KLB KÖTZTAL

KLB block joints on industrial and parking surfaces

Processing information and dimensioning

High performance under heavy loads

The KLB product combination for block joints connects two concrete slabs to form a seamless surface, providing high load-bearing capacity with flexible properties. This ensures reliable crack-bridging, even under frequent vehicle traffic, such as forklift trucks or lorries.

Rapid-setting for short downtimes

The fast curing of the products means that block joints can be formed within a very short time. The individual layers harden in just a few hours, so that they can be used again quickly. The option of carrying out renovations over the weekend minimises downtime – without having to compromise on quality and durability.

Can be driven over smoothly and quietly

A level block joint not only has a positive effect on the health of employees, but also allows industrial trucks to be used in a way that is gentle on their equipment: reduced noise, vibrations, shocks or impacts significantly improve the working conditions in the company.

KLB KÖTZTAL

Table of content

Edition 11/2024

APPLICATION AREAS FOR KLB BLOCK JOINTS

KLB products enable the creation and renovation of elastic, accessible joints

Product	KLB-SYSTEM ACRYL AC 353	KLB-SYSTEM ACRYL AC 356	KLB-SYSTEM POLYURETHAN PU 466
Indoor area	✓	✓	✓
Outdoor area (also covered)	–	✓	✓
Industrial and commercial halls	✓	✓	✓
Exhibition halls	✓	✓	✓
Storage halls	✓	✓	✓
Transshipment halls, e.g. forwarders	✓	✓	✓
Car parks	–	✓	✓
Old concrete slab	✓	✓	✓
Young concrete slab	–	–	✓*
Dynamic vibrations	–	✓	✓
Constant temperatures	✓	✓	✓
Temperature fluctuations	–	✓	✓
Slightly varying temperatures (no frost)	✓	–	✓
Narrow-aisle truck (Vulkollan tyres)	✓	–	–
Forklift and pallet truck traffic	✓	–	✓
Light forklift traffic	✓	✓	✓
Truck traffic	✓	✓	✓

ATTENTION:

* Seek advice from us in case of young concrete slabs where drying shrinkage is not yet complete.

✓ Product is recommended without limitation.

✓ Suitable for joint widths of > 200 mm - 300 mm. Not for narrower joints!

1.

Joint grouting in a short time

Performing under high load

Structural joints are unavoidable in modern construction, especially with (industrial) reinforced concrete slabs. The size of these slabs can only be dimensioned to a limited extent, as cracking occurs over large areas due to drying shrinkage. Therefore, industrial halls are generally constructed from a number of slabs separated by structural joints. Metal joint profiles are usually used to bridge this type of joints. However, their ability to withstand the combination of concrete shrinkage and intensive use is limited.

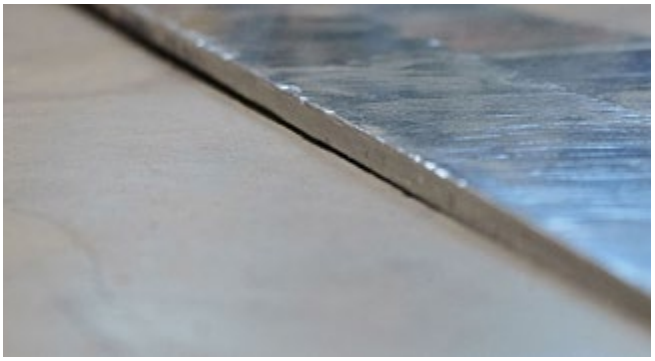
The deformation and torsion caused by metal profiles generate vibration and noise when forklift trucks drive over them. This results in physical strain for personnel, which has a negative impact on their well-being and can only be reduced by heavy braking before crossing the joint. Which in turn reduces the efficiency of transport processes. Costly renovation or replacement of the joint profiles becomes necessary and leads to longer downtime of ongoing operations. Especially in industrial and commercial buildings, car parks and other areas of application, long-lasting joints are essential for smooth traffic flow, and minimising machine stoppage is an important aspect for economical workflows.

