	SW2214-B
Appearance	Clear Liquid	Brown Liquid
Viscosity (25°C/77°F, cps)	8,000~10,000	50~100
Density (25°C/77°F, g/cm^3)	1.10~1.20	1.15~1.25
A/B Ratio(weight)	100:80	
Initial Mix Viscosity (25°C/77°F, cps)	1,100~1,900	
Exothermic Peak Time (25°C/77°F, 100g, hours)	>24	
Exothermic Peak Time (120°C/248°F, 1g, mins)	3.5~4.5	
Exothermic Peak Time (150°C/302°F, 1g, mins)	0.8~1.2	
Shelf-Life (month)	12	

Typical property of 3.2mm clear casting

Items	SW2214-A/B	Test Method
Tensile Strength (MPa)	65~75	ASTM D638
Tensile Modulus (GPa)	2.5~3.0	ASTM D638
Elongation of Break (%)	3~6	ASTM D638
Flexural Strength (MPa)	100~115	ASTM D790
Flexural Modulus (GPa)	2.5~3.0	ASTM D790
Tg (°C/°F)	125~135/257~275	DSC test, 10°C/50°F, min
HDT (°C/°F)	120~130/248~266	ASTM D648

*Curing condition: post cure for 1 hour at 120°C/248°F.

Filament Winding Epoxy Resin System

SWANCOR 2216-A/B is designed for filament winding process and can be cured under high temperature and medium-high temperature which is composed of particular epoxy resin and hardener. Their main characters are as follows:

- ✓ Superior Tg
- ✓ Low viscosity
- ✓ Excellent mechanical property
- ✓ Long pot life under room temperature
- ✓ Short pot life under medium-high temperature
- ✓ Good wetting out property to both glass fiber and carbon fiber

Typical Properties of Liquid Resin

Items	SW2216-A	SW2216-B
Appearance	Clear Liquid	Brown Liquid
Viscosity (25°C/77°F, cps)	1,000~1,400	250~350
Density (25°C/77°F, g/cm^3)	1.10-1.20	1.15-1.25
A/B Ratio(weight)	100 : 150	
Initial Mixed Viscosity(25°C/77°F, cps)	700~900	
Exothermic Peak Time (25°C/77°F, 100g, mins)	>24	
Exothermic Peak Time (120°C/248°F, 0.5g, mins)	13~15	
Exothermic Peak Time (150°C/302°F, 0.5g, mins)	1~2	
Exothermic Peak Time (160°C/320°F, 0.5g, mins)	1~1.1	
Exothermic Peak Time (180°C/356°F, 0.5g, Sec.)	32~38	
Exothermic Peak Time (200°C/392°F, 0.5g, Sec.)	10~20	
Shelf-Life (month)	12	

Typical property of 3.2mm clear casting

Items	SW2216-A/B	Test Method
Tensile Strength (MPa)	45-60	ASTM D638
Tensile Modulus (GPa)	2.1 - 3.1	ASTM D638
Elongation of Break (%)	2.0 - 3.5	ASTM D638
Flexural Strength (MPa)	100 - 120	ASTM D790
Flexural Modulus (GPa)	2.1 - 3.1	ASTM D790
Tg (°C/°F)	220~230/410~428	DSC test, 10°C/50°F, min

*Curing condition: post cure for 1 hour at 95°C/203°F+1 hour at 120°C/248°F+1 hour at 150°C/302°F+1 hour at 180°C/356°F。

Pultrusion Epoxy Resin System

SWANCOR 2208-A/B and SWANCOR 2209-A/B are two-component epoxy systems designed for pultrusion process. The main difference is the Tg temperature. Their main characters are as follows:

- ✓ Easy demolding
- ✓ Perfect surface quality
- ✓ Excellent pot life with low viscosity
- ✓ Quick cure rate at elevated temperatures

