

SUPER HIGH STRENGTH GROUT C100/115

V1[®]/30HF SUPER HIGH STRENGTH GROUT
V1[®]/60HF SUPER HIGH STRENGTH GROUT
V1[®]/0HF SUPER HIGH STRENGTH GROUT

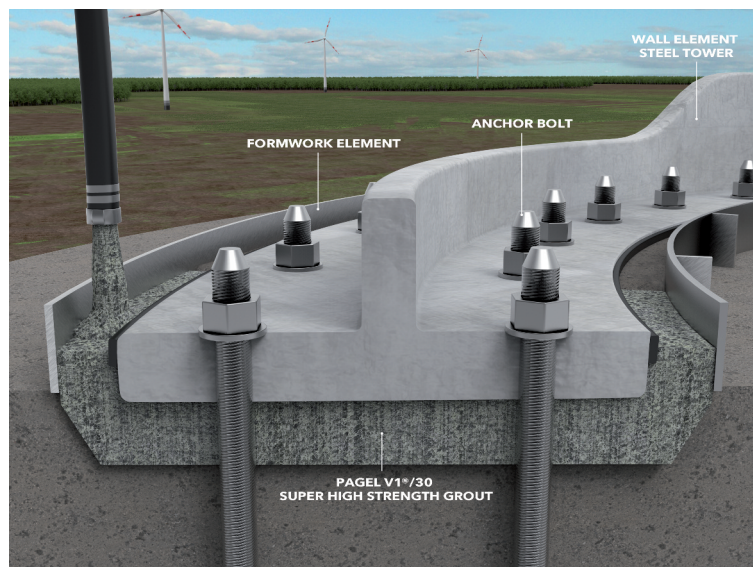
TEST CERTIFICATES AND SUPPORTING DOCUMENTS

- › Certificate of conformity DAfStb Directive (VeBMR) „Herstellung und Verwendung von zementgebundenem Vergussbeton und Vergussmörtel“ (Manufacture and use of cementitious concrete grout and grout) (QDB)
- › High frost-deicing salt resistance - Verification by CDF procedure
- › High resistance against fatigue loading - Verification by expert opinion(s) and test reports
- › Suitability test PAGEL[®] SUPER HIGH STRENGTH GROUT **V1[®]/30HF** for wind turbines - Verification by test reports
- › Long processing time - Verification by test report
- › Testing of Grout PAGEL[®] **V1[®]/30HF** for offshore structures (acc. to Offshore Standard Det Norske Veritas DNV-OS-C502) - tested at + 0.5 °C, + 20 °C and + 35 °C
- › Verification of the Poisson's ratio acc. to ASTM C469 (**V1[®]/30HF**)
- › Approved for the reconstruction of FF supporting points of the system NBU 2012 (**V1[®]/30HF**)
- › Confirmation of the voluntary external monitoring by the QDB
- › Factory production control acc. to DIN EN 1504-6
- › Company certification acc. to DIN EN ISO 9001:2015



Application example

Grouting of a steel tower segment of a wind turbine (WTG) with **V1[®]/30HF** high-strength grout



PROPERTIES

- › High strength after 24 h
- › High fatigue resistance
- › Sedimentation stability
- › Pumpable over long distances
- › Long processing time
- › Microsilica-modified
- › Controlled swelling
- › High frost and frost-deicing salt resistance
- › Building material class A1 acc. to decision 2000/605/EC of the European Commission dated September 26, 2000 (published in the official journal L258)

AREAS OF APPLICATION

- › Onshore grouting: Hybrid tower, steel, reinforced concrete, and prestressed concrete towers
- › Offshore grouting: Monopiles, jackets, transformer platforms
- › Portal and container railway systems
- › **V1®/0HF**: Forerun mixture for the lubrication of conveying hoses

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

Moisture class	WO	WF	WA	WS
V1®/30HF, V1®/60HF	•	•	•	•

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
		1 2 3 4	1 2 3	1 2 3	1 2 3 4	1 2 3*	1 2 3

