

## Make your own pond with polyester

This package contains all materials to make your own pond just the way you want it.

### A polyester pond?

Of course you can use a pond tarp or foil to make a pond. However, the possibilities with such a tarp are limited and the finish is often not so tight.

With laminated polyester you can make beautiful shapes in your pond and you can also easily create beautiful waterfalls, rock structures and other eye catchers. A filter bin or a place to conceal the pump can also be made with polyester.

Polyester for ponds and other laminating work is available in all desired colors.

A well thought out and well laminated polyester pond will last for many decades.

Polyester ponds are very easy and durable to repair with new polyester laminate.

*Note: This is a guide for laminating a pond or other basin for water without chlorine or salt. If a pool or chlorinated basin is desired, we recommend using the pool package. The topcoat we supply in that package is made of a different material and is more resistant to these kinds of chemicals.*

### The required products (in the pond package and laminating package)

*Polyester primer Neviprim*, primer and surface sealant. Keep tightly closed. Close immediately after use. Use 250 grams per m<sup>2</sup> surface.

*Laminating polyester*, the resin with which you make the laminate. Store in closed packaging, not in the sun, between 18 and 25 ° C. Certainly not above 30 ° C, best before 3 months. Use 1.5 Kg Polyester / m<sup>2</sup> / layer. So with two layers a total of 3 kg / m<sup>2</sup>.

*Hardener for laminating polyester*, A ketone peroxide. This is necessary for the polyester to harden. The polyester discolours (from red to colourless) by adding this hardener. Keep tightly closed and close again immediately after opening. Best before 1 year. See table for use:

Ambient temperature in ° C	% catalyst compared to polyester	Example
15-18 ° C	2.5	2.5 ml hardener on 100 grams of polyester
18-20 ° C	2	2 ml hardener on 100 grams of polyester
20-25 ° C	1.5	1.5 ml hardener on 100 grams of polyester

> 25 ° C

1.2

1 ml hardener on 100 grams of polyester

*Glass fiber mats 450 grams / m<sup>2</sup>*, These cloths/ mats provide the desired strength of the pond with the laminating polyester. Depending on the stability of the substrate, we recommend 2 (on e.g. concrete substrate) or more layers.

*Polyester topcoat* , used to finish the laminating work of polyester and glass mats and applied in the desired color. The dense topcoat protects the underlying laminating against moisture and chemicals. Topcoat is usually bought in a certain color, but can also be coloured by the user himself. About 300 to 400 grams / m<sup>2</sup>. For a swimming pool you need a higher quality topcoat than for a pond.

### **The auxiliary materials (in the auxiliary package)**

Polyester processing requires the below materials

*Acetone* , The solvent for liquid polyester (uncured polyester) for cleaning tools etc. Best before 2 years.

*Sandpaper* , Grit 60 is mainly used for roughening previous layers for better adhesion with new layers.

*Velor roller* , Depending on the surface and shape, different sizes are possible. Both velor rollers and fur rollers can be used. 10 or 18 cm long, 1 piece / 15m<sup>2</sup>

*Fleece roller/ Fy roller*, For coarser surfaces, 11 or 18 cm long, 1 piece / 5m<sup>2</sup>

*Roller holder* , To use the velor roller and fur roller. 1 piece per 50m<sup>2</sup>

*Disposable brushes* , For applying resin and primer where rollers are difficult. 20 and 50 mm width. 1 piece / 5m<sup>2</sup>

*Venting rollers* , in various sizes and shapes, 1 piece / 100m<sup>2</sup>

*Roller bins*, to roll / wet the rollers in, 1 piece / 60m<sup>2</sup>

*Square buckets*, to be used as a roller bin for larger work 1 pcs / 10m<sup>2</sup>

*Spatulas*, disposable spatulas to mix 1 piece / 4m<sup>2</sup>

*Mixing cups* , Disposable plastic mixing cups 2 liters, 1 piece / 7m<sup>2</sup>

*Tent, tent canvas or shade cloth* , the project should not be carried out in full sun and remain free from (rain) water. We therefore recommend to consider the use of a party tent or shade cloth. This product is not for sale with us.

### **The safety materials (in the safety package)**

*Safety glasses* , especially to be used with liquid polyester and resin, but also with the primer, a small drop can cause a lot of trouble.

*Respirator* , Inhalation of vapors from resins and primers is unhealthy. We recommend using a mask with organic filters. In addition, work as much as possible in a well-ventilated environment

*Overall*, Protect your clothes and prevent resin and other material from seeping through the clothes and sticking to the skin for a long time. 1 overall per person per day.

*Gloves* , Avoid contact with skin. Latex About 4 pairs / 10m<sup>2</sup> if you work with 2 people.

Sanding mask / mouth cap, Important when sanding so as not to inhale dust particles. Dust particles have a large surface area of still active resin and are therefore unhealthy.

