Handipack

Multi-purpose Epoxy System

- **Ideal for repairs and other small tasks**
- **Suitable for gluing, coating, laminating and filling**
- **Simple 2:1 by volume mix ratio**
- **Supplied with dispensing pumps**

Introduction

Handipack is a multi-purpose epoxy, supplied only in a small pack. It is designed for quick repair work and small scale construction jobs. The system is extremely reactive with a pot-life of just 8 minutes at 20°C. It is therefore best suited to small tasks, and should not be applied in thicknesses exceeding 3mm.

The medium to low viscosity of the material enables it to be used for small **laminating** tasks, using lightweight glass fabrics, such as those from the SP-High Modulus' reinforcements range. The system's good clarity makes it a good sheathing matrix system.

Used as a **coating**, it cures rapidly at ambient temperatures to form a tough, clear film, with good moisture resistance. If the coating is to remain unpainted, the cured material should be overcoated with a UV-resistant varnish such as Ultravar 2000, since an unprotected epoxy coating will gradually yellow in sunlight.

By using the SP range of filler powders, a Handipack resin and hardener mix can be turned into a very effective **adhesive** or **filling** compound.

The Handipack is available only in one size (250ml resin and 125ml hardener), with resin and hardener components each supplied with a dedicated dispensing pump that attaches to the container. The resin/hardener/pumps package is contained in a clear blister pack, that can stand on a display shelf or hang from a display rack.

Instructions for Use

Ambient Conditions

The Handipack system should be used ideally at between 10°C - 25°C. At lower temperatures the components thicken and therefore it becomes necessary to prewarm the resin, hardener and the surfaces to be bonded or coated before use. At higher temperatures pot life and working time will be reduced.

Surface Preparation

Ensure that surfaces to be bonded, coated or filled are clean, dry and dust-free. All surfaces should be prepared by abrading with medium grit paper. The dust should then be removed and the surfaces wiped down with acetone or SP Fast Epoxy Solvent (Solvent A) for maximum adhesion.

Metering and Mixing Resin and Hardener in the Correct Ratio

Only one hardener is available and this has a faster reaction speed than other multi-purpose epoxies. Use the hardener provided in the ratio:

Resin		Hardener
2	:	1 (by volume)

Mix as accurately as possible since varying the amount of hardener will not change the cure speed but will greatly reduce the cured strength and water resistance properties of the material.

Use SP graduated cups, syringes or the Handipack pump dispensers. Handipack contains solvent-free epoxy so expect limited pot life. **Mix no more than can be used within 5 minutes of the start of mixing** - this will avoid excessive heat build up, early gelling and resin wastage.

The resin and hardener should be mixed thoroughly for at least 30 seconds. To maximise working time use quickly from the pot. (See Working Properties).

Handipumps

These are plastic plunger-type pumps which are designed to screw directly onto the resin and hardener containers. Apart from the cap colour (blue - resin; red - hardener) the pumps are identical. Both pumps will dispense the same volume (5 ml approx.) with each full stroke. Therefore correct mix ratio of resin to hardener for the Handipack system is achieved by pressing the resin pump twice as many times as the hardener pump for each batch to be mixed. This is a convenient way of providing the essential accuracy required for SP's epoxy systems. It is therefore important to check that the pumps deliver the correct volumes prior to use.

How to fit the pumps

Unscrew the caps from both containers and remove the seals. Cut the dip tubes to the length specified below:

Resin **94mm**
Hardener **55mm**

Screw each pump into place. Now depress the plungers several times to expel all of the air and a small quantity of resin and hardener into a spare container. **Prime the pumps by depressing the plunger several times until spluttering stops and the material is dispensed as a steady stream.** In cold conditions the pumps will be more difficult to prime correctly and may dispense inaccurate volumes. It is therefore advisable to store the resin and hardener at 15° - 25°C for a while before actual use.

How to use the pumps

(1) Always ensure that the pumps are primed before use.

(2) Place a mixing cup under the hardener spout and press the hardener pump for one complete stroke using a slow deliberate movement. This will deliver 5 ml of hardener.

(3) Then move the container under the resin spout and press the resin pump twice with a slow, deliberate action (each pump delivers 5 ml) to deliver the resin in the correct 2:1 volume ratio.

(4) For larger volumes, repeat (2) and (3), but do not dispense more than can be used within 5-10 minutes.

(5) Mix thoroughly as described above.

Pump Maintenance

The pumps are designed to provide continuous service for up to 3 months without maintenance. However, care should be taken to ensure that the exposed parts of the plungers and spouts are kept clean by occasionally wiping with acetone or SP Fast Epoxy Solvent (Solvent A). Cover the ends of the spouts, when pumps are not in use, to help maintain the pumps in a primed condition and stop them dripping. This can be done by inserting a piece of rolled up masking tape or a suitably sized self-tapping screw.

