

# hints & tips



**PPC**  
**CEMENT**



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## PPC Cement Product Range

**PPC SureBuild CEM II 42,5 N - PPC SureBuild Cement 42,5 N** with extra strength is a premium general purpose cement for building, civil engineering work, and the manufacturing of cement-based products. PPC Surebuild Cement 42,5 N with extra strength makes 15% more concrete than regular 32,5 general purpose cements.



The composition of **PPC SureBuild Cement 42,5 N** varies with source factory and depends on the availability of suitable high quality extenders.

**PPC OPC CEM I 52,5 N - PPC OPC Cement 52,5 N** with extra strength is a portland cement, ideal for a range of applications in the readymix, construction, precast and concrete products manufacturing industries and where early strength is required. PPC OPC Cement 52,5 N with extra strength gives 15% more yield than regular cements. It is ideal for blending with fly ash, blastfurnace slag and Corex™ slag.



## Safety

- Do not stack loose bags more than 12 high.
- Do not stack palletised cement more than two pallets high.
- Pick up bags correctly in order to avoid back injury.
- Avoid contact with eyes, skin and clothing as cement and cement paste are highly alkaline and can cause severe chemical burns as well as skin irritation and dermatitis.

## Cement Storage and handling

Cement has a limited storage life when packed in bags. Bags are permeable to water vapour and will absorb moisture if exposed to rain and water. Portland cement is designed to react chemically with water and any exposure to moisture will cause it to set and harden. If cement starts to harden in the bags it should be discarded. The following steps will help to prolong the shelf life of cement.

- Store on pallets off the floor, preferably with a plastic sheet under the pallets.
- Stack close together to minimize air circulation.
- Keep the cement store doors and windows closed.
- Stack away from walls.
- Cover stacks with plastic sheet.

Handle bags carefully and do not walk on bags in order to reduce breakages and dust nuisance. In the event of problems with damp cement or excessive bag breakages contact your PPC sales consultant immediately.

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## Concrete, mortar, plaster and screed mixes

Mixes for concrete, mortar, plaster and sand-cement screeds are given on page 4. These mixes assume the use of good quality aggregates and general purpose cements. Crushed concrete stone from commercial sources is generally of suitable quality.

Sand sources are often highly variable and should be checked if in doubt. Common problems with natural sands include excessive clay or silts, presence of organic material (fertilizer, urine, sugars), presence of roots and seeds, poor particle size distribution leading to poor workability. The best guide to an aggregate's performance is its record of past performance.

Tap water is normally suitable for use as mixing water. Borehole and dam water should be checked before use. Sea water must not be used for any work of importance.

## PPC Surebuild Cement 42,5 N concrete mixes

Low strength concrete (10-15 MPa)			
Cement	Sand: Damp and bulked	Stone	Water
2 bags	4 x  260 litres	4 x  260 litres	60-65 litres
For 1m <sup>3</sup> of concrete you need 5,0 bags of cement, 0,70m <sup>3</sup> of sand 0,70m <sup>3</sup> of 19 or 13,2mm stone			

Medium strength Concrete (20-29 MPa)			
Cement	Sand: Damp and bulked	Stone	Water
2 bags	3 x  200 litres	3 x  200 litres	55-60 litres
For 1m <sup>3</sup> of concrete you need 6,4 bags of cement, 0,70m <sup>3</sup> of sand 0,70m <sup>3</sup> of 19 or 13,2mm stone			

High strength Concrete (30 to 35 MPa)			
Cement	Sand: Damp and bulked	Stone	Water
2 bags	2,5 x  165 litres	2,5 x  165 litres	46-50 litres
For 1m <sup>3</sup> of concrete you need 7,5 bags of cement, 0,70m <sup>3</sup> of sand 0,70m <sup>3</sup> of 19 or 13,2mm stone			

Mortar Quantities for Masonry*		
Cement	Lime	Sand: Damp and bulked
2 Bags	0-2 Bags	6 x
2 Bags	0-80 litres	400 litres
<i>Depending on wastage this is enough mortar to lay approximately:</i> <ul style="list-style-type: none"> <li>• 600 bricks or maxi bricks in a cavity or single leaf wall</li> <li>• 500 bricks or maxi bricks in a solid 230-mm wall</li> <li>• 600 hollow blocks (390x90x190)</li> <li>• 400 hollow blocks (390x140x190)</li> <li>• 300 hollow blocks (390x190x190)</li> </ul>		

- Concrete masonry units should be dry when laid.
- Clay masonry units with high water absorption should be wetted before laying.