### Directions for use and accident.

Use the recommended safety materials 

*Wash hands and skin thoroughly after work, but also after contact with the skin.*

*Do not eat, drink or smoke while working with these materials. Thoroughly clean hands before consumption.*

*Rinse eyes with clean water for at least 10 minutes when irritated by one of the materials.*

*Rinse mouth when taken orally, do not vomit.*

*Consult a doctor for persistent or worsening irritations!*

### Step 1a Preparations and approach

In your design, of course, take into account the necessary depth of the pond for frost, the placement of piping, pump and filter trays etc.

The easiest way to make a pond is to shape it in the pit where the pond really should be.

However, it might be that this is not possible, due to temperature (too cold or too warm) or the weather (too wet) or because the pit is continuously under water (rain or groundwater). In that case you will have to make a mold in a sufficiently large and well-ventilated room with the right temperature, against which you will laminate the polyester. You can make such molds with numerous products, from dry clay to lacquered wood. If the mold does not have to become a permanent part of the bath, it must of course be ensured that the polyester laminate does not adhere to the mold (for example by using a tarp). This approach differs from this manual. In this approach, we request that you contact us.

*Note: Make sure that the required amount of materials, auxiliary materials and especially safety materials are present. Your safety is important to us, so please follow the safety recommendations.*

## Step 1b Substrate, piping and preparation.

As a surface we recommend concrete, but underlayment or foils etc are also possible. You must first reinforce this with the help of a first layer of laminate so that everything is properly secured. Use the same polyester resin and fiberglass mat for this as for the rest of the project. Usually 1 layer is sufficient. Allow this layer to cure completely. Make sure that the foil or other material lies between the first layer of polyester and the wet soil to promote proper curing of the polyester.

It is important that the surface is stable, so that it does not move too much and that the surface is dry. New concrete surfaces must be given sufficient drying time. Allow at least 3 weeks of drying time.

In addition to the fact that concrete is a nice stable surface, it is also a handy material for fixating the piping. The piping can of course also be secured with polyester. With PVC piping, we recommend that you roughen it first (grain 60) for good adhesion.

On dry days, preferably work at a temperature between 18 and 20 ° C (especially above 15 ° C) but not in full sun, especially when applying the top coat / topcoat. In rainy or very sunny weather, we strongly recommend the use of a shade cloth or tent.

Make sure the surface is clean. That is to say dust-free and grease-free. If necessary, degrease the substrate with, for example, propanol. The tools to be used must also be clean.

## Step 2 primer

*At this step you should use safety glasses, gloves and respirator with organic filters or adequate ventilation.*

Always use a primer on the concrete substrate or the substrate you have made yourself. The primer protects the polyester against any moisture and contamination from the substrate and ensures good adhesion to concrete, chipboard, wood, cement and cured polyester.

Primers should almost never be applied too thick, because the adhesion will deteriorate or the primer will not dry completely. Use approximately 250 grams of primer per m<sup>2</sup>.

Let the primer work for 3 hours at 20 ° C and high humidity (50%), at slightly lower temperatures or lower humidity you can wait up to 8 hours. Preferably do not wait more than 24 hours.

Prime no more surface than you can cover with polyester in 4-6 hours.

## Step 3 Apply polyester

*At this step you should use gloves and respirator or adequate ventilation, goggles and protective clothes.*

A concrete surface is usually already quite strong. A 2-layer glass fiber laminate is often sufficient. For a more flexible or less strong surface, we recommend applying up to 5 or even 6 layers of laminate.

Fiberglass is a cheap and strong fiber and is not affected by water and many chemicals. When using a 450 gram / m<sup>2</sup> glass fiber mat, we use 1 to 1.5 Kg polyester / m<sup>2</sup>. So with two layers of fiberglass mat 2 to 3 kg of polyester.

Lamination is a relatively simple, but intensive process. It is best to work with several people, with one person preparing, mixing and assisting and the other applying the products.

Start with the walls of the pond and afterwards start on the bottom. Let the sides of the bottom rise 10 to 20 cm against the wall.

1. Polyester resin heats up during curing (exothermic process). This warming accelerates the curing process. The more resin you mix in a bucket or cup, the warmer it gets and the faster it hardens. So don't make too much resin at a time. Depending on how trained the user is, we recommend not producing more resin than can be processed in 15 minutes. The ideal mixing ratio at 18-20 ° C is 2%, so with 1 kg resin 20 ml hardener and 1.5 kg resin 30 ml hardener. See table for good mixing ratio.
2. Paint or roll the substrate with the well-mixed polyester. Don't work in too big steps. Preferably start with 1 m<sup>2</sup> per layer (1 to 1.5 kg of resin).
3. Now lay or press the mat in the treated spot in the wet polyester and press it well. The mat can now be brushed or rolled again with the rest of the prepared polyester with a fur roller. The mat becomes smoother and easier to fold. Make sure the mat is completely covered, but avoid thick gloss layers as this will reduce the strength later. The mat is well covered when the white glass mat no longer leaves any white spots. Use about 1-1.5 kg of resin on 1 m<sup>2</sup> glass mat (so per layer).
4. After rolling in and covering the glass mat, it must be vented immediately if the polyester is still liquid and has not started gelling (has started to thicken). Venting is very important to prevent later problems. When venting, the laminate becomes slightly darker in color. Vent as soon as possible after step 3 because the more fluid the resin is, the easier air bubbles can escape.
5. After venting you can start mixing virgin polyester and start making the second layer (according to point 1 t / m 4). Preferably lay the layers in connection (staggered) with an overlap of 10 to 20 cm. When there is too long a delay between the 1st and 2nd layer and the first layer is cured too far, it is recommended that you lightly sand (grain 60) this layer, de-dust it and de grease it (e.g. with iso propanol). Then prime the layer with Neviprim adhesive primer, and then proceed to step 1 and continue the laminating process. Use a dust mask when sanding!

