

# Turn Your Ideas into Shape

Fast Creation of FRP Moulds with  
Novel Polylite® 33542 Profile Tooling System



**REICHHOLD**



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In open mould manufacturing processes it is vital to use quality moulds in order to make quality parts. You have created a unique shape and surface appearance (gloss, texture), so you want it to be perfectly reproduced during scale up and commercial manufacturing. Meanwhile your moulds must be robust in practical use, and should be low in maintenance.

Varying with production series size, anticipated exposure to wear, to mechanical stress and to elevated temperatures, different tooling solutions are available. Depending on ultimately desired shape and/ or surface quality, these include steel, aluminium, as well as FRP solutions based on polyester, vinyl ester and epoxy resin systems. Polyester FRP moulds have gained a wide acceptance in the composite industry, because of the versatility of the polyester material and the attractive overall economics.







## Fast Creation of FRP Moulds with Novel Polylite® 33542 Profile Tooling System

Making a mould can be a timely exercise, so you want to ensure the FRP tool is right the first time you make it. Reichold provides you now with the novel **PolyLite® 33542 Profile Tooling System** featuring:

- Good reproducibility of plug dimensions through close-to-zero resin shrinkage
- No hassle in preparation: one-pack solution (filled resin, pre-promoted, thixotropic)
- Ease of application in conventional spray up and hand lay up process
- Quick curing while using standard MEKP peroxides
- Shelf life increased to 6 months

**Benefits of PolyLite® 33542 Profile Tooling System are clear:**

Benefits	Features
<ul style="list-style-type: none"> <li>• Tools ready in days not weeks (tool production in only 20 % of the time vs. conventional FRP solutions)</li> <li>• Significant reduction in labour costs</li> </ul>	<ul style="list-style-type: none"> <li>• Easily spray-able</li> <li>• Quick Curing System</li> <li>• Better overall cure in early stage (allows to make more laminates in one go)</li> </ul>
<ul style="list-style-type: none"> <li>• Excellent dimensional accuracy and laminate stiffness</li> <li>• Elimination of surface defects and dimensional inaccuracies</li> </ul>	<ul style="list-style-type: none"> <li>• Close-to-zero shrinkage through fine-tuned filler and low profile package</li> </ul>
<ul style="list-style-type: none"> <li>• Easy material handling during tool production</li> </ul>	<ul style="list-style-type: none"> <li>• Available as one-pack solution</li> <li>• Quick curing with standard MEKP peroxides</li> <li>• Shelf life increased to 6 months</li> </ul>

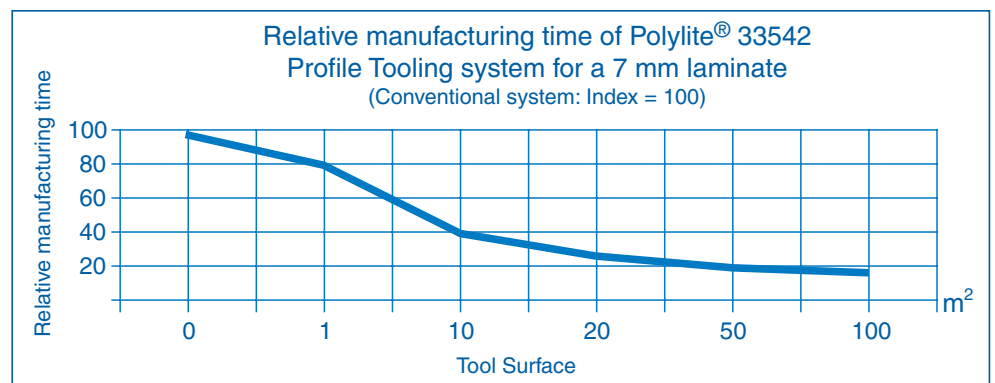




## PolyLite® 33542 Profile Tooling System

### Reduced tool manufacturing time

Compared to conventional tooling resins, the **PolyLite® 33542 Profile Tooling System** allows manufacturing time to be reduced by up to 80% (depending on the tool surface involved).



