

High performance superplasticising admixture

Uses

- To provide excellent acceleration of strength gain at early ages and major increases in strength at all ages by significantly reducing water demand in a concrete mix.
- Particularly suitable for precast concrete and other high early strength requirements.
- To significantly improve the workability of site mixed and precast concrete without increasing water demand.
- To provide improved durability by increasing ultimate strengths and reducing concrete permeability.
- In screeds it reduces the water content required to give suitable workability for placing and compaction.

Advantages

- Major increases in strength at early ages without increased cement contents are of particular benefit in precast concrete, allowing earlier stripping times.
- Makes possible major reductions in water:cement ratio which allow the production of high strength concrete without excessive cement contents.
- Use in production of flowing concrete permits easier construction with quicker placing and compaction and reduced labour costs without increasing water content.
- Increased workability levels are maintained for longer than with ordinary sulphonated melamine admixtures.
- Improved cohesion and particle dispersion minimises segregation and bleeding and improves pumpability.
- Chloride free, safe for use in prestressed and reinforced concrete.
- In screed material, the lower water content leads to quicker drying times

Standards compliance

Conplast SP430 complies with BS 5075 Part 3 and with ASTM C494 as Type A and Type F.

Description

Conplast SP430 is a chloride free, superplasticising admixture based on selected sulphonated naphthalene polymers. It is supplied as a brown solution which instantly disperses in water.

Conplast SP430 disperses the fine particles in the concrete mix, enabling the water content of the concrete to perform more effectively. The very high levels of water reduction possible allow major increases in strength to be obtained.

Technical support

Fosroc provides a technical advisory service for on-site assistance and advice on admixture selection, evaluation trials and dispensing equipment. Technical data and guidance can be provided for admixtures and other products for use with fresh and hardened concrete.

Typical dosage

The optimum dosage of Conplast SP430 to meet specific requirements should always be determined by trials using the materials and conditions that will be experienced in use. This allows the optimisation of admixture dosage and mix design and provides a complete assessment of the concrete mix. Starting points for such trials, based on the primary use of the product, are to use a dosage within the normal typical ranges.

For high strength, water reduced concrete the normal dosage range is from 0.70 to 2.00 litres/100 kg of cementitious material, including PFA, GGBFS and microsilica. For high workability concrete the normal dosage range is from 0.70 to 1.30 litres/100 kg of cementitious material.

Where a combination of performance is required, such as some increase in workability combined with a reduced water content, then the whole range of dosages from 0.70 to 2.00 litres/100 kg of cementitious material can be considered.

Use at other dosages

Dosages outside the typical ranges quoted above may be used if necessary and suitable to meet particular mix requirements, provided that adequate supervision is available. Compliance with requirements must be assessed through trial mixes. Contact the Fosroc Customer Service Department for advice in these cases.

Properties

Appearance:	Brown liquid
Specific gravity:	Typically 1.20 at 20°C
Chloride content:	Nil to BS 5075
Air entrainment:	Typically less than 2% additional air is entrained at normal dosages.
Alkali content:	Typically less than 72.0 g. Na ₂ O equivalent/litre of admixture. A fact sheet on this subject is available.

Instructions for use

Mix design

Where the primary intention is to improve strengths, initial trials should be made with normal concrete mix designs. The addition of the admixture will allow the removal of water from the mix whilst maintaining the workability at the levels obtained before the use of the admixture. After initial trials, minor modifications to the overall mix design may be made to optimise performance.

Where the primary intention is to provide high workability concrete, the starting mix design should be one suitable for use as a pump mix. Advice on mix design for flowing concrete is available from the Fosroc Customer Service Department.

In correctly designed flowing concrete, the improved dispersion of the cement particles and the more efficient use of mixing water will improve mix cohesion. The slight air entrainment obtained with Conplast SP430 will also help to minimise bleed and segregation. After initial trials, minor modifications to the mix design may be made to optimise performance.

Compatibility

Conplast SP430 is compatible with other Fosroc admixtures used in the same concrete mix. All admixtures should be added to the concrete separately and must not be mixed together prior to addition. The resultant properties of concrete containing more than one admixture should be assessed by the trial mix procedure recommended on this data sheet to ensure that effects such as unwanted retardation do not occur.

Conplast SP430 is suitable for use with all types of ordinary Portland cements and cement replacement materials such as PFA, GGBFS and silica fume.

Dispensing

The correct quantity of Conplast SP430 should be measured by means of a recommended dispenser. Normally, the admixture should then be added to the concrete with the mixing water to obtain the best results. Where high workability concrete is required from normal workability concrete delivered to site, Conplast SP430 may also be added to concrete in the drum of a readymix truck. Full blending of the admixture and the concrete should be ensured by mixing in the truck drum at high speed for a period of at least two minutes.

