



Fosroc Grouting Solutions

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constructive solutions

"The greatest constructions require solid foundations, the best being built on ROCK. Here is the foundation that supports FOSROC"

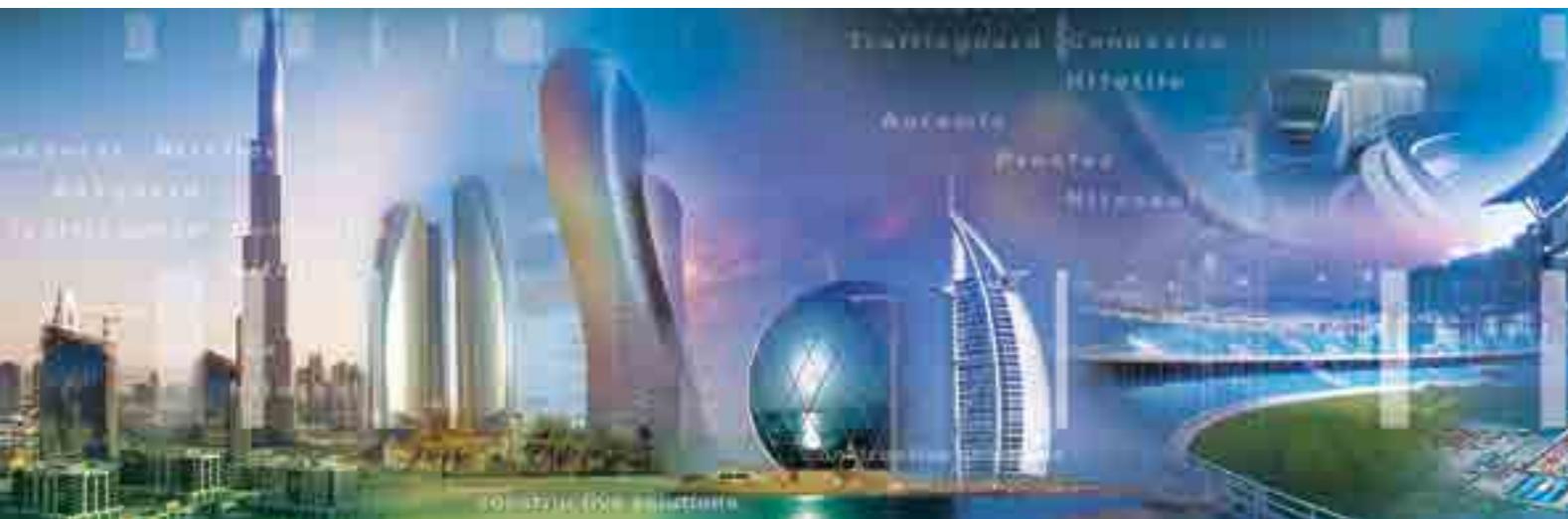
Dr. James Hay, Chairman - JMH Group

Our Profile

Fosroc commenced its Indian operations in 1981 and established a 100% subsidiary in 1999.

Fosroc has four state-of-the-art manufacturing facilities at Bengaluru, Karnataka; Ankleshwar, Gujarat; Kolkata, West Bengal and Keshwana, Rajasthan.

Fosroc Chemicals (India) Pvt. Ltd. works closely with its customers, including distribution and Applicator associates, through its well-equipped technical service department, a network of sales engineers, customer service professionals, Concrete technologist, Specification team etc. Fosroc India prides itself for the level of technical and customer support that it gives to its valued customers.



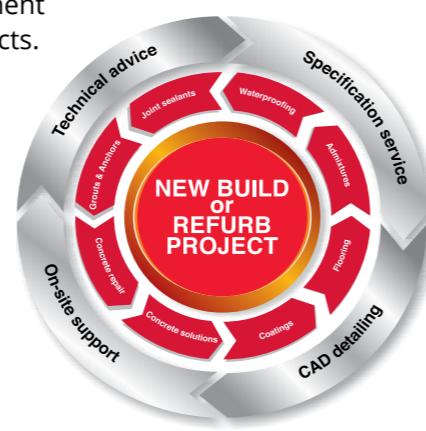
International leverage gives Fosroc the opportunity to offer tried and tested solutions from one geographical region to another with great confidence.

Fosroc Chemicals (India) Pvt. Ltd. provides time-tested solutions that include services such as:

- Diagnosis and Specification Support
- Application Support
- Distribution Support
- After-Sales Service
- Mix design support

Fosroc Chemicals (India) Pvt. Ltd. remains focused on the Industry, Infrastructure and Building Segment with a wide range of quality products.