### Mechanical properties of PolyLite® 33542 Profile Tooling system

Filled resin system, reinforced with 20–25% of glass fibre  
Cured with 1.25% of standard MEKP

PolyLite® 33542 Profile Tooling System	
Tensile strength (MPa)	80-90
Tensile modulus (MPa)	7,000-8,000
Elongation (%)	1.8-2.2
Flexural strength (MPa)	140-150
Flexural strength (MPa)	7,500-8,500
Glass fibre content (%)	20-25
Filler content (%)	50

Post cured for 24 h at 60°C and 3 h at 100°C



## Quality Moulds Step by Step

### Polylite® 33542 Profile Tooling System laminate build-up

#### STEP 5

*Polylite® 33542 Profile Tooling System*

Continue in steps of minimum 3 x 450 gr/m<sup>2</sup> until recommended thickness has been reached

#### Notes:

When the desired laminate thickness is reached, a stiffening frame can be laid down in the wet laminate or glued on to the cured surface.

Core materials can be used as part of the construction for increasing stiffness

#### STEP 4

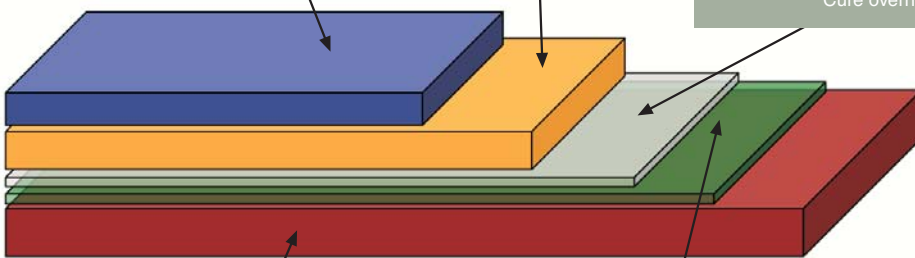
*Polylite® 33542 Profile Tooling System*

Use 3 x 450 gr/m<sup>2</sup> powder bonded glass at minimum (wet on wet)  
Cure with 1,25% standard MEKP at minimum 20°C

#### STEP 3

*High quality skin laminate*

Use 1 x 450 g/m<sup>2</sup> powder bonded glass mat  
Use high quality PolyLite® polyester laminating resin or Dion® vinyl ester resin  
Cure overnight



#### STEP 1

*Master plug*

Ensure plug can resist styrene and heat  
Start with optimum surface finish  
Design shape which can be released  
Use standard mould wax as release system

#### STEP 2

*Special Tooling Gelcoat*

Use Norpol GM (vinyl ester based gelcoat), hand or spray quality.  
Film thickness should be 600 µm at minimum.





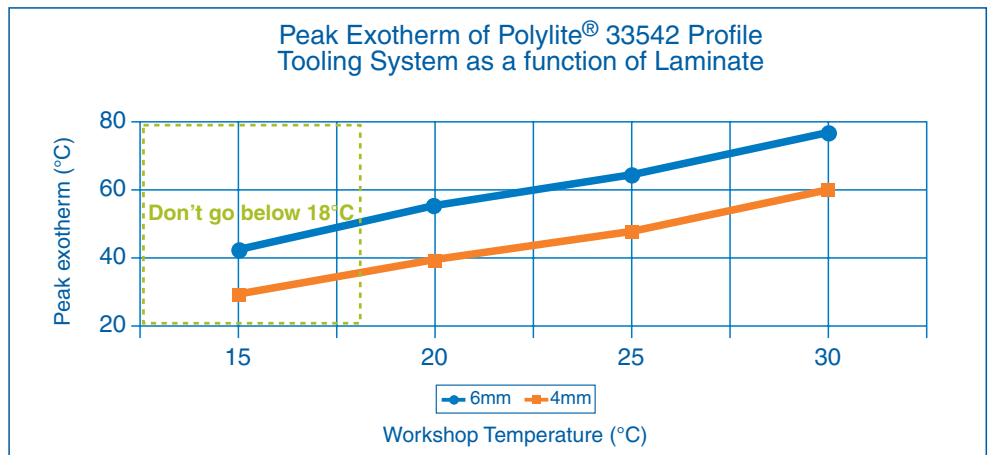


## General comments

The **Polylite® 33542 Profile Tooling System** has a high filler content:

