

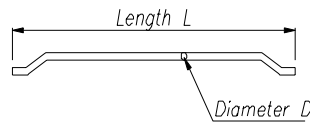
Wirand Steel Fibres

Concrete Reinforcement

It is estimated that up to 1 billion square metres of structural concrete is used worldwide each year. To help reduce this volume and enhance the performance Maccaferri has embarked on a challenging programme to develop fibre reinforcement. With this in mind we are pleased to introduce a new range of fibres into the UK that will offer both structural and economical benefits to our customers.

Types of fibres

- FF Fibres for Flooring
- FS Fibres for sprayed concrete



Maccaferri fibres for reinforced floor slabs



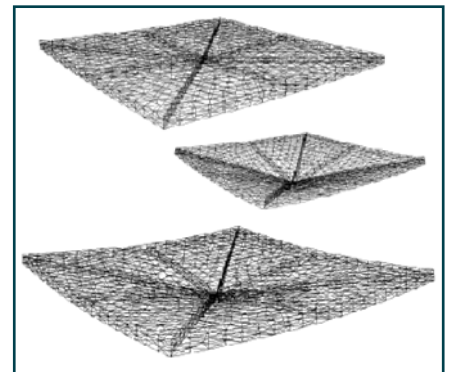
Maccaferri fibres for tunnelling projects

Fibre type	D (mm)	L (mm)	L/D
FF1	1.00	50	50
FF3	0.75	50	67
FS1	0.55	37	67
FS3N	0.75	33	44
FS4N	0.60	33	55
FS7	0.55	33	60

Maccaferri has commissioned extensive research into the behaviour of concrete reinforced with fibres.

Together with the Universities of Bergamo and Brescia, Italy (Prof Plazzari) we have developed a numerical analysis program and offer our customers a full technical support package to support sales of our steel fibres.

Maccaferri was represented by Mr B Rossi and Dr R Winterberg on CEN Technical Committee 104/Working Group 11 that compiled the new European Standards for fibres and fibre reinforced concrete.



Numerical simulation of steel reinforced concrete slabs

Maccaferri Service:

The level of design support, technical advice and on-site assistance you have come to expect from Maccaferri is also available with Maccaferri structural fibres.

For technical detail on this, or any of our wide range of solutions please contact Maccaferri.

MACCAFERRI



Flexural tests on concrete beams

Description and shape

Cold drawn steel wire fibre, for concrete reinforcement

The double end hooks of WIRAND® fibres ensure perfect anchorage in concrete.

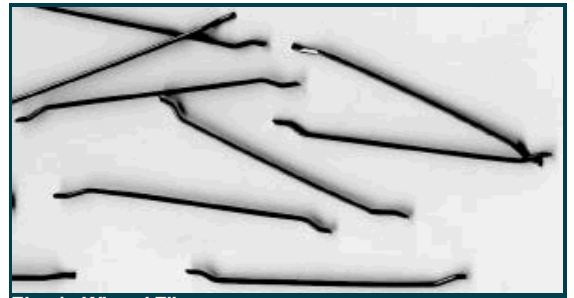


Fig. 1 - Wirand Fibres

Applications

- n Jointless flooring
- n Precast concrete
- n Industrial flooring
- n Sprayed concrete
- n Precast concrete
- n Tunnelling



Fig. 3 - Typical sprayed fibre application using Wirand

Packaging

WIRAND® fibres are delivered in big bags of 600, 750, 950 kg or in carton boxes of 20 kg.

Storage and disposal

Preserve the pallets from atmospheric corrosion.

For correct waste disposal of packaging material, please follow the directives stated in European Directives and on National Laws.



Fig. 4 - Packaging

Dosage machines

Maccaferri can supply a range of machines depending on the application and size of the project. There are 2 basic types

- n Circular doser - can be incorporated in the batching plant
- n Dosage box (hopper type) - puts fibres directly into the concrete mixer



Fig. 5 - Maccaferri dosage and pumping machines

The producer, for his optimisation and improving process of the product's technical characteristics, has the faculty to modify the standards and the characteristics of the product without any pre-advice. All the information are given in base to our experience; in any case no responsibility for an uncorrect use could be referred to the producer or one of his distributors.

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BVQI Certified . Quality System Company with SINCERT's and UKAS' s accreditation.

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DOSO BOX is a machine used to unravel the fibres and transport them, through a pneumatic and vibrating transporting mechanism, inside the concrete mixer.

By using **DOSO BOX** the loading of fibres into the concrete is quicker, easier and safer.

Fibres are added by emptying the boxes inside the hopper. Then the **DOSO BOX** unravels the fibres by vibrating them, which creates a uniform flow in the output tube placed directly in the concrete mixer (fig 3).

DOSO BOX is the size of two pallets of fibres so it can easily be transported with the material order.