Typical Properties of Liquid Resin

Items	SW2208A	SW2208B	SW2209A	SW2209B
Viscosity (25°C/77°F, cps)	8,000~10,000	40~60	250~350	150~250
A/B Ratio (weight)	100:80		100:150	
Initial Mixed Viscosity (25°C/77°F, cps)	300~400		250~350	
Exothermic Peak Time (25°C/77°F, 100g, hour)	>24		>24	
Exothermic Peak Time (120°C/248°F, 100g, min)	3~4		3~4	
Exothermic Peak Time (150°C/302°F, 100g min)	1		1	
Shelf-Life (month)	12		12	

Typical property of 3.2mm clear casting

Items	SW2208-A/B	SW2209-A/B	Test Method
Tensile Strength (MPa)	75~85	65~75	ASTM D638
Tensile Modulus (GPa)	2.5~3.0	2.5~3.0	ASTM D638
Elongation of Break (%)	3~5	3~5	ASTM D638
Flexural Strength (MPa)	125~135	125~135	ASTM D790
Flexural Modulus (GPa)	2.5~3.0	2.5~3.0	ASTM D790
Tg (°C/°F)	120~130/ 248~266	150~160/ 302~320	DSC test, 20°C/50°F, min
HDT (°C/°F)	105~115/ 221~239	120~130/ 248~266	ASTM D648

*Curing condition: 2208-A/B: 1 hour at 90°C/203°F + 1 hour at 120°C/248°F + 2 hour at 160°C/320°F

2209-A/B: 1 hour at 90°C/203°F + 1 hour at 120°C/248°F + 2 hour at 160°C/320°F

Pultrusion Epoxy Resin SystemPultrusion Epoxy Resin System

SWANCOR 2210-A/B and SWANCOR 2211-A/B are two-component epoxy systems designed for pultrusion process with superior Tg performance. Their main characters are as follows:

- ✓ Easy demolding
- ✓ Perfect surface quality
- ✓ Excellent pot life with low viscosity
- ✓ Quick cure rate at elevated temperatures

Typical Properties of Liquid Resin

Items	SW2210A	SW2210B	SW2211A	SW2211B
Viscosity (25°C/77°F, cps)	350~450	300~400	3,800~4,800	700~900
A/B Ratio (weight)	100:150		100:150	
Initial Mixed Viscosity (25°C/77°F, cps)	350~450		1,200~1,800	
Exothermic Peak Time (25°C/77°F, 100g, hour)	>24		>24	
Exothermic Peak Time (120°C/248°F, 100g, min)	–		–	
Exothermic Peak Time (150°C/302°F, 100g min)	1~2		1~2	
Shelf-Life (month)	12		12	

Typical property of 3.2mm clear casting

Items	SW2210-A/B	SW2211-A/B	Test Method
Tensile Strength (MPa)	45~55	45~55	ASTM D638
Tensile Modulus (GPa)	2.1~2.3	2.1~2.3	ASTM D638
Elongation of Break (%)	2.5~3.5	2.5~3.5	ASTM D638
Flexural Strength (MPa)	100~110	70~80	ASTM D790
Flexural Modulus (GPa)	2.1~2.3	2.1~2.3	ASTM D790
Tg (°C/°F)	180~200/356~392	230~240/446~464	DSC test, 20°C/50°F, min

*Curing condition:2210-A/B: 1 hour at 90°C/203°F + 1 hour at 120°C/248°F + 1 hour at 150°C/302°F + 2 hour at 180°C/356°F

2211-A/B: 1 hour at 90°C/203°F + 1 hour at 120°C/248°F + 1 hour at 150°C/302°F + 1 hour at 180°C/356°F + 2 hour at 200°C/356°F

Adhesive Epoxy Resin System

SWANCOR 2205-A/B is two component, ambient temperature curing paste adhesive, which after post-curing either at application and in service, will give bonds with temperature resistance up to 100°C/212°F and excellent resistance to common chemicals.

