MAXGROUT® 60

Free Flow, High Strength, Non-Shrink, Cementitious Precision Grout

Maxgrout® 60 is a cement based non-metallic, non-shrink, dual expansion, free flow grout supplied as a dry powder. Maxgrout® 60 has excellent flowability and is the most versatile grout.

Maxgrout® 60 is a blend of Portland cement, graded fillers and chemical additives which impart controlled expansion in the plastic state while minimising water demand. The low water demand ensures high early strength. The graded fillers are designed to assist uniform mixing and produce a consistent grout.

Uses

- Maxgrout® 60 is used for the installation of large and heavy machinery base plates, crane rails, stanchion base plates, bridge bearings, bolt pockets and all other areas requiring precision grouting.
- Can be used for filling precast joint sand tie holes with adjustable consistency.
- Can be used for reinstating damaged structural elements by placing formwork.
- Can be used for anchoring bolts in rocky strata.

Benefits

- Ready to use, requires only addition of water.
- Highly flowable and self-leveling.
- Able to fill, intricate and narrow voids.
- Ensures highest, effective bearing area.
- High early strength without the use of chlorides.
- High strength ensures the durability of the hardened grout.
- No bleeding or segregation.
- Compensates for shrinkage in both plastic and hardened states.
- No metallic iron content to cause staining/corrosion.
- The expansion system ensures dimensional stability by offsetting shrinkage.

Technical Support

An experienced technical advisory team is available to give technical service on request.

Properties

Compressive Strength (N/mm^2) (Min.)		
Age (days)	Consistency	
	Flowable (W/P 0.18)	Pourable (W/P 0.16)
1	25	27
3	36	45
7	44	55
28	54	60

Compressive Strength with addition of 10 mm aggregates

Compressive Strength (N/mm^2) W/P 0.18			
Age (days)	% of 10 mm aggregates (IS 516 - 1959)		
	50%	75%	100%
1	24	27	29
3	39	42	45
7	49	52	54
28	58	63	65

Flexural Strength (BS 4551, 1998)	
Flexural Strength (N/mm^2)	
Age (days)	W/P 0.18
1	2.5
3	7.0
7	9.0
28	10.0

Tensile Strength @ (W/P - 0.18)	3.5 N/mm^2 @ 28 days
Adhesive Bond Strength @ (W/P - 0.18)	10 N/mm^2 @ 7 days
	15 N/mm^2 @ 28 days
Time for Expansion	Start - 20 minutes
	Finish - 120 minutes
Wet Density	2.20-2.30 gm/cc
Young's Modulus (ASTM 469 - 94)	28 kN/mm^2
Coefficient of Thermal Expansion	11 x 10^{-6}/°C
Unrestrained Expansion	Up to 4% in the plastic state enables to overcome shrinkage
Dynamic Load Resistance	Specimens of Maxgrout® 60 remained undamaged even after subjecting them to alternate loads of 5 N/mm & 25 N/mm at the rate of 500 cycles per minute for two million cycles
Pressure to Restrain Plastic Expansion	0.004 N/mm^2 approx.

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Longer term expansion in the hardened state is designed to comply with the requirements of ASTM C1107 to Compensate for drying shrinkage.

Flow characteristics: The maximum distance of flow is governed by the gap width and the head of the grout. Typical data for flow design assuming grout is poured immediately after mixing is given in the table below:

Grout Max. consistency		Flow distance in mm		
	Gap width (mm)	50 mm head	100 mm head	250 mm head
Flowable	30	350	1000	1500
	40	500	1500	2000
	50	900	2000	3000+

Note: This table is based on the following factors temperature- 30ºC; water saturated substrate; Minimum unrestricted flow width is 300mm.

Specification Clauses

Performance Specification

All grouting shown on the drawing must be carried out with are packed cement based product which is chloride free. It shall be mixed with clean water to the required consistency. The grout must not bleed or segregate. A positive volumetric expansion shall occur while the grout is plastic by means of gaseous system.

Typical Detail of Stanchion Base Plate

The compressive strength of the grout must exceed 50 N/mm^2 at 7 days and 60 N/mm^2 at 28 days. The flexural strength of grout must exceed 9N/mm^2 @ 28 days. Fresh wet density of the mixed grout must exceed 2150 kg/m^3. The storage, handling and placement of the grout must be in strict accordance with the manufacturer's instructions.