A good, quick and cost-effective solution is offered by joint grouting compounds: with their elastic properties, they are able to permanently absorb the expected movements of the floor slabs caused by shrinkage or mechanical loads. The joint can then be driven over smoothly and quietly. Once installed, there is a level transition between the floor slabs and the concrete elements. Joint installation is usually carried out during running operations and can be completed in a matter of hours.

The fast-curing grouting materials from KLB reduce downtimes during renovation. The products **KLB-SYSTEM POLYURETHAN PU 466** as well as **KLB-SYSTEM ACRYL AC 353** and **AC 356** enable the creation and renovation of elastic, traversable joints in the shortest possible time. Their durability provides an economical solution for joint grouting.

The advantages of KLB block joints on one glimpse:

- resistant to mechanical load, suitable for forklift trucks
- impervious to liquids and weather-resistant
- tough-elastic and deformable
- rapid-setting and low-shrinkage
- suitable for material handling equipment
- solvent-free
- resistant to chemicals
- durable



Before: A deformed metal joint profile.

After: Joint grouting to floor level with KLB products.

2.

Dimensioning of block joints

Table of technical data depending on building characteristics

Correct technical execution and dimensioning are essential for a durable structural connection with KLB block joints. The following table serves as a guide for this.

In order to provide effective on-site advice, all requirements and expected loads must be clearly defined in advance. The criteria in the table will help you determine the suitable joint material as well as the correct width and depth of the joint block.

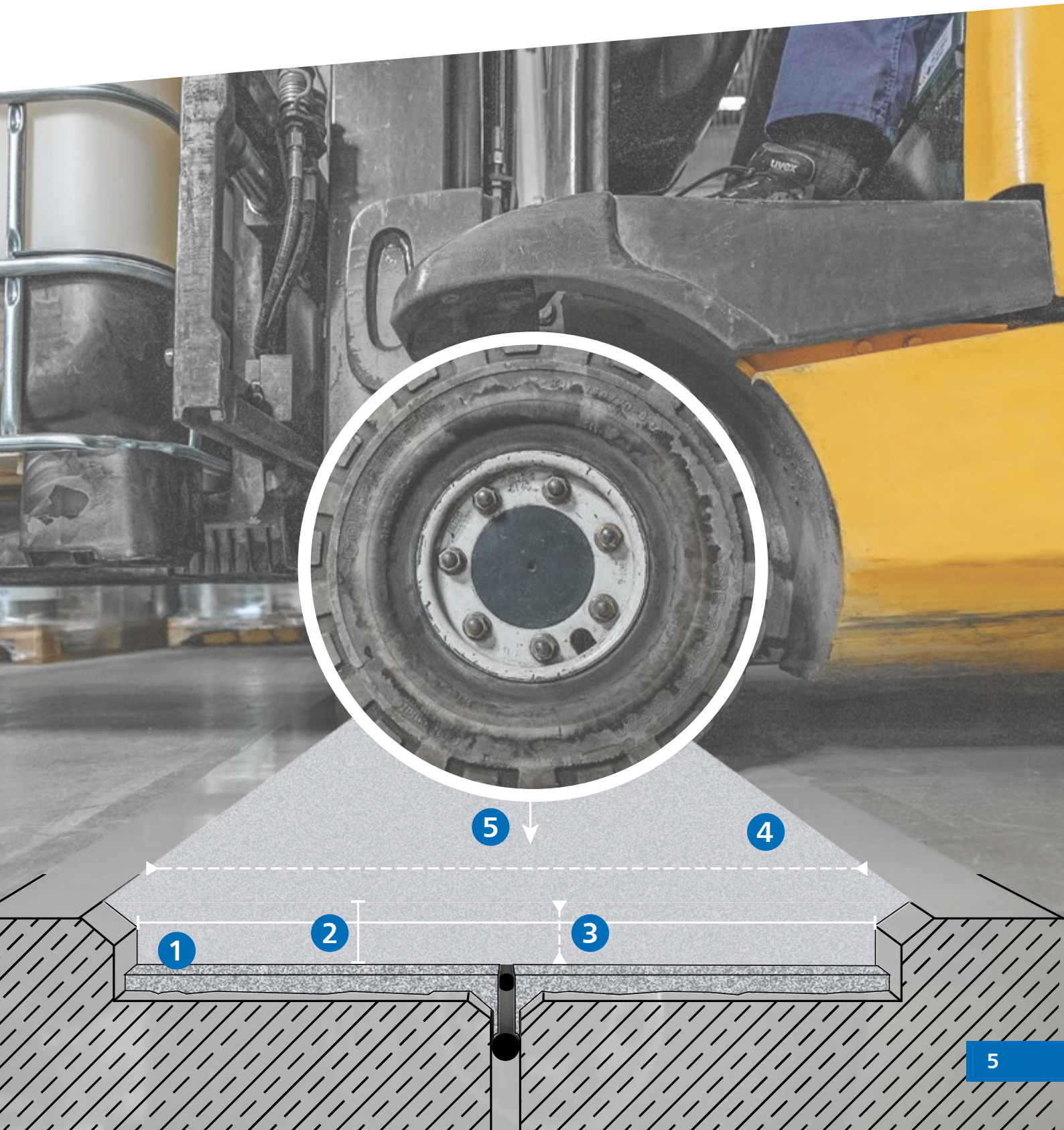
The load assumptions of the floor slabs from the structural engineer can also be used as reference values. While the load cases for vehicles (cars, lorries, forklifts and pallet trucks) from German and European standards are useful for dimensioning the joint.

