

WIRAND® STEEL FIBERS Fiber-Reinforced Concrete Flexural Toughness Factors Re,3 (JSCE SF-4)

Product Description

Wirand® steel fibers can be used for structural design.

The principal property that refers to the most relevant codes is the flexural strength beam tests as EN 14651, ASTM C1609, C1399 or JSCE SF-4.

The flexural toughness factors Re,3 (displayed for the chosen steel fiber type and dosage and expressed in %), according to the Japanese Standard JSCE SF-4 and based on Maccaferri's experimental data base, is the ratio between the equivalent post-peak flexural strength and the MOR (Modulus of Rupture).

These values can be used as the Re,3 suggested in the ACI 360R-06 or in TR 34/3 (also called equivalent flexural strength ratio) for the slabs-on-grade structural design.

Flexural Toughness Factors Re,3							
Fiber Type	Fiber Dosage kg/m3 (lbs/cu.yd)						
	20 (34)	25 (42)	30 (50)	35 (60)	40 (67)	45 (75)	50 (85)
Wirand® FF1	48	57	64	71	77	83	89
Wirand® FF3	55	74	88	97	102	108	112
Wirand® FS1	55	75	93	109	122	134	142
Wirand® FS3N	33	42	50	57	63	70	75
Wirand® FS4N	39	49	58	67	75	81	87
Wirand® FS7	48	65	79	92	103	113	120

Fibers Properties						
Fiber Type	Material	Tensile Strength Mpa (kips/in2)	Dimensions			
			Length mm (in)	Diameter mm (in)	Aspect Ratio 0	N° of Fibers / kg n° / kg (n° / lb)
Wirand® FF1	Low carbon cold-drawn steel wire	> 1100 (159,5)	50 (1,9685)	1,00 (0,0394)	50	3200 (1451)
Wirand® FF3	Low carbon cold-drawn steel wire	> 1100 (159,5)	50 (1,9685)	0,75 (0,0295)	67	5700 (2585)
Wirand® FS1	Low carbon cold-drawn steel wire	> 1200 (174,0)	37 (1,4567)	0,55 (0,0217)	67	14300 (6484)
Wirand® FS3N	Low carbon cold-drawn steel wire	> 1100 (159,5)	33 (1,2992)	0,75 (0,0295)	44	8600 (3901)
Wirand® FS4N	Low carbon cold-drawn steel wire	> 1200 (174,0)	33 (1,2992)	0,6 (0,0236)	55	14900 (6759)
Wirand® FS7	Low carbon cold-drawn steel wire	> 1200 (174,0)	33 (1,2992)	0,55 (0,0217)	60	16100 (7303)

Fibers Performance						
Properties	Wirand®					
	FF1	FF3	FS1	FS3N	FS4N	FS7
Ductility & toughness	•••	••••	••••	••	•••	••••
Fatigue Resistance	••	••	•••	•••	•••	•••
Impact resistance	•••	•••	••••	••	•••	•••
Permeability	••	••	•••	••	••	•••
Shrinkage	••	••	••	••	••	••
Abrasion	••	••	•••	••	••	•••
Thermal Effects	••••	••••	•••	••	••	•••

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UKAS' s accreditation.*