



WALCOOM

Walcoom Corporation



STEEL FIBER

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According to the standards of ASTM A820/A820M and ISO 13270, steel fiber is a kind of cold-draw wire fibrous material that used in concrete to enhance its structural durability and strength. The types of steel fibers are divided into five types, cold-drawn wire, cut sheet, melt-extracted, mill cut, modified cold-drawn wire, which based upon the product or process of steel fiber.

Walcoom steel fiber category is also based on the product or process but divided into six types.

Walcoom steel fibers are suitable for concrete and mortar, such as sprayed concrete, flooring, precast and in situ and repair concretes.

This PDF covers detailed specification of steel that Walcoom can provide.

Steel fiber

Types

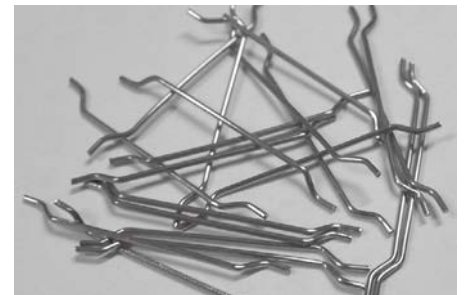
- Type-1: Round crimped steel fiber
- Type-2: Melt-extract stainless steel.
- Type-3: Hooked end steel fiber.
- Type-4: Glued steel fiber.
- Type-5: Flat end fiber.
- Type-6: Flat crimped steel fiber.



Type-1



Type-2



Type-3



Type-4



Type-5



Type-6

Symbols for steel fiber

Table-1: Symbols and definitions (ISO 1327-2013)

Symbol	Definitions	Unit
w^a	width of the fibre	mm
t^a	thickness of the fibre	mm
d	diameter or equivalent diameter of the fibre	mm
R_m	tensile strength of the fibre	MPa
l	length of the fibre	mm
λ	aspect ratio of the fibre ($\lambda = l/d$)	–
l/d	aspect ratio	mm
m	mass of the fibre	g
v_f	the amount of steel fiber added to concrete	%

Tensile strength of steel fiber (BS EN 1489, ISO 13270)

- **Cold-draw wire:** The tolerance on the declared value of R_m is 15% for individual values and 7.5% for the mean value. At least 95% of the individual specimens meet the specified tolerance.
- **Cut sheet:** The tensile strength is determined from source plate before deformation.
- **Melt-extracted, mill cut, modified cold-drawn wire:** Are determined from fibers with a minimum length of 20 mm clamped within the jaws of the testing machine.

Coating

- Non-coating.
- Epoxy resin.
- Galvanized.

Bending requirements

According to ASTM A820/A820M and ISO 22034, steel fiber shall withstand 3 mm diameter pin to an angle of 90° at temperatures not less than 16°C without breaking.

Package

- Each shipping container only provides for one type and size of steel fiber.
- The material of shipping containers provide sufficient protection when handling and transportation.
- The shipping container will be marked with type, material, size, specification designation, net weight and name of trademark of manufacturer.

The quantity of steel fiber added to concrete

The amount of steel fibers added to concrete are based upon "volume fraction" (V_f). V_f is usually arranged from 0.1% to 0.3%.

Aspect ratio

Ratio of length (l) to equivalent diameter of the fiber.

Benefits of steel fiber

- Improve concrete structural integrity and durability.
- Improve impact- and abrasion-resistance.
- Improve freeze-thaw resistance.
- Reduce cracking widths.
- Reduce steel requirements.
- Shrinkage control.
- Easy to handle.

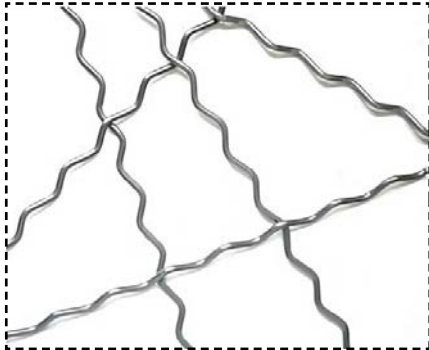
Application

- Sprayed concrete.
- Flooring pavement.
- Precasting concrete.
- Situ and repair concretes.

Exact application

- Flooring pavement.
- Tunnel construction.
- Burner blocks.
- Blast furnace.
- Low cement castable.
- Fire clays.
- Torpedo ladle.
- Building construction.
- Highway construction.
- Bridge construction.
- Dam construction.

