Shrinkage Cracking

NYCON REINFORCING FIBRES HELP YOU BETTER AND SMARTER "TM" BY CONTROLLING SHRINKAGE CRACKING IN CONCRETE.

Cracks and crack Control and Nylon RC as an aid in prevention.

Crack can occur in concrete for a variety of reason. Some cracking is inevitable because concrete moves with changes in temperature and its moister content. Specifically, it shrinks as it loses moister.

NYLON RC fibres inhibit the formation of plastic shrinkage and plastic settlement cracking by internally providing a support system for the concrete matrix. Fibres help concrete through the period when it most vulnerable to cracking. That is when the concrete is beginning to harden and shrink due to volume changes and loss of water. NYLON RC fibres discourage plastic shrinkage at the source and share the loads of shrinkage across the entire surface of the concrete, this includes internally throughout the concrete matrix as well.

Concrete cracks in two categories.

- Cracking prior to set.
- Cracking after set.

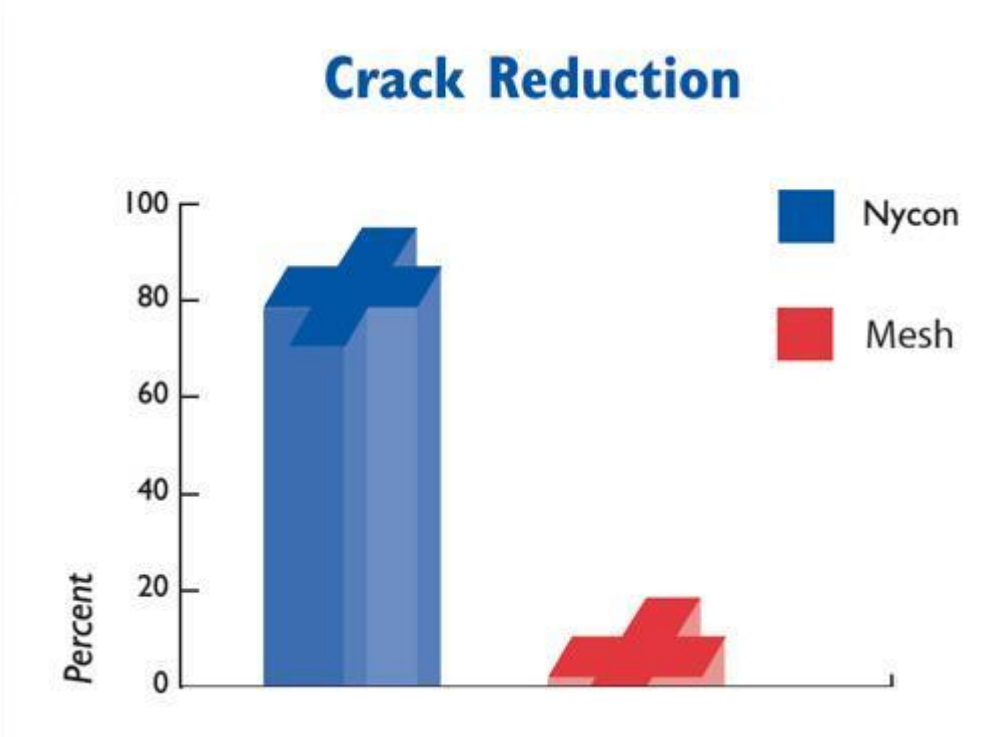
Cracking prior to set.

Cracks in concrete prior to final setting are not always recognised since they can be closed up by bull floating or maybe hidden by surface bleed water. The two common form of off pre-settlement cracking are plastic shrinkage cracking and plastic settlement cracking.