\* NHBC guidelines

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## Plaster Quantities\*

Cement	Lime	Sand: Damp and bulked
2 Bags	0-2 Bags	6 x
2 Bags	0-80 litres	400 litres

*Depending on wastage this is enough plaster to cover approximately 20m<sup>2</sup> at a thickness of 15 - mm.*

- Do not allow plaster to dry out too quickly.
- Use up your mortar and plaster within two hours of mixing.
- You need builders lime in the mix if your sand lacks fine material.
- **Do not add gypsum based proprietary plasters (e.g. Crestestone or Rhinolite) to Portland cement plaster mixes.**

\* NHBRC guidelines

## Sand - cement Screed quantities\*

Cement	Sand: Damp and bulked
2 Bags	3 x
2 Bags	200 litres

*For 1m<sup>3</sup> of screed you need 11 bags of cement and 1,1m<sup>3</sup> of damp , bulked sand*

- Sand-cement floor screeds are for light duty applications only. They are not suitable for use in workshops, factories and other heavily trafficked areas.
- For heavy-duty applications a 30 MPa concrete topping or a granolithic topping should be used. For a true granolithic mix, replace at least half of the sand with 6,7 or 9,5 mm single - sized stone.
- Enough water should be added to sand - cement screed mixes to make the mix workable enough to be fully compacted .

It is very poor practice to make a dry screed mix and finish the top surface with cement-water slurry. The cement rich top layer soon starts to crack and delaminate.

\* NHBRC guidelines

## Batching and mixing materials

Consistent batching and uniform mixing are essential to achieve concrete of consistent quality. Generally speaking, in the retail cement market, materials are batched by volume and mixed by hand or in relatively small mechanical mixers. The following points are therefore relevant:

- One bag of cement has volume of 33 litres (0,033m<sup>3</sup>).
- One builder's wheelbarrow, filled level to the top, has volume of 65 litres (0,065m<sup>3</sup>). One wheelbarrow is therefore equivalent to two bags of cement by volume.
- Sand bulks in volume when damp. The mix designs on the following pages are based on the use of damp bulked sand. If your sand is dry, reduce the amount of sand batched by 20 to 25 % . For example batch 175 litres of dry sand for the low strength concrete mix rather than 230 litres of damp sand. The mix yield will be the same but you will need to add more water to the mix to compensate for the lack of water in the sand.
- Stones do not bulk in volume and no correction for stone volume or water content is necessary.
- Do not split bags when batching except for small or unimportant work.
- Use a concrete mixer or hand mix on a dry, clean, non-absorbent surface.
- When mixing concrete by hand, first mix the cement, sand and water thoroughly and mix in the stone last - this saves a lot of effort.
- Mix until the colour and workability of the mix are uniform.
- Add enough water to make the mix plastic and workable. Too little water will make the mix difficult to compact and too much water will weaken the mix.

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## Transporting, placing and compaction

- Concrete must be transported from the mixer in such a way as to avoid contamination, loss of paste and segregation.
- Concrete should be placed as near as possible to its final resting place.
- Concrete must be compacted to remove trapped air, which weakens the concrete.
- Concrete may be compacted using hand tools or with mechanical vibrators.

## Curing of Concrete

- Concrete gains strength over a period of time by means of chemical reactions between the cement and the mixing water. These reactions are called “hydration”.
- If the concrete is allowed to dry out, hydration will stop and the concrete will not reach its potential strength.
- Curing concrete means to protect it from drying out and is best done by keeping the concrete wet for as long as possible. In practise the first three days of wet curing are the most important.

## Simple test for sand quality

- Weight out 5 kg of dry sand and 1 kg of cement. Measure out 1litre of water and two further separate volumes of water, one of 200ml and one of 300ml
- Mix the sand, cement and 1 litre of water. If the mix is plastic and workable the sand is good quality. If not :
  - Mix in 200ml water. If the mix is plastic and workable the sand is average quality. If the mix is still not workable, mix 300ml of water. If the mix is now workable, the sand quality is poor and it should only be used for unimportant work.
  - If the mix is still not workable the sand is unsuitable for mortar and plaster.
  - Sand - Cement floor screeds are for light duty applications only. They are not suitable for use in workshops, factories and other heavily trafficked areas.

## Handy Contacts

Company	Telephone	website
PPC Cement helpline PPC Cement (head office)	0800 023 470 011 386 9000	www.ppc.co.za
<b>PPC Cement Sales Offices:</b>		
Gauteng	011 626 3150	
Cape Town	021 550 2100	
Port Elizabeth	041 486 2272	
George	044 871 3024	
Nelspruit	013 741 4140	
Polokwane	015 297 2503	
Rustenberg	014 547 0100	
Pietermaritzburg	033 386 6171	
PPC Botswana(Gaborone)	00 267 390 1553	
PPC Zimbabwe (Bulawayo)	00 263 979 241	
Cement and Concrete institute	011 315 0300	www.cnci.org.za



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Visit our website at: <http://www.ppc.co.za>

For more advice on cement please ask your PPC Cement stockist or call the PPC toll-free help line 0800 023 470 (SA only).

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