

TECHNICAL INFORMATION

CEMENT PRODUCTS

PRODUCT NAME

MICROFINE[®] Cements
MC300[®] Ultrafine D₉₅ of 6µm
MC500[®] MICROFINE[®] D₉₅ of 9.5µm
MC800 Fine D₉₅ of 16µm

MANUFACTURER

De Neef Construction Chemicals, Inc.
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PRODUCT DESCRIPTION

MICROFINE[®] Cements are blast furnace slag based cements composed of ultrafine particles and are designed for injection into loose soils, rock and concrete. They feature a maximum grain size ranging from a D₉₅ of 6µm to a D₉₅ of 16µm. Depending on the application and the permeability of the strata, different grain size can be used. The composition is comparable to high sulfate – resistant cements. It is suited for stabilizing or sealing all earthen foundations; especially for permanent structures such as tunnels, dams, deep foundations and oil storage tanks. Because they cure into a hardened concrete, **MICROFINE[®] Cements** cause no pollution to underground soils or water supplies.

APPROPRIATE APPLICATIONS

- Geotechnical grouting
- Oil well remedial cementing
- Seal off underground streams
- Create cut off walls for dam construction
- Reinforce foundations in dams and buildings
- Reinforce and waterproof tunnel walls and roofs
- Create waterproof basins for reservoirs
- Facilitate all types of excavation
- Stabilize hazardous waste and provide secondary containment for nuclear waste

FORMULATION		MC300 [®]	MC500 [®]	MC800
ASTM C 150				
Bulk Specific Gravity	Kg/dm ³	approx 0.7	approx 0.7	approx 0.7
Absolute Density	Kg/dm ³	approx 2.9	approx 2.9	approx 2.9
Surface (BET Method)	cm ² /g	approx 19,000	approx 16,000	approx 12,000
Grain Size d ₅₀ ASTM C 204	µm	[2.5	[3.5	[5.0
Grain Size d ₉₅ ASTM C 204	µm	[6.0	[9.5	16.0
Water/Cement Ratio		2:1	2:1	2:1
Superplasticizer		NS-200	NS-200	NS-200
Superplasticizer Content	% by mass	2.0	2.0	2.0

PROPERTIES* at 20°C

Run out time	sec/dm ³			
Marsh's funnel device	0"	approx 29	approx 29	approx 29
	30"	approx 30	approx 30	approx 30
	60"	approx 30	approx 30	approx 30
	90"	approx 30	approx 30	approx 30
Sedimentation**	% by vol.			
	30"	0	0	0
	60"	[2	[3	[3
	90"	[3	[5	[5
Compressive Strength***	N/mm ²			
	3 days	<3.5 (508 psi)	<3.0 (435 psi)	<2.5 (363 psi)
	7 days	<5.0 (725 psi)	<4.0 (580 psi)	<3.0 (435 psi)
	14 days	<6.0 (870 psi)	<4.5 (653 psi)	<3.5 (508 psi)
	28 days	<6.0 (870 psi)	<4.5 (653 psi)	<4.0 (580 psi)

* 2 liter batch; mixed with dissolving plate at 7000 rpm; mixing time 5 minutes; mixing sequence - water, NS200, **MICROFINE[®] Cement**. Suspension mixed continuously at 350 rpm until time of test.

** 250 cm³ graduated cylinder filled after suspension made.

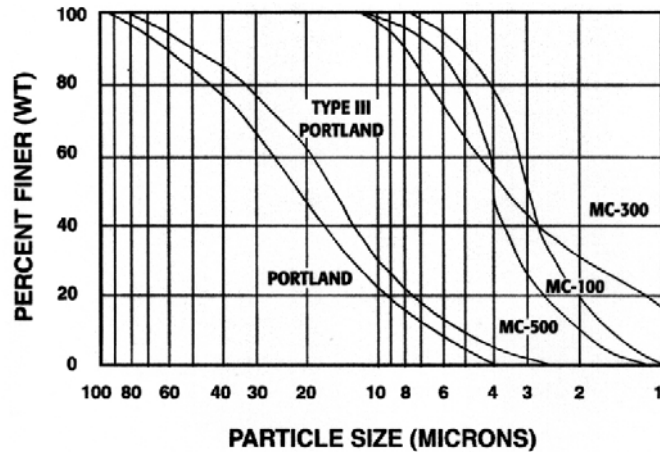
*** determined using 4X4X16 cm prisms with DIN standard sand.

