Gurit EPOXY

PRODUCT DATASHEET

Gurit

SPABOND™ 545

INDUSTRIAL EPOXY ADHESIVE

Spabond 545 is a two-component epoxy adhesive offering outstanding performance in numerous bonding applications, ideally suited as a assembly adhesive for different materials.

Spabond 545 thixotropic adhesive and can be applied in varying thicknesses between 0.2 and 20mm. The resin and hardener components are pigmented to give visual indication of mix quality. With a simple 2:1 mix ratio by volume and is supplied in pails and cartridges.

Depending on environmental temperature and volume of adhesive being used the typical working time of the adhesive is

Spabond 545 Fast Hardener 60 minutes working time at 18°C
Spabond 545 Slow Hardener 120 minutes working time at 18°C

- Bonds multiple substrates
- Black cured color
- Gap filling properties of up to 20mm in thickness
- Easy to apply from cartridges, manual or pneumatic dispense guns
- Two hardener speeds to suit most application requirements
- Mix ratio by volume 2:1 (Fast & Slow hardener)
- Mix ratio by weight 100:47 (Fast hardener)
- Mix ratio by weight 100:46 (Slow hardener)

INSTRUCTIONS FOR USE

APPLICATION

The product is optimized for use at 15 - 25°C. At lower temperatures the components thicken and may eventually become unworkable. To ensure accurate mixing and good workability pre-warm the resin & hardener as well as the surfaces to be bonded before use.

SURFACE PREPARATION

Before using the product ensure that surfaces to be bonded are clean, dry and dust-free. Prepare all surfaces by abrading with medium grit paper or other suitable abrasive, remove dust then wipe with acetone.

- Metals – Aluminum, Cold Rolled Steel, Stainless Steel, Copper, Brass require MEK solvent wipe / abrade with medium grit paper / MEK solvent wipe.
- Plastics – ABS, Polycarbonate (PC), Acrylic (PMMA), Polyvinyl chloride (PVC) require IPA solvent wipe / abrade with medium grit paper / IPA solvent wipe.
- Epoxy, Polyester or vinylester composite laminate - ensure laminates are fully cured before bonding, then abrade with medium grit paper or other suitable abrasive, remove dust then wipe with suitable solvent..
- Ferrocement - etch with 5% solution of hydrochloric acid, wash with fresh water, then dry.
- Timber - sand with abrasive paper across grain. Degrease oily timber with a fast evaporating solvent (e.g. acetone). For resinous or gummy timber, etch with 2% caustic soda solution, wash off with fresh water and dry.

MIXING & HANDLING

When mixing by hand, mix thoroughly for at least one minute, paying particular attention to the sides and bottom of the mixing vessel, to ensure no streaks remain. Once fully mixed the adhesive should have a uniform color. Use from pot quickly to maximize resin working life.

CARTRIDGE USE

If dispensing product from a two-component cartridge, first prime the cartridge by dispensing slowly until both resin and hardener are at the outlet of the cartridge. Secondly, clean the outlet and attach the mixing head. When starting a new cartridge, dispense and discard a small amount of adhesive (typically the length of a mix head) prior to applying adhesive to the substrate, in order to ensure thorough mixing of the system. If using a pneumatic gun, regulate supply air pressure to a maximum of 4 Bar. Relieve the pressure on the cartridge after use.

CURE SCHEDULE

A post-cure is required to generate optimum mechanical properties for this system. The recommended minimum cure schedule is 16 hours at 50°C. Ambient temperature cure of this system will not generate adequate mechanical properties and is therefore not recommended.

TRANSPORT & STORAGE

The resin and hardener should be kept in securely closed containers during transport and storage. Any accidental spillage should be soaked up with sand, sawdust, cotton waste or any other absorbent material. The area should then be washed clean (see appropriate Safety Data Sheet). Adequate long term storage conditions will result in a shelf life, as per table, from the date of manufacture for both the resin and hardeners, see product container label for expiry date.

COMPONENT	UNITS	10 – 25°C
Spabond 545 Resin	Months	24
Spabond 545 Fast and Slow Hardeners	Months	24

Storage should be in a warm dry place out of direct sunlight and protected from frost. The storage temperature should be kept constant between 10°C and 25°C, cyclic fluctuations in temperature can cause crystallization. Containers should be firmly closed. Hardener, in particular, will suffer serious degradation if left exposed to air. Hardeners may darken over time, however the physical properties are not affected.

