
TODAY PRODUCTS

The new generation synthetic fiber “Concord H” , Helical structure with polyester



More than 70% of the country's land is made up of mountainous regions and has a smaller land area than the population. South Korea, which has been developing rapidly since the great war in South and North Korea in 1950, has invested heavily in highways and railways, which are infrastructures (social overhead capital). For this reason, Korea is constructing about 200 tunnels every year. Tunnels are an essential element in constructing straight-line roads and railroads in a narrow country.

In addition, when expanding existing roads or constructing new roads and railways, it is necessary to link tunnels and bridges to achieve straightening and simplification.

The new generation synthetic polyester fiber “ helical structure” made in Korea

Korea, which has started to build many tunnels since the early 1990s, has a lot of know-how in construction of tunnels.

In the early 1990s, we imported many tunnel equipments and materials from abroad. However, we have localized the materials for various tunnels construction. Especially, we develop necessary consumable materials and replace them with new material rolls.

Today 's product is a new invention of fiber which is essential in the work of shotcrete, which is sprayed concrete after blasting which is essential in tunnel construction.

Generally speaking, when building a tunnel by drill & blasting method, it means blowing the concrete to the wall with a certain thickness in order to prevent the collapse of the tunnel and to stabilize the stress of the rock after the blasting. In this case, In order to improve the quality of the fiber, various kinds of ash are mixed and used.

Fiber is an old wisdom that when people build houses using soil, they can be understood as the same principle as mixing rice straw.

As a result of the use of a mixture of rice straw rather than a simple material, concrete is applied to concrete by mixing various fibers such as concrete, which is a typical example of an iron fiber made of steel.

This steel fiber has a diameter of about 0.2 ~ 0.6 mm, which is used up to today.



Tunnel shotcrete with synthetic fiber. Construction highway tunnel in Korea.

‘ New synthetic polyester fiber for shotcrete at tunnel works .

-SH LEE/BL KOREA LTD

Nonetheless, it has been determined that Steel Fiber today has many problems. First, it is difficult to handle at the work site, the workability is poor, and various problems have occurred after construction.

First, it is easily corroded under rivers and water-prone waters. Due to the nature of shotcrete, the fiber that is to be mixed with concrete should be strong against water, especially strong against salty water. However, steel fiber did not solve this problem.

Steel fiber, which is easily rusted in areas where there is water or high salinity water, is considered to have a lot of problems in improving the tensile strength and compressive strength. Also, there was a lot of balling that tangled with each other.

Various other materials have been invented and used to reinforce these disadvantages.

However, the new materials so far have only satisfied one or two of the many shortcomings of Steel Fiber.

The new concept of polyester fiber we are introducing today is not simple processing but aiming to develop optimal fiber by secondary processing of primary material and we want to call this material as fourth generation fiber.

Comparison Data

Description	Shotcrete with Synthetic fiber		Steel fiber	Concord H (Helix polyester fiber)
	Nylon	Polypropylene		
Shape of fiber				
Diameter(mm)	0.025~0.034	0.05~0.6	0.2~0.6	0.5~0.9
Length(mm)	5~50	6~12	10~60	30~60
Tensile strength(MPa)	580	520	400~2,000	750~800
Strain at break(%)	14~21	12~21	3.5	15~21
Density(g/cm3)	1.14	0.96	7.85	1.35
Convenience	Good	Good	Bad	Excellent
Dispersibility	Bad	Bad	Bad	Excellent
Adhesion with concrete	Excellent	Bad	Bad	Excellent
Alkaline stability	Good	Excellent	Bad	Excellent
Remark	<ul style="list-style-type: none"> ● No good dispersibility ● hydrophilicity 	<ul style="list-style-type: none"> ● light Gravity ● Easy suspension ● Hydrophobicity 	<ul style="list-style-type: none"> ● Easy make Balling ● Corrosion problem in water ● Too heavy gravity 	<ul style="list-style-type: none"> ● Same gravity with concrete ● No problems in sea water ● Very safe for operation ● Cost save & good working performance