The elasticity of KLB grouting materials allows them to absorb movement in the adjacent concrete slabs, as shown in the table below. However, driving over the joints with hard wheels, especially those of forklift trucks, can cause indentations in the elastic block joint. It is therefore important to ensure that the maximum point load of 30 N/mm² is not exceeded.

	Product	KLB-SYSTEM POLYURETHAN PU 466 Filled with 33% KLB-Mischsand 2/1								
	Area of application	Industrial floors						Park decks		
1	Width of joint block (mm)	120–160	160–200		200–250		250–300	160–200	200–250	250–300
2	Depth of joint block (mm)	15–20	15–20	21–25	21–25	26–30	26–30	26–30	20–25	26–30
3	Horizontal motion absorption (+/- mm)	7	9	10	12	13	15	9	12	15
4	Vertical motion absorption (+/- mm)	3	5	6	8	9	11	5	8	11
5	Suitable for the following load cases*:									
	Truck wheel load (kN)	100	100	100	100	100	100	-	-	-
	Truck single axle (kN)	200	200	200	200	200	200	-	-	-
	Truck total load (kN)	600	600	600	600	600	600	-	-	-
	Car wheel load (kN)	-	-	-	-	-	-	15	10	10
	Forklift truck wheel load (kN)	FL6 / 85	FL6 / 85	FL6 / 85	FL6 / 85	FL6 / 85	FL6 / 85	-	-	-
	Pallet truck (kN)	≤ 40	≤ 40	≤ 40	≤ 40	≤ 30	≤ 30	-	-	-

	Product	KLB-SYSTEM ACRYL AC 353 filled with 50-75% mixed sand KLB-Mischsand 2/1					AC 356 Filled with 50% KLB-Mischsand 2/1		
	Area of application	Industrial floors					Park decks		
1	Width of joint block (mm)	120–160	160–200		200–250	250–300	200–250	200–250	250–300
2	Depth of joint block (mm)	15–20	15–20	21–25	25–30	26–30	26–30	20–25	26–30
3	Horizontal motion absorption (+/- mm)	3	4	6	7	10	7	8	11
4	Vertical motion absorption (+/- mm)	2	3	4	6	7	6	5	9
5	Suitable for the following load cases*:								
	Truck wheel load (kN)	55	55	65	65	65	-	-	-
	Truck single axle (kN)	110	110	130	130	130	-	-	-
	Truck total load (kN)	300	300	300	300	300	-	-	-
	Car wheel load (kN)	-	-	-	-	-	15	10	10
	Forklift truck wheel load (kN)	FL6 / 85	FL6 / 85	FL6 / 85	FL6 / 85	FL6 / 85	-	-	-
	Pallet truck (kN)	≤ 40	≤ 40	≤ 40	≤ 30	≤ 30	-	-	-

*Load cases following DIN EN 1991


5
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2
3

3.

