

Building instructions with epoxy resin and PU topcoat

Holidays at home

Having your own swimming pool or swimming pond in the garden is a dream for many. A pool in the house or on the roof terrace - with a few helpers, our good advice and the necessary material, this dream can be realized. In the morning, after getting up, go for a swim..... if it's too hot in the afternoon, don't go to an overcrowded swimming pool. Instead, they simply jumped into their own pool and cooled off.

Fulfil your dream of having your own pool or swimming pond.

We will be happy to advise you.

Step by step to your own pool or swimming pond

with epoxy resin, biaxial glass scrims and PU topcoat



We will also be happy to prepare an offer for you.

DD Composite GmbH Tow den Bürgerhufen 604924 Bad Liebenwerda OT Lausitz

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1. Swimming pool - noble and heatable

1.1 The advantages



Swimming pools have a consistent, germ-free water quality because you can positively influence it at any time .

If you want to have your bathing water germ-free and don't want to share it with fish, newts and water striders, you can swim in the clear pool water.

With a heating system, the pool water can be brought to the desired feel-good temperature. So the fun can already begin when the sun is not yet at its full power in April, but it is already nice and warm during the day

With the right lighting, the pool is a real eye-catcher, and it is really wonderful to step into the illuminated pool on a nice warm evening.

In a swimming pool, you can make a lot of things possible. From massage jets, to whirlpool seats, to counter-current systems. Even the design can be flexibly designed with curves, reclining options or stairs.

To make the swimming pool childproof, a roller cover can be attached. Thus, the water does not cool down so quickly. Transparent material allows a clear view.

With the right equipment, nothing stands in the way of bathing pleasure, such as a surface vacuum cleaner or an overflow channel, and cleaning can also be automated with special robots.

1.2 The Cons

Depending on the design, a longer construction period is required for a pool.

Many years of studies have shown that you need to maintain a pool more often than a swimming pond.

Furthermore, you have to expect higher water consumption, the water must occasionally be partially drained and replaced by fresh water.

A large, covered and well-tempered pool can be expensive.

The maintenance effort for a pool facility is usually higher than for a pond.

Before the start of the season, a pool must be thoroughly cleaned. Afterwards, only the right technology with a sand filter system, surface extractor or overflow channel ensures that the water remains clean.

2. Swimming pond - idyllic and chemical-free



2.1 The advantages

Swimming ponds are usually natural - without the addition of chemicals, which in turn benefits people, plants and possibly also the animals living in them.

Furthermore, a swimming pond is always a botanical eye-catcher in the garden.

And numerous animals also like to seek its proximity, such as dragonflies, butterflies, frogs, etc.

Water striders ensure that mosquitoes do not multiply in the pond, as they are simply eaten. A swimming pond also requires less maintenance than a pool and significantly less time for cleaning, as this is done by the plants and microorganisms. Once a year, the water of the bathing area is sucked out, and the plants have to be cut back.

In addition, the swimming pond offers numerous design variants that appear less sterile than a pool facility. The trend is clearly moving away from geometrically straight lines to natural shapes that fit into the garden. If the swimming pond is harmoniously fitted into the garden, it is a very beautiful eye-catcher all year round.

The swimming pond equipment or the swimming pond requirements are also quite manageable.

2.2 The disadvantages

A swimming pond requires more space than a pool, as you have to plan for a regeneration zone with plants. Together with the microorganisms, these ensure natural cleaning.

Only about a third of the swimming pond can be used as a bathing area.

It is difficult to heat the water, which is why you can use a swimming pond far less than a pool.

Even with solar absorbers, a pond cannot be kept warm so evenly.

A cover and thus a safety barrier for small children is hardly possible with a swimming pond.

As a child safety device, there is only the option of blocking off the bathing area or fencing off the entire swimming pond.

Cleaning cannot be automated as with a pool.

Note: These instructions can also be applied to the construction of a pond, fish tank, fountain, stream, slide or other water park sculptures.

Swimming pond or swimming pool?

What suits me better? - Pure nature or elegance?

In the end, your personal preferences will probably be the deciding factor.

Now it's time to weigh up all the arguments...

... and then: Have fun swimming

3. The preliminary considerations

To build a pool or swimming pond, certain points should be considered in advance so that they can enjoy it for a long time and no unpleasant surprises appear.



3.1 How big should the pool be?

From a water volume of 100 cubic meters, a building permit is required in Germany.