The machine can be offloaded by forklift truck or by crane using the special lifting eyes.

TECHNICAL DETAILS

PERFORMANCES:

Maximum hourly production	50/80	kg/min
Allowed box capacity	15/25	kg

DETAILS

Power	380 V
Frequency	50 Hz
Power installed	10 Kw

DIMENSION:

Mass	1200 kg
Settled for transport	1600x1200x1490(h) mm



Figure 1



Figure 2



Figure 3

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CIRCULAR DOSER

The circular doser is used in conjunction with other plant to feed the correct ratio of Wirand steelfibres into the concrete mix.

Using a combination of accurate weighing and vibration, the doser feeds the correct quantity of fibres per volume of concrete into the batching plant setup.

Control of the doser can be carried directly from a control panel on the machine or from a remote control unit.

There are two main models available from Maccaferri that differ in their diameters and method of dosing - weight and vibration (see fig 1 and table below)



Figure 1

	DOSO 1.6	DOSO 2.0	
Fibre Production	50/200	50/200	Kg/min
OVERALL DIMENSION			
Nominal Diameter	1600	2000	Mm
Overall height	2300	2335	
Overall Dimension	1750	2200	
Overall Dimension	2300	2700	
Sack capacity	600/900	600/900	Kg
Weight	2200	2800	Kg
DETAILS			
Power	400	400	V
Frequency	50	50	H
Power installed	6.75	6.75	Kw
Total current	13.8	13.8	A



Figure 2

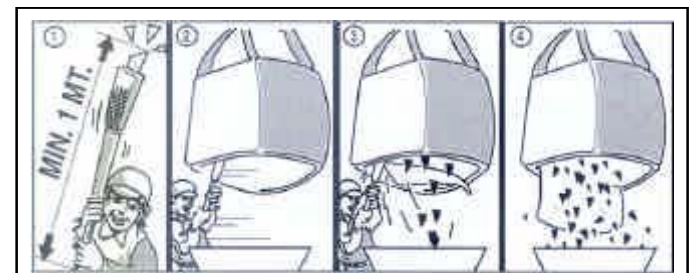


Figure 3

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WIRAND® FIBRE FF1

DESCRIPTION:

WIRAND® FF1 steel wire fibres for concrete reinforcement

TYPE:

Wirand® FF1

NOMINAL DIMENSIONS:

- Diameter D: 1.00 mm;
- Length L: 50 mm;
- Aspect ratio L/D: Ratio between Length L and diameter D: $50/1.00 = 50$

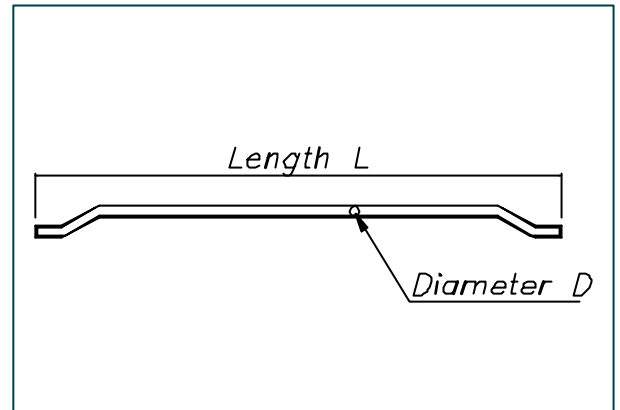


Figure 1

WIRE MECHANICAL PROPERTIES

R_m (Tensile strength of the wire): > 1100 MPa
 Δl (strain at failure) $< 4\%$

SHAPE

The ending shapes WIRAND® FF1 fibre are very important to grant adhesion between fibre and concrete.

REFERENCE STANDARDS

- UNI-EN 10016 "Non-alloy steel rod for drawing and/or cold rolling—Part 1: General requirements"
- UNI-11037 – Fibre di acciaio da impiegare nel confezionamento di conglomerato cementizio rinforzato
- pr-EN 14889-1 – Fibres for concrete – Part 1 – Steel fibres – Definition, specifications and conformity

PACKAGING

The WIRAND® FF1 fibre are delivered packed in big bags of 600, 750, 950 kg weight, or in carton boxes of 20 kg.