SPABOND 545 RESIN & FAST HARDENER

This product summary is intended for use in conjunction with further advice provided under the Instructions for Use section. All data has been generated from typical production material and does not constitute a product specification.

PROPERTY	UNITS	SPABOND 545 RESIN	SPABOND 545 FAST HARDENER	MIXED SYSTEM	TEST METHOD
Appearance - color	Description	Black	Pink	Black	-
Appearance - form	Description		Thixotropic paste		
Mix ratio by weight	Parts by weight	100	47	-	-
Mix ratio by volume	Parts by volume	100	50	-	-
Density at 21 °C	g/cm3	1.17	1.10	1.14	ISO 1183-1B

PROCESSING PROPERTIES

PROPERTY	UNITS	AMBIENT TEMPERATURE: 21 – 23°C	TEST STANDARD
Working time (pot-life 100 g, mixed in air)	Minutes	26	-
Gel time (10mm bead, mixed in air)	Minutes	89	-
Time to 1 MPa lap shear (green strength)	Hours	5	ISO 4587
Time to 10 MPa lap shear	Hours	9	ISO 4587

ADHESIVE PERFORMANCE

METAL SUBSTRATES	SYMBOL	UNITS	ROLLED STEEL	STAINLESS-STEEL	ALUMINIUM	GLASS FRP	CARBON FRP	TEST STANDARD
Lap shear strength**	$\tau_{lapshear}$	MPa	29*	20	31*	29	28	ISO 4587
Cleavage strength**	$\tau_{cleavage}$	kN	9.9	-	-	-	-	BS 5350 Part C1

PLASTIC SUBSTRATES	SYMBOL	UNITS	POLYAMIDE	POLYCARBONATE	ACRYLIC	ABS	PVC	TEST STANDARD
Lap shear strength***	$\tau_{lapshear}$	MPa	2.6	4.6 (3 / 5 substrate failures)	4.4 (4 / 5 substrate failures)	3.7	3.5 (4 / 5 substrate failures)	ISO 4587

DISSIMILAR SUBSTRATES	SYMBOL	UNITS	CFRP TO MILD STEEL	CFRP TO STAINLESS-STEEL	CFRP TO ALUMINIUM	TEST STANDARD
Lap shear strength**	$\tau_{lapshear}$	MPa	29	25	26	ISO 4587

CONDITIONED STEEL LAPSHEAR ADHESIVE PERFORMANCE

CONDITIONING MEDIUM	SYMBOL	UNITS	30 DAYS @ 23°C	60 DAYS @ 23°C	90 DAYS @ 23°C	90 DAYS @ 60°C	60 DAYS @ 80°C	90 DAYS @ 90°C	TEST STANDARD
Distilled water	$\tau_{lapshear}$	MPa	15***	15***	12***	18**	-	12**	ISO 4587
Petrol***	$\tau_{lapshear}$	MPa	25	27	-	-	-	-	ISO 4587
Diesel***	$\tau_{lapshear}$	MPa	26	25	-	-	-	-	ISO 4587
Acetic acid, 10%***	$\tau_{lapshear}$	MPa	12	11	12	-	-	-	ISO 4587
Lubricating oil***	$\tau_{lapshear}$	MPa	28	22	-	-	-	-	ISO 4587
Paraffin***	$\tau_{lapshear}$	MPa	26	26	25	-	-	-	ISO 4587
Anti-freeze***	$\tau_{lapshear}$	MPa	23	19	-	-	-	-	ISO 4587
Hot-air**	$\tau_{lapshear}$	MPa	-	-	-	-	36	-	ISO 4587

CONDITIONING TEMPERATURE	SYMBOL	UNITS	-40°C	-20°	0°C	23°C	40°C	60°C	80°C	TEST STANDARD
Strength steel to steel**	τ_{steel}	MPa	14	16	29	29	22	7.0	2.7	ISO 4587

