BASF

The Chemical Company

Technical Data Guide

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Non-Metallic
Non-Shrink Grouting

MasterFlow® 1205

High-performance duct grout for highly stressed steel

PACKAGING
55 lb (25 kg) multi-wall paper bags
2,500 lb (1,134 kg) bulk bags

YIELD
0.55 ft^3 per 55 lb bag (0.016 m^3/25 kg)

STORAGE
Store in unopened containers in a cool, clean, dry area

SHELF LIFE
55 LB BAG: 6 months
when properly stored
BULK BAG: 3 months
when properly stored

VOC CONTENT
0 g/L less water and exempt solvents

DESCRIPTION
MasterFlow 1205 is a cement-based pumpable grout with specially graded aggregate. It produces a pumpable, nonbleeding, high-strength fluid product with an extended working time. The specially graded spherical aggregate mitigates chloride migration while still allowing the product to be easily pumped over long distances through small openings. MasterFlow 1205 meets all the compressive strength and volume change requirements ASTM C 1107 (CRD C621) at a fluid consistency.

PRODUCT HIGHLIGHTS
- High compressive strengths
- Hardens without bleeding, settlement, segregation, shrinkage or formation of voids
- Minimum 1 hour pumpability at 90°F (32°C)
- Prepackaged quality for bag-to-bag uniformity
- Compatible with high-strength steel
- Integral corrosion inhibitor for added protection of embedded steel reinforcement
- Easy to pump or pour for easy of placement
- Can be pumped or re-circulated for relatively long periods of time
- Can be used over a wide range of mixed grout and placement temperatures

APPLICATIONS
- Pumping around post-tensioned tendons, cables, and high-strength rods to encapsulate and protect highly stressed steel from corrosion
- Placing around end sections of unanchored cables and rods for subsequent tensioning
- Filling voids in restricted spaces between wall panels, beams, and columns where grout will contact highly stressed steel
- Grouting cable anchor-plates or other plates where grout will contact highly stressed anchorages

HOW TO APPLY

SURFACE PREPARATION

1. Clean cables and strands of all oxidation, dirt, oil, or any loose materials. Ducts should be watertight, clean and free of any defects.
2. Check proposed method of mixing and pumping to ensure continuous placement once pumping starts. Have a source of high-pressure water with connections for flushing grout hoses or partially grouted cable ducts in case the pumping is interrupted.
3. Test the pump and grout lines with water or pressurized oil-free air. Confirm that they are capable of withstanding the required pressure and that all connections are tight, without leaks. Loss of water from slow or nonmoving grout can result in a blocked line.
4. Provide plug, ball, or gate valves at the pump outlet, the inlet ends of vertical ducts, and at both ends of the horizontal ducts. Also use a valved by-pass hose or pipe from the pump discharge line back to its hopper. This will ensure that the grout continues to recirculate from pump to hopper during connection changes and other pumping delays. Draped tendons typically also require venting at the crests and troughs as well as slightly uphill of crests. See the Post-Tensioning Institute "Guide Specification for Post-Tensioned Grouting" for more complete information.

Technical Data

Composition

MasterFlow 1205 is a hydraulic, cement-based, pumpable grout with specially graded aggregate.

Compliances

- Meets all compressive strength and settlement shrinkage requirements at a fluid consistency per ASTM C 1107 (CRD 621)