- Admixtures and Surface Treatments
- Grouts and Anchors
- Industrial Flooring
- Concrete Repair
- Protective Coatings
- Joint Sealants and Adhesives
- Waterproofing
- Cement Additives



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Product Range



Admixtures and Surface Treatments



Grouts and Anchors



Industrial Flooring



Concrete Repair



Structural Strengthening



Joint Sealants and Adhesives



Waterproofing



Cement Additives

Introduction to Grout

Fosroc has been servicing grout requirement of Indian industry for more than three decades. Conbextra range of cementitious and Epoxy grouts are considered to be the most dependable grouting solutions by engineers, erectors and machine manufacturers.

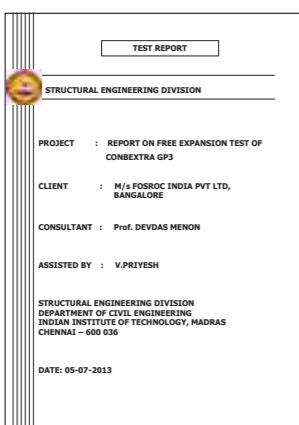
The journey started way back in mid-eighties when Indian power sector accepted the locally produced Conbextra GP2 and stopped importing cement grouts from European sources. Since then almost all the critical equipments like turbine, generator and other equipments in thermal power sector are grouted with Conbextra GP2. Consequentially the product is also accepted in other sectors like steel, petrochemical, cement and general engineering.

Conbextra range offers comprehensive solutions to grouting requirements of wide sectors like thermal power, wind energy, refineries, steel plants, transportation and precast. The range offers both cement and epoxy grouts.

Conbextra range of grouts offer high performance standards in terms of high early and ultimate strength, flow properties, high EBA (Effective Bearing Area) and also dynamic load resistance.

The product range outperforms industry laid norms and standards.

The product range has been certified by institutions of repute like Indian Institute of Technology, Chennai and strongly recommended by equipment manufacturers like BHEL in Power industry, Loche in Cement industry and also consultants.



Why Grout?

The typical machine installation sequence in industrial scenario calls for filling the gap between the steel base plate / frame and concrete foundation. The gap arises during alignment of steel frame as the frame cannot rest directly over the concrete foundation due to its uneven surface texture. The base frame therefore is placed over shim plates leaving gap between frame and concrete foundation.

The gap filling of foundation frame is a precision job and requires specially designed material with technical parameters in plastic and hardened state. The materials should fill the gap effectively achieving sufficient contact with steel plate without any cavities and also have

sufficient mechanical properties to effectively transfer the load of machine – static load and also vibrations – dynamic load to concrete foundation during service life of equipment.

As traditional concrete or mortars do not have sufficient flow properties and also shrink during hardening process, they are not suitable and therefore necessitates requirement of high precision engineering grouts like Fosroc Conbextra range with specific technical parameters like non-shrink, high flow, high early and ultimate strength dynamic load resistance etc. These grouts can be either cementitious complying with ASTM C 1107 or epoxy grouts ASTM C 1181.

