BASF
The Chemical Company

MASTERFLOW® 870

Cementitious ultra-high strength non-shrink precision grout

DESCRIPTION

MASTERFLOW 870 is a non shrink, natural aggregate precision grout with excellent high early and ultimate strengths. It is specially formulated to provide extended working time even at high ambient temperatures when mixed and placed at any recommended consistency. **MASTERFLOW 870** is normally placed at a flowable consistency to completely fill voids between 10mm and 100mm. Thicknesses greater than 100mm are possible with the addition of aggregate.

RECOMMENDED FOR

All precision, non shrink grouting applications with clearances of 10mm or more including:

- Critical equipment baseplates, soleplates and columns.
- Precast wall panels, beams, columns, structural building members and curtain walls.
- Patching poured in place concrete structures e.g. honeycombing, using preplaced aggregate techniques.
- Underpinning.
- Concrete repair applications where a form and pour material is required.
- Applications requiring high early compressive strengths and high ultimate compressive strengths.

FEATURES AND BENEFITS

- **High early strength-**ensures rapid commissioning of new equipment and structures.
- **High ultimate strength-**ensures permanence of the installation under static and moderate repetitive loads
- **Flowable long life grout-**easy to grout intricate spaces normally inaccessible by conventional grouting technique.
- **Extended working time**-facilitates grouting of large or difficult placements in a single pour, often without the use of a pump.
- **Economical-**greater volumes of grout can be mixed and handled with less labour.
- **Dense, non-shrink grout-**hardens free of bleeding, settlement and drying shrinkage, ensuring tight contact with all grouted surfaces.
- **Easy to use** requires no special mixing equipment, it can be mixed in a standard concrete mixer or in a pail using a grout stirrer.
- **No added chloride.**
- **Strict quality control-**ensures reliable and consistent product performance.
- **Compliance with codes-**meets the non-shrink requirements of ASTM C1090 and CRD-C 621, Corps of Engineers Specification for Non Shrink Grout; provides complete non shrink performance when tested in accordance with simulated Bedplate Technique; tested to the requirements of AS1478.2 “Methods of sampling and testing admixtures for concrete, mortar and grout”.

PERFORMANCE DATA

Strength Development - The strength of the grout is often the determining factor in deciding when loads can be put on structural members or machinery. The strength of the grout is dependent on the amount of mixing water, ambient temperature, curing and age of the hardened grout. Typical rates of strength development under variable conditions are as follows:

1. Effect of consistency on compressive strength (MPa) strength development at 20ºC.

Age	Consistency	
	Flowable	Plastic
1 day	30	42
3 days	50	61
7 days	65	69
28 days	80	94

Test Method: AS1478.2 Appendix A

Note: For applications requiring higher compressive strength, refer to **MASTERFLOW 880** or BASF range of epoxy grouts.

2. Effect of temperature on compressive strength (MPa) development when placed at ‘flowable’ consistency.

Age	Temperature		
	10ºC	20ºC	30ºC
1 day	17	30	39
3 days	42	50	61
7 days	56	65	78
28 days	75	80	94

Test Method: AS1478.2 Appendix A

Flexural Strength (MPa) - effect of temperature on strength development when placed at ‘flowable’ consistency. (Test Method: JIS R 5201)

Age	Temperature		
	10ºC	20ºC	30ºC
1 day	3.0	4.5	7.5
3 days	5.0	6.0	9.0
7 days	6.0	7.2	9.8
28 days	7.8	8.6	11.4

Indirect Tensile Strength (MPa) - effect of temperature on strength development when placed at ‘flowable’ consistency. (Test Method: AS1012.10)

Age	Temperature		
	10ºC	20ºC	30ºC
1 day	2.2	2.6	3.3
3 days	2.4	3.1	5.0
7 days	4.1	4.5	5.5
28 days	4.8	6.3	7.4

Volume Change - effect of temperature on volume change when placed at ‘flowable’ consistency. (Test Method: ASTM C1090 (CRD-C621))

Age	Temperature		
	10ºC	20ºC	30ºC
1 day	Positive	Positive	Positive
3 days	Positive	Positive	Positive
7 days	Positive	Positive	Positive
28 days	Positive	Positive	Positive

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Flow Retention - effect of temperature on flow retention when placed at 'flowable' consistency.

Age	Flow Retention (%)		
	10ºC	20ºC	30ºC
Initial	100	100	100
After 30 minutes	75	90	65
After 1 hour	60	75	60

Bleeding, Plastic Density and Setting Time - effect of temperature on plastic properties when placed at 'flowable' consistency. (Test Methods: Bleeding AS1012.6; Plastic density AS1012.5; Setting time AS1012.18)

Temp.	Bleeding (%)	Plastic Density (kg/m^3)	Setting Time	
			Initial (hr:min)	Final (hr:min)
10°C	0	2120	4:40	6:00
20°C	0	2155	4:30	5:20
30°C	0	2245	3:10	4:00

Water Demand

Depends on consistency required and temperature (both ambient and grout). Do not use too much water, as it will cause grout to bleed or segregate. As a guide, the following table indicates the appropriate quantity of water required to mix a 20kg bag of **MASTERFLOW 870** to various consistencies at the temperature shown.

Water Demand - Litres per 20kg bag		
Temperature °C	Consistency	
	Flowable (1)	Plastic (2)
20 ºC	3.3	2.6

1) AS1478.2 Appendix D, 45-55cm lateral flow in the flow trough.
2) ASTM C230/C230M, 100-120% flow by flow table after 5 drops in 3 s or AS1478.2 Appendix D, 20-30cm lateral flow in the flow trough.

The performance data is typical and based upon controlled laboratory conditions. Actual performance on the job site may vary from these values based on actual site conditions. Field and laboratory tests should be conducted on the basis of the desired placing consistency rather than strictly on indicated water demand. If the project requires strength tests be made on site do not use cylinder moulds.

VOC content: 6g/L Test method: SCAQMD 304-91

ESTIMATING DATA

MASTERFLOW 870 mixed in accordance with BASF recommended procedures to the required consistency, will provide the following approximate yields:

Approximate Yield, Litres per 20kg bag		
Temperature °C	Consistency	
	Flowable	Plastic
20ºC	10.8	10.4

APPLICATION

For information about application, please obtain a copy of the BASF "Application Guide for MASTERFLOW® Cementitious Precision Grouts" from your local representative. For 'dry pack' (damp pack) application, refer to **MASTERFLOW 95** or **MASTERFLOW 500**.

PACKAGING

MASTERFLOW 870 is packaged in 20kg bags.

SHELF LIFE

MASTERFLOW 870 has a shelf life of approximately 12 months when stored in a cool dry environment.

PRECAUTIONS

For the full health and safety hazard information and how to safely handle and use this product, please make sure that you obtain a copy of the BASF **Material Safety Data Sheet (MSDS**) from our office or our website.

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