Specification of steel fiber



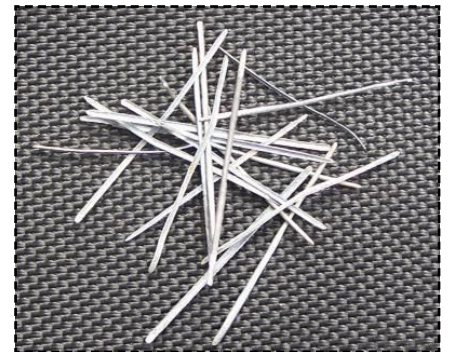
Walcoom round crimped steel fiber

Table-1: Round crimped steel fiber

Item	Diameter (mm)	Fiber length (mm)	Wave depth (mm)	Wave length (mm)	Aspect ratio (l/d)	Tensile strength (MPa)	Number of fibers per kg	Total fiber length 10 kg (m)
RC39/35BN	0.9	35	0.4–0.65	8.0	39	≥ 1200	5500	1925
RC50/50BN	1.0	50	0.4–0.65	8.0	50	≥ 1150	3100	1550
RC60/60BN	1.0	60	0.4–0.65	8.0	60	≥ 1500	2500	1550
RC39/50BN	1.3	50	0.4–0.65	8.0	39	≥ 900	1850	910

Melt extract stainless steel fiber

- **Material:** stainless steel 330, 310, 316, 316L, 321, 304, 446, 430 and 430Al.
- **Equivalent diameter:** 0.3–0.4 mm, 0.4–0.5 mm, 0.45–0.55 mm, 0.55–0.60 mm.
- **Length:** 20 mm, 25 mm, 30 mm, 35 mm.
- **Aspect ratio:** 40–45, 45–50, 50–55, 55–60.
- **Packaging:** 20 kg/bag or 20 kg/carton or as required.



Walcoom melt extract stainless steel fiber



Walcoom hooked end steel fiber

Table-2: Hooked end steel fiber

Item	Diameter (mm)	Length (mm)	L/D	Tensile strength (Mpa)
HE60/60BN	1.0	60	60	≥ 1100
HE50/50BN	1.0	50	50	≥ 1100
HE67/60BN	0.9	60	67	≥ 1100
HE56/50BN	0.9	50	56	≥ 1100
HE50/40BN	0.8	40	50	≥ 1100
HE62/45BN	0.8	45	62	≥ 1100
HE60/45BN	0.75	45	60	≥ 1100
HE58/35BN	0.6	35	58	≥ 1100
HE50/30BN	0.6	30	50	≥ 1100
HE50/20BN	0.5	25	50	≥ 1100



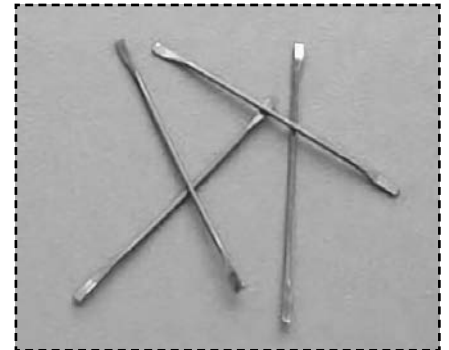
Walcoom glued steel fiber

Table-3: Glued steel fiber

Item	Diameter (mm)	Length (mm)	Aspect ratio (L/D)	Tensile strength (Mpa)
G50/25BN	0.5	25	50	≥ 1100
G60/30BN	0.5	30	60	≥ 1100
G70/35BN	0.5	35	70	≥ 1100
G70/35BN	0.6	25	42	≥ 1100
G50/30BN	0.6	30	50	≥ 1100
G58/35BN	0.6	35	58	≥ 1100
G40/30BN	0.75	30	40	≥ 1100
G47/35BN	0.75	35	47	≥ 1100
G80/30BN	0.75	60	80	≥ 1100
G38/30BN	0.8	30	38	≥ 1100
G44/35BN	0.8	35	44	≥ 1100
G75/60BN	0.8	60	75	≥ 1100
G56/50BN	0.9	50	56	≥ 1100
G67/60BN	0.9	60	67	≥ 1100
G50/50BN	1.0	50	50	≥ 1100
G60/60BN	1.0	60	60	≥ 1100

Flat end fiber

- **Diameter:** 0.65 mm.
- **Length:** 35 mm.
- **Aspect ratio l/d:** 54.
- **Tensile strength:** 1150 MPa.
- **Packaging:** net weight/box: 25 kg/ also available in a bag of 1000 kg.