Preparation of joint grouting

Work steps for reprofiling joints

When renovating joints, it is necessary to remove the old joint profile. Please note that the break-out must be adapted to the expected loads in the area of application, depending on future dimensioning. Please refer to the table of dimensions: Chapter 2 “Dimensioning of block joints”, on page 4.

To remove the concrete quickly and efficiently, we recommend using suitable tools that already mill out the joint profile to a suitable width. This can be done with a diamond saw by making several cuts to the appropriate depth at intervals of a few centimetres. The cut concrete strips can then be chiseled out. Old metal profiles may need to be separated with a cutting disc.

Then prepare the concrete edge zones between the joint and the floor surface. Use a concrete grinder to flatten transitions at an angle of 45° to a size of approx. 10 x 10 mm. This will ensure optimum adhesion of the following layers between the joint and the concrete, while significantly reducing the forces acting on the edge.

The next step is to mechanically vacuum the joint to remove any dust. The entire concrete surface in the joint areas is then primed with a recommended KLB product (see table on page 7).

Before grouting, it must be checked whether the joint to be filled meets the requirements for dimensioning. It’s then necessary to reprofile the break-outs with a rapid-setting mortar to the required minimum layer thickness of the joint grouting (see table on page 7).

After the mortar has hardened, the filled joint is reopened by a separating cut in the middle with the diamond saw to separate the two concrete parts/slabs again from each other. A closed-cell PE round cord of a width suitable for the joint is then inserted into the cut to prevent the grouting compound from running behind.

The joint geometry must be adapted to the loads in the respective area of application.

Cutting with a diamond saw.

Chiseling out the concrete.

Priming the mortised joint area.

Use a fast-curing mortar for reprofiling to the required minimum layer thickness.

Priming and reprofiling

	KLB-SYSTEM POLYURETHAN PU 466	KLB-SYSTEM ACRYL AC 353	KLB-SYSTEM ACRYL AC 356
Chiselling out the existing joint profile. Remove the concrete in the joint area to the required width. At the transition between concrete surface and joint, the edge is to be milled off at an 45° angle approx. 10 x 10 mm.			
Check the substrate for stability and sufficient load-bearing capacity. Thorough cleaning of the substrate using a vacuum cleaner.			
Application of the primer based on the indications of the respective product information.	**PU 68 Rapid U** • consumption approx. 0.3 - 0.5 kg/m² (avoid puddle formation), open scattering with quartz sand 0.7/1.2 mm, consumption approx. 0.5 - 1.0 kg/m² • Hardening time at 20 °C / 68 °F: 60–90 min	**AC 23** • consumption approx. 0.35 - 0.45 kg/m², optionally, open scattering with quartz sand 0.7/1.2 mm, consumption approx. 0.5 - 1.0 kg/m² • Hardening time at 20 °C / 68 °F: 20 min	**AC 23** • consumption approx. 0.35 - 0.45 kg/m², optionally, open scattering with quartz sand 0.7/1.2 mm, consumption approx. 0.5 - 1.0 kg/m² • Hardening time at 20 °C / 68 °F: 20 min
Reprofiling of the now exposed joint to the required minimum layer thickness of the subsequent block joint grouting. For consumptions, please refer to the product information sheets.	**PU 68 Rapid U** and mixed sand **KLB-Mischsand 1** in a weight ratio of 1 : 10 parts by weight Hardening at 20 °C / 68 °F: 60–90 min	**AC 353** and mixed sand **KLB-Mischsand 1** in a weight ratio of 1 : 3.5 to 1 : 4 parts by weight Hardening at 20 °C / 68 °F: 60–120 min	**AC 356** and mixed sand **KLB-Mischsand 1** in a weight ratio of 1 : 3.5 to 1 : 4 parts by weight Hardening at 20 °C / 68 °F: 60–120 min
Important note:	During installation, the mortar must be well compacted, as air pockets disturb the curing process and do not allow sufficient stability.		
Separating the concrete slabs:	After the profiling mortar has hardened (after approx. 60 - 90 min), it must be separated by a cut between both concrete parts with a diamond saw. The joint is then completely closed with a closed-cell **KLB PE round cord 6/15/25 mm.**		

Insertion of the KLB PE round profile into the separating cut.