Grouting Solutions for Various Sectors



Industry



Power



Transport



Precast



Anchors

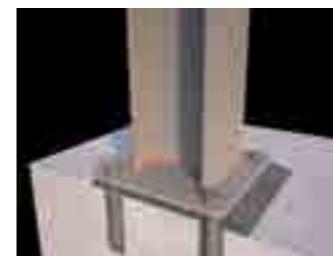


Product Range

PRODUCT NAME	PRODUCT DESCRIPTION	TECHNICAL PARAMETERS								RECOMMENDED APPLICATIONS	
		W/P RATIO	FLOW/EFFUX	COMPRESSIVE STRENGTH				FLEXURAL STRENGTH			
				1D	3D	7D	28D	28 Days			
CEMENT GROUTS											
1	Conbextra GP1	Non-shrink cementitious grout	ASTM C 1107 Type A	0.15	> 20 cm	10 N / mm ²	27 N / mm ²	35 N / mm ²	45 N / mm ²	Static load applications like steel column foundation, pipe rack foundations and equipments with only static load	
2	Conbextra GP2	Plastic shrinkage compensated, high flow, high strength cementitious grout	ASTM C 1107 Type A	0.18	> 20 cm	24 N / mm ²	45 N / mm ²	55 N / mm ²	65 N / mm ²	10 N / mm ²	
3	Conbextra GP2 N	Plastic shrinkage compensated, high flow, high strength cementitious grout with low exothermic heat	ASTM C 1107 Type A	0.16	> 20 cm	24 N / mm ²	45 N / mm ²	55 N / mm ²	65 N / mm ²	10 N / mm ²	
4	Conbextra GP3	Dual shrinkage compensated, high strength, high flow cementitious grout	ASTM C 1107 Type C	0.14	> 20 cm	30 N / mm ²	50 N / mm ²	60 N / mm ²	70 N / mm ²	10 N / mm ²	
5	Conbextra TS	Plastic shrinkage compensated, high flow, high strength cementitious grout with low exothermic heat and suitable for grouting thickness up to 250 mm	ASTM C 1107 Type A	0.14	750 mm @ 20 °C < 20 sec.	20 N / mm ²	35 N / mm ²	45 N / mm ²	65 N / mm ² in 100 mm Cube	6.7 N / mm ²	
6	Conbextra HF	Dual shrinkage compensated, ultra high flow high strength cementitious grout	ASTM C 1107 Type C	0.19	20-30 sec. efflux time when measured with CRDC cone	20 N / mm ²		44 N / mm ²	56 N / mm ²	8 N / mm ²	
7	Conbextra AT	Plastic shrinkage compensated, high flow, high early and ultimate strength cementitious grout	ASTM C 1107 Type A	0.16	> 20 cm	40 N / mm ²	60 N / mm ²	70 N / mm ²	80 N / mm ²	10 N / mm ²	
8	Conbextra HES	Plastic shrinkage compensated, high flow, high early and ultimate strength cementitious grout	ASTM C 1107 Type A	0.21	> 20 cm	1 hr - 15 N / mm ² 3 hrs - 20 N / mm ² 6 hrs - 25 N / mm ² 24 hrs - 30 N / mm ²	40 N / mm ²	48 N / mm ²	55 N / mm ²	5 N / mm ²	
9	Conbextra UHS 90	Plastic shrinkage compensated, high flow, high early and ultimate strength cementitious grout	ASTM C 1107 Type A	0.14	> 20 cm	12 hrs - 10 MPa 14 hrs - 25 MPa 16 hrs - 30 MPa 1 day - 35 MPa	60 N / mm ²	70 N / mm ²	90 N / mm ²	12 N / mm ²	
10	Conbextra HR	Heat resistant cementitious grout	ASTM C 1107 Type A	0.14	> 20 cm	35 N / mm ²	60 N / mm ²	70 N / mm ²	90 N / mm ²	9 N / mm ²	
11	Conbextra BB72IN	Free Flow, Non Shrink, High Strength Cementitious precision grout	ASTM C 1107 Type A	0.15 to 0.16	>250mm	24 N / mm ²		55 N / mm ²	75 N / mm ²	10 N / mm ²	
12	Conbextra BB92O	Sulphate resistant high early and ultimate strength onshore wind mill grout	ASTM C 1107 Type A	0.11	> 20 cm	30 N / mm ²		75 N / mm ²	90 N / mm ²	12 N / mm ²	
13	Conbextra BB92IN	High early and ultimate strength wind mill grout	ASTM C 1107 Type A	0.11 to 0.12	> 25 cm	30 N / mm ²		75 N / mm ²	90 N / mm ²	10 N / mm ²	
14	Conbextra UW	Anti-washout, non-shrink, high strength cementitious underwater grout	ASTM C 1107 Type A	0.22		15 N / mm ²	30 N / mm ²	44 N / mm ²	53 N / mm ²	Underwater repairs	
EPOXY GROUTS											
15	Conbextra EP10LV	High strength, Low viscous epoxy injection grout	ASTM C1181			40 N / mm ²	65 N / mm ²	80 N / mm ²	29 N/mm ² @7 days	Structural crack repair	
16	Conbextra EP10M	Moisture insensitive epoxy resin injection material	ASTM C1181							Structural crack repair	
17	Conbextra EP10	Low viscosity epoxy injection grout		Not Relevant		45 N / mm ²	65 N / mm ²	80 N / mm ²	40 N / mm ²	Structural crack repair	
18	Conbextra EP 75	High flow, high early and ultimate strength epoxy grout suitable for grouting thickness up to 75 mm	ASTM C 1181	Not Relevant	> 18 cm	75 N / mm ²		95 N / mm ²	26 N / mm ²	Machine base grouting of heavy duty compressors, rail plates in ballast less metro track	
19	Conbextra EP120	Epoxy resin free flow grouts	ASTM C1181				60 N / mm ²	90 N / mm ²	34 N/mm ² @7 days	Machine base grouting with dynamic or heavy loads, reciprocating testing equipment, heavy crane and transporter rails, high speed turbines and centrifuges and drop forges	
20	Conbextra EP 300	Low exotherm epoxy grout. Suitable for grouting thickness up to 300 mm	ASTM C 1181	Not Relevant	> 18 cm		82 N / mm ²		30 N / mm ²	Machine base grouting of heavy duty compressors, rail plates in ballast less metro track with grouting section thickness up to 300 mm	
21	Conbextra EBG (M)	Epoxy resin bearing grout	ASTM C 1181	Not Relevant	> 18 cm	40 N / mm ²		60 N / mm ²		Elastomeric Bearing Pads	
CEMENT GROUT ADDITIVES											
22	Cebex 100	Non-shrink, expansive, plasticising additive for cement slurry grouts									
23	Cebex 200	Non-shrink, expansive, plasticising additive for cement slurry grouts with hydrogen free expansion system									
24	Cebex EN	Plasticising and hydrogen free expansion grout admixture	EN 445 & EN447 - 2007								
CABLE GROUTS											
25	Conbextra Cable Grout	Pre-bagged, non-shrink cementitious grout for post tensioned cable duct grouting	EN 445 &447 - 2007	0.35	> 20 cm		27 N / mm ²	30 N / mm ²		Grouting of PT cable ducts, grouting ground anchors with small gaps.	
26	Conbextra Cable Grout HS	Pre-bagged, non-shrink cementitious grout for post tensioned cable duct grouting	EN 445 &447 - 2007	0.3	> 20 cm		55 N / mm ²	70 N / mm ²		Grouting of PT cable ducts, grouting ground anchors with small gaps.	
BEDDING MORTAR											
27	Conbextra Bedding Mortar	Single component cementitious high strength bedding mortar		0.15		25 N / mm ²		55 N / mm ²	65 N / mm ²	Structural bedding of precast modular concrete units.	
28	Conbextra Bedding MortarPLUS	Single component cementitious high strength bedding mortar		0.15		45 N / mm ²		70 N / mm ²	90 N / mm ²	Structural bedding of precast modular concrete units.	