V1®/30HF	•	••••	•••	•••	••••	•••	•
V1®/60HF	•	••••	•••	•••	••••	•••	•

* Having sulfate attack up to 600 mg/l
With protective measures according to DIN 1045-2

Classification acc. to the DAfStb VeBMR directive:

		Flowability class	Slump flow class	Shrinkage class	Early strength class	Compressive strength class
V1®/30HF	Categorisation	f1	-	SKVM 0	A	C100/115
V1®/60HF	Categorisation	-	a2	SKVB 0	A	C100/115



TECHNICAL DATA

TYPE			V1/30HF	V1/60HF	V1/0HF
Grain size		mm	0-3	0-6	0
Undergrouting height		mm	30-75 (300)**	40-150 (300)**	-
Water quantity	%	max.	9	9	20
Consumption (dry mortar) appr.		kg/m ³	2,300	2,300	1,850
Fresh mortar raw density appr.		kg/m ³	2,450	2,450	2,200
Processing time appr.	20 °C	min	60	60	60
Slump	5 min	mm	≥ 550	n. d.	≥ 800
	30 min	mm	≥ 450	n. d.	n. d.
Measure of extension	5 min	mm	n. d.	≥ 600	≥ 600
	30 min	mm	n. d.	≥ 520	≥ 520
Swelling	24 h	Vol.-%	≥ 0.1	≥ 0.1	≥ 0.1
Compressive strength*	24 h	N/mm ²	≥ 70	≥ 70	≥ 60
	7 d	N/mm ²	≥ 90	≥ 90	≥ 85
	28 d	N/mm ²	≥ 120	≥ 115	≥ 100
	56 d	N/mm ²	≥ 135	≥ 120	n. d.
	91 d	N/mm ²	≥ 135	≥ 120	n. d.
E-Modul (static)	28 c	N/mm ²	≥ 40,000	≥ 37,000	n. d.

* DIN EN 196-1-compliant mortar compressive strength testing

DIN EN 12390-3-compliant concrete compressive strength testing

** E DIN 18088-5:2017-12

n. d. = not determined

V1[®]/30HF: Correlation compressive strength factor: Prism compressive strength 40 x 40 x 160 mm:
Cube compressive strength 150 mm³ = 0.98

Note: All stated test values correspond to the DAfStb VeBMR directive.

Tests of fresh and solid mortars at 20 °C ± 2 °C, storage of the test specimen after 24 hours until the strength test in water 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: 20-kg bag, Euro palette 960 kg, 1,000 kg Big Bag
Hazard class: Non-dangerous goods, observe information on packaging
GISCODE: ZP1

PAGEL[®] 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 DIN EN 13263 (microsilica, etc.)
 Admixtures: acc. to DIN EN 934-4

APPLICATION

SURFACE 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 tear strength (i.m. $\geq 1.5 \text{ N/mm}^2$, KEW $\geq 1.0 \text{ N/mm}^2$) must be ensured.

Prewetting:

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

Reinforcing steel:

Blast all rust off exposed reinforcement bars until the underlying metal has been exposed acc. to purity grade Sa 2 ½ in accordance with DIN EN ISO 12944-4.

Non-iron metals:

Cement and cement-bound building materials may cause non-iron-metals in the transitional area of the contact surface (e.g. aluminum, 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. Measure out the specified quantity of water and pour most of it into a clean and suitable mixing device (e.g. compulsory mixer). Add the dry mortar and mix for at least 3 minutes. Add the remaining water and mix for at least another 2 minutes (4 minutes if you use a paddle mixer) until it forms a homogeneous mass.

Depending on mixing equipment, water content may be increased by up to 1 % to achieve the correct flow - mixing time may also be increased to 7-10 minutes per batch (flow acceptance criteria should be met).

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.

On machine installations, cavities should be filled first (up to around just below the top edge) and then the base of the machine or similar.

Temperature range: + 0.5 °C to + 35 °C

Mixing water: Drinking water quality

FOLLOW-UP TREATMENT:

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