4.

Execution of joint grouting

Joint grouting

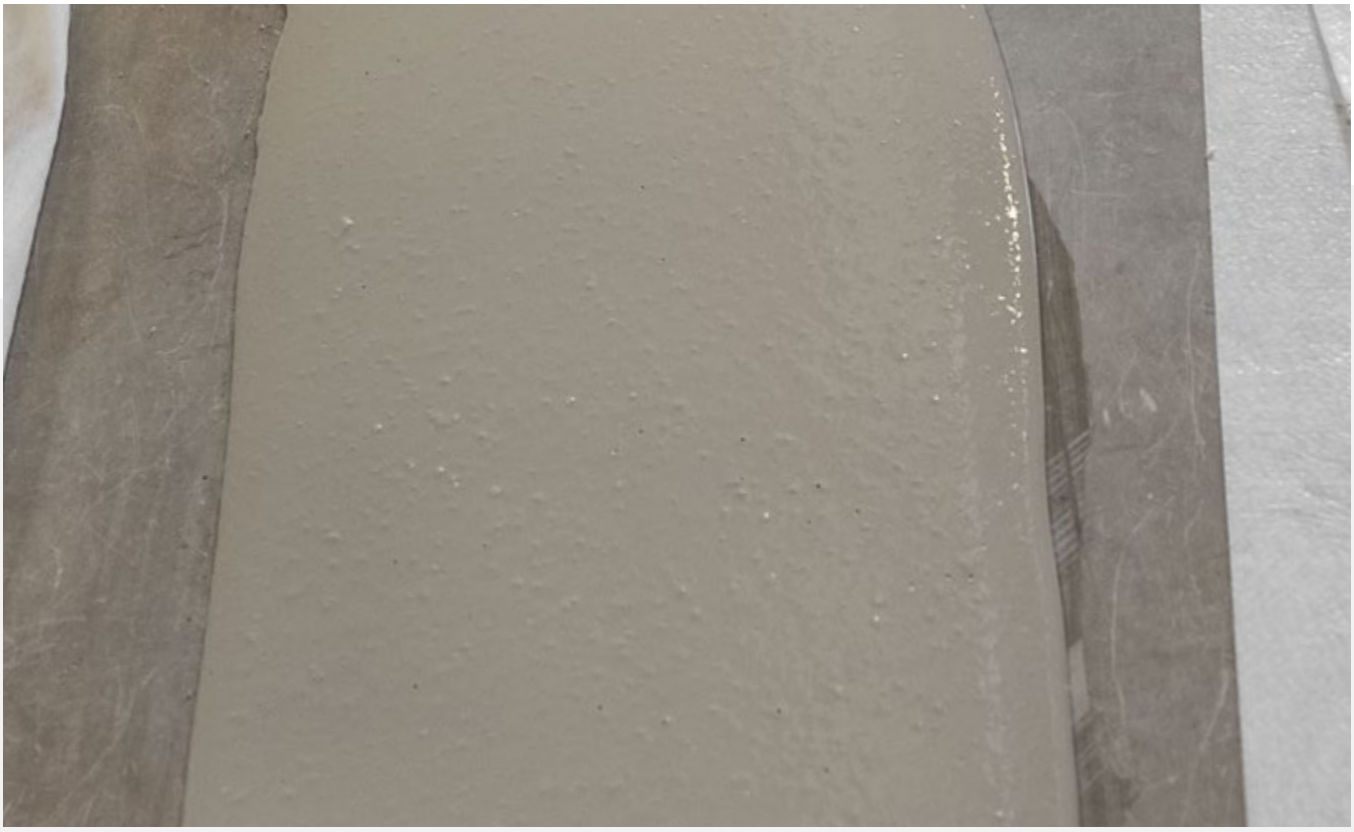
After all necessary preparations have been made, proceed with the joint grouting. Always use the latest version of the respective product information sheets. The grouting compound is poured evenly into the prepared joint and spread with a slight excess.

It is important that it does not exceed the joint by more than 1 mm to avoid having to grind off too much material later. Grind the joint even with the concrete slabs as soon as the required hardness has been achieved. See page 10 for details on execution and recommended tools for grinding.