Grouting Solutions for Hydro Carbon, Steel and Heavy Engineering Sector

Fosroc has a wide range of precision grouts ensuring the smooth running of plant and factory facilities from steel plants, petrochemical, cement plants, sugar etc. We understand the strains placed upon machinery and the importance of minimising downtime, and have the solutions to achieve these aims.



Column foundation



Cement grout machine foundation



Epoxy grout machine foundation



Lokfix Anchors

APPLICATIONS		PRODUCT DESCRIPTION	REFINERY			STEEL PLANTS		CEMENT PLANTS		GENERAL INDUSTRIES	
GROUTS			Steel Column Foundation / Pipe racks	Compressor Foundation	Other Equipments	Steel Column Foundation / Pipe racks	Sinter Plant, Blast Furnace, Coke Oven and Other Equipment Foundations	Steel Column Foundation / Pipe racks	Mill Foundation/ Compressors, Pumps	Static Load Applications	Equipment Grout With Static and Dynamic Load
1	Conbextra GP1	Non shrink cementitious grout with static load resistance	●			●		●		●	
2	Conbextra GP 2	Plastic shrinkage compensated cementitious grout for static and Dynamic load resistance			●		●		●		●
3	Conbextra GP3	Dual shrinkage compensated cementitious grout with static and Dynamic load resistance			●		●		●		●
4	Conbextra USH 90			●	●				●		●
5	Conbextra HR	Heat Resistant cementitious grout					●				
6	Conbextra EP75 / 300	Free flow, High Strength epoxy grout		●							

Grouting Solutions for Power Sector

Power generation has been the key to economic and social development of any country. Fosroc has been servicing this sector since last three decades. Conbextra range of grouts are widely accepted in thermal, hydel and wind power.

Lokfix anchoring systems are used in solar power sector.



