



POLYESTER RESIN

User Guide and Manual

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Introduction

The following is intended to act as a general guide for customers who have purchased polyester resin from Resin Library.

What is Polyester Resin?

Polyester resin is an excellent matrix material in the creation of fibreglass (GRP) in the presence of a catalyst and combined with glass fibre chopped strand matting (CSM). It has many applications and is notable cheaper and easier to use than other resin systems.

The following guide provides recommendations on the correct quantities of catalyst (hardener) to add and the correct application environment.

Planning & Preparation

Health & Safety

Please familiarise yourself with the Material Safety Data Sheets (MSDS) before starting.

Personal protective equipment (PPE) should be worn at all times. Recommended PPE includes safety goggles, gloves and overalls. A suitable mask is advised if work is being performed indoors.

For product or technical support, please email (sales@resinlibrary.com) or telephone us on 0333 567 0822.

Use of the products in applications not specified or not described in this manual, may result in improper function, personal injury, or damage of the product or material.

Workable amounts

Users should take care to use manageable quantities. As such, preparing large amounts of resin in one container should be avoided. Workable amounts, usually defined as 1 – 2 kg of resin, should be dispensed and catalysed in a clean, separate bucket.



Note: catalysed resin will show signs of curing within a 15 – 30-minute window depending on temperature and catalyst quantity. Soak tools (brushes, wool rollers, etc.) contacted with resin in acetone when not in use. This will preserve their function by removing resin that would otherwise solidify them.

How much catalyst should be added?

MEKP catalyst should be added at 1 – 4 % of the resin weight. Concentrations of catalyst outside of this range are not recommended; they will lead to sub-optimal curing and premature laminate failure.

- Lower concentrations of catalyst (1 – 2 %) will deliver slower curing rates. A preference for a slower curing rate is desirable when temperatures are higher (e.g. summer). This is because the resin will harden quicker, so users have less time before the resin cures
- Higher concentrations of catalyst (3 – 4 %) will deliver faster curing rates. A preference for a faster cure rate is desirable for when temperatures are lower (e.g.

winter). This is because the resin will take more time to cure, meaning that users might want to speed things up a bit.

A more informative guide is outlined in Table 1 below.

Note: prepare workable amounts of catalysed resin as it takes time to prepare.

Table 1. Recommended catalyst volumes (mL) per weight of resin (kg).

Curing	Slower curing (Suited to warmer weather)		Faster curing (Suited to colder weather)	
	Catalyst (%)	1%	2%	3%
<i>Note:</i> relative quantities of MEKP catalyst to be added in mL per weight of resin (kg)				
Resin Amount	Hardener Usage (mL)			
1 kg	10 mL	20 mL	30 mL	40 mL
2 kg	20 mL	40 mL	60 mL	80 mL
3 kg	30 mL	60 mL	90 mL	120 mL
4 kg	40 mL	80 mL	120 mL	160 mL
5 kg	50 mL	100 mL	150 mL	200 mL
6 kg	60 mL	120 mL	180 mL	240 mL
7 kg	70 mL	140 mL	210 mL	280 mL
8 kg	80 mL	160 mL	240 mL	320 mL
9 kg	90 mL	180 mL	270 mL	360 mL
10 kg	100 mL	200 mL	300 mL	400 mL
11 kg	110 mL	220 mL	330 mL	440 mL
12 kg	120 mL	240 mL	360 mL	480 mL
13 kg	130 mL	260 mL	390 mL	520 mL
14 kg	140 mL	280 mL	420 mL	560 mL
15 kg	150 mL	300 mL	450 mL	600 mL
16 kg	160 mL	320 mL	480 mL	640 mL
17 kg	170 mL	340 mL	510 mL	680 mL
18 kg	180 mL	360 mL	540 mL	720 mL
19 kg	190 mL	380 mL	570 mL	760 mL
20 kg	200 mL	400 mL	600 mL	800 mL

Note: mL = millilitres; kg = kilogram

Application

Catalyst should be measured using a clean cylinder and added into dispensed polyester resin in a clean bucket. Mixing should be performed using a clean paddle or mixing instrument for around 2 minutes.

Note: Mix thoroughly but avoid excessive mixing; air bubbles can enter the resin and cause structural weakness in the laminate.

In the context of applying catalysed polyester resin to glass fibre, users should ensure sufficient tools are available in advance. These centre on:

- Wool roller – or a synthetic alternative. This roller should be used to disperse resin across a designated and workable area of glass fibre matting. Ensure the resin is applied in the correct amount per unit surface area of glass fibre CSM. For instance:

	Chopped Strand Matting (CSM)		
	300 g	450 g	600 g
Quantity of Polyester Resin	0.65 kg	1 kg	1.5 kg

Note: quantities of polyester resin are estimates and should be tested in advance for individual projects.

Note: A standard foam roller should NOT be used as this will dissolve easily in the resin and compromise the laminate.

- Paddle roller – this is critical in driving out excess air bubbles from the resin *after* a wool roller has been used to apply resin. Moderate pressure should be applied to drive out excess resin from the glass fibre creating a more consistent layer of laminate is created.

More detail on glass fibre chopped strand matting (CSM) cutting, sizing and laminating can be found in the Glass Fibre or individual Fibreglassing Kit Manuals.

Suitable Conditions

In addition to careful application, polyester resin should be used only under certain conditions.

Effect of Temperature

Temperature is a critical factor that affects curing and therefore the pot life of catalysed resin. An ideal range for curing is between 15 and 25 °C.

Note: higher temperatures = faster curing and lower temperatures = slower curing.

In general, at a temperature of 20 °C, MEKP catalyst added to create a 2 % concentration will give a pot life of 15 – 20 minutes. As detailed in our MEKP catalyst manual, judgement is required when adding catalyst to resin to ensure appropriate curing.

Practice with smaller quantities is recommended in advance to ensure correct mixing ratios are being used for respective temperatures.

Clean, dry and free of debris

The performance of the resin is strongly affected by the presence of moisture and contaminants.

Work should be performed under dry conditions – particularly if outdoors. Sufficient time (24 hours) should be allowed prior to any exposure to rainwater. If the surface itself is wet, determine the source of the dampness and take steps to dry it out. Avoid performing work in an area with dust or other particulates as this will also negatively impact curing. Provide adequate time for the existing moisture to evaporate; the surface should be dry in advance.

Note: if underlying damp is likely to be an ongoing issue, or if external contamination from outside liquids (e.g., groundwater entering into ponds), a primer (purchased separately) is strongly recommended.

Surfaces should also be rendered appropriately to remove grease, dust, damaged or weakened debris, whilst also creating a smooth surface with a good degree of roughness to enable adequate adhesion. This may involve sanding or a more aggressive scaling system. Acetone should be used in advance to wipe the surface immediately before use.

Storage

Unsaturated polyester resin can be stored for extended periods (> 6 months) under the right conditions. Resin should be in a sealed tin inside a cool, clean and dark room at a temperature between 5 – 25 °C. Temperatures above 25 °C will shorten the resin lifetime, and as will UV light via premature curing.

Once opened, the shelf life of the resin is approximately 3 months. It must be kept sealed at all times. This is further accelerated if there is much more air inside the tin than there is resin.

As detailed in the MSDS, polyester resin is a hazardous chemical. It should be kept away from sources of ignition and should only be combined with MEKP catalyst in workable quantities.