NS-200 DISPERSANT:

Appearance: Dark Brown Liquid

Composition: Naphthalene Sulfonate Formaldehyde Condensate

Solids: 40% ± 1%



ONE COMPONENT GROUT MIX – MC500® (Large Batch 1:1, 2:1 & 3:1)

Set Time 3-5 hours

Batch Size	5 Bags	5 Bags	4 Bags	4 Bags	3 Bags	3 Bags
Bag Size	20 kilo (44lb)	25 kilo (55lb)	20 kilo (44lb)	25 kilo (55lb)	20 kilo (44lb)	25 kilo (55lb)
Water: MC500®	1:1 ⁽¹⁾	1:1	2:1	2:1	3:1	3:1
Water	100 Liters ⁽²⁾ (26.4 gal)	125 Liters (33 gal)	160 Liters (42.3 gal)	200 Liters (53 gal)	180 Liters (47.6 gal)	227 Liters (60 gal)
NS-200	0.8 Liters ⁽³⁾ (0.2 gal)	1.0 Liters (0.28 gal)	0.66 Liters (0.17 gal)	0.83 Liters (0.22 gal)	0.5 Liters (0.13 gal)	0.6 Liters (0.16 gal)
MC500®	100 kilos ⁽⁴⁾ (220 lb)	125 kilos (274 lb)	80 kilos (176 lb)	100 kilos (220 lb)	60 kilos (132 lb)	75 kilos (165 lb)
Total	134 liters (35 gal)	167 liters (44 gal)	187 liters (49 gal)	235 liters (62 gal)	200 liters (53 gal)	254 liters (67 gal)

TYPICAL GROUT FORMULATIONS - One Component Grout Mix. MC500® used for reinforcing foundations requires particular strength and durability. The one component grout mix consists of water, dispersant and MC500® MICROFINE® Cement. Typically, it will be a 2:1 water:cement ratio.

ONE COMPONENT GROUT MIX – MC500® (Small Batch 1:1)

Set Time 3-5 hours

Batch Size	2 Bags	2 Bags	1-1/2 Bags	1-1/2 Bags	1 Bag	1 Bag
Bag Size	20 kilo (44lb)	25 kilo (55lb)	20 kilo (44lb)	25 kilo (55lb)	20 kilo (44lb)	25 kilo (55lb)
Water: MC500®	1:1 ⁽¹⁾	1:1	1:1	1:1	1:1	1:1
Water	40 Liters ⁽²⁾ (11 gal)	50 Liters (13 gal)	30 Liters (7.8 gal)	37.5 Liters (9.75 gal)	20 Liters (5.28 gal)	25 Liters (6.5 gal)
NS-200	0.34 Liters ⁽³⁾ (.09 gal)	.42 Liters (.11 gal)	.25 Liters (.066 gal)	.30 Liters (.08 gal)	.15 Liters (.04 gal)	.21 Liters (.055 gal)
MC500®	40 kilos ⁽⁴⁾ (88 lb)	50 kilos (110 lb)	30 kilos (66 lb)	37.5 kilos (82.5 lb)	20 kilos (44lb)	25 kilos (55 lb)
Total	54 Liters (14 gal)	67 Liters (17.4 gal)	40 Liters (10.4 gal)	50 Liters (13.05 gal)	27 Liters (7 gal)	34 Liters (8.71 gal)

ONE COMPONENT GROUT MIX – MC500® (Small Batch 2:1)

