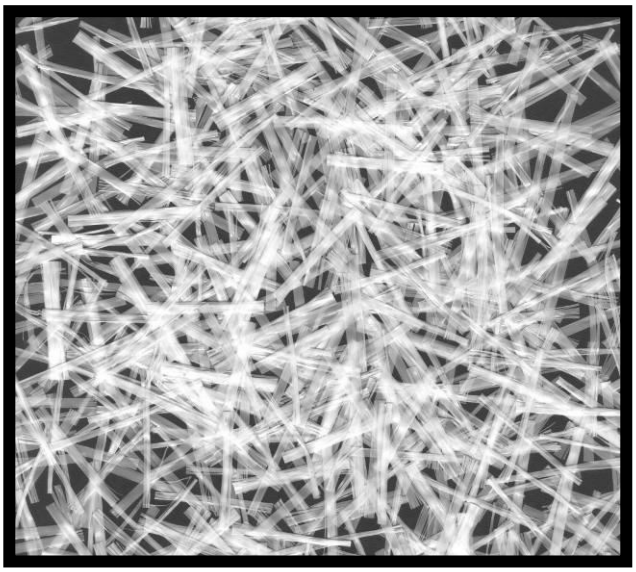
DURACRETE®

Polypropylene Fibres for Improved Concrete, Plaster & Stucco Performance



For reducing plastic shrinkage cracking.

Enhancing concrete performance.

With 3-dimensional reinforcement.

Duracrete® Polypropylene fibres inhibit shrinkage and settlement cracking in both plastic and hardened stages of concrete while delivering greater impact capacity, abrasion and shatter resistance with lower water migration. By introducing millions of fibers into the mix, Duracrete fibres give concrete a multi-dimensional secondary reinforcement that enhances concrete performance.

Major Benefits

- Inhibits plastic settlement cracking
- Controls plastic shrinkage cracking
- Lowers water migration in concrete
- Resists impact and shatter forces
- Increases abrasion resistance
- Increases freeze/thaw durability
- Provides lasting reinforcement
- Provides significant improvement in fire protection

Features

- Excellent dispersion providing three-dimensional reinforcement
- Improves concrete cohesiveness – requires no mix design changes
- Easily mixes into concrete – does not ball or tangle
- Non-corrosive, non-toxic, rust-proof, inert material

Improving Concrete Performance

Inhibits plastic settlement cracking

Duracrete fibres in concrete create an advanced internal support system that inhibits plastic settlement cracking. Fibres distribute evenly in the concrete mix and inhibit segregation and settlement of the heavier concrete ingredients. As the heavier ingredients do not drift downward, the mix water is not displaced. The uniform bleeding throughout the concrete gives it the optimum long-term integrity.

Controls plastic shrinkage cracking

The uniform distribution of Duracrete fibres increases the tensile strain capacity of concrete when it is in its most vulnerable early 'plastic' stage. As the concrete hardens and shrinks, the formation of plastic shrinkage cracks is discouraged. The onset of weakened planes that develop into these cracks is minimized.

Lowers water migration in concrete

Plastic cracks, which develop during the early stages of concrete hydration, allow water to pass. As Duracrete fibres reduce this micro-crack formation, it enables the concrete to progress from plastic to hardened state with greater integrity. Thus the water resistance of hardened concrete is greatly increased.

Resists impact and shatter forces

As the millions of Duracrete fibres distributed uniformly throughout concrete are equally elastic in all directions, impact and shatter forces are easily resisted. The fibres help absorb the shock of the force, as well as giving a concrete maximum integrity to withstand the force.

Improves abrasion resistance

The decrease in plastic shrinkage and settlement minimizes concrete surface weakness and defects and thus improves abrasion resistance.

Increases freeze/thaw durability

Duracrete fibres reduce water migration, giving concrete greater longevity in freeze/thaw environments.

Provides lasting reinforcement

Duracrete fibres are made from 100% homopolymer polypropylene, a tough, durable synthetic resin that can withstand the harsh environments inside concrete. Duracrete fibres are nonmagnetic and non-corrosive, as well as chemically inert. Because they are unaffected by the alkaline environment of concrete, and stabilized against long-term heat exposure, Duracrete fibres do not degrade and provide lasting reinforcement.

Significant improvement in fire protection

Duracrete reinforced concrete provides better protection to structures against exposure to fire.
Use of Duracrete Fibre in cement plaster and concrete works provide significant improvement in fire resistance, reduction to spill -damage and better structural integrity. On exposure to fire, Duracrete fibres in the concrete melt, forming channels to allow the steam to escape from inside.

- **Short term benefits**

Duracrete fibres substantially reduce the formation of plastic shrinkage and settlement cracking in concrete by increasing the tensile strain capacity of concrete when it is in its most vulnerable 'plastic' stage.

- **Long term benefits**

The reduction of plastic cracks enables the concrete to develop its optimum long-term integrity, thus improving concrete durability, impact and shatter resistance, and abrasion resistance. The multi-dimensional reinforcement provides additional post-crack residual strength, ensuring concrete longevity.