A pool with a diameter of 8 meters and a water depth of 1.5 meters, for example, has a volume of 75 cubic meters and is therefore not subject to approval. If you are not sure, you can inquire at your responsible building authority.

3.2 Does the location provide enough sun?

To ensure that the water warms up to a pleasant temperature in the morning, it should be oriented to the southeast. This means that it is exposed to solar radiation for the longest time. In the case of a pool, there should be no trees in the immediate vicinity.

3.3 Are there existing electricity and water pipes nearby?

In order to avoid new laying of electricity and water pipes, it makes sense to plan the location of the pool near existing pipes.

When laying the water pipes, there must be a slight slope to the pool. This prevents water from remaining in the pipes when emptying the pool and freezing at sub-zero temperatures. A burst water pipe would be inevitable and you would have high repair costs.

3.4 What is GRP?

GRP is the abbreviation for glass fibre reinforced plastic and is a fibre-plastic composite of fibres/fabric and polyester or epoxy resins. The fibers serve as mechanical reinforcement, while the resin must be chosen depending on the application.

4. Why with composites?

- Cost-effective and durable
- High resistance of the hardened material
- UV and frost resistant
- RAL colour can be mixed
- Resilient (break, impact, tread resistant)
- seamless processing
- No wrinkling as with a foil
- Easy to clean
- No trouble with roots
- freely configurable shape
- More durable than any film
- Older pools can be reworked
- Expandable at any time



Note: the advantage - primer and laminating resin the same system

5. The primer

Our epoxy resin "Epox4307/Hardener1203-F" is a universal system for coatings, it is ideal for priming.

- Very good adhesion to wood, metal, concrete, polystyrene, GRP, etc.
- Low viscosity
- Solvent- and filler-free
- Good impregnation properties
- Good chemical resistance

For damp substrates, we recommend our primer Epox 4305 and Hardener 180.
(VZ 30min, MV 100/60)

Processing:

- Mix ratio 100parts / 60parts (100parts resin / 60parts hardener) by weight!
- Processing temperature from 10°C
- Processing time (at 20°C) approx. 60min
- Curing time (at 20°C) approx. 24 - 48 hours

EP43RV Reactive Thinner to make the primer a little thinner.

6. The laminating resin

Our epoxy resin "Epox4305/Hardener1203-F" is a universal system for coatings, it is ideal for impregnating biaxial glass scrim.

- Very good adhesion to wood, metal, concrete, polystyrene, GRP, etc.
- Low viscosity
- Solvent- and filler-free
- Good impregnation properties
- Good chemical resistance

Processing:

- Mix ratio 100parts / 60parts (100parts resin / 60parts hardener) by weight!
- Processing temperature from 10°C
- Processing time (at 20°C) approx. 60min
- Curing time (at 20°C) approx. 24 - 48 hours

Alternatively, you can also work with epoxy resin 4307 and hardener 1208-F.
(Processing time approx. 40min, mixing ratio 100/50)

7. The reinforcing fibres and the tear-off fabric

Our biaxial glass fabric 450g/m² consists of two glass fibres sewn together, parallel to each other, at an angle of -45°/+45°, which achieves a very high strength. It can be fitted ideally, has good drapability and the advantage that the scrim can be draped, which is guaranteed by the movability of the fibers. A particularly good feature is that you can laminate a beautiful smooth surface with the glass scrim.

- with a resin consumption of approx. 0.5kg/m², a laminate thickness of approx. 0.5mm is achieved
- Width of the roll 1.27 m, 1m² corresponds to a width of 1.27m and a length of 0.78m

The tear-off fabric:

We recommend that you laminate a tear-off fabric onto the last layer of resin that is still wet with a vent roller. The advantage is that after hardening, the laminate is absolutely dust-free and clean. The epoxy resin does not adhere well to the fabric and therefore it can be easily peeled off from the rest of the laminate after hardening. You get an optimal substrate for the final coat and the annoying sanding and removal of sanding dust is no longer necessary.

8. The final coat / PU topcoat

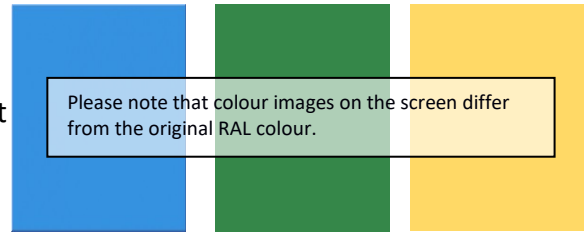
The PU Topcoat 1-K is applied as a final coat. Our PU Topcoat 1-K is an aliphatic one-component polyurethane resin for the protection of swimming pools, which hardens when reacting with humidity and results in a hard and flexible coating. PU Topcoat 1-K is an excellent surface protection for water-prone structures such as swimming pools, ponds, and water park slides and pools. This product does not yellow when exposed to sunlight.

