PSCS - KrampeHarex® Hooked End Fiber ASTM A820 Type I Cold-Drawn Natural Steel Wire Chart

Performance Structural Concrete Solutions (PSCS) is the exclusive distributor in North America for KrampeHarex steel fibers. Founded in 1982 and headquartered in Hamm, Germany, KrampeHarex® is a second generation, family owned, privately held company. All products are manufactured and produced in accordance to ISO 9001:DIN 2008. All design services are performed by Schulz Concrete Engineering.

ASTM A820 recognizes and identifies five different kind of steel fibers intended for use in fiber-reinforced concrete. Of the five types of steel fibers, type I steel fibers yield the highest and greatest tensile strength. For the manufacturing of ASTM A820, Type I – cold-drawn wire, the wires are produced to the desired diameter, length, shape, and strength by passing the steel wire through sets rollers working in opposite directions. Depending on the segment used on the rollers, the wires are bent to their specific form and cut to length during the final production stages of this operation. PSCS Performance Steel Fibers are produced in accordance to ISO 9001:2008. This includes all phases: from inspecting and testing of raw materials, right up to the finished product.

PSCS Performance Type I High Tensile Strength Cold Drawn Hooked End Steel Fibers, are normally manufactured in lengths of 0.98 in. (25 mm), 1.18 in. (30 mm), 1.38 in. (35 mm), 1.77 in. (45 mm), 1.97 in. (50 mm), and 2.36 in. (60 mm). The wire diameters range from 0.020 in. (.50 mm), to 0.039 in. (1.0 mm). A hooked end fiber allows for maximum anchorage in the concrete matrix.

Steel fibers are able to bridge cracks, and therefore transmit forces from one crack edge to the other. Concrete reinforced by steel fibers is characterized by greater ductility and may even accept forces after cracking.

Characteristics, Features, and Benefits:

- Increases crack resistance, ductility, energy absorption, and toughness of concrete bodies
- Improves impact resistance, fatigue endurance, shear strength, and post-crack behaviors of concrete bodies
- High tensile strength fiber bridging cracks allows for tighter aggregate interlock
- The higher dosage, the better the ability to keep micro cracks within the concrete structure itself
- Increased loading capacities allow for either greater load capacity, or a reduction in the concrete section itself
- Requires less labor vs. traditional reinforcement
- Steel fibers do not pose a hazard like rebar
- Allows for a reduction in project schedule, as placement of reinforcement is eliminated
- Manufactured and certified in accordance with DIN/EN ISO 9001:2008.

Applications:

- Slabs on ground
- Slabs on piles
- Slabs on decks
- Airport pavements
- Heavy traffic pavements
- Mining and tunneling
- Shotcrete
- Equipment foundations
- Precast concrete products

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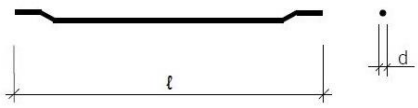
Natural Steel Hooked End Cold Drawn Steel Fibers:

Name	Length ± 10%	Diameter ± 10%	Cross Section	Aspect Ratio L/D	Tensile Strength ± 15%
DE 60/1.0 M	2.4 in / 60 mm	0.039 in / 1.0 mm	Round	60	203 ksi / 1,400 mpa
DE 60/1.0 H	2.4 in / 60 mm	0.039 in / 1.0 mm	Round	60	348 ksi / 2,400 mpa
DE 60/0.9 N	2.4 in / 60 mm	0.035 in / 0.9 mm	Round	66.6	167 ksi / 1,150 mpa
DE 60/0.8 M	2.4 in / 60 mm	0.035 in / 0.9 mm	Round	66.6	224 ksi / 1,550 mpa
DE 60/0.8 H	2.4 in / 60 mm	0.035 in / 0.9 mm	Round	66.6	348 ksi / 2,400 mpa
DE 60/0.75 N	2.4 in / 60 mm	0.035 in / 0.9 mm	Round	66.6	174 ksi / 1,200 mpa
DE 50/1.0 N	1.97 in / 50 mm	0.039 in / 1.0 mm	Round	50	167 ksi / 1,150 mpa
DE 50/1.0 M	1.97 in / 50 mm	0.039 in / 1.0 mm	Round	50	203 ksi / 1,400 mpa
DE 50/1.0 H	1.97 in / 50 mm	0.039 in / 1.0 mm	Round	50	348 ksi / 2,400 mpa
DE 50/0.9 N	1.97 in / 50 mm	0.035 in / 0.9 mm	Round	55.6	167 ksi / 1,150 mpa
DE 50/0.8 M	1.97 in / 50 mm	0.031 in / 0.8 mm	Round	62.5	224 ksi / 1,550 mpa
DE 50/0.8 H	1.97 in / 50 mm	0.031 in / 0.8 mm	Round	62.5	348 ksi / 2,400 mpa
DE 50/0.75 N	1.97 in / 50 mm	0.030 in / 0.75 mm	Round	66.7	174 ksi / 1,200 mpa
DE 35/0.75 N	1.38 in / 35 mm	0.030 in / 0.75 mm	Round	46.7	174 ksi / 1,200 mpa
DE 35/0.7 N	1.38 in / 35 mm	0.028 in / 0.7 mm	Round	50	174 ksi / 1,200 mpa
DE 35/0.6 N	1.38 in / 35 mm	0.024 in / 0.6 mm	Round	58.3	181 ksi / 1,250 mpa
DE 35/0.55 N	1.38 in / 35 mm	0.021 in / 0.55 mm	Round	63	196 ksi / 1,350 mpa
DE 30/0.6 N	1.18 in / 30 mm	0.024 in / 0.6 mm	Round	50	181 ksi / 1,250 mpa
DE 30/0.5 N	1.18 in / 30 mm	0.020 in / 0.5 mm	Round	60	181 ksi / 1,250 mpa
DE 25/0.6 N	0.98 in / 25 mm	0.024 in / 0.6 mm	Round	41.7	181 ksi / 1,250 mpa
DE 25/0.55 N	0.98 in / 25 mm	0.020 in / 0.5 mm	Round	50	196 ksi / 1,350 mpa
DE 25/0.5 N	0.98 in / 25 mm	0.020 in / 0.5 mm	Round	50	181 ksi / 1,250 mpa
DE 25/0.4 N	0.98 in / 25 mm	0.016 in / 0.5 mm	Round	63	1,200 mpa / 174 ksi

*For a complete listing of all fibers produced by KrampeHarex®, please visit www.krampeharex.com/en/.



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