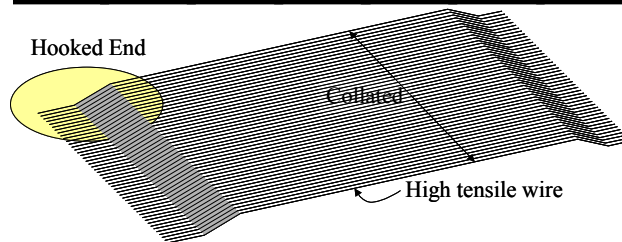
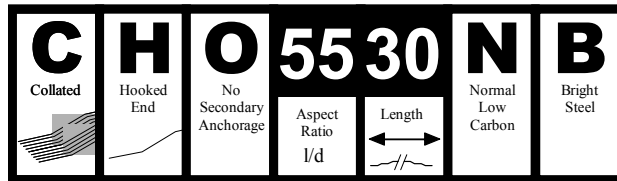


Scanfibre CHO55/30NB

Shotcrete fibre for use where performance is important

DESCRIPTION



The properties of Scanfibre CHO55/30NB are described below. Also refer to Scancem data sheet "*Scanfibre for Slabs on Grade, Shotcrete and Precast*".

C - Collated.

Wire from forty spools is fed to a glue line where a water dissolvable glue is applied.

H - Hooked End

The hooked end is designed to provide anchorage in a non rigid way. The fibre cross section remains unchanged so it can pull through the concrete at high loads to prevent brittle failure due to fibre breakage and to promote high energy absorption. Also refer to Scancem data sheet "*Fibre Geometry*".

O - No Secondary Anchorage

Although there is no secondary anchorage the hooks are specifically designed to maximize performance across the full range of concrete strengths.

55 - Aspect Ratio

Aspect ratio (length/diameter) is a key characteristic in determining performance. High aspect ratios lead to high performance (toughness) but without collation fibres tend to ball at aspect ratios over 50.

30 - Length

Length of 30mm is generally acceptable for shotcrete. It is long enough to ensure aggregate overlap and short enough not to block equipment.

N - Normal

Normal low carbon steel is pulled through a series of dyes to give a wire strength of over 1300MPa

B - Bright

Bright steel is the norm for steel fibres in concrete. Corrosion is not generally an issue The fibres are not interconnected so there can be no corrosion current, hence galvanizing is not normally necessary.

QUALITY

ISO 9001 - Quality Plan

The fibre is manufactured ISO9001.

QC - Production Testing

Samples of the fibre are tested for:

- Dimensional accuracy
- Tensile strength
- Surface condition

Conforms to ASTM A820 Type 1

PACKING

Paper Bags

Bags are in 20kg. They are degradable and can be added directly to the mix without being opened. In each 20kg bag there are approximately 360,000 fibres or at 50kg/m³ there are approximately 0.9million fibres in each cubic meter of concrete.

Fibres are packed 19.2T/20'FCL on 1.2T pallets.

Scanfibre - The right steel wire fibre for each application

HANDLING

Manual

Paper bags are loaded into the mixer after addition of all other ingredient.

Automated

Automated systems that can be wired to the batching computer are available.

Also refer to the Scancem data sheets on "*Readymix Production of Scanfibre Concrete*"

PERFORMANCE

The performance of fibre reinforced concrete is dependent on the fibre type and dosage. Hence, specifiers should use an appropriate performance specification. See also Scancem data sheet "*Equivalent Dosage Charts For Different Fibre Types*"

$f'_{ct,fl}$

Characteristic flexural tensile strength is calculated from the characteristic cylinder compressive strength (f'_{cm}) by the formula:

$$f'_{ct,fl} = 0.4 \times (1.25 f'_{cm})^{0.67}$$

$R_{e,3}$

Equivalent Flexural Ratio ($R_{e,3}$) is multiplied by the $f'_{ct,fl}$ to give equivalent flexural strength ($f_{e,3}$). This equates to the average flexural strength up to 3mm deflection in a standard JSCE beam test.

An estimate of $R_{e,3}$ can be calculated from the formula

$$R_{e,3} = \frac{180WLD^{1/4}}{(180C) + (WLD^{1/4})}$$

where
 D = fibre diameter (mm)
 W = fibre dosage (Kg/m³)
 L = fibre aspect ratio
 C = Scanfibre CHO constant = 21

$R_{10,30}$

Toughness ratio is multiplied by $f'_{ct,fl}$ to give equivalent flexural strength ($f_{10,30}$). This equates to the average flexural strength between I₁₀ and I₃₀ values (approx 0.25-0.75mm deflection) in a standard ASTM beam test. An estimate of $R_{10,30}$ can be calculated from the formula:

$$R_{10,30} = \frac{180WL}{(180xC) + (W \times L)}$$

w	Dosage (kg/m ³)	2	3	3	4	4	5
R _{10,30}		4	5	6	6	7	7
f _{10,30}	For 32MPa conc.	2.	2.	2.	3.	3.	3.
R _{e,3}		4	4	5	6	6	6
f _{e,3}	For 32MPa conc.	2.	2.	2.	2.	3.	3.

Also refer to Scancem data sheet on "*Flexural Toughness Testing*"

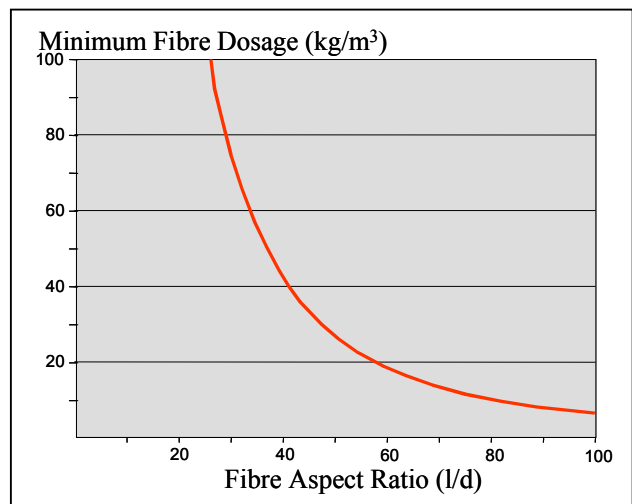
Spacing

It is important that the stress is transferred from one fibre to the next by the concrete forming compression struts i.e. there is a limit to the spacing of fibres. Spacing can be calculated using spacing theory of McKee using the following formula:-

$$S = \sqrt[3]{(\pi d^2 / 4 \sigma)}$$

The maximum average spacing of fibres should be 0.45 times the typical fibre length. This recommendation comes from a technical committee of learned professors brought together to formulate a design guideline for SFRC for use with the European Code on concrete structures. For this fibre the minimum dosage to satisfy spacing factor is 22kg/m³, as shown in the chart below.

See also Scancem data sheet "*Minimum Performance Levels and Dosage Rates*".



The information given is based on knowledge and performance of the material. Every precaution is taken in the manufacture of the product and the responsibility is limited to the quality of supplies, with no guaranty of results in the field as Scancem Materials has no control over site conditions or execution of works.

SCANCEN MATERIALS

Products For Engineered Concrete

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