

Pigmented Concrete

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CHRYSO® Solutions

Additional CHRYSO® products for pigmented concrete

■ CHRYSO®Fibre Plus

CHRYSO®Fibre Plus controls and reduces plastic shrinkage and plastic settlement cracks. It also greatly improves the surface quality of concrete by reducing the amount of bleed. Excessive bleeding on the surface can cause the colour to fade and make the concrete porous.

Furthermore, **CHRYSO®Fibre Plus** assists in the efficient hydration of cement and improves the bonding of the cement matrix, achieving a more durable concrete surface that is abrasion resistant. (Concrete that is not abrasion resistant wear rapidly and eventually reveals aggregate that is not the same colour of the pigmented concrete).

■ CHRYSO®Superplasticers

The **CHRYSO®Fluid Optima** range (for readymix) and the **CHRYSO®Fluid Premia** range (for precast) assists in the homogenous dispersion of pigments throughout the concrete mix.

■ CHRYSO®Dem Aqua 100

An ideal mould release agent for concrete manufacturers with stringent quality surface requirements, **CHRYSO®Dem Aqua 100** creates a consistent, smooth and blemish free concrete surface that has reduced blow holes and reduced dusting of mould surfaces. It does not leave stains on the concrete and is particularly suited to the production of architectural and decorative concrete.



BUS RAPID TRANSIT (BRT) – CAPE TOWN

CHRYSO Southern Africa (Pty) Ltd.
Gauteng (Head Office):
26 Malcolm Moodie, Crescent, Jet Park
T: +27(0)11 395 9700 | F: +27(0)11 397 6644 | W: www.chryso.com
Sharecall facility: 0861 CHRYSO

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Application features

A number of factors can influence the shade, brightness and consistency of colour in concrete:

■ Cement

Portland cement can vary significantly in colour – from light grey to dark grey. This change in colour can in turn influence the final colour of the pigmented concrete. Therefore, when making large quantities of pigmented concrete, it is extremely important to use the same cement throughout production. In order to produce pigmented concrete with great colour clarity, especially when using bright colours, it is advisable to use white cement. The higher the cement content, the more intense the colour as the less diluted the pigment becomes with water and aggregate.



■ Aggregates

Like Portland cement, the colour of aggregates also has an influence over the ultimate colour of pigmented concrete. It is important to make sure that the entire surface area of the aggregate is coated with the pigmented cement paste so that the final product is not a mixture of the colour of the pigment and the colour of the aggregate.

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■ Mixing water

Water dilutes the colour of the pigments in the mix. Furthermore, excess water evaporates from concrete and leaves behind pores. These pores scatter incident light and lighten the colour of the pigment. Excess water in a mix design can cause excessive bleeding and a non-uniform colour. It is important to monitor the mixing water very carefully in order to prevent colour fluctuations within a production line.

■ Formwork

The type, colour and condition of formwork can influence surface colour. Formwork with different rates of absorption will create surfaces with different shades of colour. Absorption discoloration can also occur when the release agents are not applied uniformly. Formwork that pulls away from the concrete surface or has leaky joints can cause uneven water loss from the concrete can cause a streaky surface.

■ Dispersion

In order to ensure the homogenous dispersion of a pigment through the concrete mix, it is important to mix the pigment with the aggregate before the cement is added. From then on the mixing process is the same as un-pigmented concrete. Mixing time also has a direct impact on the dispersion of concrete.

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■ Temperature during curing

In higher temperatures, fine crystals develop in the cement matrix. These crystals determine how the light that falls onto the concrete is scattered. Therefore – the smaller the crystals, the lighter the pigment in the concrete.

■ Efflorescence

Efflorescence is the result of free lime formed when the cement sets that, dissolved in the mixing water (primary efflorescence) or in external water such as rain or dew (secondary efflorescence), migrates through capillaries in the concrete matrix to the surface. There it reacts with carbon dioxide in the air to form insoluble calcium carbonate on the surface of the concrete product. These unsightly white deposits on coloured concrete are far more noticeable than on un-pigmented concrete.

Care should be taken when using admixtures with high levels of calcium chloride as this can result in primary efflorescence. The more impermeable the concrete, the less likely efflorescence will appear.

CHRYSO® has a large product offer pigmented concrete

■ Bayferrox Pigments

CHRYSO is the sole distributor of Lanxess inorganic iron oxide Bayferrox pigments for the construction industry in Southern Africa. All Bayferrox pigments are UV-stable and comply with EN 878 (The use of pigments for colouring building materials), and ASTM C 979 (Pigments for integrally coloured concrete). Due to Lanxess's factory production controls and the resulting certification, all Bayferrox pigments have the CE mark on their packaging.