Test Data Based on 1.95 gal (7.4 L) of water per 55 lb (25 kg) bag

PROPERTY	[1]RESULTS	TEST METHOD
Wet Density, lb/ft^3 (g/cm^3)	122–131 (1.95–2.1)	ASTM C 138 or Per PTI spec Section 4.4.8 (ASTM D4380 Mud Balance Test)
Flow, sec		
Immediately after Mixing	11–30	ASTM C 939
30 Minutes after Mixing with 30 Sec Remix	11–30	
Modified Flow, sec		
Immediately after Mixing	7–20	Per PTI spec Section 4.4.5.2
30 Minutes after Mixing with 30 Sec Remix	7–20	
Final set, hrs	< 10	ASTM C 953
Volume change, %		ASTM C 1090
1 day	> 0.0	
28 days	> 0.0 and < 0.2	
Prehardened expansion height, % change at 3 hours	< 0.2	ASTM C 940
Compressive strength, psi (MPa)		ASTM C 942
1 day	> 2,000 (13.8)	
3 days	> 4,000 (27.6)	
7 days	> 5,500 (37.9)	
28 days	> 8,000 (55.2)	
Chloride permeability, coulombs, at 28 days moist cure	< 2,500	ASTM C 1202 Modified PTI, 30 V
Acid soluble chloride content % by weight of cement	< 0.08	ASTM C 1152
Schupack-Gelman Pressure Bleed, 10 min at 30 psi at vertical rise of 6 ft (1.6 m) maximum pressure	< 2	Per PTI spec Section 4.4.6.2 Table 4.1 Type B
Wick induced bleeding, %, at 3 hrs	0	Per PTI spec Section 4.4.6.1 Wick induced bleed test
Electrical Resistivity, Ω-cm, at 28 days	> 9,000	ASTM C 1202
PTI accelerated corrosion test, hrs	> 1,000 (greater than control)	Per PTI spec Section 4.4.7 corrosion test (ASTM C1741/ACI 423.9M)

[1]Results assume a temperature of 70° F (21° C)

Expect reasonable variations from the results shown above. Control field and laboratory tests on the basis of the desired placing consistency rather than strictly on water content.

5. The inside diameter of the pipe, hose, and valves through which MasterFlow 1205 is pumped should be at least ½–2" (12.5–51 mm) and consistent throughout the system. Avoid connector elbows if possible.
6. The pump lines and grout line, if needed, may be flushed with high pH lime-saturated water to lubricate and cool the ducts. The oncoming grout will displace and discharge this water at the outlet end before accessing the air-free mixed grout. Collect the lime-saturated water and use as mix water if needed. Discard the transitional grout.

TEMPERATURE

The recommended temperature of the mixed grout should be 40 to 90° F (4 to 32° C). The duct temperatures should also be within the same temperature range. Ambient and substrate temperatures from 40º to 100ºF (4º to 38ºC) are possible when grout is pre-conditioned to 70ºF (21ºC). Follow special precautions for hot or cold weather. Higher temperatures increase the amount of mixing water needed for a given fluidity and limit working time. Lower temperatures induce bleeding, retard set, and impede early strength gain, but permit reducing the mixing-water content for a given fluidity and increase ultimate strength.

HOT-WEATHER GROUTING

When duct temperatures are above 90° F (32° C), use techniques to produce a lower mixed-grout temperature. Cool bags of MasterFlow 1205 by storing them in a shaded or cool area. Use cold potable water to obtain the proper temperature for the mixed grout. If ice chips are added to the mixing water, verify removal on the ⅛" screen over the pump hopper. Do not let the grout temperature drop below 50° F (4° C). Circulating cold water can also cool ducts. Lime (Ca OH_2) can be added to the circulating water to increase pH; this will help passivate the steel and reduce the potential for steel oxidation before grouting.

COLD-WEATHER GROUTING

When duct temperatures are 40° F (4° C), the temperature of the mixed grout should be increased by mixing in warm potable water. Ducts can be heated by circulating warm water throughout the ducts. Lime (Ca OH_2) may be added to the mixing water to increase pH and lubricate the duct. Do not exceed 90° F (32° C) temperatures when warming both the mixed grout and the duct.