Set Time 3-5 hours

Batch Size	2 Bags	2 Bags	1-1/2 Bags	1-1/2 Bags	1 Bags	1 Bags
Bag Size	20 kilo (44lb)	25 kilo (55lb)	20 kilo (44lb)	25 kilo (55lb)	20 kilo (44lb)	25 kilo (55lb)
Water: MC500 ®	2:1 ⁽¹⁾	2:1	2:1	2:1	2:1	2:1
Water	80 Liters ⁽²⁾ (21gal)	100 Liters (26 gal)	60 Liters (15.6 gal)	75 Liters (20 gal)	40 Liters (10.4 gal)	50 Liters (13 gal)
NS-200	.34 Liters ⁽³⁾ (.09 gal)	.42 Liters (.11 gal)	.25 Liters (.066 gal)	.30 Liters (.08 gal)	.15 Liters (.04 gal)	.21 Liters (.055 gal)
MC500 ®	40 kilos ⁽⁴⁾ (88 lb)	50 kilos (110 lb)	30 kilos (66 lb)	37.5 kilos (82.5 lb)	20 kilos (44 lb)	25 kilos (55 lb)
Total	94 Liters (24.3 gal)	117 Liters (30.4 gal)	70 Liters (18.2 gal)	88 Liters (23 gal)	47 Liters (12.16 gal)	59 Liters (15.2 gal)

(1) Kilogram water:kilogram dry **MC500**® (one liter of dry **MC500**® weighs 1.0 kg, 63lb/ft³)

(2) Liters X 0.2642 equals gallons

(3) One wt. % dispersant on cement (density NS-200 1.2 kg/L, 10 lb/gal)

(4) Kilograms X 2.205 equals pounds (20 kg MC500® displaces 6.6 liters of water)

For example using the 2:1 water/**MC500**® grout mix, start with 160 liters (42.3 gal) water and add 0.66 liters (0.17 gal) **NS-200** dispersant and mix well. Next add 80 kilos (4 bags) **MC-500**® to the tank and shear mix with colloidal mixer. Set time for the one component grout mix is 3-5 hours. Initial hardening time is 30-40 hours.

ADVANTAGES

- Penetrating Power – Ultrafine particle size allows the grout to penetrate fine sands and finely cracked rock
- High Cured Strength – Ultrafine grains are chemically activated so curing provides rapid curing to high strength
- Excellent Durability – After curing by hydration, the grout acquires impermeability which protects it from underground as well as sea water to insure extremely long durability
- Low Permeability – Neat **MICROFINE**® Cements exhibit a 10⁻⁹ cm/sec permeability in laboratory testing. This allows them to be used for hazardous waste stabilization and nuclear waste secondary containment

PACKAGING

MC500®

25 kg (55 lbs) Paper bags

40 bags per pallet (1 metric ton)

NS-200

20 kg (55 lbs) pails

SURFACE PREPARATION

Refer to De Neef Surface Preparation Guidelines for more details.

INSTALLATION PROCEDURES

Contact a DeNeef technical services representative for application specific installation procedures.

STORAGE & HANDLING

MICROFINE® cement may deteriorate after long periods of storage. Keep in dry area stored on pallets in cool location.

PRECAUTIONS

Freshly mixed cement grout may cause skin injury. Avoid contact with skin where possible and wash exposed skin promptly with water. Use dust mask when breaking bags and mixing. Avoid eye contact, if exposed rinse immediately with water and seek prompt medical attention. Always use protective clothing, gloves and goggles during use. Do not ingest. Refer to Material Safety Data Sheet for detailed safety precautions.

SAFETY INFORMATION

In the event of an EMERGENCY call: CHEM-TREC 800-424-9300.

WARRANTY INFORMATION

De Neef Construction Chemicals, Inc. products are warranted under the policy set forth under the WARRANTY section of the De Neef Construction Chemicals Inc., product catalog. Warranty information can also be obtained via the De Neef Construction Chemicals Inc. website at www.deneef.com, by calling 713-896-0123 or toll free at 1-800-732-0166.

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