Applications

Epoxy adhesive bonds composite pipes, which are used for a wide range of applications for both underground and aboveground installations, including crude oil conveyance, flowlines, fire water lines, potable water lines, seawater cooling systems, industrial waste and marine and offshore applications.

Typical Properties of Liquid Resin

Items	SW2205-A	SW2205-B
Appearance	Yellow paste	White paste
Viscosity (25 °C/77°F, cps)	100,000~300,000	100,000~300,000
Density (25°C/77°F, g/cm^3)	1.1~1.3	1.1~1.3
A/B Ratio (weight)	100/50	
Tg (°C/°F)*	>140/284	
Pot-Life (25°C/77°F, 250g, min)	10~15	
Pot-Life (40°C/104°F, 250g, min)	5~10	
Exothermic Peak Temperature (°C/°F, 25°C/77°F, 250g)	230~280/446~536	
Exothermic Peak Temperature (°C/°F, 40°C/104°F, 250g)	250~320/482~608	
Shelf-Life (month)	24	

Potlife in minutes

°C	20	25	30	35	40
°F	68	77	86	95	104
Minutes	20	13	11	9	7

Typical property of 3.2mm clear casting

A. FRP-FRP Tensile Lap Shear Strength in Versus Temperature

Temperature (°C/ °F)	Test Result (MPa)	Test Method
20/68	17.16 ± 1.29	ISO 4587
40/104	14.76 ± 1.19	ISO 4587
60/140	11.68 ± 0.49	ISO 4587
80/176	11.77 ± 0.20	ISO 4587
100/212	10.98 ± 0.66	ISO 4587

Curing condition : 1 hour at 125°C/257°F

FRP-FRP Tensile Lap Shear Strength in Versus Water Immersion

Test Condition	Test Result (MPa)	Test Method
20°C/68°F, 500 hrs	16.23±0.91	ISO 4587
20°C/68°F, 1000 hrs	15.49±1.00	ISO 4587
20°C/68°F, 2000 hrs	13.07±1.26	ISO 4587
80°C/176°F, 500 hrs	8.54±0.63	ISO 4587
80°C/176°F, 1000 hrs	8.44±0.3	ISO 4587
80°C/176°F, 2000 hrs	7.46±0.32	ISO 4587
100°C/212°F, 500 hrs	6.91±0.56	ISO 4587
100°C/212°F, 1000 hrs	6.18±0.27	ISO 4587
100°C/212°F, 2000 hrs	5.40±0.28	ISO 4587

Curing condition : 1 hour at 125°C/257°F

B. Shear Strength by Compressive Loading

Test Temperature	Test Result (MPa)	Test Method
20°C/68°F	22.88± 1.15	ASTM 2564

Curing condition: 7 days at room temperature + 1 hour at 125°C/257°F

C. Weight Absorption Test

Test Property	Result (%)
Water, 80°C/176°F, 2000 hour	3.18
Methanol 100%, 20°C/68°F, 2000 hour	1.01
Acetone 100%, 20°C/68°F, 2000 hour	0.05
Xylene 100%, 20°C/68°F, 2000 hour	0.1
Xylene 100%, 80°C/176°F, 2000 hour	0

Adhesive Epoxy Resin System

SWANCOR 2213-A/B is two component, ambient temperature curing paste adhesive, which after post-curing either at application and in service, will give bonds with temperature resistance up to 100°C/212°F and excellent resistance to common chemicals.

Applications

Epoxy adhesive bonds composite pipes, which are used for a wide range of applications for both underground and aboveground installations, including crude oil conveyance, flowlines, fire water lines, potable water lines, seawater cooling systems, industrial waste and marine and offshore applications.

