Gurit EPOXY

PRODUCT DATASHEET

Gurit

GR110

STRUCTURAL EPOXY RESIN SYSTEM

GR110 is available with two different speed hardeners, fast and extra slow, which can be blended if different speeds are required. These allow working time and cure time to be tailored depending on the size of component and workshop temperature.

The resin system has low colour and low viscosity making, optimized for a wide range of applications including the lamination, of glass and carbon fiber reinforced composite laminates.

- Low viscosity epoxy system for the lamination of composites
- Range of hardener speeds to suit application temperature and open time
- Crystallization resistant resin formulation
- Good through cure

INSTRUCTIONS FOR USE

APPLICATION

The product is optimized for use between 18 - 25°C (64 – 77°F), mixing is recommended at minimum 15°C. The mixed system will cure at lower temperatures on substrates down to 5°C. Lower application temperatures will progressively increase the viscosity of the resin and hardeners making it difficult to mix and wet out the reinforcement. Recommended relative humidity for use is 40-70%.

MIXING AND HANDLING

Accurate measurement and thorough mixing are essential when using this system, and any deviation from the prescribed mix ratios may degrade the physical properties of the cured system.

The resin and hardener must be stirred well for two minutes or more, with particular attention being paid to the sides and bottom of the container. As soon as the material is mixed the reaction begins. This reaction produces heat (exothermic), which will in turn accelerate the reaction. If this mixed material is left in a confined mixing vessel the heat cannot disperse and the reaction will become uncontrollable.

Gurit produces a separate full Safety Data Sheet for each component of this system. Please ensure that you have the correct SDS to hand for the materials you are using before commencing work. A more detailed guide for the safe use of Gurit resin systems is also available from Gurit and can be found on our website at www.gurit.com. 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).

APPLICATION

GR110 is usually applied by foam roller from a roller tray or brush. Accurate fiber volume fractions can be obtained by applying a known weight of mixed resin / hardener to each fabric / fiber layer. If the laminate is particularly thick, it is recommended that slower hardeners are used for laminating the first layers and faster hardeners in the later layers. In this way the whole thickness laid down remains workable for approximately the same time. For further advice, please contact Gurit Technical Support.

CURE SCHEDULE

The system has been developed to provide good mechanical properties after an ambient only cure. The minimum recommended cure temperature is 18°C (64°F). Post curing the laminate will greatly increase mechanical/thermal properties.

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 (50 – 77°F)
GR110 Resin	Months	24
GR110 Fast hardener	Months	24
GR110 Extra-slow hardener	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 - 25°C (50 – 77°F), 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. Be aware of a possible mixed system color change if very old and new hardeners are used on the same project.

GR110 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	RESIN	HARDENER	MIXED SYSTEM	TEST METHOD
Color	-	Colorless	Light Yellow	Pale Yellow	-
Mix ratio by weight	Parts by weight	100	26	-	-
Mix ratio by volume	Parts by volume	100	32	-	-

COMPONENT & MIXED SYSTEM PROPERTIES

PROPERTY	UNITS	25°C	TEST METHOD
GR110 Resin viscosity	P	10-13	-
GR110 Fast Hardener viscosity	P	TBD	-
Initial mixed system viscosity	P	4.5-5.5	-
Thin film gelation	hrs:min	01:40	Gurit WI

CURED RESIN PROPERTIES

PROPERTY	SYMBOL	UNITS	5 HOURS @ 70°C*	TEST METHOD
Glass transition temp.	Tg_2	°C	91	ISO 11357 (DSC)
Tensile strength	σ_T	MPa	71	ISO 527-2
Tensile modulus	E_T	GPa	3.2	ISO 527-2
Tensile strain	ε_T	%	8	ISO 527-2
Flexural strength	σ_F	N/mm^2	124	ISO 178
Flexural modulus	E_F	GPa	3.1	ISO 178
Flexural strain	ε_F	%	9.4	ISO 178

**initial cure of 24 hours at 21°C*

GR110 EXTRA 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	RESIN	HARDENER	MIXED SYSTEM	TEST METHOD
Color	-	Colorless	Colorless	Light Yellow	-
Mix Ratio by weight	Parts by weight	100	26	-	-
Mix Ratio by volume	Parts by volume	100	32	-	-

COMPONENT & MIXED SYSTEM PROPERTIES

PROPERTY	UNITS	25°C	TEST METHOD
GR110 Resin viscosity	P	10-13	-
GR110 Extra Slow Hardener viscosity	P	TBD	-
Initial mixed system viscosity	P	3.5-4.5	-
Thin film gelation	hrs:min	05:08	Gurit WI

CURED RESIN PROPERTIES

PROPERTY	SYMBOL	UNITS	5 HOURS @ 70°C*	TEST METHOD
Glass transition temp.	Tg_2	°C	82	ISO 11357 (DSC)
Tensile strength	σ_T	MPa	67	ISO 527-2
Tensile modulus	E_T	GPa	3.1	ISO 527-2
Tensile strain	ε_T	%	8	ISO 527-2
Flexural strength	σ_F	N/mm^2	118	ISO 178
Flexural modulus	E_F	GPa	3.0	ISO 178
Flexural strain	ε_F	%	9.4	ISO 178

**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:

Europe	+44 1273 289451
Americas	+1 646 844 7309
APAC	+65 3158 1412