CURED MECHANICAL AND THERMAL PROPERTIES

MECHANICAL PROPERTIES	SYMBOL	UNITS	POST-CURED 16HRS at 40°C**	POST-CURED 16HRS at 50°C***	TEST STANDARD
Glass transition temperature	Tg_2	°C	61	-	ISO 11357 (DSC)
Tensile strength	σ_T	MPa	41	47	ISO 527-2
Tensile modulus	E_T	GPa	2.8	2.9	ISO 527-2
3-point flexural strength	σ_F	N/mm2	83	83	ISO 178
3-point flexural modulus	E_F	GPa	2.8	2.7	ISO 178

**BS5350 part C5* ***initial cure: 24 hrs at 21°C + post-cure: 16 hrs at 40°C* ****initial cure: 24 hrs at 21°C + post-cure: 16 hrs at 50°C*

***initial cure of 24 hours at 21°C*

SPABOND 545 RESIN & SLOW HARDENER

This product summary is intended for use in conjunction with further advice provided under the Instructions for Use section. All data has been generated from typical production material and does not constitute a product specification.

PROPERTY	UNITS	SPABOND 545 RESIN	SPABOND 545 SLOW HARDENER	MIXED SYSTEM	TEST METHOD
Appearance - color	Description	Black	Grey	Black	-
Appearance - form	Description		Thixotropic paste		
Mix ratio by weight	Parts by weight	100	46	-	-
Mix ratio by volume	Parts by volume	100	50	-	-
Density at 21 °C	g/cm3	1.17	1.10	1.14	ISO 1183-1B

PROCESSING PROPERTIES

PROPERTY	UNITS	AMBIENT TEMPERATURE: 21 – 23°C	TEST STANDARD
Working time (pot-life 100 g, mixed in air)	Minutes	88	-
Gel time (10mm bead, mixed in air)	Minutes	140	-
Time to 1 MPa lap shear (green strength)	Hours	10	ISO 4587
Time to 10 MPa lap shear	hours	16	ISO 4587

ADHESIVE PERFORMANCE

METAL SUBSTRATES	SYMBOL	UNITS	ROLLED STEEL	STAINLESS-STEEL	ALUMINIUM	GLASS FRP	CARBON FRP	TEST STANDARD
Lap shear strength**	$\tau_{lapshear}$	MPa	27*	20	11	29	30	ISO 4587
Cleavage strength**	$\tau_{cleavage}$	kN	10.5	-	-	-	-	BS 5350 Part C1

PLASTIC SUBSTRATES	SYMBOL	UNITS	POLYAMIDE	POLYCARBONATE	ACRYLIC	ABS	PVC	TEST STANDARD
Lap shear strength***	$\tau_{lapshear}$	MPa	2.4	8.0 (5 / 5 substrate failures)	4.4 (4 / 5 substrate failures)	5.9 (4 / 5 substrate failures)	4.1 (3 / 5 substrate failures)	ISO 4587

DISSIMILAR SUBSTRATES	SYMBOL	UNITS	CFRP TO MILD STEEL	CFRP TO STAINLESS-STEEL	CFRP TO ALUMINIUM	TEST STANDARD
Lap shear strength**	$\tau_{lapshear}$	MPa	29	29	29	ISO 4587

CONDITIONED STEEL LAPSHEAR ADHESIVE PERFORMANCE

CONDITIONING MEDIUM	SYMBOL	UNITS	30 DAYS @ 23°C	60 DAYS @ 23°C	90 DAYS @ 23°C	90 DAYS @ 60°C	60 DAYS @ 80°C	90 DAYS @ 90°C	TEST STANDARD
Distilled water	$\tau_{lapshear}$	MPa	18***	17***	15***	28**	-	20**	ISO 4587
Petrol***	$\tau_{lapshear}$	MPa	28	25	-	-	-	-	ISO 4587
Diesel***	$\tau_{lapshear}$	MPa	25	26	-	-	-	-	ISO 4587
Acetic acid, 10%***	$\tau_{lapshear}$	MPa	14	11	13	-	-	-	ISO 4587
Lubricating oil***	$\tau_{lapshear}$	MPa	27	28	-	-	-	-	ISO 4587
Paraffin***	$\tau_{lapshear}$	MPa	27	27	26	-	-	-	ISO 4587
Anti-freeze***	$\tau_{lapshear}$	MPa	23	21	-	-	-	-	ISO 4587
Hot-air**	$\tau_{lapshear}$	MPa	-	-	-	-	36	-	ISO 4587