Good self-levelling properties make the grouting compounds easy to apply.

KLB products for joint grouting

	KLB-SYSTEM POLYURETHAN PU 466	KLB-SYSTEM ACRYL AC 353	KLB-SYSTEM ACRYL AC 356
Grouting Add the grouting material and fill the joint at the edge with approx. 1 mm.	**PU 466** filled with 33% of mixed sand **KLB-Mischsand 2/1** **Consumption:** approx. 1.90 kg/l **Hardening time:** at 20 °C / 194 °F: 60–90 min	**AC 353** filled with 50–75% of mixed sand **KLB-Mischsand 2/1** **Consumption:** approx. 1.65 kg/l – approx. 1.8 kg/l **Hardening time:** at 20 °C / 194 °F: 60–120 min	**AC 356** filled with 50–75% of mixed sand **KLB-Mischsand 2/1** **Consumption:** approx. 1.6 kg/l – approx. 1.7 kg/l **Hardening time:** at 20 °C / 194 °F: 60–120 min



The grouting compound should not be filled more than 1 mm over the joint edge in order to facilitate grinding afterwards.

5.

Grinding KLB block joints

Tool recommendations for grinding to floor level

KLB-SYSTEM POLYURETHAN PU 466

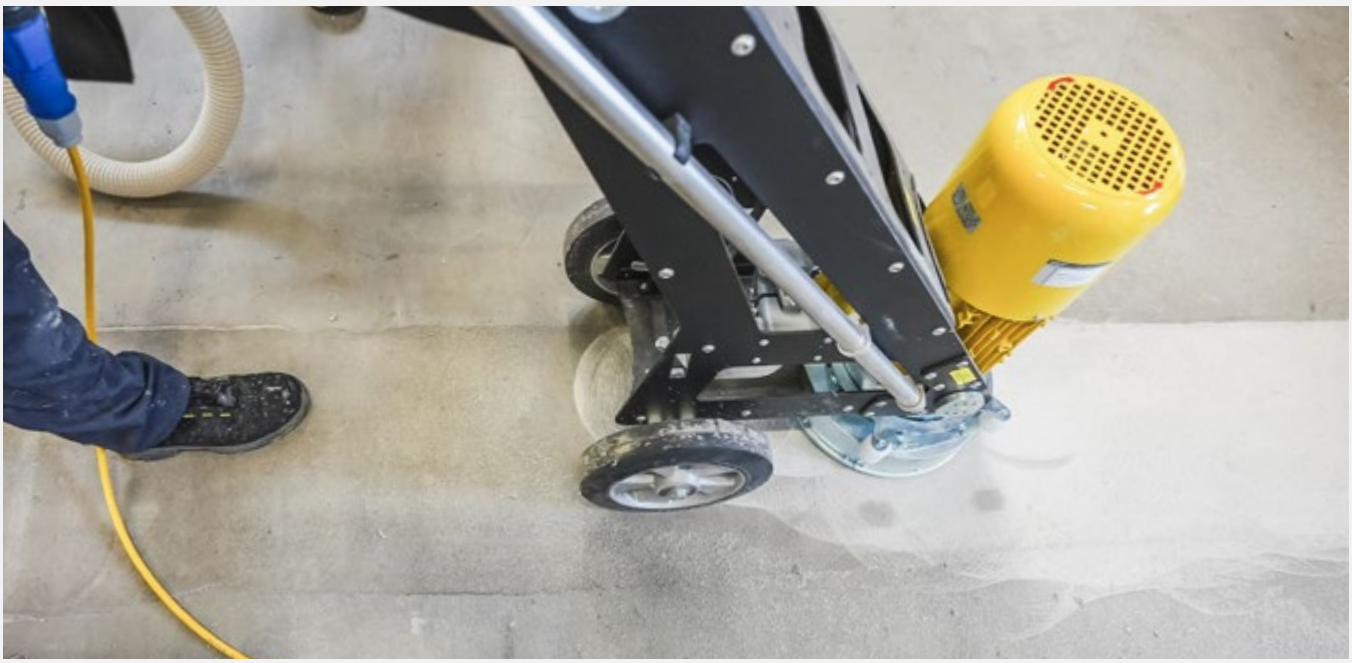
We recommend grinding **KLB-SYSTEM POLYURETHAN PU 466** at the earliest 1.5 - 2.5 hours after installation. During this time, the joint has a soft consistency, which is ideal for grinding off any excess. To remove the remaining joint material from the grout down to the level of the adjacent surfaces, PU 466 can be finished with a hand-held concrete grinder using PCD grinding cups (see table "tool recommendations" on page 11 1 and 2). PCD cups are suitable for coarse removal. For finer work, a diamond cup 5 is recommended. When grinding the joint, make sure that the cup wheel is not held in one place, as this will result in an uneven surface that will still be visible after sealing.