Column foundation



Cement grout machine foundation



Epoxy grout machine foundation

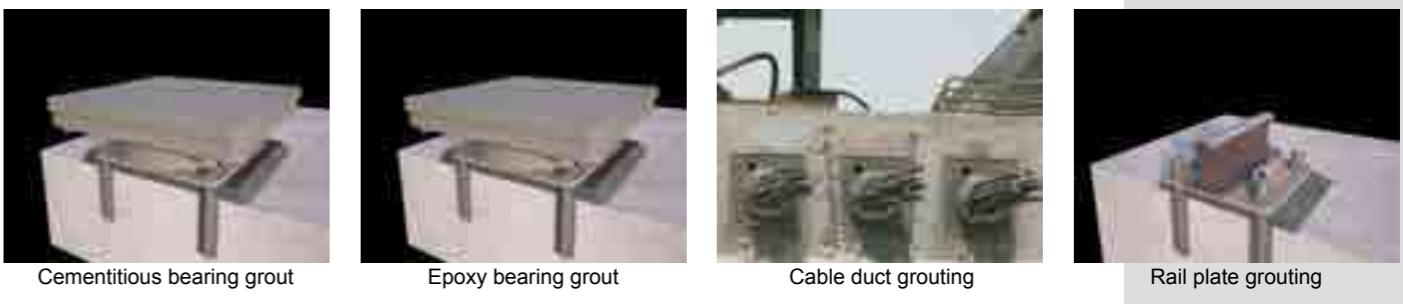
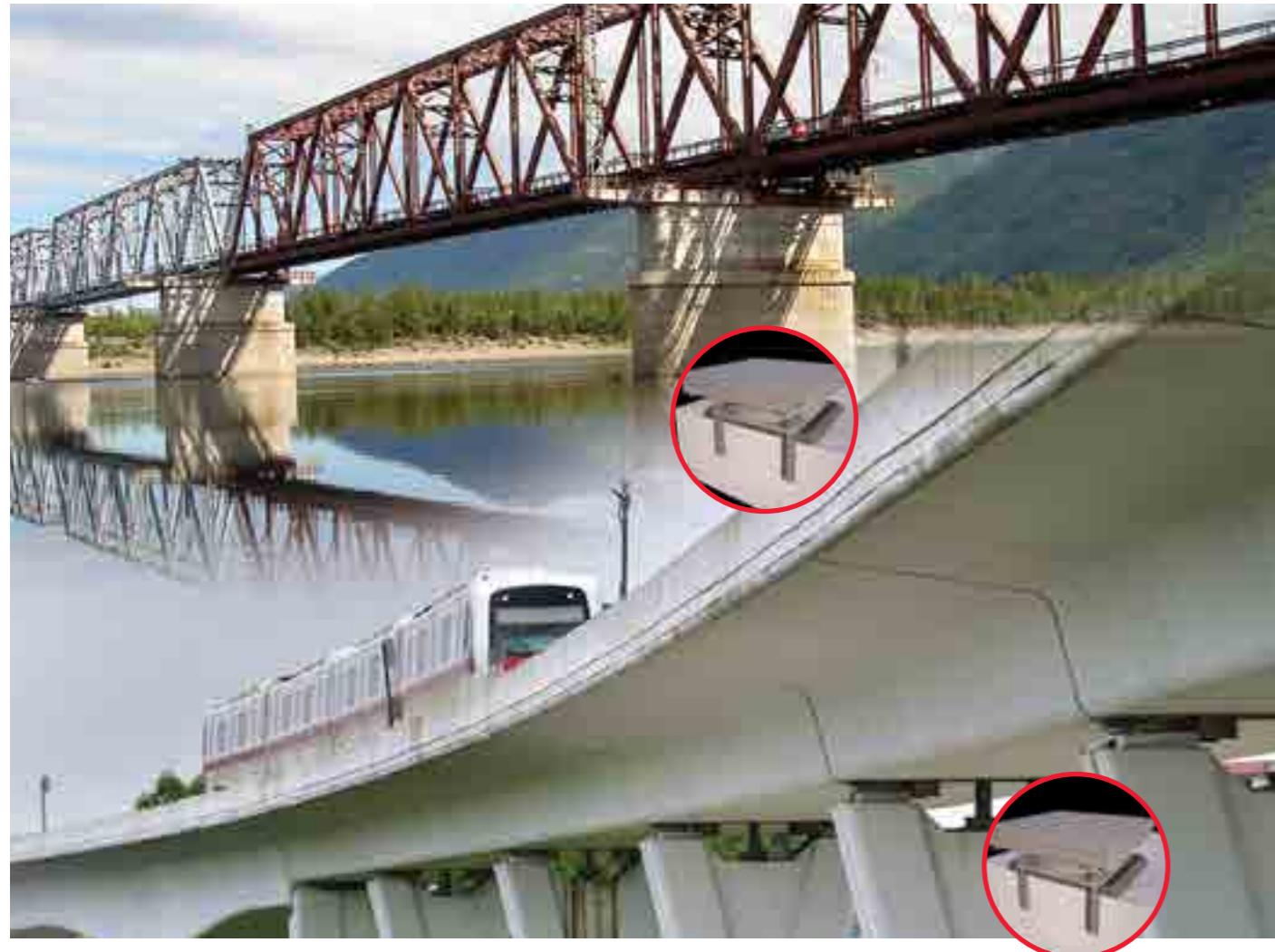