Typical Properties of Liquid Resin

Items	SW2213-A	SW2213-B
Appearance	Green Paste	White Paste
Viscosity (25 °C/77°F, cps)	300,000~600,000	300,000~600,000
Density (25°C/77°F, g/cm^3)	1.55~1.75	1.45~1.65
A/B Ratio(weight)	100:25	
Tg (°C/°F)	135~140/275~284	
Pot-Life (25°C/77°F, 250g, min)	30~50	
Pot-Life (40°C/104°F, 250g, min)	15~25	
Exothermic Peak Temperature (°C/°F, 25°C/77°F, 250g)	140~180/284~356	
Exothermic Peak Temperature (°C/°F, 40°C/104°F, 250g)	180~240/356~464	
Shelf-Life (month)	12	

Typical property of 3.2mm clear casting

D. FRP-FRP Tensile Lap Shear Strength in Versus Temperature

Temperature (°C/ °F)	Test Result (MPa)	Test Method
20/68	14.23~16.97	ISO 4587
40/104	12.33~14.51	ISO 4587
60/140	10.13~11.11	ISO 4587
80/176	10.40~11.00	ISO 4587
100/212	9.53~10.45	ISO 4587

Curing condition : 1 hour at 125°C/257°F

E. FRP-FRP Tensile Lap Shear Strength in Versus Water Immersion

Test Condition	Test Result (MPa)	Test Method
20°C/68°F, 500 hrs	13.10~16.40	ISO 4587
20°C/68°F, 1000 hrs	12.27~15.89	ISO 4587
20°C/68°F, 2000 hrs	7.78~15.98	ISO 4587
80°C/176°F, 500 hrs	6.62~8.90	ISO 4587
80°C/176°F, 1000 hrs	7.12~8.22	ISO 4587
80°C/176°F, 2000 hrs	6.20~7.36	ISO 4587
100°C/212°F, 500 hrs	5.27~7.29	ISO 4587
100°C/212°F, 1000 hrs	5.13~6.11	ISO 4587
100°C/212°F, 2000 hrs	4.41~5.41	ISO 4587

Curing condition : 1 hour at 125°C/257°F

F. Shear Strength by Compressive Loading

Test Temperature	Test Result (MPa)	Test Method
20°C/68°F	20.80±1.048	ASTM 2564

Curing condition: 7 days at room temperature + 1 hour at 125°C/257°F

G. Weight Absorption Test

Test Property	Result (%)
Water, 80°C/176°F, 2000 hour	4.66
Methanol 100%, 20°C/68°F, 2000 hour	1.54
Acetone 100%, 20°C/68°F, 2000 hour	0.13
Xylene 100%, 20°C/68°F, 2000 hour	0.3
Xylene 100%, 80°C/176°F, 2000 hour	0

Adhesive Epoxy Resin System

SWANCOR 2532-A/BS/BF is two component, ambient temperature curing paste adhesive, which after post-curing either at application and in service, will give bonds with temperature resistance up to 100°C/212°F and excellent resistance to common chemicals.

Applications

Epoxy adhesive bonds composite pipes, which are used for a wide range of applications for both underground and aboveground installations, including crude oil conveyance, flowlines, fire water lines, potable water lines, seawater cooling systems, industrial waste and marine and offshore applications.

Typical Properties of Liquid Resin

Items	SW2532-A	SW2532-BS	SW2532-BF
Appearance	Yellow Paste	Blue Paste	Red Paste
Viscosity (25 °C/77°F, cps)	350,000~550,000	250,000~450,000	300,000~500,000
Density (25°C/77°F, g/cm^3)	1.1~1.3	1.0~1.2	1.0~1.2
Thixotropic Index	>7	>6	>6
Pot-Life (25°C/77°F, 100g, min)	---	~150	~30
Exothermic Peak Temperature (°C/°F, 25°C/77°F, 100g)	---	~40/104	~170/338
Pot-Life (30°C/86°F, 100g, min)	---	~90	~20
Exothermic Peak Temperature (°C/°F, 30°C/86°F, 100g)	---	~80/176	~190/374
A/B Ratio (weight)	100:45±5		
Shelf-Life (month)	12		

Mechanism Property

Test Item	Test Result	Test Method
Tensile Strength (MPa)	55~62	ASTM D638
E Modulus (MPa)	3500	ASTM D638
HDT (°C/°F)	75/167	ASTM D648
Bending Strength (MPa)	100	ASTM D790

