



Clean Wave

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Concrete Solutions Datasheet

POLYPROPYLENE FIBRE CONCRETE

With Circular Clean-Wave Readymix you can be assured of getting the best range of concrete solutions, specifically designed to high specifications for various end uses. Polypropylene Fibre Concrete is versatile and can be used in most applications.

Polypropylene fibre (short-cut strands of very fine denier monofilament*) is added to the concrete during batching.

Thousands of individual fibres are then evenly dispersed throughout the concrete during the mixing process creating a matrix-like structure.

*fibrillated fibres can also be supplied on request.



Applications

- Most small builder, cash sales and DIY applications
- 3D Concrete Printing
- Internal floor-slabs (retail stores, warehouses, etc.)
- External slabs (driveways, yards, etc.)
- Agricultural applications
- Roads, pavements, driveways, kerbs
- Shotcrete; thin section walling
- Overlays, patch repair
- Water retaining structures, marine applications
- Security applications such as safes and strongrooms
- Deep lift walls

Features and Benefits

Plastic state advantages

The addition of fibres helps to maximise the intrinsic early strength of the concrete and specifically:

<p>Improves concrete's resistance to plastic shrinkage cracking.</p> <p>Inhibits formation of micro-cracks due to dimensional change.</p> <p>Reduces sedimentation.</p>	<p>Reduced frequency of plastic cracking.</p> <p>Improved durability and reduced permeability.</p> <p>Decreases risk of plastic settlement cracking over re-bar.</p>
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NOTE:

Polypropylene fibres actually help inhibit the formation of cracks in concrete, whereas steel mesh only has functional value after the concrete has cracked.

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Features and Benefits (continued)

Working improvements

Polypropylene fibres offer many installation advantages, enabling a better job to be achieved in less time:

Feature	Benefits
Increased cohesion of the mix.	Reduced settlement.
No requirement for crack control steel mesh.	Easier finishing.
Concrete placement and crack control in ONE operation.	No need to purchase and store additional material.
Reduced bleeding.	No delays to fast track schedule.
Less expensive (per m ²) than conventional steel mesh reinforcement.	Easier positioning of joints.
	Reduced site labour requirement.
	No secondary steel mesh is required and reinforcement is automatically positioned.
	Easier finishing of the concrete surface.
	Reduced project costs.

NOTES:

1. Effective protection and curing is essential for all concrete slabs - including polypropylene fibre concrete.
2. Polypropylene fibre concrete CANNOT be used as a substitute for structural steel reinforcement.

Final concrete performance

The effects of polypropylene fibre concrete in its plastic state lead to other advantages in its hardened state:

Feature	Benefits
Reduced plastic cracking means a reduction in surface permeability.	Enhanced durability.
Bleed water control inhibits migration of cement fines and sand to the surface.	Harder, more durable surface with better abrasion resistance.
Even distribution of fibres throughout the concrete.	Improved flexural properties.
A tougher surface with fewer bleed holes	Increased resistance to spalling at higher temperatures and so.... better fire resistance.
	Reduced absorption of water, chemicals and dirt

Cost benefit analysis

- Cost savings in secondary reinforcement steel mesh for ground supported slabs
- Faster construction (removes the need to lay mesh and spacers etc.)
- Plastic shrinkage control.
- Reduced freeze-thaw effects.
- Improved durability.
- Reduced shrinkage.
- Improved fire resistance.

Health and Safety

Contact with concrete may cause irritation, dermatitis or severe alkali burns. There is serious risk of damage to the eyes. Wear suitable waterproof protective clothing, gloves and eye/face protection. In case of contact with eyes, rinse immediately with plenty of clean water and seek medical advice. After contact with skin, wash immediately with plenty of clean water. Keep out of reach of children. Contains Chromium (VI), may cause allergic reaction.

Specifications and Standards

All CIRCULARCLEAN-WAVE.ORG Readymix products meet or exceed the relevant British and European standards.

FAQ's

Q. Can fibre be used in structural concrete?

A. Yes, but it cannot be used to replace or supplement structural reinforcement. However, it can be used in conjunction with the steel to help reduce settlement cracking over structural reinforcement, particularly in deep sections such as walls and columns.

Q. Is it more cost-effective to use fibre instead of crack control steel mesh?

A. Yes, polypropylene fibre is about half the cost of A142 steel mesh per square metre of slab. There is also a saving in handling and an increase in site productivity, as the mixer can reverse right up to the point of placing.

Q. Are any special finishing techniques required?

A. No, the concrete can be compacted and finished normally. Trowelling totally embeds the fibres in the concrete surface. Some fibres may be exposed where a textured finish is applied, but these quickly disappear.

Q. Can concrete with fibre be pumped?

A. Yes, fibre actually improves the pumping characteristics.

Q. Are movement joints necessary?

A. Yes, contraction joints are necessary and should be spaced at the normal intervals prescribed for an 'unreinforced slab design'.

Q. What is the dosage rate for polypropylene fibres?

A. Normally 0.9kg/m³ for most applications.



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DESCRIPTION

Rec-Plas-crete 10mm PP fibre is a 100% Recycled polypropylene fibre specifically selected for use in concrete and sand/cement screeds.

APPLICATIONS

Rec-Plas-crete 10mm PP fibre is used to control plastic shrink- age and settlement cracking. Rec-Plas-crete 10mm PP fibre will provide secondary reinforcement in all concrete applications.

COMPATIBILITY

Rec-Plas-crete 10mm PP is compatible with all types of EN 197 cement systems and offers a wide range of benefits particularly in the production of sand/cement screed.

STORAGE

Store the product in a dry environment, moisture ingress will cause the water soluble bags to degrade.

HANDLING

Please refer to the Rec-Plas-crete 10mm PP Material Safety Data Sheet but in line with normal handling procedures, personal protective equipment should be worn.

PACKAGING

Rec-Plas-crete 10mm PP is supplied in 600 gram water soluble bags, 30 bags per box.

Fire protection

Synthetic micro fibres increase the fire resistance of concrete, which is particularly important in structures like traffic tunnels. If a fire were to break out, the synthetic fibres within the concrete melt and create a capillary system through which water vapour pressure can be relieved. Concrete spalling is either reduced significantly or prevented completely, so the amount of repair work required is also reduced. All this results in a structure that is safer, more stable and more durable.

- Reduced plastic shrinkage cracking
- Reduced settlement and bleed in deeper sections
- Improved surface durability
- Improved cohesion of the fresh concrete
- Greater flexural and shear strengths
- Improved load capacity and ductility
- Increased abrasion resistance
- Increased fire resistance
- Potential to reduce CO2
- Lower construction costs
- Easier construction method
- Improved health and safety on site

PROPERTIES

Nature:	Monofilament fibre
Appearance:	Grey
Specific Gravity:	0.91 g/cm³
Fibre Length:	12mm
Absorption:	Nil
Chemical Resistance:	High
Tensile Strength:	340 MPa
Melting Point:	160°C

ADDITION RATES

Dosage rates will be dependant on mix design, process, types of aggregates and the desired effect, but typically:

1 x 600g bag per cubic metre

STANDARDS

Rec-Plas-crete 10mm PP fibre complies with the requirements of BSEN 14889-2:2006.