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WIRAND® FIBRE FF3

DESCRIPTION:

WIRAND® FF3 steel wire fibres for concrete reinforcement

TYPE:

Wirand® FF3

NOMINAL DIMENSIONS:

- Diameter D: 0.75 mm;
- Length L: 50 mm;
- Aspect ratio L/D: Ratio between Length L and diameter D: $50/0.75 = 67$

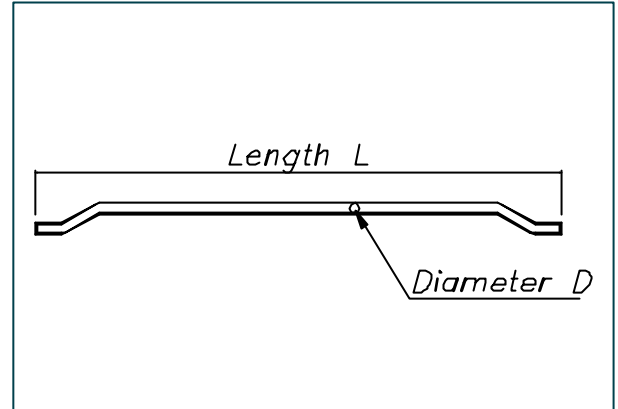


Figure 1

WIRE MECHANICAL PROPERTIES

R_m (Tensile strength of the wire): > 1100 MPa
 Δl (strain at failure) < 4%

SHAPE

The ending shapes WIRAND® FF3 fibre are very important to grant adhesion between fibre and concrete.

REFERENCE STANDARDS

- UNI-EN 10016 "Non-alloy steel rod for drawing and/or cold rolling—Part 1: General requirements"
- UNI-11037 – Fibre di acciaio da impiegare nel confezionamento di conglomerato cementizio rinforzato
- pr-EN 14889-1 – Fibres for concrete – Part 1 – Steel fibres – Definition, specifications and conformity

PACKAGING

The WIRAND® FF3 fibre are delivered packed in big bags of 600, 750, 950 kg weight, or in carton boxes of 20 kg.

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WIRAND® FIBRE FS1

DESCRIPTION:

WIRAND® FS1 steel wire fibres for concrete reinforcement

TYPE:

Wirand® FS1

NOMINAL DIMENSIONS:

- Diameter D: 0.55 mm;
- Length L: 37 mm;
- Aspect ratio L/D: Ratio between Length L and diameter D: $37/0.55 = 67$

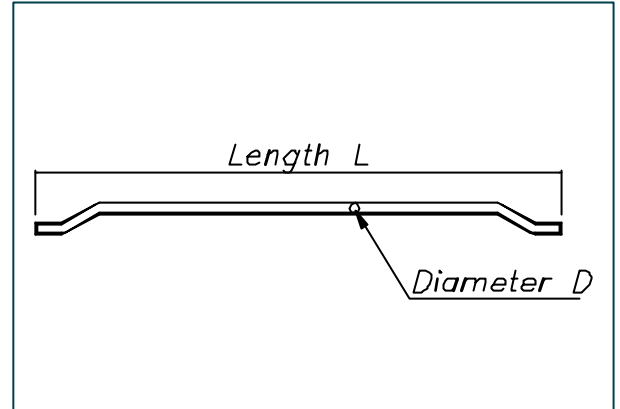


Figure 1

WIRE MECHANICAL PROPERTIES

R_m (Tensile strength of the wire): > 1200 MPa
 Δl (strain at failure) < 4%

SHAPE

The ending shapes WIRAND® FS1 fibre are very important to grant adhesion between fibre and concrete.

REFERENCE STANDARDS

- UNI-EN 10016 "Non-alloy steel rod for drawing and/or cold rolling—Part 1: General requirements"
- UNI-11037 – Fibre di acciaio da impiegare nel confezionamento di conglomerato cementizio rinforzato
- pr-EN 14889-1 – Fibres for concrete – Part 1 – Steel fibres – Definition, specifications and conformity

PACKAGING

The WIRAND® FS1 fibre are delivered packed in big bags of 600, 750, 950 kg weight, or in carton boxes of 20 kg.

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WIRAND® FIBRE FS3N

DESCRIPTION:

WIRAND® FS3N steel wire fibres for concrete reinforcement

TYPE:

Wirand® FS3N

NOMINAL DIMENSIONS:

- Diameter D: 0.75 mm;
- Length L: 33 mm;
- Aspect ratio L/D: Ratio between Length L and diameter D: $33/0.75 = 44$

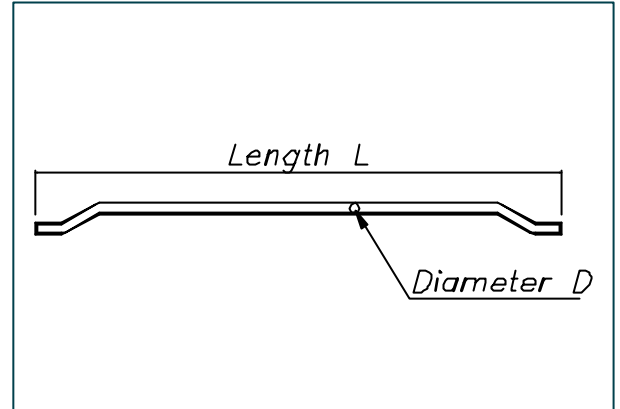


Figure 1

WIRE MECHANICAL PROPERTIES

R_m (Tensile strength of the wire): > 1100 MPa
 Δl (strain at failure) < 4%

SHAPE

The ending shapes WIRAND® FS3N fibre are very important to grant adhesion between fibre and concrete.