Lokfix Anchors

APPLICATIONS		THERMAL POWER			WIND POWER		HYDEL POWER		SOLAR POWER		NUCLEAR POWER			
GROUTS		PRODUCT DESCRIPTION			Steel Column Foundation / Pipe racks	Turbine Assembly	BFP / ID Fan / ESP / Pumps and other Auxiliary Equipments	On shore Wind Mill Foundation	Precast Joints for Concrete Towers	Sluice Gates, Steel Column Foundations and Other Static Load Applications	Hydroturbine and Auxiliary Equipment	Solar Power Panel Foundation Bolt anchoring	Steel Column Foundation / Pipe racks	Equipment Grouts
1	Conbextra GP1	Non-shrink cementitious grout with static load resistance			●					●			●	
2	Conbextra GP 2	Plastic shrinkage compensated cementitious grout for static and dynamic load resistance					●							
3	Conbextra GP3	Dual shrinkage compensated cementitious grout with static and dynamic load resistance			●						●			●
4	Conbextra BB92 O	Sulphate resistant, high early and ultimate strength, plastic shrinkage compensated wind mill grout					●							
5	Conbextra BB92 IN	High early and ultimate strength, plastic shrinkage compensated wind mill grout					●							
6	Conbextra BB72 IN	Plastic shrinkage compensated cementitious grout for static load resistance						●						

Grouting Solutions for Transport Sector

Transportation sector in India has shown exponential growth in last couple of years. There are three major grouting applications in this sector – ballast less track (rail fixing plates), bridge bearings, bearings in elevated viaducts, cable duct grouting of post-tensioned cables – cable stay bridges. Fosroc offers customised product solutions for these applications:



	APPLICATIONS	METRO					
		BRIDGES		METRO			
		Rail , Road , Cable stay Elevated Viaducts		Ballastless Metro Track			
GROUTS	PRODUCT DESCRIPTION	Bearings	Stressing Cable Grouts	Injection Grouting of Shear Connectors	Rail Plate Grouting	Bearings	Stressing Cable Grouts
1	Conbextra GP1	Non-shrink cementitious grout with static load resistance					
2	Conbextra GP 2	Plastic shrinkage compensated cementitious grout for static and dynamic load resistance	●			●	
3	Conbextra GP3	Dual shrinkage compensated cementitious grout with static and dynamic load resistance	●			●	
4	Conbextra EBGM	Epoxy Grout	●			●	
5	Conbextra EP75 / 300	Free flow, high strength epoxy grout			●		
6	Conbextra EP10	Low viscosity epoxy injection grout		●			
CABLE GROUTS							
7	Conbextra Cable Grout	Pre-bagged, non-shrink cementitious grout for post tensioned cable duct grouting	●				
8	Conbextra Cable Grout/HS	Pre-bagged, non-shrink cementitious grout for post tensioned cable duct grouting	●				
GROUTING ADDITIVES							
9	Cebex 100		●				●
10	Cebex 200		●				●
11	Cebex EN	Plasticising and hydrogen free expansion grout admixture	●				