Tensile Shear Strength (Cure condition: SWANCOR 2532A/BS/BF 70°C, 10 hours)

Storage	24h at 23°C Humidity 50%		1000h at 23°C In distilled water		Method
Test Temperature	23		23		
Film Thickness (mm)	0.5	3	0.5	3	
Steel / Steel Tensile Shear Strength(MPa)	25~30	13~16	20~25	13~16	ASTM D1002
FRP/FRP Tensile Shear Strength(MPa)	15~20		15~20		ASTM D1002
T-Peel Resistance (N/mm)	>2	>2	>2	>2	ISO 11339

Adhesive Epoxy Resin System

SWANCOR 2533-A/B is two component, ambient temperature curing paste adhesive, which after post-curing either at application and in service, will give bonds with temperature resistance up to 100°C/212°F and excellent resistance to common chemicals.

Applications

Epoxy adhesive bonds composite pipes, which are used for a wide range of applications for both underground and aboveground installations, including crude oil conveyance, flowlines, fire water lines, potable water lines, seawater cooling systems, industrial waste and marine and offshore applications.

Typical Properties of Liquid Resin

Items	SW2533-A	SW2533-BS	SW2533-BF
Appearance	Yellow Paste	Blue Paste	Red Paste
Viscosity (25 °C/77°F, cps)	20,000~30,000	20,000~30,000	30,000~40,000
Density (25°C/77°F, g/cm^3)	1.1~1.3	1.0~1.2	1.0~1.2
Thixotropic Index	>7	>6	>6
Pot-Life (25°C/77°F, 100g, min)	---	~150	~30
Exothermic Peak Temperature (°C/°F, 25°C/77°F, 100g)	---	~40/104	~170/338
Pot-Life (30°C/86°F, 100g, min)	---	~90	~20
Exothermic Peak Temperature (°C/ F, 30°C/86°F, 100g)	---	~80/176	~190/374
A/B Ratio (weight)	100:50±5		
Shelf-Life (month)	12		

Mechanism Property

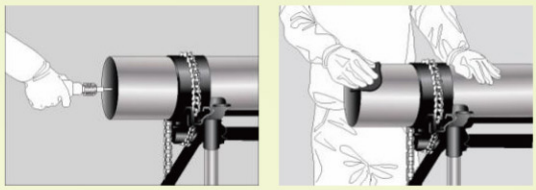
Test Item	Test Result	Test Method
Tensile Strength (MPa)	45~52	ASTM D638
E Modulus (MPa)	> 3200	ASTM D638
HDT (°C/°F)	>75/167	ASTM D648
Bending Strength (MPa)	>100	ASTM D790

Tensile Shear Strength (Cure condition: SWANCOR 2533A/BS/BF 70°C, 10 hours)

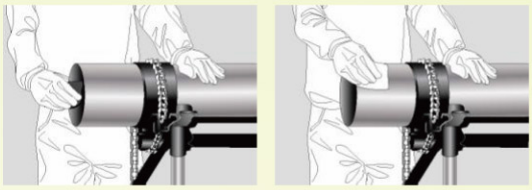
Storage	24h at 23°C Humidity 50%		1000h at 23°C In distilled water		Method
Test Temperature	23		23		
Film Thickness (mm)	0.5	3	0.5	3	
Steel / Steel Tensile Shear Strength(MPa)	25~30	12~15	20~25	12~15	ASTM D1002
FRP/FRPTensile Shear Strength(MPa)	17~22		14~22		ASTM D1002
T-Peel Resistance (N/mm)	>3	>3	>3	>3	ISO 11339

PROTOCOL FOR ADHESIVE

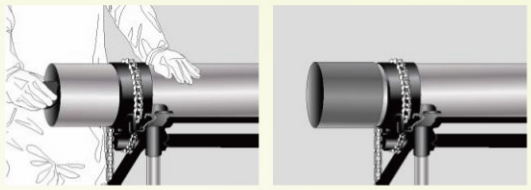
1. The removal of all traces of oil and grease from the surfaces is essential. Degrease by solvent such as acetone, MEK, Ethanol or iso-propanol solvent vapor in a vapor degreasing unit. Remove inner and outer surface deposits, e.g. tarnish, rust or mill scale, preferably by blasting with sharp grit.



