PSA CONNECTION GROUT - TECHNICAL DOCUMENT Rev 1.1

High Strength, shrinkage-compensated, “Class C” flowable/ pumpable cementitious grout.

DESCRIPTION

PSA Connection Grout is a specially designed high strength and shrinkage-compensated grout, tested for special purpose use with the PSA S-Connection and PSA M-Connection systems.

PSA Connection Grout is supplied as a ready to use dry powder, which is to be added slowly in a controlled manner, to the predetermined amount of clean water, (relative to application) producing a flowing no shrink grout for gap thicknesses from 10mm up to 100mm.

PSA Connection Grout is a blend of Portland cement, graded fillers and chemical additives which impart controlled expansion in the plastic state whilst minimising water demand. The low water demand ensures high early strength. The graded filler is designed to assist uniform mixing and produce a consistent grout.

USES

PSA Connection Grout is a high strength grout suitable for the following applications:

- Grouting the PSA M-Connection
- Grouting of the PSA S-Connection
- General purpose high strength grouting
- Precast and dry packed grouting
- Grouting works for machine foundations, anchor bolts etc.
- Filling of cavities, gaps, recesses, etc.
- Grout projects requiring 100MPa compressive
- strengths
- Static load grouting
- Machine base plates
- Anchor bolting
- Bridge bearing pads
- Pre-cast concrete sections
- Shear Key Grouting

ADVANTAGES

- Easy to mix and apply
- Flowable consistency (according to mix)
- Trowel applied and ramming
- Rapid strength development
- Non-corrosive
- Non-toxic
- Iron and chloride free
- Shrinkage-compensated
- Good pumping properties

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APPROVALS / CERTIFICATES

Department of Main Roads Qld (TMR) 2019, Product Index for Bridges and Other Structures, Section 5. Registered and Conforming Products, 5.33 Repair Materials (Concrete) – Grouts

PRODUCT INFORMATION

Packaging	20 kg bag
Colour	Grey
Appearance	Pre-mixed powder
Shelf Life	12 months from the date of production
Storage Conditions	Store properly in original, unopened and undamaged sealed packaging in dry conditions at temperatures between +10 °C and +35 °C. Protect from direct sunlight.
Density	~2.2 kg/l (depending on consistency and temperature)
Maximum Grain Size	Dmax: 0.3 mm

TECHNICAL INFORMATION

NB_ Water/Powder Ratio used for the table 0.20 @ 20°C.

Compressive strength	45 MPa @ 1 day
In accordance with AS1012	75 MPa @ 7 days
	110 MPa @ 28 days
Time for expansion	
Start:	5 minutes
Finish:	2 hours
Fresh Wet Density	Approximately 2240 kg/cu.m, depending on the consistency used.
Expansion characteristics	An expansion of up to 1% overcomes plastic settlement in plastic material.
Expansion max 3.0% (Flowable consistency)	(AS 1478.2-2005 Appendix E)
	To gain the full benefit of expansion, place the grout within 20 minutes of
	mixing.
Setting Times AS1012	
Initial	240 minutes
Final	310 minutes

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APPLICATION INFORMATION

Preparation of 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.

Pre-soaking
For foundation use, the area of cleaned foundation should be flooded with fresh water several hours prior to application.

MIXING RATIO

Consistency	Relative to Litres of clean Water required per 20Kg Grout Bag.

These mix ratios are a guide and preliminary trials at local temperatures / humidity conditions are recommended.

Stiff	2.9
Plastic- Trowelable	3.0 - 3.2
Flowable	3.6 - 3.8 NOTE- M-Connection & S-Connection best suited 3.6 Litres/ bag.

In particular for PSA Connections, Err on the side of caution, where less water is best, however always ensure sufficient grout is prepared having a smooth flowable consistency, to ensure the connections may be filled in an even, continuous manner.

Layer thickness

Consistency	Thickness	
Stiff & Plastic	10 mm min. / 100 mm max.	
Flowable	10 mm min. / 50 mm max.	(Subject to consistency and constraints)

~Ambient air & substrate temperatures
+10 °C min. / +35 °C max.

Pot Life
30 mins approx.

CONSUMPTION
Yield

Plastic	Flowable
10 litres	11 litres

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APPLICATION STEPS_
MIXING

Place about 70–80 % of the premeasured clean water (depending on consistency required – refer to "Mix Ratio") into a clean container and gradually add the whole bag of PSA Connection Grout into it while continuously mixing. Add the remaining water until the desired consistency is obtained.

Mix for 5 minutes with a low speed drill (500 rpm max.).

For best results a mechanically powered grout mixer should be used. When quantities up to 40kg are used, a slow speed drill fitted with a high shear mixer is suitable. Larger quantities will require a high shear vane mixer. Do not use a colloidal impeller mixer.

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

APPLYING

M-Connection & S-Connection @ the flowable consistency.
Pour by use of a watercan or similar to provide for an even and continuous flow until the void is full.

After mixing, stir lightly for several seconds to release any entrapped air.
The grout may then be poured immediately into the prepared formwork.
When carrying out baseplate grouting, ensure sufficient pressure head is maintained for uninterrupted mortar flow. For formwork repair, the prepared formwork must be firmly in place and kept watertight.

When placing grout over a large area, it is important to maintain a continuous flow throughout. Work sequence must be properly organised to ensure an uninterrupted flow. In large areas, PSA Connection Grout may be pumped using heavy duty diaphragm pumps. Screw feed and piston pumps may also be used.

Specific Areas of Application;

PSA M-Connection	- pouring	Flowable consistency
PSA S-Connection	- pouring	Flowable consistency
Grouting under baseplate		Flowable consistency
Formwork grouting	- pouring method	Flowable consistency
Formwork grouting	- prepacked method	Flowable / Plastic consistency
Grouting anchor bolts		Plastic / Stiff consistency
Dry packed / Precast grouting		Stiff consistency

Grouting large volumes
For sections thicker than 100 mm, it is necessary to fill PSA Connection Grout with graded 10 mm silt free aggregates to minimise temperature rise generated during the curing stage. The quantity of aggregates should not exceed 1 part aggregates to 1 part PSA Connection Grout by weight. For such mixes, a conventional concrete mixer and pump may be used. To further ensure that air entrapped during mixing is allowed to fully escape, it may be necessary to make breather holes. Use steel rods or chains to assist the flow of grout where necessary. Preliminary trials are recommended.

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CURING TREATMENT
When formwork type repair is used, leave the formwork in place for at least 3 days.

Upon removal of the formwork, cure the exposed surfaces immediately with Antisol® curing compound or use other approved curing methods.

CLEANING OF EQUIPMENT
Clean all tools and application equipment with water immediately after use. Hardened or cured material can only be mechanically removed.

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