Wind Materials - Independent Test Data Summary

English technical screening document

This document separates the acceptance requirement from the measured result. A reported result is not a guaranteed minimum unless the requirement column states it. Final acceptance must follow the current approved technical data sheet, the applicable test method, project specification, batch documentation and agreed method statement.

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INDEPENDENT TEST DATA

CBGM-80 Wind Turbine Foundation Grout

Onshore baseplate and anchor-cage grout; 80 MPa-class 28-day requirement.

Property	Minimum / specified requirement	Reported test result
Compressive strength - 1 / 3 / 28 days	>=30 / >=50 / >=80 MPa	37.2 / 57.6 / 84.9 MPa
Flowability - initial / 30 min	>=290 / >=260 mm	310 / 280 mm
Vertical expansion - 3 h / 24 h minus 3 h	>=0.02 / >=0.02%	0.05 / 0.03%
Static compressive elastic modulus	>=45 GPa	45 GPa
Freeze-thaw grade	>=F300	F300
Chloride ion content / bleeding	<=0.06% / 0%	0.041% / 0%

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INDEPENDENT TEST DATA

CBGM-100 Wind Turbine Foundation Grout

High-flow cementitious grout for onshore wind turbine load-transfer zones.

Property	Minimum / specified requirement	Reported test result
Compressive strength - 1 / 3 / 28 days	>=35 / >=60 / >=100 MPa	40.7 / 65.8 / 115.8 MPa
Flowability - initial / 30 min	>=290 / >=260 mm	310 / 270 mm
Vertical expansion - 3 h / 24 h minus 3 h	>=0.02 / >=0.02%	0.04 / 0.02%
Static compressive elastic modulus	>=45 GPa	47 GPa
Freeze-thaw grade	>=F300	F300
Chloride ion content / bleeding	<=0.06% / 0%	0.030% / 0%

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INDEPENDENT TEST DATA

CBGM-120 Wind Turbine Foundation Grout

Ultra-high-strength grout for large onshore baseplates and anchor cages.

Property	Minimum / specified requirement	Reported test result
Compressive strength - 1 / 3 / 28 days	>=40 / >=70 / >=120 MPa	42.8 / 76.5 / 127.8 MPa
Flowability - initial / 30 min	>=290 / >=260 mm	330 / 290 mm
Vertical expansion - 3 h / 24 h minus 3 h	>=0.02 / >=0.02%	0.06 / 0.03%
Static compressive elastic modulus	>=45 GPa	49 GPa
Freeze-thaw grade	>=F300	F300
Chloride ion content / bleeding	<=0.06% / 0%	0.018% / 0%

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INDEPENDENT TEST DATA

CBGM-125 Offshore Wind Turbine Grout

High-modulus offshore grout for monopile, transition-piece and jacket connections.

Property	Minimum / specified requirement	Reported test result
Initial setting time	>=120 min	354 min
Apparent density / air content	2,350-2,500 kg/m3 / <=4%	2,400 kg/m3 / 1.6%
Flowability - initial / 30 / 60 min	>=290 / >=260 / >=230 mm	344 / 320 / 312 mm
Vertical expansion - 3 h / 24 h minus 3 h	0.1-3.5 / 0.02-0.50%	0.12 / 0.11%
Compressive strength - 1 / 3 / 28 days	>=50 / >=90 / >=125 MPa	54.0 / 97.3 / 131.0 MPa
Elastic modulus - 1 / 28 days	>=12 / >=45 GPa	13 / 47 GPa
Flexural / splitting tensile - 28 days	>=15.0 / >=6.0 MPa	16.4 / 7.1 MPa

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INDEPENDENT TEST DATA

CBGM-130 Offshore Wind Turbine Grout

130 MPa-class offshore grout for fatigue-sensitive marine load-transfer joints.

Property	Minimum / specified requirement	Reported test result
Apparent density / air content / bleeding	>=2,350 kg/m3 / <=4% / 0%	2,413 kg/m3 / 1.4% / 0%
Initial setting time	>=120 min	282 min
Flowability - initial / 30 / 60 min	>=290 / >=260 / >=230 mm	310 / 284 / 251 mm
Vertical expansion - 3 h / 24 h minus 3 h	0.1-0.8 / 0.02-0.5%	0.13 / 0.11%
Compressive strength - 1 / 3 / 28 days	>=50 / >=85 / >=130 MPa	64.7 / 98.6 / 147.2 MPa
Elastic modulus - 1 / 28 days	>=12 / >=45 GPa	12.7 / 47.2 GPa
Flexural / splitting tensile - 28 days	>=15 / >=7 MPa	17.1 / 8.5 MPa

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INDEPENDENT TEST DATA

CBGM-140 Wind Turbine Foundation Grout

Very-high-strength wind turbine grout for heavily loaded baseplates and anchor cages.

Property	Minimum / specified requirement	Reported test result
Compressive strength - 1 / 3 / 28 days	>=45 / >=80 / >=140 MPa	50.3 / 89.4 / 150.3 MPa
Flowability - initial / 30 min	>=290 / >=260 mm	302 / 271 mm
Vertical expansion - 3 h / 24 h minus 3 h	>=0.02 / >=0.02%	0.05 / 0.04%
Static compressive elastic modulus	>=45 GPa	49 GPa
Chloride ion content / bleeding	<=0.06% / 0%	0.04% / 0%

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INDEPENDENT TEST DATA

CBGM-C50 Offshore Foundation Infill Grout

High-flow C50-class infill grout for offshore foundation cavities and skirt annuli.

Property	Minimum / specified requirement	Reported test result
Apparent density / air content / bleeding	>=2,100 kg/m3 / <=4% / 0%	2,210 kg/m3 / 1.7% / 0%
Initial setting time	>=120 min	288 min
Flowability - initial / 30 / 60 min	>=290 / >=260 / >=210 mm	315 / 287 / 226 mm
Compressive strength - 1 / 3 / 28 days	>=15 / >=30 / >=50 MPa	20.2 / 46.5 / 71.6 MPa
Elastic modulus - 1 / 28 days	>=10 / >=40 GPa	11.6 / 43.2 GPa
Flexural / splitting tensile - 28 days	>=10 / >=3 MPa	12.8 / 4.9 MPa

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INDEPENDENT TEST DATA

Kuaizhuang Hybrid Wind Tower Segment Epoxy Adhesive

Two-component thixotropic structural epoxy for precast concrete wind tower segment joints.

Property	Minimum / specified requirement	Reported test result
Application time / bonding time	>=20 / >=60 min	32 / 90 min
Sag resistance	>=10 mm	14 mm
Compressive strength	>=80 MPa	146.2 MPa
Instantaneous / 1 h delayed compressive modulus	>=8,000 / >=6,000 MPa	13,365.5 / 8,158.1 MPa
Tensile strength / elongation	>=30 MPa / >=0.3%	40.2 MPa / 0.35%
Concrete compression shear / steel tensile shear	>=14 / >=17 MPa	21.0 / 20.0 MPa
Glass-transition temperature / shrinkage	>=60 C / <=0.1%	76.7 C / 0.04%
Non-volatile content / VOC	>=99% / <=100 g/kg	99.7% / 8 g/kg

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