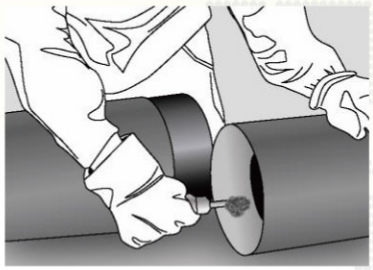
2. Clean the joint surfaces with a wire brush, or with abrasive cloth, or with waterproof abrasive paper. Dry, and remove all particles



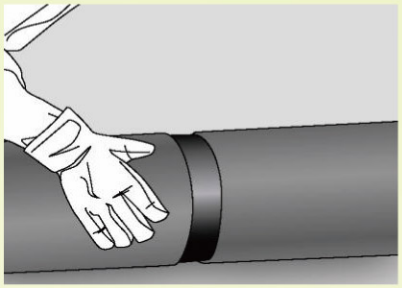
3. If bonding schedule has not taken place within one hour after pretreatment, preserve by priming the bond surfaces immediately or re-cleaning of all surface must be done.



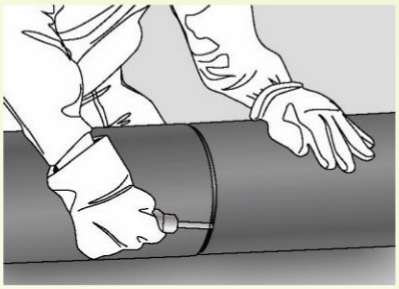
4. Mix SW 2213A and SW2213B between 20°C/68°F to 35°C/95°F manually or robotically at least 3 minutes until the mixture becomes an uniform color. A thin, uniform layer of adhesive 0.02 to 0.03 in (0.5~0.8 mm) thick to inner surface and 0.03 to 0.04 in (0.8 to 1 mm) thick to outer surface will normally impart the greatest lap shear strength to the joint.



5. Insert the spigot into the socket end push it home, rotating the pipe slowly one quarter of a turn if possible. Be sure the spigot butts against the pipe stop and when necessary tap on a wooden block, placed over the pipe end. Never hit with a metal hammer directly on pipes and fitting.

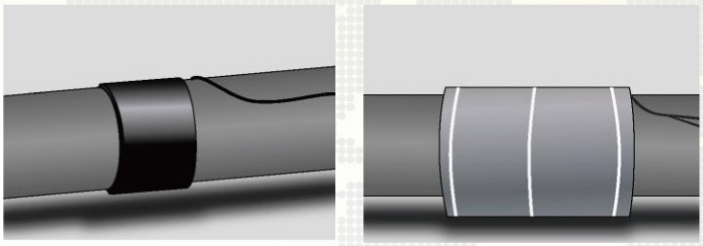


6. Remove excess adhesive from the surface with the spatula (and from the inside of the joint if possible).



*Attention: Do not disturb the curing of the adhesive by moving or vibrating the joint.

7. Good properties are obtained after ambient temperature curing, but in order to achieve optimum performance properties, an elevated temperature cure or post-cure is recommended. Insulate the heating blanket and to close one of the pipe ends is a way to prevent draught. For maximum chemical resistance, the product should be cured at 125°C/257°F for 1 hour.