FEATURES

- Clear, glossy top coat.
- One-component product. Easy to use.
- Color and UV stability.
- Resistant to chlorinated water.
- Can be pigmented with different RAL shades.

The Paint / PU Pigment

Color pigment for coloring PU Topcoat 1-K
Available in different RAL shades, please contact us.



9. The tools

- Mixing vessels (plastic buckets or cups)
- Libra
- Stirring Bars
- Brushes
- Vent Roller
- Rolling mills and
- Scissors
- Cutter knife
- Acetone
- Rain and sun protection (tent or tarpaulin)
- Protective gloves
- Protective suit
- Safety Glasses
- Respiratory protection



Do not work in direct sunlight. It is best to set up a parasol or a cheap pavilion from the hardware store. If resin hardens on or in the tool, it is very difficult and can usually only be removed mechanically. Therefore, make sure to wash out tools you use to process resin in acetone from time to time.

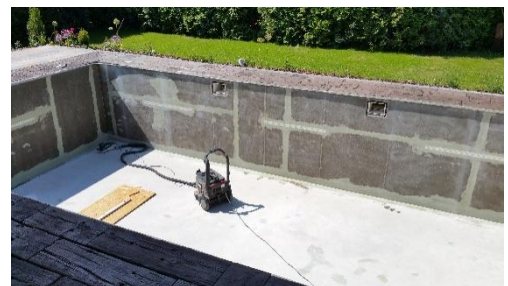


Step by step to your own pool or swimming pond

10. The preparatory work

10.1 in pond construction

After you have decided what your pond should look like, you can start excavating the earth. After excavation, you should level the edge of the pond. Now a base course with lean concrete, mortar or screed can be applied. The thickness of the base course should be approx. 3-5 cm. For complicated areas, you can also apply the edge more heavily. Try to make the edge round, it should be at least 50 mm wide and protrude 100 mm into the ground. Avoid sharp edges and heels, it will make it easier to process the GRP later. You should also keep in mind that fiberglass materials pull out of the corners in a similar way to wallpaper, so you should compensate for sharp corners with a wooden groove. After the edge is finished, you can now plaster the pond from top to bottom. As soon as the concrete begins to set, it can be swept off and leveled with a hand brush, roughening and leveling the surface. After the drying time (about 30 days), you can start with the actual coating.

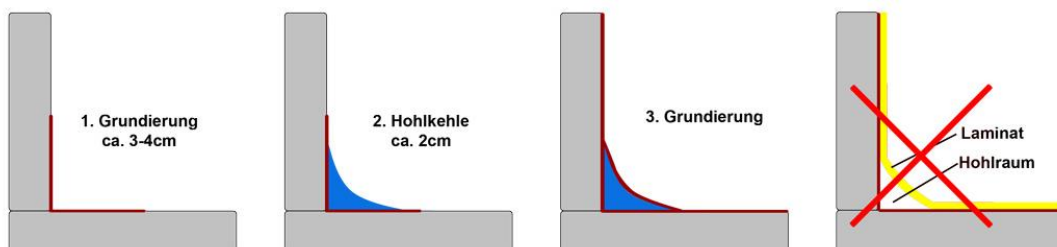


11.2 in pool construction

In pool construction, it is more the case that straight shapes are desired. Then you should shell the pool after excavating the earth. You can do this with concrete formwork blocks or with classic wooden formwork. Do not use types of concrete that contain water-repellent ingredients. However, walls can also be completely bricked. The surface should now be evenly level. Then the brick walls do not have to be completely plastered. It is sufficient if you only rework the joint areas or other unevenness.

NOTE: Cove

To avoid sharp corners, we recommend a cove so that the laminate does not lie "hollow" and there are breaks in the corners. If you have not yet taken this into account during construction, you can also add them later. For this purpose, we recommend our Nautic – epoxy resin filler. You first prime only the corners, when the primer has set (is still slightly sticky), draw a cove with a rounded spatula. Once the filler has hardened, you can sand the corners clean. After removing the sanding dust, you can start with the complete primer (point 13).