To clean the pumps first allow each to drain completely. Warm air from a hairdryer or careful use of a hot air gun will help this process. Then use hot soapy water, followed by SP Cleaning Fluid (Solvent C) and allow to dry completely. The pumps may then be used. While the cleaning process should remove all traces of the resin or hardener, it is recommended that a pump previously used for resin, is used for resin again. Poor maintenance can affect the accuracy of the pumps. We therefore recommend that if accuracy is in doubt the pump dispensed volumes should be checked using a calibrated measuring cylinder or cup. SP cannot accept liability for poor results following inaccurate pump performance.

Gluing

Handipack is a most effective glue for bonding wood, metals, stone, concrete and grp. To enhance its gap-filling properties and prevent glue-starved joints, and SP filler powder should be added to make a 'thicker' mix, as described in the section below concerning fillers.

Fillet Bonding

Constructing a radiused fillet joint, using epoxy plus fillers, is a convenient, economical method for bonding panels which meet at an angle. Use SP filler powder mix to give a thicker consistency for this application.

Coating

With a minimum of 450 microns coating thickness, Handipack forms an effective water resistant seal on wood. On flat surfaces this can be achieved in one coat but on inclined or vertical surfaces, multiple coats will be required. A second coat can be applied as soon as the first has cured enough to not be disturbed (typically $1^1/_2$ - 2 hours at 20 - 25°C). However it must be applied before the first has completely lost its 'tack' as otherwise a poor bond may occur. If the cure of the first coat has progressed beyond this point, then allow it to cure hard (6 - 8 hours at 20 - 25°C or faster if heated) and then sand thoroughly, preferably using wet abrasive paper, and dry thoroughly before reapplying another epoxy coat or paint system.

Conventional paints can be applied over cured and sanded Handipack but ideally, SP Hibuild 302 should be applied as the final layer before painting. This filled surfacing material enables very even surfaces to be obtained after just a light sanding, and provides an ideal base for many paint schemes.

Pigmenting

Use SP epoxy pigments up to 10% by volume (black, grey or white are available). Add pigment to Handipack resin component and then to this volume of Handipack/pigmented resin add the appropriate volume of Handipack hardener.

Wood Staining

Only water-based wood stains should be used. Do not use oil-based stains or preservatives.

Fibre Reinforcement

The use of Handipack should be limited to taping or small repairs where its fast curing properties are advantageous.

Using Filler Powders

Filler powders control the working properties of the resin mix and are beneficial for almost all bonding operations to give additional gap-filling properties and extend the glue quantity. Fillers are also used for fillet bonding and to create low cost, low density epoxy fairing mixes. When using fillers always mix the resin and hardener first and then stir in the appropriate filler(s) in the correct quantity. Note that addition of filler powder can reduce working time as the insulating nature of the fillers causes the heat generated by the resin/hardener reaction to dissipate more slowly, thereby accelerating the reaction.

How Much Filler to Use

Proportions shown in the first table are based on mixed volume of resin & hardener (mixed resin & hardener = 100% by volume). For further information see the Filler Guide.

	Microfibres	Glass Bubbles or Microballoons	Colloidal Silica [2]
General wood bonding	30-50%	-	-
Wood veneer adhesive [1]	30-50%	200%	-
Bonding grp	30-50%	-	20%*
High density fillet bonding mix	100%	-	70% *
Low density fillet bonding mix	-	250%	70%

[1]- Use either Microfibres or Glass Bubbles but not both. [2] - Add the Colloidal Silica as well as the Microfibres and Glass Bubbles.
*Suggested addition - can be adjusted to give desired non-sag properties.

Coverage

Thickness (per coat)	50-150 microns**
Coating coverage (@ 100 microns)	Approx. 8 - 10m^2/litre
Glue coverage	Approx. 3 - 4m^2/litre

**Depending on temperature and surface inclination.

Properties

Component Properties		
	Resin	**Hardener**
Mix Ratio (by weight)	100	44
Mix Ratio (by volume)	100	52
Viscosity @ 15°C (cP)	1900	6310
Viscosity @ 20°C (cP)	1160	3565
Viscosity @ 25°C (cP)	700	2005
Viscosity @ 30°C (cP)	430	1150
Shelf Life (months)	24	24
Colour (Gardner)	1	6
Mixed Colour (Gardner)	-	3
Component Dens. (g/cm^3)	1.164	0.984
Mixed Density (g/cm^3)	-	1.11
Hazard Definition	Xn, N	C

Cured System Properties	
	Cured (28 days @ 21°C)
Tg DMTA (Peak Tan δ)(°C)	51.3
Tg Ult - DMTA (°C)	57.6
ΔH - DSC (J/g)	0
Tg1 - DMTA (°C)	41.77
Moisture Absorp. (%)	2.04
Cured Density (g/cm^3)	1.149
Linear Shrinkage (%)	1.5
Shear Strength on Steel (MPa)	15.3
Shear Strength Wet Retention (%)	93

Notes: For an explanation of test methods used see 'Formulated Products Technical Characteristics'.
All figures quoted are indicative of the properties of the product concerned. Some batch to batch variation may occur.
† All times are measured from when resin and hardener are first mixed together.

