Gurit EPOXY

PRODUCT DATASHEET

Gurit

StrucPro GR220

EPOXY ANHYDRIDE PULTRUSION SYSTEM

GR220 has been innovated for the use in heated pultrusion die lines for the manufacture of carbon and glass fiber pultruded epoxy composites.

Utilising low shrinkage, high pultrusion-die release chemistry, this system is designed for pultrusion manufacturing lines. The low viscosity, low surface tension formulation ensures improved fibre wetting and high quality laminate production.

When mixed a long bath life of >12 hrs is achieved (depending on bath depth and temperature) to maximize production efficiency. However with the addition of varying levels of available accelerator the cure times can be reduced as required.

Available in a wide range of formats from small pack sizes to drums and IBCs. Due to the many variables experienced in pultrusion lines, including die design, laminate dimensions, die temperature, path length, pull rate and bath configuration, some customisation of the epoxy resin system may be required to optimise reactivity and impregnation properties. Please contact Gurit Technical Support for further information.

- Epoxy anhydride structural pultrusion resin
- 130°C Thermal performance
- <2 min gel at 135°C
- <50 second gel at 150°C
- Long bath/pot life (>12hrs)
- Cure times can be reduced with addition of accelerator
- 7% tensile strain
- In-built internal release

INSTRUCTIONS FOR USE

MIXING AND HANDLING

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

The resin, hardener and any accelerator 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.

If the cure speed of the standard system is determined to be too slow the addition of GR220 accelerator can be used to shorten the cure time. While trialing the use of accelerator carry out trials in increments of 0.25 parts of accelerator at each time up to a maximum addition of 2%. Please contact Gurit Technical Support for any further info working outside of these limits

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

The correct amount of hardener and accelerator, if required, should be weighed and added to the corresponding resin and well mixed. To maximize bath life, and prevent localized gelation or exotherm, only use the minimum amount of mixed resin, and top-up during the process. For further advice, please contact Gurit Technical Support.

CURE SCHEDULE

The system is designed to have a long shelf life when mixed at ambient temperatures, however if accelerator is added this will be reduced and exotherm temperatures will be increased. Whilst the system will gel at ambient temperatures, mechanical and thermal performance will only be achieved after an elevated cure during the pultrusion process. It is recommended that die and pultrusion ovens are heated to >135°C.

TRANSPORT & STORAGE

The resin, hardener and accelerator 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.

This product is anhydride based. Care must be taken to minimize exposure of the GR220 hardener to moisture present in the atmosphere. Drums should be stored closed, and depending on mixing equipment, dry lines and desiccant installed to ensure reactivity and cured performance are not impacted.

COMPONENT	UNITS	10 – 25°C (50 – 77°F)
GR220 Resin	Months	24
GR220 Hardener	Months	12
GR220 Accelerator	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.

GR220

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	GR220 RESIN	GR220 HARDENER	TEST METHOD
Mix ratio by weight	Parts by weight	100	83	-
Mix ratio by volume	Parts by volume	100	80	-

COMPONENT & MIXED SYSTEM PROPERTIES

PROPERTY	UNITS	15°C	20°C	25°C	30°C	40°C	TEST METHOD
GR220 Resin viscosity	cP	-	-	3200-3700	-	-	-
GR220 Hardener viscosity	cP	-	-	50-70	-	-	-
Initial mixed system viscosity	cP	-	-	420-480	-	-	-
Pot life (150 g, mixed in water)*	hrs:min	-	-	>12:00	-	-	Tecam gel time

CURED RESIN PROPERTIES

PROPERTY	SYMBOL	UNITS	60 SECONDS @ 150°C	TEST METHOD
Glass transition temp.	Tg_2	°C	130	ISO 11357 (DSC)
Tensile strength	σ_T	MPa	84	ISO 527-2
Tensile modulus	E_T	GPa	3.2	ISO 527-2
Tensile strain	ε_T	%	7.4	ISO 527-2
Flexural strength	σ_F	N/mm^2	120	ISO 178
Flexural modulus	E_F	GPa	2.9	ISO 178

**working time properties are highly subjective to ambient conditions and should be used as an approximate guideline for all systems. Figures given are without any addition of accelerator*

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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