REFERENCE STANDARDS

- UNI-EN 10016 "Non-alloy steel rod for drawing and/or cold rolling—Part 1: General requirements"
- UNI-11037 – Fibre di acciaio da impiegare nel confezionamento di conglomerato cementizio rinforzato
- pr-EN 14889-1 – Fibres for concrete – Part 1 – Steel fibres – Definition, specifications and conformity

PACKAGING

The WIRAND® FS3N fibre are delivered packed in big bags of 600, 750, 950 kg weight, or in carton boxes of 20 kg.

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WIRAND® FIBRE FS4N

DESCRIPTION:

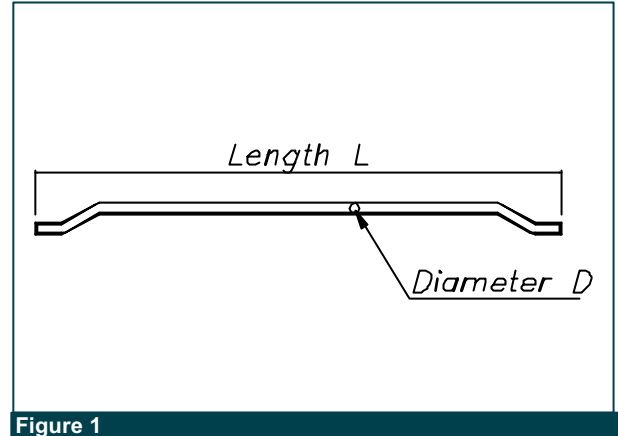
WIRAND® FS4N steel wire fibres for concrete reinforcement

TYPE:

Wirand® FS4N

NOMINAL DIMENSIONS:

- Diameter D: 0.60 mm;
- Length L: 33 mm;
- Aspect ratio L/D: Ratio between Length L and diameter D: $33/0.60 = 55$



WIRE MECHANICAL PROPERTIES

R_m (Tensile strength of the wire): > 1200 MPa
 Δl (strain at failure) < 4%

SHAPE

The ending shapes WIRAND® FS4N fibre are very important to grant adhesion between fibre and concrete.

REFERENCE STANDARDS

- UNI-EN 10016 "Non-alloy steel rod for drawing and/or cold rolling—Part 1: General requirements"
- UNI-11037 – Fibre di acciaio da impiegare nel confezionamento di conglomerato cementizio rinforzato
- pr-EN 14889-1 – Fibres for concrete – Part 1 – Steel fibres – Definition, specifications and conformity

PACKAGING

The WIRAND® FS4N fibre are delivered packed in big bags of 600, 750, 950 kg weight, or in carton boxes of 20 kg.

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WIRAND® FIBRE FS7

DESCRIPTION:

WIRAND® FS7 steel wire fibres for concrete reinforcement

TYPE:

Wirand® FS7

NOMINAL DIMENSIONS:

- Diameter D: 0.55 mm;
- Length L: 33 mm;
- Aspect ratio L/D: Ratio between Length L and diameter D: $33/0.55 = 60$

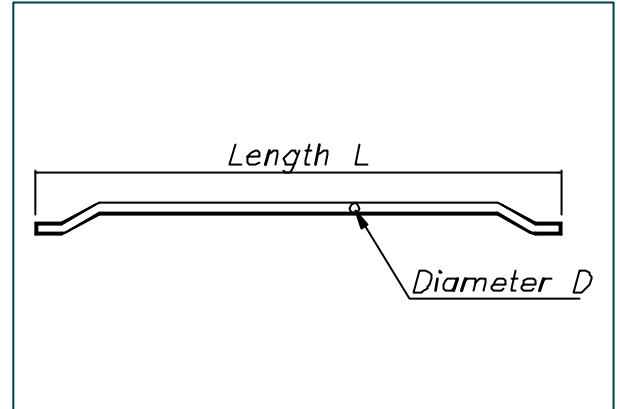


Figure 1

WIRE MECHANICAL PROPERTIES

R_m (Tensile strength of the wire): > 1200 MPa
 Δl (strain at failure) $< 4\%$

SHAPE

The ending shapes WIRAND® FS7 fibre are very important to grant adhesion between fibre and concrete.

REFERENCE STANDARDS

- UNI-EN 10016 "Non-alloy steel rod for drawing and/or cold rolling—Part 1: General requirements"
- UNI-11037 – Fibre di acciaio da impiegare nel confezionamento di conglomerato cementizio rinforzato
- pr-EN 14889-1 – Fibres for concrete – Part 1 – Steel fibres – Definition, specifications and conformity

PACKAGING

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