

METAPOR® is manufactured in blocks of 500x500x400mm resp. 1000x500x200mm and can be sawn into slabs of various thicknesses. Due to the sawing process, the air permeability of the slab surfaces is reduced due to partial closure of the pores. It is essential to **mill both surfaces** of the slab by cutting off approx. 0.5 - 1.0 mm in order to provide full air-permeability again.

Slab identifier

	METAPOR Air permeable aluminium	075701	56	10
Product group				
Name of material				
Reference number of slab				
Characteristic value for air permeability: 0= resistance-free air permeability, 60= no air permeability				
Thickness of slab in mm				

Storage

Store in a dry place; protect against crashes and impacts. Avoid contact with grease and liquids.

Machining / Grinding / Polishing

The machinability of METAPOR® is excellent. It is possible to machine METAPOR® faster than aluminium. Due to its naturally porosity, there is no need to drill holes in it. **METAPOR® has to be machined dry**, without any contact to coolant liquid. To prevent clogging of the pores, very sharp tools with cutting edge geometry for aluminum must be used. It is possible to use HSS or carbide tools.

Cutting speed up to 1000 m/min can be applied without any problems. The forward feed can be set up to 0.1mm/ tooth. In areas of thin walls and edge exits, the forward feed should be reduced. Grinding and polishing of the machined surfaces can be made by hand or with a vibrating grinder. Use corundum paper with grains of 400/600/1200 in the ascending order. **METAPOR® has to be polished dry and without any polishing paste!**

Best results in milling 3D geometries have been achieved with following parameters:

Cutter Type: SANDVIK, 6 mm ballnose, uncoated, R216.42-06030-AK10A H10F;

Speed rpm: 7750 min⁻¹; Stepover: 0.05 mm; Feed per tooth: 0.05 mm; Coolant: compressed air.

It is recommended to use dust extraction.

Cleaning of areas, contaminated with grease, fluids or dust

Rub the affected area with light dishwashing liquid and wash with plenty of clean water until it is cleared of foam. Afterwards, the METAPOR® has to be dried for approx. 3 hours (depending on the size) in an oven. Temperature: 80-100°C.

The pores of METAPOR® can also be cleaned by ultrasonic cleaning. Good results have already been achieved after 15 minutes at a frequency of 33kHz.

Sealing of pores

Should non air-permeable areas within a METAPOR® device be required, the pores in those areas can be easily sealed with synthetic resin-paint, adhesive, epoxy resin, tape or similar materials.

Adhesive bonding

For all METAPOR® products, except for HD 210 AL, we recommend to use ARALDITE 2014 from HUNTSMAN resp. GP14 from Gössl & Pfaff.

For the high temperature material HD 210 AL, we recommend to use Hysol 9394C-2.

For optimal bonding and a minimum thickness of bonding line, the METAPOR® material and the adhesive should be preheated to 40-50 °C.

The width of the witness line is depending on the slab thickness and realization. We can achieve adhesive seams as follows:

Slab thickness / width of the witness line

10 – 30 mm = approx. 0.05 – 0.3 mm

31 – 100 mm = approx. 0.3 – 0.8 mm

101 – 200 mm = approx. 0.8 – 1.5 mm

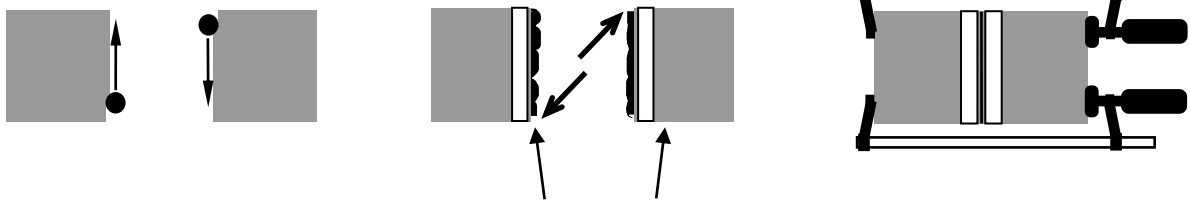
Type, Adhesive	Producer / Supplier	Temperature
Araldite 2014	Huntsman	100 °C
GP14	Gössel & Pfaff	100 °C
Scotch-Weld DP 760	3M	147 °C
Araldite AV4415 mit HV4416-1	Bodo Müller	180 °C
Hysol 9394C-2	Henkel	185 – 230 °C

How to produce a proper bonding:

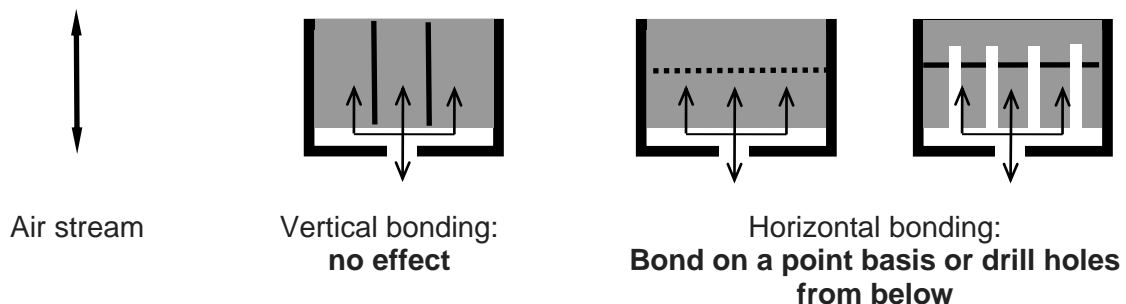
Surfaces to be connected, have to be milled at the front side. Clean the surface with acetone.

Cover frame segments with tape and apply adhesive on both sides. Rub the adhesive a little bit into the pores.

Press parts together. Allow adhesive to harden.



Effect of bonded areas on air permeability



Inserts in METAPOR® tools

Optimal connections are achieved by glued-in inserts (threaded bushings) into a METAPOR® tool. The drilling should have an oversize of approx. 1 mm. The threaded bushing should be sized as long as possible and glued into the drilling with sufficient adhesive (e.g. ARALDIT 2014).

How to mount / screw a METAPOR® mould or slab on a support unit

If you plan to screw METAPOR on a (e.g. aluminium support plate) we recommend to mill elongated holes into the METAPOR. This makes sure that you will not face any mechanical stresses due to different temperature elongations between the METAPOR and the support material.

If you plan to glue a METAPOR® slab into an support frame please consider having approx. 0.5 – 2.5mm air left/right and top/bottom between the frame and METAPOR® (this air gap eliminates the buckle risk because of possible temp. differences).

The frame must have a subsection on the outsides and support bridges where the METAPOR® will be glued on afterwards.

The support bridges avoid bending of the METAPOR®.

If you plan to build a vacuum chuck by yourselves please ask us for the document “How to build a vacuum device with METAPOR”

Repair of METAPOR® tools

In cases of small damages, due to mechanical influences, the METAPOR® tool can be repaired as follows:

Drill out a damaged area with a conical cavity; machine a slightly oversized METAPOR® plug. For larger damages, some spots of adhesive should be applied to the contact surfaces. Drive the METAPOR® plug into the conical cavity and grind or mill off the plug down to the surface.