MIXING

1. A colloidal mixer is the preferred mixing equipment for MasterFlow 1205.
2. MasterFlow 1205 is a ready-to-use product requiring only the addition of potable water. Normal mixing water content should be from 1.8 to 2.1 gallon (6.8 to 7.9 of water per 55 lb (25 kg) bag. Mix until wet density is equal or greater than 121.7 lb/ft^3 (1.95 g/cm^3) and produces "0" bleeding in the Post-Tensioning Institute ASTM C 940-based Wick Induced Bleeding Test, using the specified mixer for mixing the grout at the job. A flow between 15 and 25 seconds (ASTM C939) should produce a pumpable consistency. Consult your BASF representative for special mixing instructions.
3. Do not use water in an amount or at a temperature that will produce a flow immediately after mixing of less than 15 seconds on the flow cone (ASTM C 939) or cause mixed grout to bleed or segregate. Jobsite conditions such as the size and complexity of the grouted space, pumping-line diameters, height, mixing and pumping methods, and temperatures are all factors that determine the actual amount of water needed.
4. Have one or more mixers available with the capacity to allow mixing and pumping to proceed simultaneously and continuously.
5. Place water in the mixer first, then steadily add the grout with mixer operating. Mix until the grout is homogeneous and free of lumps, approximately 1–2 minutes, scraping all of the dry material from the mixer sides. Convey the mixed grout into the pump surge hopper and pass through a screen with 0.125–0.188" (3–5 mm) openings to catch possible lumps; then start pumping grout, after verifying grout efflux, into the duct.
   Note: Do not mix more grout than can be placed through a pump in 60 minutes, depending on temperature.

APPLICATION

Place MasterFlow 1205 in accordance with section C 5.6.3 Grouting Operations as stated in the PTI Specification for Grouting of Post-Tensioned Structures.

FOR BEST PERFORMANCE

- Do not mix Masterflow 1205 and MasterFlow 1205 together under any circumstances, as this results in abnormal thickening of the resulting mixture. If it is necessary to use both products on the same job, contact your BASF representative for assistance well in advance of planned installation date.
- Do not add plasticizers, accelerators, retarders, or other additives.
- The water requirement may vary with mixing efficiency, temperature, and other variables.
- The walls of the space grouted should be between 40 and 90° F (4 and 32° C) and saturated with lime water for optimum results. For use at temperatures above the range, consult BASF Technical Service.
- If used in non-duct grout applications, cure all exposed grout areas by wet curing for 24 hours with clean, wet rags (do not use burlap), followed by the application of an ASTM C 309 or preferably ASTM C 1315 compliant curing compound.
- In cold weather, keep grout temperature above 45º F (7º C) until final set. Thereafter, keep temperature above freezing until grout attains a compressive strength of 1,500 psi (10.3 MPa).
- Hold a pre-job conference with your local representative to plan the installation. Hold conferences as early as possible. Conferences are important for applying the recommendations in this product bulletin to a given project, and they help ensure a placement of highest quality and lowest cost.
- DO NOT use mixing water in an amount or at a temperature that will produce a flow of less than 20 seconds (CRD C 611 or ASTM C 939) or cause the mixed grout to bleed or segregate when tested by the PTI Wick Induced Bleeding Test (based on ASTM C 940).
- BASF is not responsible for corrosion caused by ingredients in the flushout, saturation, or mixing water or by contaminants in the space being grouted or in other materials used in the system.

- Make certain the most current versions of product data sheet and SDS are being used; visit www.master-builders-solutions.BASF.us to verify the most current versions.
- Proper application is the responsibility of the user. Field visits by BASF personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the jobsite.

HEALTH, SAFETY AND ENVIRONMENTAL

Read, understand and follow all Safety Data Sheets and product label information for this product prior to use. The SDS can be obtained by visiting www.master-builders-solutions.basf.us, e-mailing your request to basfbscst@basf.com or calling 1(800)433-9517. Use only as directed. **For medical emergencies only, call ChemTrec® 1(800) 424-9300.**

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BASF Corporation
Construction Systems

889 Valley Park Drive, Shakopee, MN 55379
www.master-builders-solutions.basf.us

Customer Service 1(800) 433.9517
Technical Service 1(800) 243.6739