With floor grinders such as MKS Eraser concrete grinder or Schwamborn DSM 450, PCD cups can also be used for roughly grinding the excess joint 3.

After such rough grinding, the joint must be reworked with diamond equipment. This can be done either with a hand-held concrete grinder 5 or a floor grinding machine 6.

As a time-saving alternative, the excess joint material can be scraped off with a floor stripper. Good results are achieved here with MKS Razormax Circle-Cut using a self-cutting rigid blade 4. A levelling intermediate grinding with diamond cup for hand grinders 5 or floor grinding machines 6 is then necessary.

The joint needs to be ground within 6 or 8 hours at the latest. After this time, the material will have hardened significantly, which makes grinding much more difficult. In any case, the sanded surface must be vacuumed with a powerful industrial vacuum cleaner before the next work step.



KLB-SYSTEM ACRYL AC 353/AC 356

Despite a slightly sticky surface, **KLB-SYSTEM ACRYL AC 353** and **KLB-SYSTEM ACRYL AC 356** can be reworked already 1 – 2 hours after installation. The excess joint is either ground off with a hand-held grinder using PCD grinding cups (see "tool recommendations" 1 and 2) or a floor grinding machine, such as MKS Eraser Schwamborn DSM 450, also with PCD cups 3.

When grinding the joint, the cup wheel should be rotated in a circular motion to achieve an even surface. We then recommend reworking the joint using diamond equipment within a hand grinder 5 or a floor grinding machine 6.

Recommended grinding tools

Manufacturer	Rough grinding	Levelling / Intermediate grinding	Fine grinding
MKS Funke Im Fisserhook 28 46395 Bocholt, GER-MANY Phone: +49 2871 24750 www.mks-funke.de	1 VIGOR cup wheel 6 FN 125 mm, 150 mm	5 XC cup wheel Light green 125 mm or 175 mm	7 Eccentric grinder sandpaper / grid 80/120"
	2 VIGOR cup wheel 8FN 175 mm	6 MKS XC Arrow Red K1 Diamond grinding equipment	
	3 VIGOR PKD Big 3 or Big 5		
	4 Self-cutting blade (D/H/L) 2.4 mm x 76 mm x 203 mm (Length depends on joint width)		
Schwamborn Gerätebau GmbH Robert-Bosch-Straße 8 73117 Wangen / Göppingen, GERMANY Phone: +49 7161 2005 0 www.schwamborn.com	3 TR Stripp soft - PCD diamond equipment	6 C-HC 40 Didiamond equipment	7 Eccentric grinder sandpaper / grid 80/120"

The tool recommendations are not complete and based on KLB experience.

6.

Pore-closure and top sealer

For higher demands on visual appearance

After the necessary vacuuming of the ground joint, pores will appear due to the nature of the material, which should be closed before sealing. Such a pore-closure can be applied using a Kaupp spatula.

It is possible to proceed with a scratch coat of **KLB-SYSTEM POLYURETHAN PU 466** without any fillers to smooth the surface of the hardened, freshly ground **PU 466** block joint. For PMMA joints made of **AC 353** and **AC 356**, **PU 469** is used as a scratch coat, but filled with 33% by weight of mixed sand **KLB-Mischsand 2/1**. The same sand mixture can also be used for the **PU 466** scratch coat.

After the scratch coat has hardened and before the application of the sealer, we recommend grinding the joint with an eccentric grinder and sandpaper or grid (see table on page 11 7). Then remove dirt and dust from the surface by vacuuming it with an industrial vacuum cleaner.

