TARMAC
A CRH COMPANY

TECHNICAL INFORMATION

TOPTINT (DECORATIVE)

Contractor Guideline Toptint Decorative
Toptint coloured concrete is a proven product with an excellent track record.

PRODUCT DESCRIPTION

There are many factors that can affect the final colour of Toptint;

- Cement / combination colour – the shade of all UK cement sources vary considerably. Our colour chart is based on a mid grey CEM I. If Cement is blended with PFA the shade will darken and if blended with GGBS the shade will lighten
- Fine aggregate colour / silt content colour – this will tend to affect the lighter shades of Toptint
- Water : cement ratio - all other things being equal, the higher the water content, the lighter the colour will be. The supply of concrete at a consistent slump is critical. Water should not be added on site to take the concrete over the specified slump
- Re-tempering concrete at a later time or part way through the load – this should be avoided at all costs

Bearing these factors in mind, every effort can be made to ensure colour uniformity by following a few key processes and procedures;

- Accurate batching of materials
- Consistent raw materials
- Colour introduced early in the production cycle to ensure thorough load consistency
- Use of fresh water only
- Site preparation completed prior to the arrival of concrete on site ensuring immediate placement
- Uniform finishing by the contractor
- Please note that the Toptint colour chart is intended to provide an indication only of the colours available. As Toptint uses naturally occurring materials, the exact shade and finish achieved may vary. Please speak to your local representative who will be able to advise further.

CONTRACTOR GUIDELINES

It is too often assumed that once the concrete has been mixed nothing else can affect the colour, however, the way the concrete is handled on site will dramatically affect the finished colour. There are two general methods of finishing - concrete flatwork finished with tools and concrete in forms and complying with ISO 9001 management systems.

CONCRETE FLATWORK FINISHED WITH TOOLS

It is generally more difficult to achieve a consistent colour with flat work as the finishing and the curing are often more variable. The following guidelines should be followed;

- Trowel concrete at least twice leaving a suitable interval between trowel applications
- When hand trowelling concrete, always do so in the same direction - this ensures the particles are aligned in the same way and therefore reflect light evenly. This gives the appearance of a consistent colour. Think about this in the same way as brushing carpet pile but the effect can only be seen in concrete once it has hardened
- Never add water to the surface or allow further water onto the surface of the concrete after it has been finished as this will cause light spots or even efflorescence (calcium carbonate - chalk -deposited on the surface)
- Only commence brush finishing when the concrete has lost its sheen - brushing too early may allow bleed water to collect in the troughs giving rise to efflorescence staining.

POWERFLOATING

Power-floating is different as the concrete is harder when trowelled thus providing a finer finish where trowel marks are less visible.

- Cure the concrete with a non staining curing compound - this may need to be applied twice. Failure to cure the concrete properly is more likely to result in a weaker colour and surface and potentially efflorescence
- Ensure that curing conditions are as consistent as possible – changes in curing conditions are the most likely source of varying colour in the finished surface. Changes in humidity, temperature and wind speed will also contribute to changes in colour but using a curing agent will limit this effect.

CONCRETE IN FORMS

It is advised that the following guidelines are followed when working with concrete in forms.

- Ensure that formwork is completely clean stains on the forms will transfer to the concrete
- Ensure that forms are leak free as grout loss is unsightly. Leaks will also cause movement of grout during the pour giving rise to darker staining
- Grout prime timber shutters that are being used for the first time
- Be aware that smoother shutters will produce a lighter shade as do less absorbent shutters. Rougher textured and more absorbent shutters will produce a darker shade
- Apply release agents in sufficient time to allow them to dry before concrete is placed - release agents have a dramatic effect on the quality of the finish achieved (please refer to Tarmac technical team for advice on these)
- Place concrete at a steady rate and vibrate evenly
- Implement similar curing times and conditions – this is essential for colour uniformity, particularly in the first 24 hours
- Leave concrete to cure with the forms still in place – this is the most efficient method
- Be aware that naturally higher grade mixes will mature more quickly and may be less variable
- Be aware that longer curing times and more efficient curing produce darker shades.

WHAT IS EFFLORESCENCE AND WHAT CAUSES IT?

Efflorescence occurs with all concrete and is the most frequent problem that contractors face with coloured concrete. As the surface finish isn't always so important with 'plain' concrete, it doesn't tend to be an issue but as this is not the case with coloured concrete, it causes more concern.

Efflorescence is caused when soluble salts and other water dispersible materials come to the surface of concrete and mortars. It is induced by low temperatures, moist conditions, condensation, rain, dew and water added to the surface of fresh concrete to assist trowelling. It can occur very soon after exposure to moist or cool conditions or gradually, especially when it comes from within the concrete or from the subgrade. Efflorescence is normally white and is more obvious on darker colours than with a white or light grey because of the contrast in colour.

Any material containing portland cement results in efflorescence. The most frequent reaction occurs when calcium hydroxide (lime) formed in the hydration reaction of portland cement is transported by water to the surface through capillaries in the concrete. There it combines with carbon dioxide from the air to produce calcium carbonate (an insoluble material) and water. However, efflorescence can also be caused by hydroxides and sulphates of either sodium or potassium, which are much more soluble in water than calcium. These salts which can come from cement, aggregates, water, or admixtures, create efflorescence more rapidly than calcium hydroxide.

REDUCING THE CHANCE OF EFFLORESCENCE

There are a couple of actions you can take to reduce the possibility of efflorescence;

- Use a cement replacement like PFA or GGBS - these can lock up significant amounts of calcium hydroxide in the concrete
- Apply a sealer / coating as soon as the surface is clean and dry - the efflorescence reaction is driven by water from above or below the slab. Only vapour barriers can prevent the movement of moisture from the sub-grade to the surface of a slab. Sealers and coatings can prevent surface water from penetrating slabs.

For more details contact
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