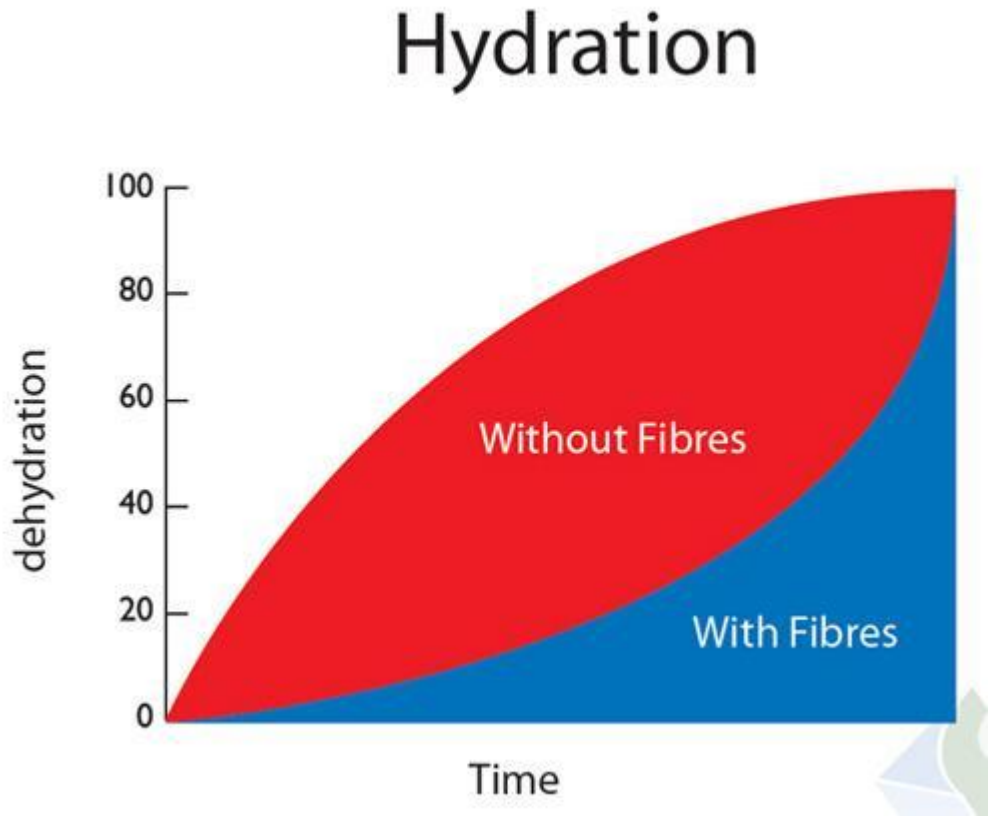
Plastic shrinkage cracking.

Rapid drying of the surface in dry windy conditions or in cooler, low humidity weather conditions can cause plastic shrinkage. In fact plastic shrinkage can occur at any time of the year. It occurs after placement, compaction and screeding as the bleed water evaporates, exposing the fresh concrete to the elements and causing the surface to shrink before it has any strength.

Nylon Micro fibres reduces Plastic Shrinkage by up to 86%



The Hydrophilic NYLON RC fibres also act as little reservoirs to keep concrete hydrated aiding in the curing process.

