

# RAPID-SETTING GROUT

**VB20 RAPID-SETTING GROUT**  
**VB50 RAPID-SETTING GROUT**  
**VB160 RAPID-SETTING GROUT**

## TEST CERTIFICATES AND SUPPORTING DOCUMENTS

- › WW-manhole mortar according to DIN 19573 (**VB20**)
- › High frost-deicing salt resistance - Verification by CDF procedure
- › High sulfate resistance - Verification by testing acc. to DIN 19573
- › High chloride penetration resistance - verified by testing the chloride migration coefficient
- › Product for anchoring reinforcement bars according to DIN EN 1504-6
- › Factory production control acc. to DIN EN 1504-6
- › Company certification acc. to DIN EN ISO 9001:2015 and DIN EN ISO 14001:2015

## PROPERTIES

- › Easy to process
- › High flowability
- › Extremely low shrinkage behaviour
- › After 30 minutes already loadable
- › High frost and frost-deicing salt resistance
- › Impermeable to water
- › Easy to process at temperatures of between +5 °C and +35 °C
- › Building material class A1 acc. to decision 2000/605/EC of the European Commission dated September 26, 2000
- › High profitability due to a fast work progress

## AREAS OF APPLICATION

- › Manhole cover grouting
- › Grouting of service connections
- › Pipe feedthroughs
- › Grouting rail supports

PAGEL® SHAFT HEAD MORTAR ACCORDING TO DIN 19573				
TEST		VB20	Requirement acc. to DIN 19573	
Fresh mortar raw density	kg/m <sup>3</sup>	2,200	-	
Consistency	mm	≥ 650	≥ 650	
Compressive strength	2 h (5 °C)	N/mm <sup>2</sup>	≥ 3	≥ 2
	2 h (20 °C)	N/mm <sup>2</sup>	≥ 15	≥ 10
	1 d	N/mm <sup>2</sup>	≥ 40	≥ 25
	28 d	N/mm <sup>2</sup>	≥ 70	≥ 50
Shrinkage*	Es, m 91 d	‰	≤ 0.5	≤ 1.5
	Es, i 91 d	‰	≤ 0.5	≤ 2.0
Frost-deicing salt resistance*		g/m <sup>2</sup>	≤ 100 1,500	
CDF method			after 28 cycles	
Sulfate resistance*	mm/m	≤ 0.5	≤ 0.8	

\* Test results from the initial test

### MOISTURE CLASSES BASED ON CONCRETE CORROSION FROM ALKALI-SILICIC ACID REACTIONS

Moisture class	WO	WF	WA	WS
<b>VB</b>	•	•	•	•

The aggregates in PAGEL®'s products comply with the requirements of alkali sensitivity class E1 from non-hazardous sources specified under DIN EN 12620.

### EXPOSURE CLASS ALLOCATION ACC. TO: DIN EN 206-1 / DIN 1045-2

	XO	XC	XD	XS	XF	XA*	XM	XWW
	1 2 3 4	1 2 3	1 2 3	1 2 3	1 2 3 4	1 2 3**	1 2 3	1 2 3 4
<b>VB20</b>	•	••••	••••	••••	••••	•••	•	•••
<b>VB50</b>	•	••••	••••	••••	••••	•••	•	
<b>VB160</b>	•	••••	••••	••••	••••	•••	•	

\* Having sulfate attack up to 600 mg/l

\*\* With protective measures according to DIN 1045-2

Classification of the sulfate resistance according to DIN 19573

## TECHNICAL DATA

TYPE			VB20	VB50	VB160
Grain size	mm		0-2	0-5	0-16
Undergrouting height	mm		6-80	20-200	80-640
Amount of water	max. %		13	13	11
Consumption (dry mortar) approx.	kg/m <sup>3</sup>		2,000	2,000	2,100
Fresh mortar raw density approx.	kg/m <sup>3</sup>		2,200	2,200	2,250
Processing time approx.	+ 20 °C	min	10	10	10
Slump flow		mm	≥ 650	≥ 650	≥ 650
Swelling	24 h	Vol.-%	≥ 0.1	≥ 0.1	≥ 0.1
Compressive strength*	30 min	N/mm <sup>2</sup>	≥ 5	≥ 5	≥ 5
	1 h	N/mm <sup>2</sup>	≥ 10	≥ 10	≥ 10
	2 h	N/mm <sup>2</sup>	≥ 15	≥ 15	≥ 15
	1 d	N/mm <sup>2</sup>	≥ 40	≥ 40	≥ 40
	7 d	N/mm <sup>2</sup>	≥ 60	≥ 60	≥ 60
	28 d	N/mm <sup>2</sup>	≥ 70	≥ 70	≥ 70
Bending tensile strength*	30 min	N/mm <sup>2</sup>	≥ 2	≥ 2	≥ 2
	1 h	N/mm <sup>2</sup>	≥ 3	≥ 3	≥ 3
	2 h	N/mm <sup>2</sup>	≥ 3.5	≥ 3.5	≥ 3.5
	1 d	N/mm <sup>2</sup>	≥ 5	≥ 5	≥ 5
	7 d	N/mm <sup>2</sup>	≥ 8	≥ 8	≥ 8
	28 d	N/mm <sup>2</sup>	≥ 10	≥ 10	≥ 10
E-Module (static)	7 d	N/mm <sup>2</sup>	≥ 23,000	≥ 23,000	≥ 23,000
	28 d	N/mm <sup>2</sup>	≥ 30,000	≥ 30,000	≥ 30,000