You can save a lot of money and time if you try to be very precise during these important preparations. The surface should be as smooth as possible, so laminating is easier and you use less resin. The finished substrate must be dry, free of dust and grease. Remove dirt, dust, solvents and grease from the surface to be coated. Without thorough cleaning, there is no exact connection.

11. The connections

Plan the built-in parts (skimmers, inlet nozzles, possibly floor drain and lighting).
Be aware of any additional seals.



12. The primer

The substrate is now thinly coated with our epoxy resin 4307 + hardener 1203-F, between 150 and 300g/m² (depending on the substrate) should be applied. Mix the epoxy exactly according to weight (scale), stir carefully and process with a brush or nylon polyamide roller. Stir intensively, but slowly and evenly. Please make sure to regularly wipe the bottom and side walls of the mixing tank with the stirring rod so that the resin and hardener are really well mixed together. Avoid blistering.

- Mix ratio 100parts / 60parts (100parts resin / 60parts hardener) by weight!
- Processing temperature from 10°C
- Processing time (at 20°C) approx. 60min
- Curing time (at 20°C) approx. 24 - 48 hours

For damp substrates, we recommend our primer Epox 4305 and Hardener 180.

- Mixing Ratio 100Pcs / 60Pcs by Weight
- Processing time (at 20°C) approx. 30min
- Curing time (at 20°C) approx. 24 hours



With EP43RV Reactive Thinner, you can adjust the viscosity if necessary and thus make the primer a little thinner. Maximum amount of addition 10% (weight percentage).

13. The laminate

You can laminate your pool/pond with a two-layer or a three-layer coating. When deciding which coating is best for you, you should assess your floor or substrate.

Two-layer coatings are sufficient for smooth and solid substrates.

Three-layer coatings are suitable for shapes, streams, stairs, unevenness, etc.

Here you can find the materials for two- and three-layer coatings:

	Two-layer coating	Three-layer coating	Two-layer coating
Fabric	Biaxial-Glasgelege 450	Biaxial-Glasgelege 450	Biaxial-Glasgelege 600
Article number	24450	24450	24600
1 Location	450g/m ²	450g/m ²	600g/m ²
2 Location	450g/m ²	450g/m ²	600g/m ²
3 Location	Tear-off fabric or sanding	450g/m ²	Tear-off fabric or sanding
4 Location	-	Tear-off fabric or sanding	-
Laminatdicke	1.0mm	1.5mm	1.2mm
Total Resin Quantity	1.0kg/m ²	1.5kg/m ²	1.0-1.2kg/m ²

When coating with our resin, we recommend the following procedure:

Before laminating, pre-cut the biaxial glass scrim in appropriate strips.

CONSTRUCTION INSTRUCTIONS STEP BY STEP

You can apply the first layer of epoxy resin 4307 + hardener 1203-F to the still plastic primer. Otherwise, sanding and cleaning is necessary.

Please make sure to regularly wipe the bottom and side walls of the mixing cup with a stirring stick so that the resin and hardener are well mixed together.

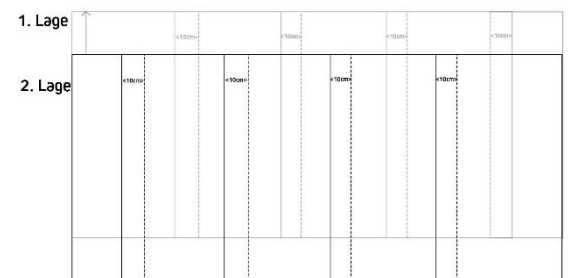
Please **never mix more than 3.0 kg** containers. Especially at temperatures above 20 °C, the container reacts more quickly.

- Mixing ratio 100 parts resin / 60 parts hardener
- Processing time (at 20°C) approx. 60min
- Curing time (at 20°C) approx. 24 - 48 hours

At the beginning, brush an area of approx. 1m² generously with the mixture. Familiarize yourself with the work steps. With later routine, you can also make larger areas. Now place a layer of tissue and soak it. Note that the wall fabric layers extend a few centimetres into the floor area so that you have a connection option for the later floor coating. If the fabric is sufficiently soaked with resin, you can use a vent roller to roll the air that is in places in the laminate out of the laminate from the inside to the outside. Proceed slowly and evenly. In the event that an air bubble is very unruly, prick it with a nail, knife or a sharp object. This allows the air to escape from the laminate. Now the second runway can begin. It should be 10cm offset on the first strip.

The second layer of clutch is first only rolled up, so it absorbs the excess resin of the first layer. There should be no seams on top of each other. In places where the resin is not sufficient, brush with resin and roll up. For a third layer, proceed in the same way.