Properties (cont'd)

Working Properties vs. Temperature				
	Resin/Hardener			
	15°C	20°C	25°C	30°C
Initial Mixed Viscosity (cP)	4174	2288	1256	682
†Gel Time - 150g Mix in Water (mins)	-	14.6	-	13.7
†Pot Life - 500g Mix in Air (hrs:mins)	Do not mix in this quantity			
†Working Time (hrs:mins)	1:45	1:30	1:15	1:00
†Tack Off Time (hrs:mins)	1:53	1:45	1:37	1:30
†Clamp Time (hrs:mins)	2:20	2:05	1:52	1:40
†Earliest Sanding Time (hrs)*	8:20	5:40	3:50	2:40

*After removal of any surface by-product.

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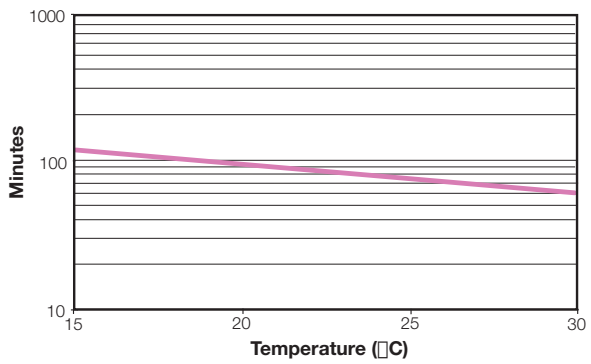
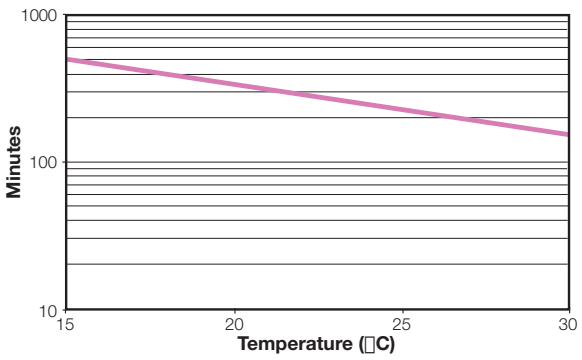
Properties (cont'd)

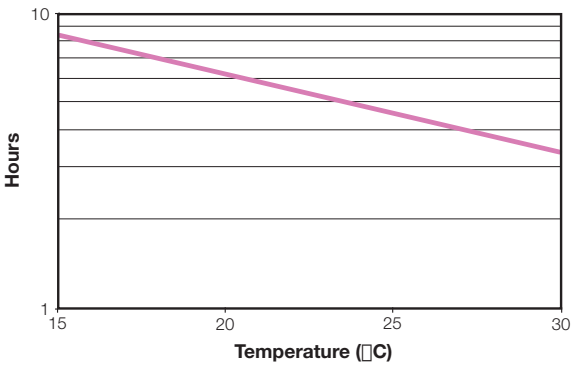
Working Time†



Clamp Time†



Earliest Sanding Time*†



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Health and Safety

The following points must be considered:

1. Skin contact must be avoided by wearing protective gloves. SP-High Modulus recommends the use of disposable nitrile gloves for most applications. The use of barrier creams is not recommended, but to preserve skin condition a moisturising cream should be used after washing.

2. Overalls or other 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 vapours 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
- 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.

SP-High Modulus produces a separate full Material Safety Data Sheet for all hazardous products. Please ensure that you have the correct MSDS to hand for the materials you are using before commencing work. A more detailed guide for the safe use of SP resin systems is also available from SP-High Modulus, and can be found at www.gurit.com

Applicable Risk & Safety Phrases

Resin	Hardener
R 20/21/22, 36/38, 43, 51/53	R 20/21/22, 34, 43, 68
S 2, 9, 13, 29/56, 36/37/39, 46	S 9, 20, 26, 36/37/39, 45, 60

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 for both materials will result in a shelf life of two years for the resin and the hardener. Storage should be in a warm dry place out of direct sunlight and protected from frost. The temperature should be between 10°C and 25°C. Containers should be firmly closed. Hardeners, in particular, will suffer serious degradation if left exposed to air.

Notice

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