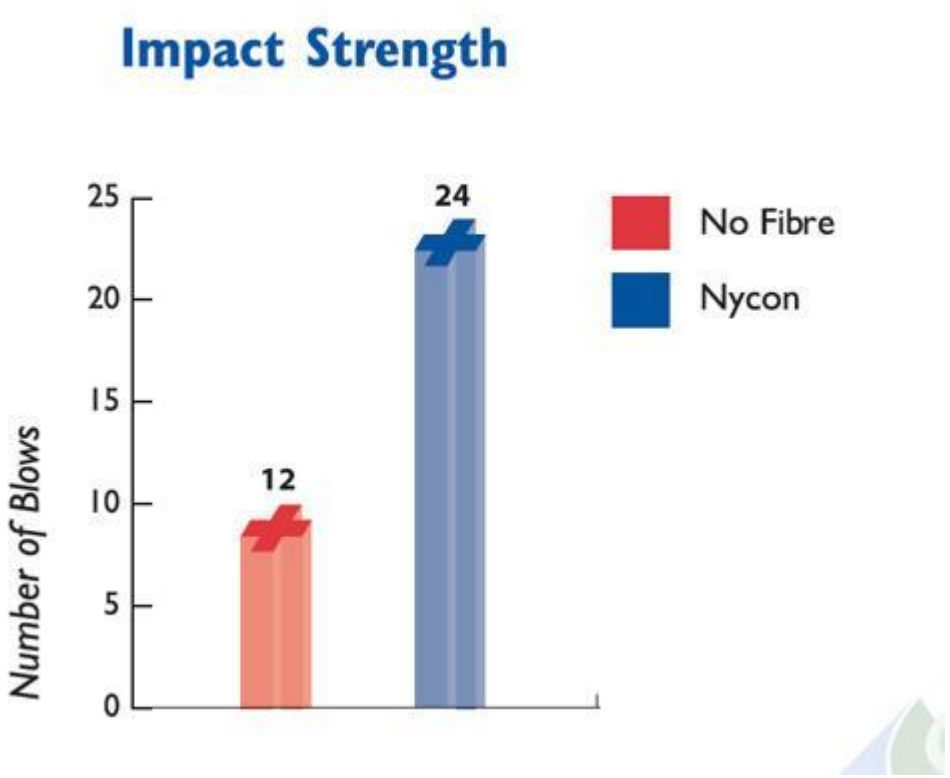


NYLON RC fibres added to the concrete mix will reduce the incidence of plastic shrinkage cracking by up to 86%.

Value/Benefit in Concrete

- Provides three-dimensional reinforcement to reduce plastic shrinkage cracking and settlement.
- As secondary reinforcement, NyconRC is more effective than welded-wire mesh in crack prevention.
- Enhances bond with mortar due to water absorption properties.
- Best critical fibre spacing to stop cracks at source.
- Produces low-maintenance, longer-life-cycle concrete with reduced permeability, improved abrasion and impact resistance and fatigue strength.
- Results in smooth, non-hairy surface, with less bleed water and finishing effort.

Concrete reinforced with NyconRC fibres has twice as much impact resistance and more than three times the resistance of unreinforced concrete.



NYCON RC total quality fibres produce a tougher, more durable, low-maintenance concrete, and outperform all other fibres in prolonging the service life of concrete.

Plastic Settlement Cracking.

This is caused when concrete settles under its own weight, often because of inadequate compaction.

It occurs over reinforcement, in deep section beams and steps in form work.

Cracking in hardening mass occurs over restraints and may leave voids under reinforcing bars.

Prevention-

As well as adding NYCON RC fibres to every cubic meter of concrete in the slab.

- Fill in any deep beam sections to the level of the bottom of the slab before placing the concrete in the slab.
- Always ensure adequate compaction.
- Revibrate surface where there is more than a 300m depth of concrete below top bars.
- Ensure all form work with
- Leave the formwork stays in place to support the concrete until it is self supporting.

Cracks after set.

General.

Cracking in concrete after setting also occurs for a variety of reason. The two most common form of after set cracking are crazing and drying shrinkage cracking.

Crazing.

A very fine cobweb like or alligator skin cracks, which are usually evident when the concrete has been subjected to periods of wetting and drying while it is still green. Steel towelled finishes that are highly polished are the most common surface for crazing.

Prevention.

- Do not work bleed water into the surface.
- Do Not with a hose drag of excess bleed water.
- Do not repeat power towelling unnecessarily.
- Do not use cement, oxides or colour hardeners to mop up excess bleed water.

Drying Shrinkage Cracks.

These are caused by concrete shrinking: The result of moister loss. This is not a major problem if the concrete is free to move, but, if restrained; tensile stresses in the concrete can develop and cause it to crack. The water content of the mix is the major factor influencing drying shrinkage. Shrinkage is however not the only cause.

Restraints, detailing geometry and construction practices may also affect the probability of cracking in hardened concrete.

Prevention.

- Do not add water to concrete on site.
- Provide adequate reinforcement and insure correct reinforcement. Macro fibres with a higher modulus than drying concrete strains is more effective than welded wire mesh in most cases. Fibres are proactive and mesh is reactive.
- Place expansion joint in correct location
- Place concrete correctly.
- Compact and vibrate the concrete adequately.
- Start curing promptly and correctly. NYLON RC fibres will aid in the curing process.