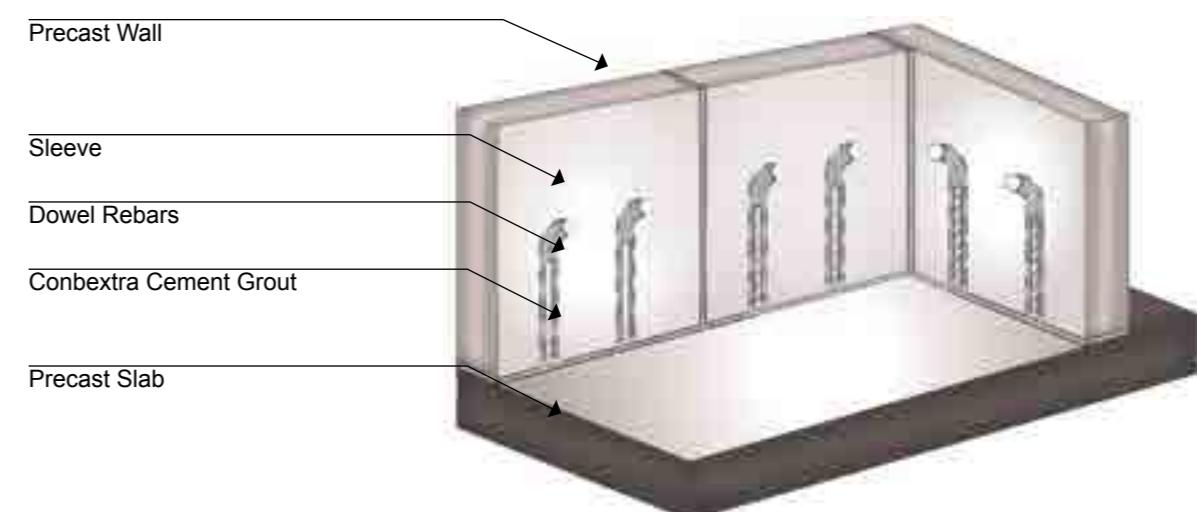
Grouting Solution for Precast Construction

Precast construction technique for mass housing is becoming increasingly popular and widely used these days.

Precast construction technique has large grouting applications between junctions of various precast elements. There are also grouting applications in dowel bar ducts.



1	Combextra GP1	Non-shrink, high flow cementitious grout
2	Combextra GP2 N	Non-shrink, high flow, high early and ultimate strength cementitious grout
Bedding Mortar		
3	Combextra Bedding Mortar	Single component cementitious high strength bedding mortar
4	Combextra Bedding Mortar Plus	Single component cementitious high strength bedding mortar



Project References

Selecting the correct grout requires more than looking at compressive strength. That is why Fosroc provides a wide array of grouting products and complimentary ancillaries. We design our materials to exhibit 'best-in-class' properties, always looking at the critical issues such as material stability, flowability and ease of application, compressive, flexural and tensile strengths. Perhaps most critically, Fosroc design the grouts to stand the test of time. Here is a selection of some of our projects from around the world:



King Fahad Causeway

Saudi Arabia

The 25 km King Fahad Causeway, linking Bahrain to Saudi Arabia, is used by over 19 million passengers a year. Reducing maintenance cycles is a key aim of all designers, this critical piece of infrastructure is no different. This enormous structure has been supported by Fosroc's Conbextra HF since its construction began in 1981.

The product was pumped under pressure between the segmental rings of the precast piles that support the bridge as they were lifted into place. The grout was selected for its flowability at high temperatures, stability under pumping pressure and dual shrinkage compensation. The speed of its set allowed rapid erection of the piles. Conbextra HF has weathered the elements and exposure, proving Fosroc is the supplier of choice for critical and durable applications.



Paradip Oil Refinery

India

Construction at the massive Paradip refinery for the Indian Oil Corporation presented a challenge to the Fosroc team. The processing units for crude oil required varying depths in application and base plate sizes were very large. To add to the difficulty, ambient temperatures during application frequently rose above 40°C. Of course, the grouts also had to exhibit resistance to a number of very aggressive chemicals and excellent flexural strength and creep resistance.

The team worked to produce special product formulations to meet the application procedures ensuring high contact, high strength and crack-free grouting beneath the machines. Our ability to produce bespoke solutions and a variety of products including Conbextra EP75, Conbextra EP300, Conbextra GP and Conbextra BB92 to meet application needs meant Fosroc were the only company selected to supply the refineries' grouting.



Emirates Airline Cable Car

UK

A novel piling technique was used to cast the supporting columns in the brisk tidal zone of London's River Thames. The use of Conbextra UW enabled a very high quality of concrete to be cast even under water. Once the piles were in place the initial skirt of the tower was set onto them almost immediately, meaning the early age compressive strength of Conbextra UW was another critical requirement.

