Rebar

Reinforcing bar or rebar is a hot rolled steel product used primarily for reinforcing concrete structures. Meeting ASTM specifications, rebar grades are available varying in yield strength, bend test requirements, composition.

Grade 300 / Grade 40

Due to lower carbon content, grade 300 is easier to bend.

Typical applications: Residential construction

Grade 420 / Grade 60

Used in high stress rated applications: higher carbon content provides increased vertical strength.

Typical applications: Dams, atomic power stations or commercial buildings

No-Grade

No-grade rebar is not tested as it is rolled. Cannot be used in applications where mill certified products are required.

Typical applications: Sidewalks, driveways, or other flat pours

ASTM Specifications

ASTM A 615

Deformed and plain billet steel bars for concrete reinforcing. Grades 300 (40) and 420 (60). Reinforcing bars manufactured to meet ASTM A 615, A 616, A 617, A 706 and are subject to availability.

Identification

Every mill uses its own identification pattern to differentiate its rebar from other. The following illustrates how to read rebar identification.

Sizes

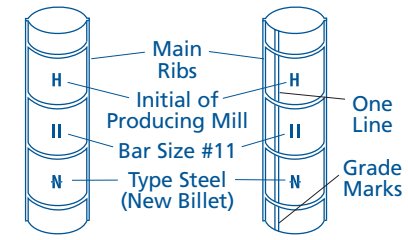
Metric Size	Bar Number	Nominal Size	Weight Per Ft. (lbs.)	Weight Per 20' (lbs.)
10	#3	3/8" (.3759)	.376	7.52
13	#4	1/2" (.5009)	.668	13.36
16	#5	5/8" (.6259)	1.043	20.86
19	#6	3/4" (.7509)	1.502	30.04
22	#7	7/8" (.8759)	2.044	40.88
25	#8	1" (1.0009)	2.670	53.40
29	#9	1-1/8" (1.1289)	3.400	68.00
32	#10	1-1/4" (1.2709)	4.303	86.06
36	#11	1-3/8" (1.4109)	5.313	106.26
43	#14	1-3/4" (1.6939)	7.650	153.00
57	#18	2-1/4" (2.2579)	13.600	272.00

Cut To Size Rebar

Cut to size rebar has a variety of applications. It can be used for concrete reinforcement, construction stakes, landscaping projects or tree and vegetable stakes.

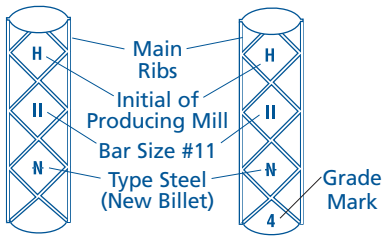
Lengths Available	Bar Diameter (inches)
12"	3/8, 1/2
18"	3/8, 1/2
24"	3/8, 1/2, 5/8
48"	3/8, 1/2, 5/8
6'	3/8, 1/2, 5/8
8'	3/8, 1/2, 5/8
10'	3/8, 1/2, 5/8

Line System—Grade Marks



Grade 300 (40) Grade 420 (60)

Number System—Grade Marks



Grade 300 (40) Grade 420 (60)

N = New Billet
A = Axle
I = Rail
W = Low Alloy

Variations: Bar identification marks may also be oriented to read horizontally. (At 90° to those illustrated above.) Grade mark lines must be continued at least five deformed spaces. Grade mark numbers may be placed within separate consecutive deformation spaces to read vertically or horizontally.

