

Data Sheet - ultra high performance grout

The ultra high performance grout, Ducorit[®] is used for structural grouted connections in wind turbine foundations and oil & gas installations - both offshore and onshore.



Quality checked by
MPA
BAU
HANNOVER

Mechanical Properties

Note that the stipulated values are mean values, based on 75x75 mm cubes i.e. the recommendable design values are slightly smaller.

PRODUCTS

The core of the Ducorit[®] products is the unique Densit[®] Binder. The different properties of Ducorit[®] S1, Ducorit[®] S2, Ducorit[®] S5 and Ducorit[®] D4 are obtained by adding aggregates such as quartz sand or bauxite.

Ducorit[®] products are characterised by extreme strength and stiffness, - making them a strong structural component and not just a filling material. Using Ducorit[®] does not require special precautions with respect to environmental or personal hazards.

PUMPABILITY

Ducorit[®] products are pumpable up to several hundred metres through hoses between 2 and 5 m. Due to viscosity and high inner cohesion of the mixed material, there is no

risk of washing out cement particles, separation or mixture with water when cast below sea level.

EARLY STRENGTH DEVELOPMENT

Ducorit[®] develop a significant early strength. After 24 hours of curing at 20°C (68°F), the strength reaches approximately 25% of the long term value. The early strength is even more pronounced with regard to the material stiffness.

FATIGUE

Due to ultra high strength and durability of Ducorit[®] products, the fatigue strength is outstanding compared to normal concrete. As fatigue strength depends upon the static strength of concrete, the fatigue strength of Ducorit[®] can be up to more than five times the strength of normal concrete.

	D4 Mean	S5 Mean	S2 Mean	S1 Mean
Compressive strength f_c [MPa/psi]	200 / 29,000	130 / 18,850	90 / 13,000	110 / 16,000
Static modulus of elasticity E_c [GPa/ksi]	70 / 10,000	55 / 8,000	40 / 5,800	35 / 5,000
Dynamic modulus of elasticity E_d [GPa/ksi]	88 / 12,800	60 / 8,700	50 / 7,250	37 / 5,400
Tension strength f_t [MPa/psi]	10 / 1,500	7 / 1,000	6 / 870	5 / 725
Flexural strength f_{bt}^* [MPa/psi]	23.5 / 3,400	18 / 2,600	-	13.5 / 2,000
Density [kg/m ³]	2740	2440	2385	2250
Poisson's ratio	0.19	0.19	0.18	0.19
Fracture energy G_F^* [kJ/m]	12	5.6	-	4.0
Consistence Class ¹⁾	-	F6 (>630mm)	-	-
Consistence Class ²⁾	a2	a1	a2	-
Compressive Strength class (en 206-1)	>C100/115	C100/115	C70/85	-
Compressive Strength class (24h) ²⁾	Class A	Class A	Class B	Class A
Shrinkage ²⁾ $s_{m,91}$	SKVB I (0,413 §)	SKVB I (0,147 §)	SKVB I (0,576 §)	-
Shrinkage ²⁾ $s_{i,91}$	SKVB I (0,421 §)	SKVB I (0,165 §)	SKVB I (0,579 §)	-

(minimum 28 days curing at 20°C). * with 1.9% by volume of steel fibres

1) EN 206-1.

2) DAFStb-Richtlinie Herstellung und Verwendung von zementgebundenem Vergussbeton und vergussmörtel (Juni 2006)



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