Contact the Fosroc Customer Service Department for advice regarding suitable equipment and its installation.

Effects of overdosing

An overdose of double the intended amount of Conplast SP430 will result in an increase in retardation as compared to that normally obtained at the intended dosage. This effect is found with most water reducing admixtures, although the degree may vary. Retardation is affected by factors other than the admixture, depending on the mix details and conditions involved. Trials to assess the effects in a particular mix are strongly recommended if this aspect is of particular importance. Provided that adequate curing is maintained, the ultimate strength of the concrete will not be impaired by increased retardation and will generally be increased. The effects of overdosing will be further increased if sulphate resisting cement or cement replacement materials are used.

Overdosage may also cause increased air entrainment, which will tend to reduce strength. The degree of this effect will depend on the particular mix design and overdose level.

An overdose will greatly increase the plasticising effect of the admixture. As concrete is normally batched to a target workability, increased plasticising will allow an increased water reduction. This will have the effect of increasing ultimate strength and partially or fully offsetting the effect of any increased air entrainment. If no increase in water reduction is taken and a significant rise in workability is allowed there is a strong possibility of mix segregation. Increased initial workability will tend to extend the working life of the concrete, which will delay finishing and stiffening times to some extent.

Curing

As with all structural concrete, good curing practice should be maintained, particularly in situations where an overdose has occurred. Water spray, wet hessian or a Concure* spray applied curing membrane should be used.

Typical performance examples

Many variables in concreting materials and conditions can affect the selection and use of an admixture. Trials should be made using relevant materials and conditions in order to determine the optimum mix design and admixture dosage to meet specific requirements.

Typical performance examples from evaluation studies of Conplast SP430 are included on this data sheet. The values quoted are representative of results obtained and are provided as illustrations of performance in different situations. Because of the variability of concreting materials, the results should only be taken as typical of the performance to be expected. Results quoted in individual

examples should not be taken as necessarily directly comparable with other examples given here or results obtained elsewhere for Conplast SP430 or other products.

Unless otherwise specified, all testing was carried out to the relevant parts of applicable British Standards.

Example 1: Laboratory testing for water reduction and workability increase, gravel aggregates

Mix	Dosage litre/100 kg	Cement content kg/m ³	W/C ratio	Slump mm	Compressive strength N/mm ²		
					1 day	7 day	28 day
Control	-	300	0.69	80	9.5	25.0	36.0
Conplast SP430	1.80	300	0.52	75	17.0	40.0	49.0
Control	-	300	0.69	75	-	29.5	38.0
Conplast SP430	1.00	300	0.69	collapse	-	27.5	38.0

Example 2: Laboratory testing with microsilica addition and gravel aggregates

Mix	Dosage litre/100 kg	OPC/microsilica kg/m ³	W/C ratio	Slump mm	Compressive strength N/mm ²		
					1 day	7 day	28 day
Control	-	325/0	0.52	85	21.5	41.5	53.5
Conplast SP430	1.20	325/0	0.43	210	35.7	60.5	72.5
Control	-	310/15	0.53	85	22.0	43.0	60.5
Conplast SP430	1.20	310/15	0.41	135	40.0	69.0	86.5
Control	-	300/30	0.56	75	18.5	39.0	57.5
Conplast SP430	1.20	300/30	0.39	80	40.0	72.0	94.0

Limitations

If alkali reactive aggregate must be used Conplast SP430 may contribute an undesirable level of alkali to the mix. Contact the Customer Service Department for advice in these situations.

Estimating – packaging

Conplast SP430 is available in 20 litre drums or bulk supply. For larger users, storage tanks can be supplied. Details of specific packaging volumes are available on request.

UN packaging regulations

To comply with current regulations, all products of a hazardous nature that are involved in a sea crossing as part of the delivery requirements must be packed in United Nations Approved receptacles.

When a known sea crossing is involved, whether local to the United Kingdom or for export worldwide, Fosroc will supply in the correct UN packaging. Where Fosroc are only requested to deliver within the United Kingdom mainland, but the purchaser intends to ship on, it is incumbent on the purchaser to specify that UN packaging is required at the time of placing the order. Otherwise, once delivery is received, the responsibility is that of the purchaser.

The use of UN packaging may affect the selling price of products. Refer to the local Fosroc office or representative.

Conplast SP430

Storage

Conplast SP430 has a minimum shelf life of 12 months provided the temperature is kept within the range of 2°C to 50°C. Should the temperature of the product fall outside this range then the Fosroc Customer Service Department should be contacted for advice.

Freezing point: Approximately -2°C

Precautions

Health and safety

For further information consult the Material Safety Data Sheet available for this product.

Fire

Conplast SP430 is water based and non-flammable.

Additional information

Conplast SP430 was previously known as Conplast 430.

* See separate data sheet

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