

DuraPozz®

Product information sheet

Internationally recognised as a high quality fly ash, DuraPozz® has become the first choice cement enhancer in South Africa for its ability to improve the performance of fresh and hardened concrete.



AshResources
Fly ash products

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Overview

DuraPozz® complements the properties of Portland cement in almost every application. Its major use is as an enhancer (or partial replacement) for cement in concretes and mortars. The ability of DuraPozz® to improve the technical properties of hardened concrete makes it the preferred enhancer for concretes used in aggressive conditions. Consultants and engineers have recognised this, with the result that DuraPozz® has been specified for and successfully used in some of the most important civil and building structures in southern Africa and other parts of the world. For general purpose construction applications, DuraPozz® is widely employed for the enhanced workability it imparts to a concrete mix.

The Classification process

DuraPozz® is a classified fly ash. This refers to its production in specialised air-separation classifier equipment to meet specified size ranges.

How DuraPozz® works

There are three main properties of DuraPozz® which give the product its unique characteristics:

- A spherical particle shape
- Very fine particle size
- Pozzolanic reactivity

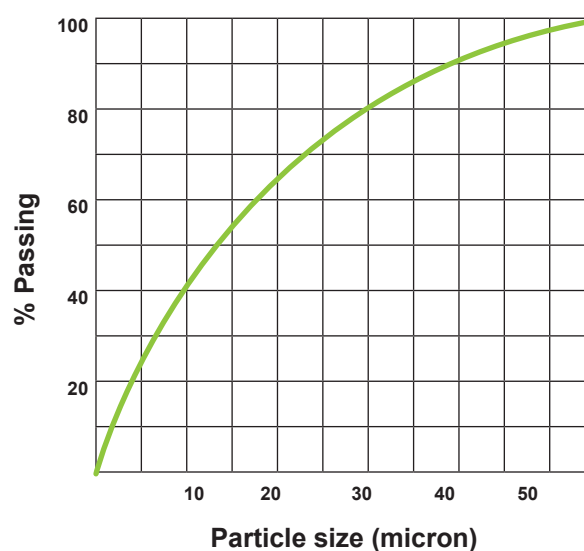
The spherical shape of DuraPozz® improves workability when blended with cement particles, which are angular in shape. This property improves compaction and greater densities are achieved with DuraPozz® concrete. The fine DuraPozz® particles displace water between the cement particles and act as hydration sites for the cement, stimulating early strength development and improving the pore structure. This physical reaction is called the "Fine Filler Effect".

The SiO₂ in DuraPozz® forms stable cementitious calcium silicate hydrate compounds (C-S-H) in reaction with the calcium hydroxide released during the hydration of cement. In the presence of water, this Pozzolanic reaction can continue for a considerable period of time and results in the higher long-term strength of DuraPozz® concrete.

Typical chemical composition %	
Silicon (SiO ₂)	47 - 57
Aluminium (Al ₂ O ₃)	25 - 40
Iron (Fe ₂ O ₃)	3,0 - 4,5
Manganese (Mn ₂ O ₃)	0,1 - 2,0
Calcium (CaO)	4,0 - 10,0
Magnesium (MgO)	0,5 - 2,5
Phosphorus (P ₂ O ₅)	0,5 - 1,0
Potassium (K ₂ O)	0,5 - 1,0
Sodium (Na ₂ O)	0,2 - 0,8
Titanium (TiO ₂)	1,0 - 2,0
Sulphur (SO ₃)	0,1 - 0,6
Loss On Ignition (LOI)	< 2,0

Quality: DuraPozz® complies with the chemical and physical requirements of SANS 50450 -1, Category S. Consistent quality is the core value at Ash Resources and has secured the company the right to use the SABS mark on its products.

Typical particle size distribution



Concrete pour on the De Hoop Dam project.



Benefits

Concrete incorporating DuraPozz® has the benefits of:

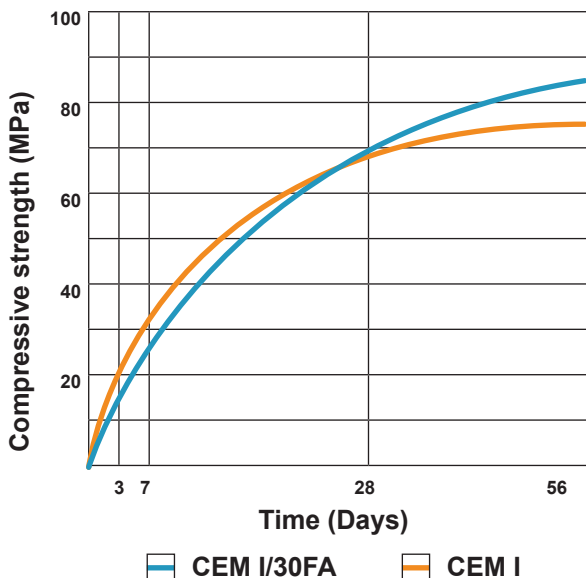
- Improved workability
- Reduced permeability
- Reduced heat of hydration
- Improved pumpability
- High sulphate resistance
- Inhibited alkali aggregate reactivity
- Increased long-term strength
- Increased resistance to chloride induced corrosion
- Better concrete finish
- Reduced shrinkage
- Reduced CO₂ footprint
- Improved aesthetics
- Better performance of mortars and concretes
- Low LOI - particularly low carbon

One of the most noticeable aspects of DuraPozz® concrete is its surface finish. The lack of unsightly “blow-holing”, sand runs or signs of segregation are features of concrete containing DuraPozz®. This can lead to considerable cost savings, through negating the need to rub-down or repair off-shutter or precast concrete.

Concretes and mortars are more dense when DuraPozz® is included. Water penetration is therefore less and the finished products are more durable, even when exposed to attack by sea water and other harsh conditions.

A benefit of the chemical reactivity of DuraPozz® is the reduction, or even elimination, of the damaging reaction between certain reactive aggregates and the alkaline products of cement hydration.

Strength development of CEM I/30FA concrete vs CEM I



The strength development of a 30% DuraPozz® mix is comparable with that of ordinary cement mixes at early ages and at 28 days. However, the key difference is that, with DuraPozz®, strength continues to develop in the long term if water is present.

As a result, concretes containing high contents of DuraPozz® can be designed for 56 day strength which, in turn, offers improved economies.

Service

DuraPozz® is supported by the resources of Afrimat’s SANAS accredited materials laboratory. Ash Resources offers its customers a mix design service, technical guidance and on-site support in all aspects of quality assurance.

DuraPozz® is firmly established as a prime component of quality cement blends marketed by major South African cement manufacturers. Backed by the company’s commitment to providing world-class technical service, Ash Resources also supplies DuraPozz® to a wide range of concrete industry customers. These include:

- Precast concrete manufacturers
- Ready-mixed concrete producers
- Site-mix concrete production in both the civil and building sectors
- Mining industry, in particular grout packs and wet-sprayed concrete for underground support

Complementing the technical service to these sectors is Ash Resources’ customised supply logistics to back up the performance demands placed on its customers.

Health & Safety: For information on Health & Safety please consult the Material Safety Data Sheet for this product. Copies are available on request.



Ash Resources’ classification plant.



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