DURACRETE®

Polypropylene Technical Data Sheet		
Compressive strength (psi)	5,500 - 8,000	ASTM D695
Flexural strength (psi)	6,000 - 8,000	ASTM D790
Tensile strength at break (psi)	4,500 - 6,000	ASTM D638
Elongation at break (%)	100 - 600	ASTM D638
Water absorption (%)	Negligible (0.01 – 0.03)	ASTM D570
Specific gravity	0.90 – 0.91	ASTM D792
Ignition point	593°C	
Melting point	160 - 170°C	
Heat & UV stabilization	Long term	
Thermal conductivity	2.8 10^{-4} cal cm/sec cm^2 °C	ASTM C177
Tensile modulus (ksi)	165 - 225	ASTM D638
Compressive modulus (ksi)	150 - 300	ASTM D695
Flexural modulus (ksi @ 25°C.)	170 - 250	ASTM D790
Rockwell hardness	R80 - R102	ASTM D785
Electrical conductivity	Low	
Salt resistance	High	
Acid resistance	High	
Alkali resistance	100% (alkali proof)	

Duracrete fibres are manufactured from 100% virgin homopolymer polypropylene to meet ASTM C-1116 standard specification for fibre-reinforced concrete and shotcrete.
Typical physical characteristics of 100% virgin polypropylene homopolymer are listed above.

Using Duracrete fibres

Duracrete fibres should be added to the concrete mix during the mixing operation. The mixing time (typically 2 to 4 minutes) ensures uniform distribution throughout the concrete. (Over mixing will not alter its performance). Duracrete easily mixes into concrete and requires no mix design changes.

Recommended Fibre dosage as per ACI range from 1.8 to 3.6 kg per cubic meter (3 to 6 lb per cubic yard) of concrete. Higher dosages are recommended depending upon the severity of load, safety of structure and environmental exposure based on experience and **good engineering judgment**.

DOSAGE

Dosage of Duracrete fibres per 50 Kg bag of cement			
Fibre	Type of Work	Recommended Dosage	Packing
DCM-06	Plaster Works (Including Color Crete)	100 gms	50 packets per carton
DCM-13	External Plaster Works, Precast Concrete and Repair of Plaster Works	100 gms	50 packets per carton
DCM-19/ or DCF-2513	Residential and Commercial Roof Screed and Roof Slab, Industrial Flooring and Pavement, RCC Structure for Water Tank, Basement Walls, Manhole and Canal Lining	300 gms	50 packets per carton
DCF-19 or DCF-2513	Water Reservoir, Sewerage Drain, Storm Water Drain and Residential Roof Screed (Over Flexible Insulation Base)	450 gms	30 packets per carton
DCF-25	Heavy Duty Industrial Floor, Hanger Floor, Runway, Quay Wall, Sea Block, Bridge Deck Screed, Expansion Joint and Industrial Roof	600 gms	25 packets per carton

Note: Dosage based on 1:2:4 concrete ratio to be adjusted for other concrete design mix.

Appearance

Moulded faces of Duracrete reinforced concrete are generally similar in appearance to normal concrete finishes. The screeded faces may show some ends of fibres sticking out that usually shear off, if surface fibre is unacceptable, flaming or removing by sand paper it.

Applications

For Residential, Commercial & Industrial Works.

Slab-on-grade

For long life and superior performance, enhance the toughness of slabs on ground. Increase impact and abrasion resistance.

- Driveways and garage floors
- Warehouse floors
- Factory floors
- Basements
- Screed toppings and overlays
- Mortars and rendering
- Concrete walls
- Sidewalks/pavements
- Commercial flooring
- Manufacturing facilities
- Industrial flooring
- Equipment foundations
- Home construction
- Office buildings
- Rooftop screeding
- Parking areas (forklift and truck parking)
- Septic tanks
- Water storage tanks (overhead & underground)
- Swimming pools
- Airport runway and parking aprons

Elevated slab

Build safer, longer lasting elevated slabs.

- Bridges
- Balconies
- Overhangs & ledges
- Cantilevered slabs

Sprayed concrete such as Shotcrete

Faster buildup and less rebound, with reduced sag and scatter in slope, vertical and overhead applications.

- Linings of canals and water courses for prevention of water seepage
- Rock and soil slope stabilization
- Restoration
- Architectural finishes

Precast

Reduce slumping, out of round bells and spigots in precast concrete products. Decrease production damage, handling stresses, and transportation damage. Increase product cohesiveness.

- Spun pipes
- Culverts
- Lintels
- Beams and slabs
- Cladding panels
- Cement tiles and pavers
- Manhole covers, cones and risers
- Submarine pipelines
- Flotation units for walkways and moorings in marine applications
- Highway dividing barriers
- Crash barriers
- Street curbs

DURACRETE improves concrete performance.

Note: *Duracrete Polypropylene Fibres are used as a secondary reinforcement only and are not a substitute for primary steel reinforcement.*

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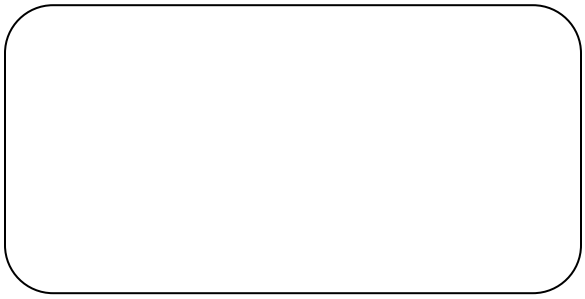

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Rev. 2011/01