If a pore-free surface is required (e.g. in hygienic areas with high cleanliness standards), the joint can then be finished with the rapid-setting and coloured top sealer **PU 469** using a velours roller. It is also possible to use the normal-curing **PU 9018** for special requirements.

Work steps	KLB-SYSTEM POLYURETHAN PU 466	KLB-SYSTEM ACRYL AC 353	KLB-SYSTEM ACRYL AC 356
Depending on tools and material used, a levelling grinding may be necessary. The surface must then be vacuumed off. (see page 10)			
Pore-closure If necessary, a scratch coat can be applied using a Kaupp spatula or trowel to close the pores created after grinding.	**PU 469** filled with 33% of mixed sand **KLB-Mischsand 2/1** **Consumption** 0.5-0.7 kg/m² **Hardening time:** at 20 °C / 194 °F: 2 - 4 hours	**PU 469** filled with 33% of mixed sand **KLB-Mischsand 2/1** **Consumption:** 0.5-0.7 kg/m² **Hardening time:** at 20 °C / 194 °F 2 - 4 hours	**PU 469** filled with 33% of mixed sand **KLB-Mischsand 2/1** **Consumption:** 0.5-0.7 kg/m² **Hardening time:** at 20 °C / 194 °F 2 - 4 hours
Fine grinding and vacuuming **are recommended.** (see page 10)			
Top sealer The joints can then be sealed with a coloured top sealer. Please refer to the indications on page 11.	**PU 469** Consumption approx.: 0.4-0.8 kg/m² Hardening time at 20 °C / 68 °F: 2-4 hours or **PU 9018 Flex Color** Consumption approx. 0.4-0.5 kg/m² Hardening time at 20 °C / 68 °F: 18 - 24 hours	**PU 469** Consumption approx.: 0.4-0.8 kg/m² Hardening time at 20 °C / 68 °F: 2 - 4 hours or **PU 9018 Flex Color** Consumption approx. 0.4-0.5 kg/m² Hardening time at 20 °C / 68 °F: 18 - 24 hours	**PU 469** Consumption approx.: 0.4-0.8 kg/m² Hardening time at 20 °C / 68 °F: 2-4 hours or **PU 9018 Flex Color** Consumption approx. 0.4-0.5 kg/m² Hardening time at 20 °C / 68 °F: 18 - 24 hours

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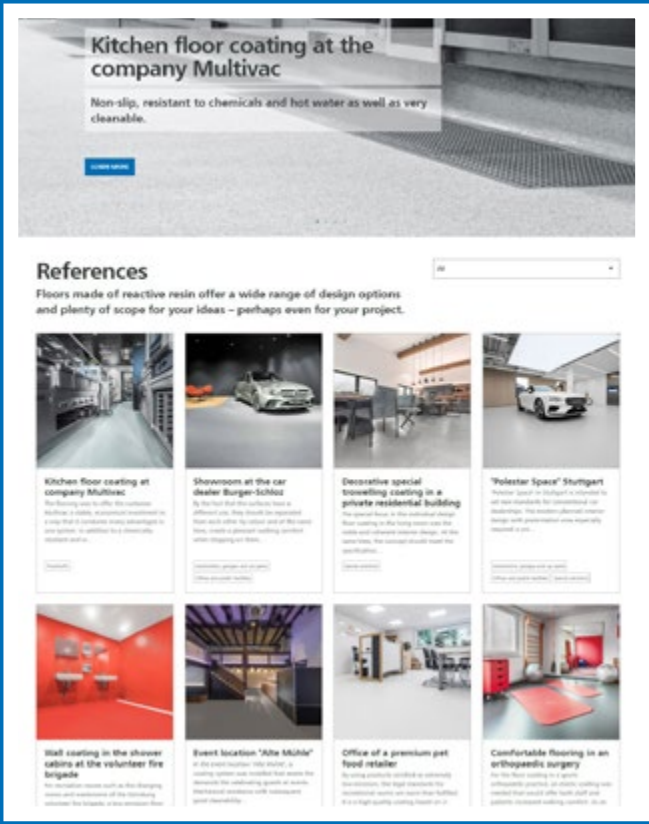

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