Walcoom flat end fiber



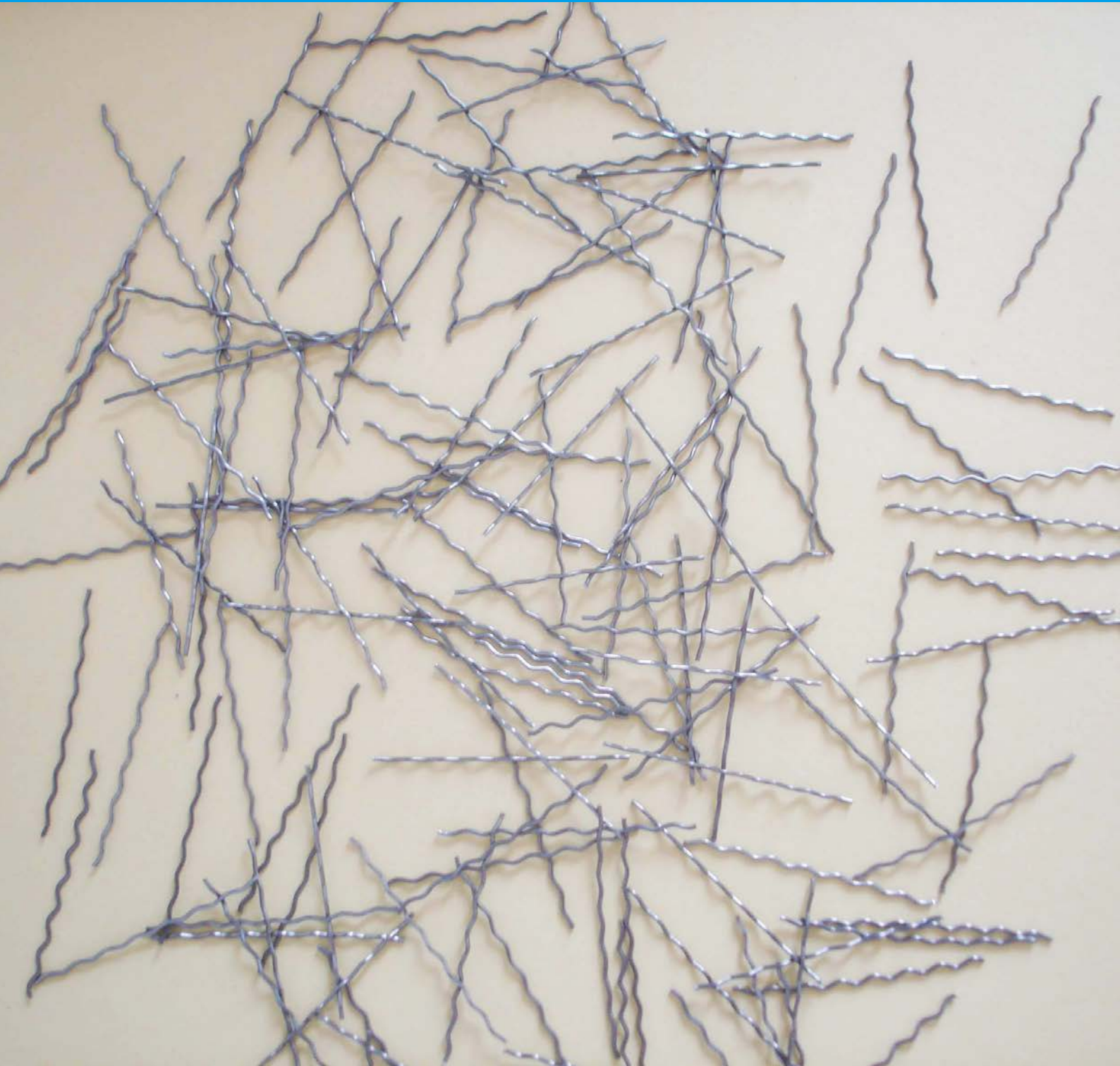
Walcoom flat crimped steel fiber

Table-4: Flat crimped steel fiber

Item	Length (mm)	Width (mm)	Thickness (mm)	Aspect ratio (l/d)	Tensile strength (MPa)
FC33/10	10	0.3	0.25	33	≥ 800
FC47/15	15	0.3	0.25	47	≥ 800
FC43/20	20	0.4	0.4	43	≥ 800
FC56/25	25	0.4	0.4	56	≥ 800
FC59/32	32	0.5	0.5	59	≥ 800

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