The **tear-off fabric** should always be cut sufficiently generously. Make sure that there is about 10 cm of protrusion on all sides, as this will make it easier for you to remove the tissue later. The tear-off fabric is applied to the last layer of resin that is still liquid with a venting or laminating roller. After the resin has hardened, the tear-off fabric can be removed. To do this, it is slowly torn off at an acute angle and the substrate is absolutely dust-free and clean immediately after peeling. This gives you an optimal substrate for the final coat (PU Topcoat 1K), which eliminates the annoying sanding and removal of sanding dust.



1. Lage
2. Lage
Abreißgewebe



14. The final coating

After curing the epoxy substrate and sanding or removing the tear-off fabric, apply the final coat. The topcoat can be applied with a brush or roller. Recommended application quantity: 750g/m². The processing temperature should be at least 20°C.

Since it is a self-leveling product, walls require several thin layers to be applied. About 5-6 layers depending on the order quantity per layer to achieve a total of 750g/m² application. At least 3 (250g/m²) coats are required to cover the pool floor. Apply the last two coats without pigments. For pigmented applications, mix the pigment paste and the corresponding amount of PU Topcoat 1-K with a slow stirrer and wait a few minutes until the bubbles have disappeared.

Mix only as much as you can process in a day. Apply the pigmented color normally.

Example: 30m² wall area - 20m² floor area

1. The wall surfaces

Day 1 - e.g.: 2 coats of pigment (morning and evening)

30m² x (2x150g) 300g Wand = 9kg

9kg 80% PU Topcoat + 20% PU Pigment = 7.2kg Topcoat + 1.8kg Pigment

Day 2 - 3x150g without pigments

2. The floor

per coat maximum 250g/m², 20x0.25=5kg per coat, depending on the opacity once or twice

5kg 80% PU Topcoat + 20% PU Pigment = 4kg PU Topcoat + 1kg PU Pigment

2x PU topcoat without pigment (see also section REAPPLICATION)



CURING TIME

The curing time depends on the environmental conditions. The curing rate increases with increasing temperature and humidity.

REUSE

A second coat of PU Topcoat 1-K can be applied when the first layer is no longer sticky, depending on the temperature for 2 to 5 hours, on the floor for 5-8 hours (at 20°C to 25°C). Do not wait more than 24 hours for the next coat to ensure good interlayer adhesion.



CURING TIME

Under normal conditions (25°C, 50% RH), the membrane can be walked on in 24-48 hours (light traffic). Depending on the final use, it is recommended to wait at least 7-10 days. **The final hardness development can take up to 15 days.** Avoid premature moisture at all costs (rain, morning dew, water intrusion, etc.). After this time (about 15 days) we ask you to wash the pool/pond thoroughly, only then can you fill it.

TOOL CLEANING

PU Topcoat 1-K can be removed with acetone and alcohols. Once cured, it can no longer be dissolved.

Further extensive information can be found in the technical data sheets for the product.

Be sure to test with a test coating beforehand to clarify all influences.

15. Pool and pond building sets (the basic materials)

Basic materials - up to approx. 50m² total area, two layers

Primer	Epoxy Resin 4307 + Hardener 1203-F	12kg
1 Location	Biaxial glass scrim 450g/m ²	55m ²
2 Location	Biaxial glass scrim 450g/m ²	55m ²
Total	Biaxial glass scrim 450g/m²	110m²
Total	Tear-off fabric	55m²
Laminating resin 1 ply	Epoxy Resin 4307 + Hardener 1203-F	26kg
Laminating resin 2 ply	Epoxy Resin 4307 + Hardener 1203-F	26kg
Total	Epoxy Resin 4307 + Hardener 1203-F	64kg
Final coating	PU Topcoat 1-K	40kg
Color paste	PU Pigment RAL for 20kg Topcoat	4kg



Basic materials - up to approx. 75m² total area, two layers

Primer	Epoxy Resin 4307 + Hardener 1203-F	18kg
1 Location	Biaxial glass scrim 450g/m ²	80m ²
2 Location	Biaxial glass scrim 450g/m ²	80m ²
Total	Biaxial glass scrim 450g/m²	160m²
Total	Tear-off fabric	80m²
Laminating resin 1 ply	Epoxy Resin 4307 + Hardener 1203-F	39kg
Laminating resin 2 ply	Epoxy Resin 4307 + Hardener 1203-F	39kg
Total	Epoxy Resin 4307 + Hardener 1203-F	96kg
Final coating	PU Topcoat 1-K	44kg
Color paste	PU Pigment RAL	12kg