Prepreg Epoxy Resin System

SWANCOR 2554 and SWANCOR 2558 are designed for manufacture hot-melt carbon fiber prepreg. It can be used for prepreg apply on sports, automobile, marine, aerospace, medical, electronic and structure reinforcement, etc.. That is especially suitable for large parts manufacturer's use. Their main characters are as follows:

- ✓ Non-Diuron and Non-AOC content
- ✓ Good fluidity, excellent immersion
- ✓ Suitable for various process conditions
- ✓ Able to storage under room temperature

Typical Properties of Liquid Resin

Items		SW2554	SW2558
Appearance		Light Yellow Paste	Off-White Paste
Viscosity (70°C/158°F, cps)		22,000~38,000	17,000~33,000
Density (25°C/77°F, g/cm^3)		1.12~1.24	1.12~1.24
Pot-Life (70°C/158°F, hours)		2~3	2~3
Curing Time*[1]	(150°C/302°F, min)	2~3	1~3
	(120°C/248°F, min)	11~14	1.5~2.5
Shelf Life	(25°C/77°F, week)	2~3	2~3
	(0°C/32°F, month)	6	6
	(-18°C/-0.4°F, month)	12	12

*Testing method:Hot Plate, 1g

Typical property of 3.2mm clear casting

Items	SW2554	SW2558	Test Method
Tensile Strength (Mpa)	70~90	65~85	ASTM D638
Tensile Modulus (Gpa)	2.7~3.3	2.7~3.3	ASTM D638
Elongation of Break (%)	2.0~3.0	4~5	ASTM D638
Flexural Strength (Mpa)	115~145	110~140	ASTM D790
Flexural Modulus (Gpa)	3.0~4.0	3.0~4.0	ASTM D790
Tg (°C/°F)	120~130/ 248~266	140~160/ 284~320	DSC test, 10°C/50°F, min

*Curing condition: 2 hours at 120°C/248°F or 1 hours at 150°C/302°F

Prepreg Epoxy Resin System

SWANCOR 2555, SWANCOR 2557 and SWANCOR 2559 are epoxy resins designed for hot melt prepregs with high Tg (DMA) performance. It's available for carbon fiber, glass fiber and other fibers. The epoxy carbon fiber prepregs are applied to sporting goods, commercial products, automobile, mechanical device, marine, contracture reinforcement and 3C products, etc..

- ✓ Superior Tg
- ✓ Non-Diuron and Non-AOC content
- ✓ Good fluidity, excellent immersion
- ✓ Suitable for various process conditions
- ✓ Able to storage under room temperature

Typical Properties of Liquid Resin

Items		SW2555	SW2557	SW2559
Appearance		Light Yellow Paste	Off-White Paste	Off-White Paste
Viscosity (70°C/158°F, cps)		17,000~33,000	17,000~33,000	17,000~33,000
Density (25°C/77°F, g/cm^3)		1.12~1.24	1.12~1.24	1.12~1.24
Pot-Life (70°C/158°F, hours)		2~3	2~3	2~3
Curing Time*1	(180°C/356°F, min)	2.5~3.5	60	60
	(150°C/302°F, min)	17~21	120	120
Shelf Life	(25°C/77°F, week)	2~3	2~3	2~3
	(0°C/32°F, month)	6	6	6
	(-18°C/-0.4°F, month)	12	12	12

*1 Testing method:Hot Plate, 1g

Typical property of 3.2mm clear casting

Items	SW2555	SW2557	SW2559	Test Method
Tensile Strength (Mpa)	65~85	65~85	65~85	ASTM D638
Tensile Modulus (Gpa)	2.7~3.3	2.7~3.3	2.7~3.3	ASTM D638
Elongation of Break (%)	2.0~3.0	4~5	4~5	ASTM D638
Flexural Strength (Mpa)	110~140	110~140	110~140	ASTM D790
Flexural Modulus (Gpa)	3.0~4.0	3.0~4.0	3.0~4.0	ASTM D790
Tg (°C/°F)	160~180/ 320~356	180~200/ 356~392	200~220/ 392~428	DSC test, 10°C/50°F, min

*Curing condition: 2 hours at 120°C/248°F or 1 hours at 150°C/302°F

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