



CHEMAX GP12

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

Description :

- **CHEMAX GP12** is supplied as a ready to use dry powder. The addition of a controlled amount of clean water produces a free flowing; non-shrink grout for gap thicknesses up to 100mm. **CHEMAX GP12** is a blend of Portland cement, graded fillers and chemical additives which impart controlled expansion in the plastic state whilst minimizing 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 :

- To grout bearings, machine foundations, columns joints in precast construction etc.
- To grout anchors in concrete
- To grout cavities, gaps and voids in concrete
- CHEMAX GP12 is used for precision grouting where it is essential to withstand static and dynamic loads.
- Typical applications would be the grouting of base plates of turbines, compressors, boiler feed pumps etc.
- It can also be used for anchoring a wide range of fixings. These include masts, anchor bolts and fence posts.

Advantages:

- Easy to use (ready to mix powder)
- Easy to mix, only add water
- High ultimate strength ensure the durability of the hardened grout
- Adjustable consistency
- Very good flow characteristics
- Rapid strength development
- Develops high early strength without the use of chlorides
- High final strengths
- Initial expansion by gas generation
- Impact- and vibration resistant
- Non-corrosive
- Not flammable, non-toxic
- Shrinkage compensated
- No metallic iron content to cause staining.
- Pre-packed material overcomes onsite batching variations
- Free flow ensures high level of contact with load bearing area

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Properties:**Compressive Strength:**

Age	Compressive Strength (N/mm ²)	
	Consistency	
Days	Flow able (w/p 0.18)	Pourable (w/p 0.165)
1	24	27
3	45	54
7	55	66
28	65	78

Compressive strength with addition of aggregates :

Age	Compressive Strength (n/mm ²) W/P 0.18		
Days	50 %	75 %	100 %
1	28	30	32
3	50	52	55
7	60	63	68
28	70	75	78

Flexural Strength :

Age	Flexural Strength (n/mm ²)
Days	W/P 0.18
1	2.5
3	7.0
7	9.0
28	10.0

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- **Tensile strength (W/P - 0.18)** : 3.5N/mm² @ 28 days
- **Pullout bond strength (W/P -0.18)** : 17 N/mm² @ 7 days
20 N/mm² @ 28 days
- **Time for expansion (after mixing)** : Start: 20 minutes
Finish: 120 minutes
- **Fresh wet density:** Approximately 2220kg/m³ depending on actual consistency used
- **Young's modulus:** 28 KN /mm²
- **Coefficient of thermal expansion:** 11 x 10⁻⁶/°C
- **Unrestrained expansion** 2 - 4 % in the plastic state enables to overcome 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 Consistency	Max flow distance in mm			
	Gap width (mm)	50mm head	100mm head	250mm Head
Flowable	30	350	1000	1500
	40	500	1500	2000
	50	900	2000	3000+

- **Note:** This table is based on the following factors temperature-30°C; Water saturated substrate; Minimum unrestricted flow width is 300mm.

Specification Clauses**Performance specification:**

- All grouting shown on the drawing must be carried out with a pre 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.



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Application instructions

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 blown clean of any dirt or 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.

Leveling 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. This 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 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.



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Mixing and placing

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 labor are available. The use of a grout holding tank with provision to gently agitate the grout may be required.

Consistency of grout mix

- The quantity of clean water required to be added to a 25kg bag to achieve the desired consistency is given below:

Pourable:	4.125 liters
Flowable:	4.500 liters
- The selected water content should be accurately measured into the mixer. The total content of the CHEMAX GP12 bag should be slowly added and continuous mixing should take place for 5 minutes. This will ensure that the grout has a Smooth even consistency.

Placing

- At 30°C place the grout within 20 minutes of mixing to gain full benefit of the expansion process. CHEMAX GP12 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 CHEMAX GP12 with well graded silt free aggregate to minimize heat buildup. Typically a 10mm aggregate is suitable. 50 - 100% aggregate weight of CHEMAX GP12 can be added.
- Any bolt pockets must be grouted prior to grouting between the substrate and the base plate. Continuous grout flow is essential. 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.

Curing

- On completion of the grouting operation, exposed areas should be thoroughly cured. This should be done by the use of CX SUPERCURE WB curing membrane, continuous application of water and/or wet hessian.



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Limitations

Low temperature working

- When the air or contact surface temperatures are 10⁰C or below on a falling thermometer, warm water (30 - 40⁰C) is recommended to accelerate strength development.
- For ambient temperature below 10⁰C the formwork should be kept in place for at least 36 hours. Normal precautions for winter working with cementitious materials should then be adopted.

High temperature working

- At ambient temperatures above 40⁰ C, cool water (below 20⁰C) should be used for mixing the grout prior to placement.

Estimating

Packaging :

- CHEMAX GP12 is supplied in 25 kg moisture resistant bags.

Shelf life

- CHEMAX GP12 has a shelf life of 12 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.

Health and Safety instructions

- CHEMAX GP12 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 water. Splashes to eyes should be washed immediately with plenty of clean water and medical advice sought.

Fire:

- CHEMAX GP12 is non flammable.