Before breaks, the tools can be cleaned well with acetone. In some cases, however, it makes more sense to just grab a new product (such as with fur rollers).

We also recommend exchanging safety material often enough. This certainly applies to gloves, but also to masks and overalls.

#### Step 4 The finish

When the entire pond is covered with polyester laminate and has hardened (preferably 12 to 24 hours), it can be lightly sanded with a coarse sandpaper (grit 60-80) and degreased with acetone or iso-propanol. This sanding is necessary to ensure that the last topcoat layer also adheres well. During sanding you have a good opportunity to check that there are no defects in the laminating work. If there are any problems, we recommend sanding them well and repairing them first according to the laminating method above in step 3. Only when everything has hardened well and has been sanded can the finish begin.

*Be sure to use a dust mask when sanding!*



Especially in this last step we recommend not to work in full sun and to protect the project against (rain) water, because discoloration and cracking are possible.

*At this step you should use gloves and respirator or adequate ventilation, goggles and protective clothes.*



Topcoat (the top layer) is normally applied with a roller. It is important that the topcoat hardens perfectly. Therefore, the correct amount of hardener is very important. At 25 ° C this is 1.5%, at 20 ° C it is 2% and at 15 ° C 2.5%.

Use approximately 300-400 grams of topcoat per m<sup>2</sup>. Here, too, we recommend making small quantities at a time. Start with 1 kg of topcoat for covering 2.5m<sup>2</sup> of laminate.

Do not apply the topcoat too thinly. This can cause poor curing. However, do not apply the topcoat thicker than indicated, as this may start to run.

After the first curing time (approx. 2-4 hours), check the topcoat for imperfections, etc. These are still easy to remove or touch up.

## **Step 5 Commissioning**

Polyester has a relatively long curing time. Although the polyester will feel well cured after 48 hours, material will still be released. This can be bad for aquatic plants and animals. We recommend not using the pond for at least a week and wait even longer at colder temperatures (below 20 ° C).

A solution to speed up the curing is to fill the pond with water at about 60 ° C (AFTER allowing the topcoat to harden for 48 hours !!) and leave it for a few hours. Subsequently replace this water with fresh water. *Please do a small test to see if the top coat has cured enough to not discolor from the warm water.*

If the topcoat discolours when water is added, the topcoat is not yet sufficiently cured. Remove the water and allow to cure further. Discoloration may improve at best, but this is not a guarantee. If necessary, re-apply topcoat according to step 4.

### Step 6 Clean up waste properly

Please consider the environment. All products used are chemicals. After complete curing, this can simply be disposed of, but liquid or sticky material must be returned to the small chemical waste.

Of course you can often save the leftover polyester for a few months for other projects. Also, with a small residual quantity, you can simply mix harder so that it hardens well and is no longer harmful. Do not do this with too much material at once because of large heat development and risk of fire!

### FAQ

- A. *Polyester does not harden or slow down ....* The laminating polyester is provided with a color indicator. The resin is red if no harder has been added. So if the resin is still red, the hardener probably has not been added. Also, too little harder may have been added or not mixed well. If too little has been added, waiting longer or raising the temperature can provide a solution. If the catalyst has not been added by mistake, you unfortunately have to start over (to a large extent). Remove everything that sticks and / or liquid and pick it up from there.
  
- B. *My topcoat discolours when water gets in ...* In that case the Topcoat is not (yet) sufficiently cured. This may be due to the points mentioned in A. It may also be that the Topcoat was applied too thin and that it was unable to develop enough heat. Then try applying the Topcoat thicker or using more hardener.
  
- C. *I would like a thicker topcoat ...* A thicker topcoat is usually made by first applying a gelcoat to the polyester laminate and then the topcoat. This results in a thicker finish than when you only use a topcoat. Contact us for further information.

### Contact

If there are any questions or if you need help, we are available for you during office hours via email, Facebook and telephone.

We are also happy to count how much product, tools and safety materials are required for a project.

### Liability

This manual has been prepared to the best of our current knowledge and is intended as a guide for your project. However, we are not liable for projects or project components that go wrong or the resulting damage. We guarantee a good product and will replace it 1 to 1 if there is unexpectedly something wrong with the product. However, we are not liable for damage caused by incorrect use of the product or the use of incorrect material. We therefore always recommend that you first test the materials for operation in your project!