CHRYSO has a colour laboratory that houses sophisticated equipment like a Colourimeter that measures the colour strength of pigmentation quantitatively. The colour laboratory helps to provide specifications to colour-match available concrete masonry production lines at competitive rates.

■ CHRYSO®Pareflo 20

This admixture is an efflorescence reducing water repellent

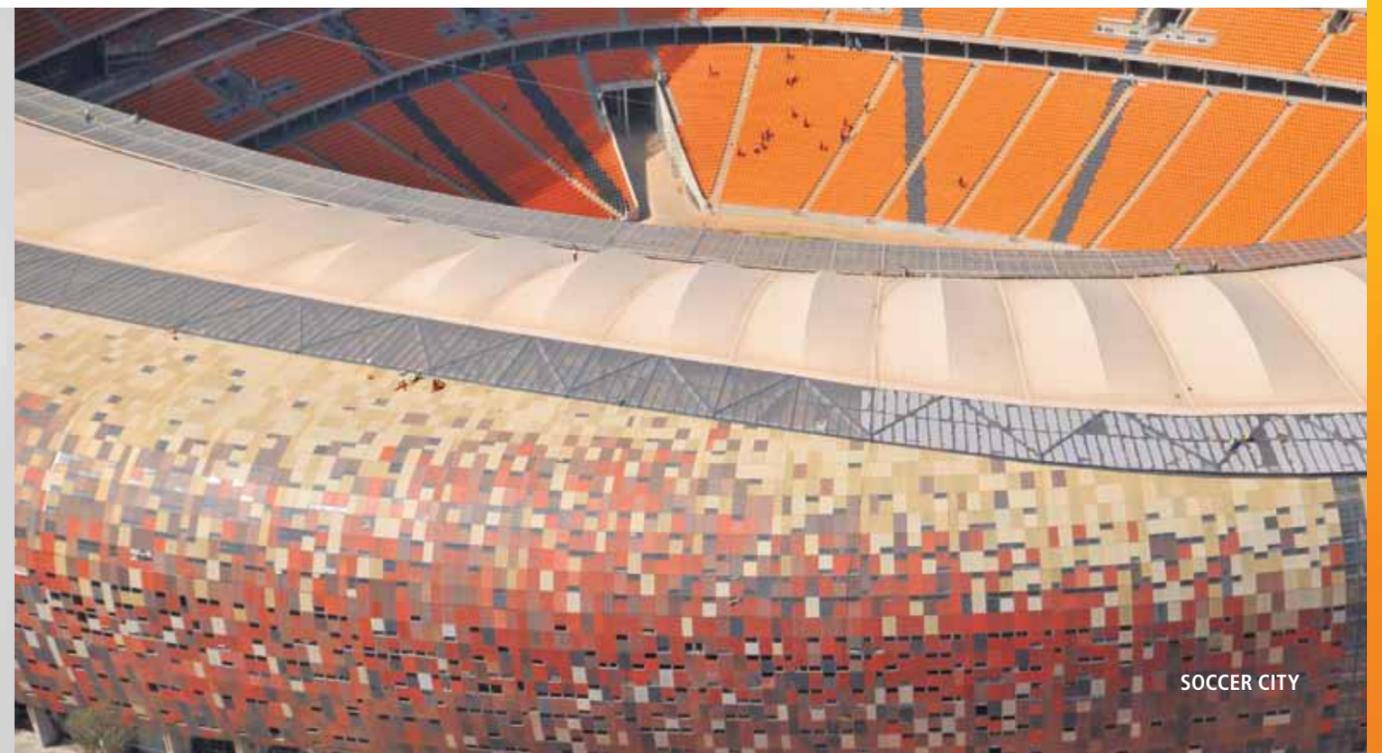
that reacts with the cement matrix, creating a polymer network that fills the capillary holes in concrete. This therefore prevents efflorescence because the soluble salts cannot travel through the capillaries and they cannot crystallise as they do not come into contact with air. As an additional advantage, **CHRYSO®Pareflo 20** limits the colour variations of concrete and assists in producing a richer colour in the concrete.

■ CHRYSO®Colour Flash D

This product is a chloride-free admixture (thus reducing the occurrence of efflorescence) that is used in dry concrete (commonly for the prefabrication of paving blocks and kerbs). Its primary function is to provide colour stability and it also facilitates in the improvement of mould filling, with higher compressive strengths and impermeability.

Project References

- Bus Rapid Transit (BRT) – Cape Town
- Soccer City - Johannesburg



SOCCER CITY