Instructions for Use

Preparation

Foundation surface

The substrate surface must be free from oil, grease or any loosely adherent material. If the concrete surface is defective or has laitance, it must be cut back to a sound base. Bolt holes and fixing pockets must be cleaned of any debris.

Pre-Soaking

Several hours prior to placing, the concrete substrates should be saturated with fresh water. Immediately before grouting takes place any free water should be removed with particular care being taken to blow out all bolt holes and pockets.

Base Plate

It is essential that this is clean and free from oil, grease or scale. Air pressure relief holes should be provided to allow venting of any isolated high spots.

Levelling Shims

If these are to be removed after the grout has hardened, they should be treated with a thin layer of grease.

Formwork

The formwork should be constructed to be leak-proof. It can be achieved by using foam rubber strip or mastic sealant beneath the constructed formwork and between joints. In some cases it is practical to use a sacrificial semi-dry sand and cement formwork. The formwork should include outlets for pre-soaking.

Unrestrained Surface Area

This must be kept to a minimum. Generally the gap width between the perimeter formwork and the plate edge should not exceed 150mm on the pouring side and 50mm on the opposite side. It is advisable, where practical, to have no gap at the flank sides.

Mixing

For best results a mechanically powered grout mixer should be used. When quantities up to 50kg are used, a heavy duty slow speed drill (400-500 rpm) fitted with a paddle is suitable. Larger quantities will require a heavy duty mixer.

To enable the grouting operation to be carried out continuously, it is essential that sufficient mixing capacity and labour should available. Use of a grout holding tank with provision to gently agitate the grout may be required.

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Consistency of Grout Mix

The quantity of clean water required to be added to a 30 kg bag to achieve the desired consistency is given below:

Pourable: 4.8 litres
Flowable: 5.4 litres

The selected water content should be accurately measured into the mixer. The total content of the Maxgrout® 60 bag should be slowly added and continuous mixing should take place for 5 minutes. This will make ensure that the grout has a smooth even consistency.

Placing

At 30ºC place the grout within 20 minutes of mixing to gain full benefit of the expansion process. Maxgrout® 60 can be placed in thicknesses up to 100mm in a single pour when used as an underplate grout. For thicker sections it is necessary to fill out Maxgrout® 60 with well graded silt free washed and SSD condition aggregate to minimise heat build-up.

Typically a 5-10mm aggregate is suitable. 50-100% aggregate by weight of Maxgrout® 60 can be added. Any bolt pockets must be grouted prior to grouting between the substrate and base plate. Continuous grout flow is essential. And sufficient grout must be prepared before starting. The time taken to pour a batch must be regulated to the time to prepare the next one.

Hopper System Removable Hopper

For large pours the grout may be hand placed or pumped into a removable hopper (trough). Pouring should be from one side of the void to eliminate any air or pre-soaked water becoming trapped under the base plate. It is advisable to pour the grout across the shortest distance of travel. The grout head must be maintained at all times so that a continuous grout flow is achieved.

Where large volumes have to be placed Maxgrout® 60 may be pumped. A heavy duty diaphragm pump is recommended for this purpose. Screw feed and piston pumps may also be suitable.

Curing

On completion of the grouting operation, exposed areas should be thoroughly cured. This should be done by the use of Maxcure® CC 75 curing membrane and/or wet hessian.

Limitations

- **Low Temperature Working**: Warm water for grouting is recommended when contact surface temperatures are 10°C and below to accelerate strength development. Formwork should be kept in place for minimum 36 hours.

- **High Temperature Working**: At ambient temperature of 40°C and above cold water (below 20°C) should be used for mixing.

Health and Safety Instructions

Maxgrout® 60 is alkaline and should not come into contact with skin and eyes. Inhalation of dust during mixing should be avoided Gloves, goggles and dust mask should be worn. If contact with skin occurs, it shall be washed with clean water. Splashes to eyes should be washed immediately with plenty of clean water and medical advice sought.

Fire

Maxgrout® 60 is non-flammable.

Storage

Shelf life
Maxgrout® 60 has a shelf life of 6 months if kept in a dry store in sealed bags. If stored in high temperature and high humidity locations, the shelf life may be reduced.

Packing

Maxgrout® 60 is supplied in 30 kg moisture resistant bags.

Yield

Consistency	Pourable	Flowable
Yield (litres)	15.6	15.9

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