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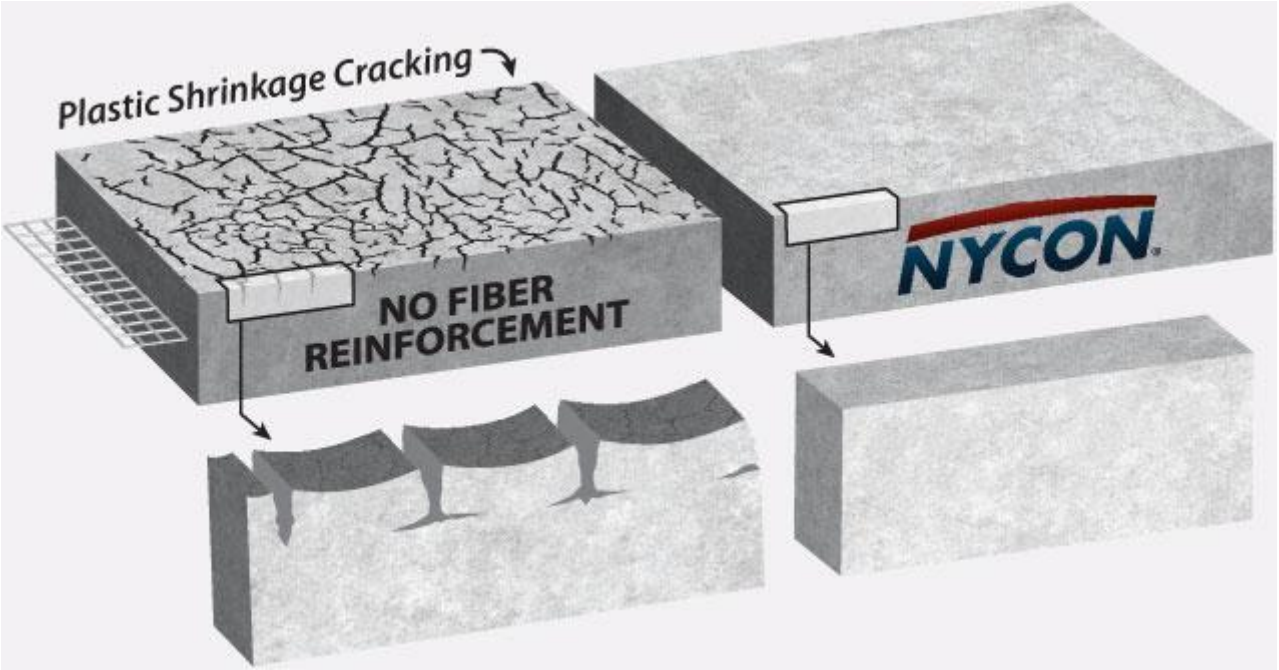

What is Plastic and Drying Shrinkage Cracking?

Drying and plastic shrinkage cracks are surface cracks that occur from water evaporating too quickly from the surface of concrete during the curing process. This causes the surface of the concrete to dry quicker than the layers below and “shrink”, leaving behind thousands of tiny cracks in your concrete.

This problem costs millions of dollars a year in mix rejection and early failure. Fortunately, Nycon has several fibers that **significantly reduce cracking from plastic and drying shrinkage**.

Product Information

Nycon-RC is a 2-denier, virgin nylon fibre that offers reduced dose while providing plastic crack control and a superior finish.

- Superior crack control at low doses.
- Instantly absorbs concrete colour.

Outperforms Polypropylene

- Tensile strength is 30% stronger than polypropylene.
- Stronger bond to concrete than polypropylene.
- Fiber design provides more surface area and more ”grip” than circular fibres’.
- Nycon-RC’s specific gravity is 1.15, which is greater than water, thus eliminating floating in concrete. Whereas, Polypropylene’s specific gravity is 0.9, causing the fibres to float.

http://www.nycon.com/shop/pdf/58/NyconRC%20Flyer2-24-11.pdf

Testimonials

"Nycon RC Nylon fibre is easy to work with; the fibre doesn’t float to the surface or impede the quality of finish required and integrity of the concrete. Having worked with other fibres over the years, I now only use Nycon RC Nylon fibres in my jobs. Adding Nycon RC Nylon fibre gives me peace of mind knowing the fibre minimises shrinkage with increased impact resistance. I do not place and finish any concrete without adding Nycon RC to my jobs." - **Joe Bagnara, PSI Pavements, Adelaide, Australia**

Ocean Marine Group utilizes a number of products supplied by INCONMAT for all Marine Asset repair and maintenance works. The quality and functionality of these materials have surpassed expectation. We will continue to use these products in all future specifications to assist asset longevity, as expected by our clients."
- Ocean Marine Group, Australia Wide.

True Line Kerbing Pty Ltd have used INCONMAT NyconRC fibres in a number of concrete floor, footpath and kerbing applications and have found the product to be exceptional. The surface finish was of the highest quality and compared to other synthetic fibres the workability is far superior. We will continue to use INCONMAT NyconRC fibres in all our concrete projects and would recommend its use in any concrete application."
- True Line Kerbing, Adelaide, Australia

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