Basic materials - up to approx. 100m² total area, two layers

Primer	Epoxy Resin 4307 + Hardener 1203-F	25kg
1 Location	Biaxial glass scrim 450g/m ²	105m ²
2 Location	Biaxial glass scrim 450g/m ²	105m ²
Total	Biaxial glass scrim 450g/m²	210m²
Total	Tear-off fabric	110m²
Laminating resin 1 ply	Epoxy Resin 4307 + Hardener 1203-F	51.5kg
Laminating resin 2 ply	Epoxy Resin 4307 + Hardener 1203-F	51.5kg
Total	Epoxy Resin 4307 + Hardener 1203-F	128kg
Final coating	PU Topcoat 1-K	72kg
Color paste	PU Pigment RAL	8kg



This information corresponds to our current knowledge and experience. However, we pass them on without obligation.

Additional tools and accessories, see point 10 and in the checklist, page 14.

Complete sets can be found in our shop under Pool & Pond Construction Complete Set. 

We will be happy to make you an individual offer.

Please let us know the total area and the condition of the substrate. You can reach us by phone from Monday to Thursday 8:00 a.m. to 11:00 a.m. and 12:00 p.m. to 5:00 p.m. and Friday 8:00 a.m. to 11:00 a.m. and 12:00 p.m. to 2:00 p.m. at 035341 47098 or by e-mail: info@phd-24.de

17. Our checklist for your project

Budget, how much can it cost?			☐
Larger than 100 cubic meters, building permit required			☐
Choice of location / free to build / sunny / not too close to trees and bushes			☐
Electricity and water supply nearby?			☐
Plan filter system (note circulation capacity)			☐
Planning a shaft for the filter system at the swimming pool			☐
Create a pipe trench to the filter site, pay attention to the slope			☐
Where to put the excavated earth?			☐
Sun protection, rain protection, dust and fly protection for the construction period			☐
Access stairs or ladder			☐
Plan Border			☐
Plan installation parts (skimmers, inlet nozzles, possibly floor drain and lighting)			☐
Planning a shower and shower basin			☐
Pool cover (canopy, solar film or mesh cover)			☐
Consider safety especially for children (safety fence, water quality)			☐
Materials for individual composition:	Article number	Qty	
Suitable, stable substrate	-		☐
Primer and laminating resin: Epox 4307 + hardener 1203-F (60min) or 1208-F (40min)	92320-F		☐
EP43RV Reactive Thinner (to adjust the viscosity of the primer)	90100RV		☐
Reinforcement fibres: Biaxial glass scrims 450g/m ²	24450		☐
Tear-off fabric	25085		☐
Finish: PU Topcoat 1-K	18001-20		☐
Color paste: PU pigment RAL tone please specify			☐
Recommended tools and aids:	Item no. Ex.	Qty	
Concrete mixer or mixing bucket	-		☐
Excavator or shovel	-		☐
Wheelbarrow	-		☐
Spirit level or leveling device	-		☐
Mixing vessels (plastic buckets or cups)	PP-E1050-1, 71002		☐
Scale for mixing epoxy resin	76083		☐
Uni stirring rod	71011		☐
Lacquer roller velour, plug-in bracket	60018		☐
Laminating brush	70050		☐
Nylon polyamide roller, plug-in bracket	60015, 60006		☐
Vent Roller	81008		☐
Paint Tub	60024		☐
Cutter, scissors	85001, 85010		☐
Acetone (for cleaning the tools)	35105		☐
Abrasives	S60		☐
Respiratory protection, safety goggles, protective suit, protective gloves	39102,86002,72011M		☐

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If you have any questions, please do not hesitate to contact us.



You can reach us by phone from
Monday to Thursday from 8:00 to 11:00 and from 12:00 to 17:00 and Friday
from 8:00 to 11:00 and from 12:00 to 14:00.

This information corresponds to our current knowledge and experience. However, we pass them on without obligation. They are intended to provide information about our products and their possible applications and therefore do not have the meaning of assuring certain properties of the products or their suitability for a specific purpose and are not complete instructions for use. We reserve the right to make changes in the context of technical progress and operational development. The use and processing of our products on the basis of our instructions is beyond our influence and is the sole responsibility of the user. The user is not exempt from checking the suitability and possible applications for the intended purpose.

We are grateful for suggestions for improvement and information on errors.



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