

# MASTERFLOW<sup>®</sup> 870

Dual shrinkage compensated, precision grout

## DESCRIPTION

**MASTERFLOW 870** is a cementitious, high strength, precision grout with natural aggregates. It is formulated to provide extended working time and dual stage expansion to compensate for shrinkage in both plastic and hardened states.

## FIELDS OF APPLICATION

**MASTERFLOW 870** is recommended for precision non shrink grouting applications with clearances of 10 mm or more including:

- critical equipment baseplates 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 and ultimate compressive strengths.
- stanchion bases, bridge bearings and sole plates.

## FEATURES AND BENEFITS

<b>Dual shrinkage compensated</b>	Maintains total contact with base plates for efficient transfer of operating loads to the foundation.
<b>Free flowing</b>	Easy and complete filling of even narrow gaps for effective grouting.
<b>High early and final strengths</b>	Early load transfer and rapid commissioning of equipment. Minimises down time.
<b>Extended working time</b>	Facilitates grouting of difficult placements in a single pour.
<b>Non metallic aggregates</b>	Non-staining grout.
<b>Factory blended</b>	Eliminates errors of site batching and blending. Consistent performance.

## TYPICAL PERFORMANCE DATA

**Compressive Strength (MPa)** – effect of consistency on strength development at 20°C.

(Test Method: AS1478.2 Appendix A)

Age	Consistency (MPa)		
	Flowable	Plastic	Stiff
1 day	30	42	54
3 days	50	61	74
7 days	65	69	82
28 days	80	94	100

**Compressive Strength (MPa)** - effect of temperature on strength development when placed at 'flowable' consistency. (Test Method: AS1478.2 Appendix A)

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

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

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

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

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

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**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 <sup>3</sup> )	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

**Note:** The data shown is based on controlled laboratory tests. Reasonable variations from the results shown can be expected. 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. Compressive strength should be determined using 50 mm cube moulds fitted with compression cover plates in accordance with AS 1478.2 App A.

## PROPERTIES

Supply form	:	Powder
Colour	:	Cement Grey
Density (wet)	Flowable	: 2.09 kg/L
	Plastic	: 2.16 kg/L

## APPLICATION

### Surface Preparation

Correct substrate preparation is critical for optimum performance. Surfaces should be structurally sound, clean, and free from any contaminant.

Cement laitence, loose particles, oil, grease, mould release agent, curing membrane, and other contaminants must be removed by wet grit blasting, high pressure water jetting (approx. 150 bars) or such other effective methods. Prepare the surface of the concrete to a rough profile with a surface level difference of at least 5 mm between trough and ridge.

Saturate the surface thoroughly with clean water before placing the grout. Before commencing the grouting operation, blow clean the grouting area with oil-free compressed air.

### Formwork

While grouting base plates and other such unconfined areas, a formwork designed to the geometry of the space to be grouted is necessary. Ensure that the formwork is grout tight, strong, and well braced to withstand the fluid pressure of the grout until it sets. It should leave a minimum gap of 100 mm at the pouring end, 20 mm at the opposite end and the minimum possible at the sides. Incorporate a pouring hopper at the pouring side of at least 300 mm height, to provide adequate grout head that can drive the grout to the

required distance.

Before erecting, coat the inner surfaces of forms with a suitable release agent for easy release.

Seal all the gaps in formwork, and those between formwork and concrete surface with a suitable joint sealant or with **MASTERFLOW 870** mixed to a stiff consistency.

### Mixing

Mechanical mixing is necessary. For a large batch use an approved grout mixer and for a small batch (up to two bags at a time), use a heavy-duty slow speed (approx. 600 rpm) drill fitted with a grout stirrer.

Water requirement (litres per 25 kg bag)

Consistency	Flowable	Trowellable
Water requirement	4.2 L	3.25 L

Place approximately 80% of the water in the mixer. Keeping the mixer running, add **MASTERFLOW 870** slowly. Mix for at least 3 minutes until a lump-free mixture is obtained. Add the remaining water while continuing to mix until the desired consistency is achieved.

Filter the grout using a 7-9 mm screen, to remove any unmixed lumps.

**Note :** If prepacked grouting is not feasible for grouting thicknesses exceeding 100 mm, it is advisable to add pea gravel of graded 12 mm aggregates to a maximum of 12.5 kg per bag of **MASTERFLOW 870**, to minimise the heat of hydration. The water requirement remains unchanged.

### Placing

Placing can be manual or using a suitable pump. Either way, it should be without interruptions until completion.

Place the mixed grout into the pouring end of the formwork within 15 minutes after mixing. Avoid entrapping air by placing from one side only.

## EQUIPMENT

**Mixing** : Grout mixer or a heavy duty slow speed drill fitted with a grout stirrer.

**Placing** : Double diaphragm air operated pump or a hand operated diaphragm type grout pump.

## CLEANING

Clean tools and equipment with water, before the grout hardens.

## ESTIMATING DATA

The yield from 25 kg **MASTERFLOW 870** with different quantities of aggregate is given below.

Quantity of aggregate	Nil	13 kg	25 kg
Flowable (4.2 L water)	13.5 L	18.5 L	23.1 L

Therefore material requirement at flowable consistency without any aggregate is 18.5 kg/m<sup>2</sup> for 10 mm



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thickness.

## PACKAGING

25 kg, multi-ply paper sacks with polythene liner.

## SHELF LIFE

**MASTERFLOW 870** can be stored in tightly sealed original bags for 12 months, if kept dry.

## PRECAUTIONS

For Health, Safety and Environmental Recommendations, please consult and follow all instructions on the product Material Safety Data Sheet.

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### STATEMENT OF RESPONSIBILITY

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