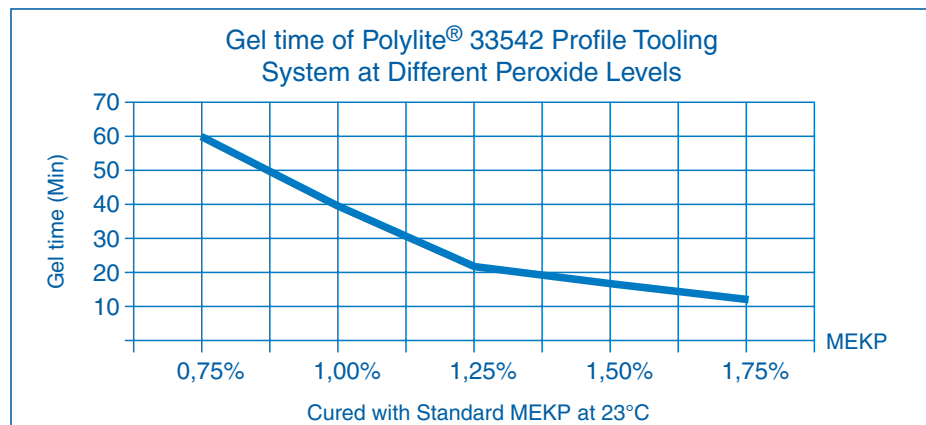
- Stir the resin well before use, as some filler settling and separation may occur during transport and storage.
- For application through spray-up processes, ensure equipment is used capable to handle high filler contents.

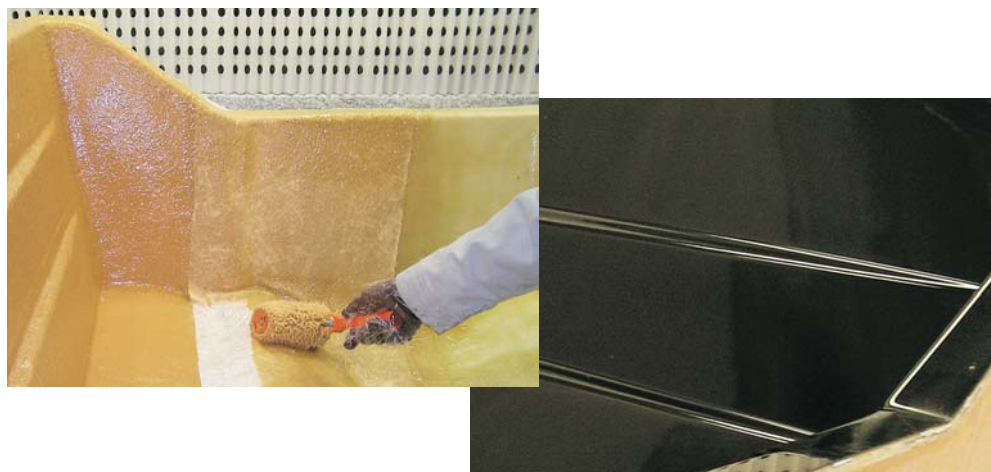
For optimum cure the thickness of the laminate should be at least 4 mm wet in-wet ( $3 \times 450 \text{ g/m}^2$ ). When laminate thickness is below 4 mm the reactivity will be too low, and laminate can be expected to not properly cure.



## Rapid cure development

The gel time can be 20-25 min with standard MEKP peroxide at a level of 1.25% (23°C). Lower peroxide levels (e.g. down to 0.75 %) will give an increase in gel time.





Time for de-moulding from the plug is typically 24 hours at room temperature.

For improved tool curing and plug de-moulding, curing times of 2-3 days are recommended at 35-40°C (while the mould is still in the plug).

Please check Barcol Hardness before use, in order to confirm final cure.



The new generation of **Polylite® 33542 Profile Tooling System** allows for easy tool manufacturing and excellent performance during practical use. In case you need advice on application and layout, feel free to contact your Reichhold representative.



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