\* Testing of bending tensile and compressive strength in accordance with DIN EN 196-1

The specified maximum amount of mixing water is valid for the predefined application temperature range and must not be exceeded.

**Note:** All fresh and solid mortars are tested at 20 °C ± 2 °C. Higher or lower temperatures result in deviating properties of fresh respectively solid mortars and test results.

Depending on the temperature, the consistency can be adapted with a slight reduction of the mixing water.

**Storage:** 12 months. Cool, dry, free from frost. Unopened in its original container.

**Delivery form:** 25-kg bag, Euro pallet 1,000 kg

**Hazard class:** Non-hazardous material, observe information on packaging.

**GISCODE:** ZP1

### PAGEL<sup>®</sup> PRODUCT COMPOSITION:

Cement: acc. to DIN EN 197-1

Aggregate: acc. to DIN EN 12620

Additions: acc. to DIN EN 450, general building inspection approval (abZ), DIN EN 13263 (fly ash, microsilica, etc.)

## PROCESSING

### SUBSTRATE PREPARATION:

Remove loose and unsound material such as cement slurry and dirt etc. using suitable methods, e.g. shot-blasting or similar until the underlying solid grain structure has been exposed. A sufficient average tear strength ( $\geq 1.5 \text{ N/mm}^2$ , KEW  $\geq 1.0 \text{ N/mm}^2$ ) must be ensured.

### Prewetting:

Prewet the concrete substrate to capillary saturation for approx. 6-24 hours.

### Reinforcing concrete:

The grade of surface preparation of reinforcement as well as other metallic parts is based on the requirements of the current applicable regulations and must be ensured before the application.

### Non-iron metals:

Cement and cement-bound building materials may cause non-iron-metals in the transitional area of the contact surface (e.g. aluminium, copper, zinc) to loosen.

Please contact us for technical advice.

### FORMWORK:

Attach in such a way that it is leak-proof and robust. Seal on the concrete substrate. Use non-absorbent formwork.

### Protruding grout:

Do not exceed the specified 50 mm when allowing grout to protrude and observe the structural specifications.

When grouting dynamically stressed and prestressed base plates and machine foundations that are subject to high compression strengths at the edges, the grout should ideally be applied to be flush with the bearing plate, provided with a 45° edge using formwork or cut off flush with the bearing plate before it has set. This will prevent any stresses from becoming superimposed on one another and from becoming annihilated (observe static and structural specifications).

### MIXING:

The dry mortar is supplied ready to use and only needs to be mixed with water. Fill the specified amount of water into a clean and suitable mixing device (e.g. compulsory mixer). Add the dry mortar and mix for 3 minutes, until it forms a homogeneous mass.

### Mixing water:

Drinking water quality

### Temperature range:

+5 °C to +35 °C

Low temperatures and cold mixing water reduce strength development, require intensive forced mixing and reduce flowability. Higher temperatures accelerate strength development and can also reduce the flowability.

### GROUTING:

The mixture must be poured from one side or corner only in one continuous pour. When grouting large areas, we recommend to pour the grout starting in the centre of the foundation plate, using a funnel or filling hose. Cavities should be filled first (up to around just below the top edge) and then the machine plate or similar.

### FOLLOW-UP TREATMENT:

Exposed grout areas must be protected from premature water evaporation (from wind, draughts, direct exposure to sun, etc.) immediately on completion of the work for a period of 3-5 days.

### Suitable curing methods:

Water spray, foil covers with jute sheets, thermofolils or moisture-retaining covering sheets, **01** Evaporation protection.

The technical data sheet must be observed when using **01** Evaporation protection.