



# Plasticiser and Super Plasticiser

*- The Difference Explained*

**ARMCON**  
CERTAINTY. IN CONCRETE

## Overview (Super Plasticiser)

A wide range of admixtures is available to the pre-cast industry today but their use is often misunderstood or, worse still, ignored altogether when in fact, the use of super plasticiser should be automatic in today's pre-cast works.

Super plasticiser will improve quality, strength, profitability and consistency. Used in the correct way it will always be cost positive and show a measurable improvement in profitability. Super plasticiser offers a number of significant benefits to the pre-caster and one of the most important is the ability to reduce cement contents.

More effective use of cement results in increased strength allowing a reduction in cement content. Have a look at the following diagrams which illustrate how super plasticiser achieves this.

### Without super plasticiser/ plasticiser

Here we see the cement particles do not disperse and are only partly wetted when they mix with the water. As you can see the red area has no water/cement contact at all and will not fully hydrate the cement.

### With super plasticiser

With the addition of super plasticiser the cement particles are dispersed allowing the later to coat the whole of each particle ensuring complete hydration resulting in increased concrete strength.

Water

Cement Particles

Cement

Particles

Water

*The economics speak for themselves:*

Say you're using a 300kg/m<sup>3</sup> cement content to achieve a 28 day strength of 35 N/mm<sup>2</sup>.

Cement cost **£24.60** at £82.00/ton If you used super plasticiser you could expect a 30% increase in strength giving 45.5N/mm<sup>2</sup> or an extra 10N/mm<sup>2</sup> strength.

Typically we need to use 6kgs cement per 1N/mm<sup>2</sup> strength gain so the 10N/mm<sup>2</sup> we have gained is equivalent to 60kgs cement (6kgs x 10).

It follows that we could safely reduce the cement content to say 240kgs/m<sup>3</sup>

Cement cost **£19.68** at £82.00/ton = **£4.92 saving in cement.**

To do this you would add 0.9 litres per 100kg cement.

The cost of admix is £3.91/m<sup>3</sup> to do this **making a saving of £1 per m<sup>3</sup> concrete.**

## Super Plasticiser Benefits

- 15%-40% water reduction.....*increased strength*
- Low water/cement ratios possible.....*mix compliance*
- Easier mould filling.....*reduced labour costs/increased production*
- Better finish.....*higher product quality/increased sales*
- Reduced blowholes.....*higher quality/no making good/no rejects*
- Reduced vibration.....*faster production/reduced H&S problems*
- Brighter colours.....*reduced pigment cost/more consistent colour*
- High early strength.....*reduced breakages/earlier de-mould*
- Higher 28 day strength.....*potential cement savings*
- Bleed water reduction.....*higher quality/increased sales*
- Reduce segregation.....*mix consistency*
- Increased density.....*improved strength/less handling damage*
- Improved durability.....*higher quality/longer life*
- Self compacting concrete..... *reduced production costs/less equipment*
- Reduced wear and tear on your mixer.....*reduced maintenance*

## Overview (Plasticiser)

### Plasticiser Benefits

- Improved strength gains up to 25% in first 24 hours
- Improved durability
- Increased density
- Less permeability
- Brighter colours
- Improved colour dispersion
- Improved ease of placing
- Recommended dose for use as water reducer is 200ml/100kg cement
- Recommended dose for use as retarder is 400ml/100kg cement
- Much improved surface finish (fewer blowholes)
- Chloride free for use with reinforced products
- Reduced segregation and bleed water effect
- Out performs other products requiring up to 60% less dosage per 100kg of cement

## What is the Main Difference between the two?

Plasticiser tends to be cheaper, but if you overdose it retards the mix, this is great in summer if you need it, and can be easily avoided if producing a standard mix. So its ideal for use in a precast works where the same mixes are used time and time again.

If your mixes vary then make sure to use a super plasticiser, this will ensure that you get the benefits of the plasticiser just without the retardation. Using a super plasticiser it is

impossible to overdose.