Initially the proposed construction method and programme meant that the cable car would not be operational until the end of the summer. Fosroc's Conbextra UW was an integral part of the success of the new innovative piling technique adopted due to its very high strength and anti-wash out characteristics. This innovative approach took 6 weeks off the completion time of the project; ensuring that it finished well ahead of schedule and was in place to assist in the logistics of staging the London 2012 Olympic Games.

Application Guidelines for Combextra Grouts

The following procedure is designed to provide guidance to achieving the best grout pour results using Combextra Cementitious Grouts. Consult your local Fosroc team for specific site guidance.



1. Planning

Correct planning is essential. Calculate the correct material consumption factoring water addition and including material wastage. Ensure that the correct head/flow/distance has been calculated. Ensure the correct equipment is available including strapping or rods as well as sufficient mixing teams to undertake a continuous pour. Plan the correct amount of time that will be needed for the work. Ensure the correct working temperatures are achieved.



3. Fixing

Make sure the bolts and bolt holes are clean and dry with sufficient mechanical key. Apply Lokfix or Lokfix DUR resin anchors into the hole. Immediately place the holding bolts into the resin, applying in a twisting motion until the required depth is reached and some resin protrudes slightly above the line of the floor. Ensure the bolts are straight and centred and allow the material to set.



2. Preparation and Setting

Remove laitance, damage or contaminants from the slab conducting repairs if necessary. Ensure all corrosion deposits have been removed from the baseplate. Identify any high spots in the baseplate and drill through to prevent air entrapment. When setting the plate, using a threaded bolt to level is often the best technique, providing maximum adjustability before, during and after the pour. Levelling shims may also be used, but must be removed after the pour.



4. Formwork

Using timber, fix the shuttering around the baseplate. Gaps at the pouring end should not exceed 150 mm and at the free end no more than 50 mm. All shuttering should be watertight and supported sufficiently to be able to withstand the pressures of the grouting process. The shuttering should be designed to allow water release or removal. The grout box shall provide sufficient head of pressure in relation to the viscosity of the grout and the length of the pour. A smooth wood should be used and, where necessary, carefully applied Reebol mould release oil may be used.



5. Saturation

Fill the formwork with clean water and allow it to stand for a minimum of 2 hours. Check formwork for leaks and plug where necessary. After saturation, drain water and remove any standing water in low spots using sponges or vacuum. Begin the grouting process immediately after completion of the saturation process. Do not saturate concrete when using Combextra epoxy resin grouts!



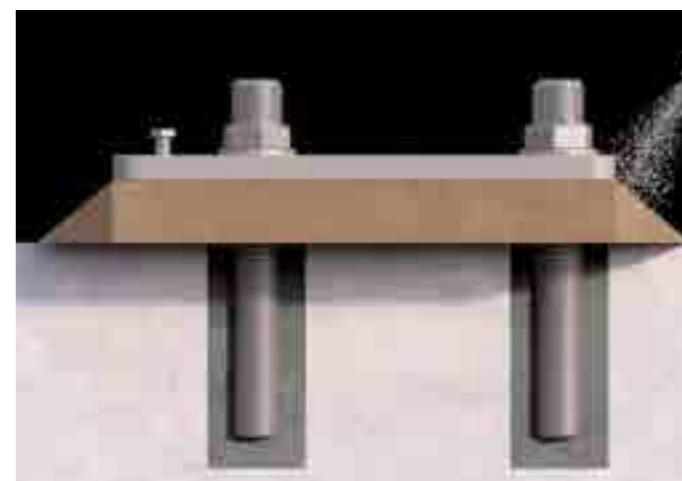
7. Pouring

Using the header box pour the grout continuously through the area, keeping gaps between pours to an absolute minimum and maintaining head of pressure. Check that material flows correctly beneath the plate, and any air vents are plugged as they become full. Pour only from one side to avoid entrapping air. Do not vibrate or agitate Combextra grout when it is in its plastic state. For large area pours consider using a grout pump.



6. Mixing

Use a slow speed drill (appx 500rpm) with Mixer Paddle MR3, for large quantities a shear vane mixer may be used. Slowly add powder to a pre-measured amount of water, ensure consistency of water/powder ratio. Do not allow material to stand for more than 15 minutes. Material mixing process should ensure that a constant pour is achieved with no time gaps.



8. Finishing

Exposed edges of the material should be cured using Concure WB. The edges of the pour should not project above the bottom level of the baseplate, especially if movement is anticipated. 45° chamfers may be achieved by formwork, cutting the grout, or by using a Renderoc mortar. Observe material strength gain information prior to loading.

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Important Note

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