CONDITIONING TEMPERATURE	SYMBOL	UNITS	-40°C	-20°	0°C	23°C	40°C	60°C	80°C	TEST STANDARD
Strength steel to steel**	τ_{steel}	MPa	21	24	22	27	24	8.9	1.7	ISO 4587

CURED MECHANICAL AND THERMAL PROPERTIES

MECHANICAL PROPERTIES	SYMBOL	UNITS	POST-CURED 16HRS at 40°C**	POST-CURED 16HRS at 50°C***	TEST STANDARD
Glass transition temperature	Tg_2	°C	61	-	ISO 11357 (DSC)
Tensile strength	σ_T	MPa	40	47	ISO 527-2
Tensile modulus	E_T	GPa	3.1	3.2	ISO 527-2
3-point flexural strength	σ_F	N/mm2	79	85	ISO 178
3-point flexural modulus	E_F	GPa	2.9	3.0	ISO 178

**BS5350 part C5* ***initial cure: 24 hrs at 21°C + post-cure: 16 hrs at 40°C* ****initial cure: 24 hrs at 21°C + post-cure: 16 hrs at 50°C*
***initial cure of 24 hours at 21°C*

HEALTH AND SAFETY

The following points must be considered:

1. Skin contact must be avoided by wearing protective gloves. Gurit recommends the use of disposable nitrile gloves for most applications. The use of barrier creams is not recommended, but to preserve skin condition a moisturizing cream should be used after washing.
2. Protective clothing should be worn when mixing, laminating or sanding. Contaminated work clothes should be thoroughly cleaned before re-use.
3. Eye protection should be worn if there is a risk of resin, hardener, solvent or dust entering the eyes. If this occurs flush the eye with water for 15 minutes, holding the eyelid open, and seek medical attention.
4. Ensure adequate ventilation in work areas. Respiratory protection should be worn if there is insufficient ventilation. Solvent vapors should not be inhaled as they can cause dizziness, headaches, loss of consciousness and can have long term health effects.
5. If the skin becomes contaminated, then the area must be immediately cleansed. The use of resin-removing cleansers is recommended. To finish, wash with soap and warm water. The use of solvents on the skin to remove resins etc must be avoided.

   Washing should be part of routine practice:
   - before eating or drinking
   - before smoking & vaping
   - before using the lavatory
   - after finishing work

6. The inhalation of sanding dust should be avoided and if it settles on the skin then it should be washed off. After more extensive sanding operations a shower/bath and hair wash is advised.

Gurit produces a separate full Safety Data Sheet for all hazardous products. Please ensure that you have the correct SDS to hand for the materials you are using before commencing work.

NOTICE

All advice, instruction or recommendation is given in good faith but the selling Gurit entity (the Company) only warrants that advice in writing is given with reasonable skill and care. No further duty or responsibility is accepted by the Company. All advice is given subject to the terms and conditions of sale (the Conditions) which are available on request from the Company or may be viewed at Gurit's Website: www.gurit.com/terms-and-conditions.aspx

The Company strongly recommends that Customers make test panels in the final process conditions and conduct appropriate testing of any goods or materials supplied by the Company prior to final use to ensure that they are suitable for the Customer's planned application. Such testing should include testing under conditions as close as possible to those to which the final component may be subjected. The Company specifically excludes any warranty of fitness for purpose of the goods other than as set out in writing by the Company. Due to the varied nature of end-use applications, the Company does, in particular, not warrant that the test panels in the final process conditions and/or the final component pass any fire standards.

The Company reserves the right to change specifications and prices without notice and Customers should satisfy themselves that information relied on by the Customer is that which is currently published by the Company on its website. Any queries may be addressed to the Technical Services Department.

Gurit is continuously reviewing and updating literature. Please ensure that you have the current version by contacting your sales contact and quoting the revision number in the bottom left-hand corner of this page.

CONTACT INFORMATION

Please see local contact information at www.gurit.com

24-HOUR CHEMICAL EMERGENCY NUMBER

For advice on chemical emergencies, spillages, fires or exposures:

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