Physical Requirements for Standard ASTM Deformed Reinforcing Bars

Type of Steel & ASTM Spec. No.	Size – Nos. Inclusive	Grade	Tensile Strength Min., PSI	Yield (a) Min., PSI	Elongation in 8" (%)	Cold Bend Pin (d) (d=nominal diameter or specimen)
Billet Steel A 615	3-11	40 300	70,000	40,000	#3 #7 . . . . . .11 #4 #5 #6 . . . . . .12 #8 . . . . . .10 #9 . . . . . .9 #10 . . . . . .8 #11 7	Under size #6 . . . . . 4d #6 and larger 5d
	3-11 14, 18	60 420	90,000	60,000	#3 #4 #5 #6 . . . . . .9 #7 #8 . . . . . .8 #9 #10 #11 #14 #18 . . .7	Under size #6 . . . . . 4d #6. . . . . 5d #7 #8 . . . . . 6d #9 #10 #11 . . . . . 8d (b) #14 #18. . . . 10d (90°)
Rail Steel A 618 (c)	3-11	60 420	90,000	60,000	#3 #4 #5 #6 . . . . . .6 #7 . . . . . .5 #8 #9 #10 #11 . . . . .4.5	Under size #9 . . . . . 6d #9 #10 . . . . . 8d #11 . . . . . 8d (90°)
Axle Steel A 617 (c)	3-11	40 300	70,000	40,000	#3 #7 . . . . . .11 #4 #5 #6 . . . . . .12 #8 . . . . . .10 #9 . . . . . .9 #10 . . . . . .8 #11 7	Under size #6 . . . . . 4d #6 and larger 5d
	3-11	60 420	90,000	60,000	#3 #4 #5 #6 #7 . . . . . .8 #8 #9 #10 #11 7	Under size #6 . . . . . 4d #6. . . . . 5d #7 #8 . . . . . 6d #9 #10 #11 . . . . . 8d
Low Alloy Steel	3-11 300	60	80,000 (e)	60,000 (f)	#3 #4 #5 #6 . . . . . .14 #7 #8 #9 #10 #11 . . . .12 #14 #18 10	Under size #6 . . . . . 3d #6 #7 #8 . . . . . 4d #9 #10 #11 . . . . . 6d #14 #18 . . . . . 8d

(a) Yield point or yield strength. See specifications.

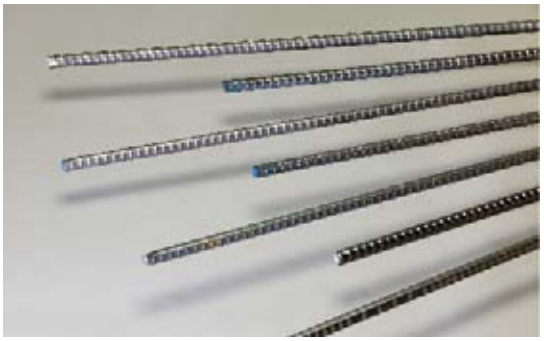
(b) Under supplemental requirements of A 615 only.

(c) Complete specification for Rail Steel A 616, Axle Steel A 617, and Low Alloy Steel A 706 reinforcing bars can be obtained from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103. Chart courtesy of Concrete Reinforcing Steel Institute.

(d) Test bends 180° unless noted otherwise.

(e) Tensile strength shall not be less than 1.25 times the actual yield strength (A 706 only).

(f) Maximum yield strength 78,000 psi (A 706 only).



Remesh (welded wire reinforcing fabric) provides uniform stress distribution and more effective crack control in slabs and walls. The ease and speed with which remesh can be installed typically save valuable installation time and costs.

- Reduces the number and size of cracks in concrete
- Permits the use of larger panels for more coverage
- Available in sheets and rolls

ASTM Specifications

ASTM A 82
Cold drawn steel wire for concrete reinforcement

ASTM A 185
Welded steel wire fabric for concrete reinforcement

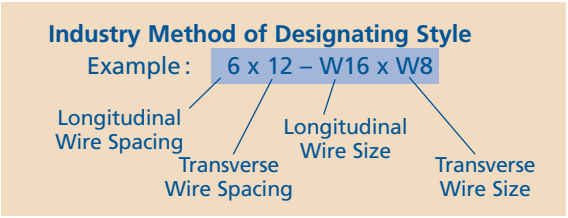
ASTM A 496
Deformed steel wire for concrete reinforcement

ASTM A 497
Welded deformed steel wire for concrete reinforcement

Nomenclature

ASTM minimum properties of steel wire in welded wire fabric.

Identification



Type	Yield of Strength (p.s.i.)	Tensile Strength (p.s.i.)	Weld Shear Strength (p.s.i.)
Welded Smooth	65,000	75,000	35,000
Deformed Welded	70,000	80,000	35,000

Source: Wire Reinforcement Institute Tech Facts TF-501.

Remesh

Style Designation Number		Steel Area (sq. in. per ft.)		Approx. Weight (lbs.) per 100 sq. ft.
Design by W-Number(a)	Design by Wire Gauge	Longitudinal	Transverse	
Rolls				
6 x 6 – W1.4 x W1.4	6 x 6 – 10 x 10	.028	.028	21
6 x 6 – W2.0 x W2.0	6 x 6 – 8 x 8(b)	.040	.040	29
6 x 6 – W2.9 x W2.9	6 x 6 – 6 x 6	.058	.058	42
6 x 6 – W4.0 x W4.0	6 x 6 – 4 x 4	.080	.080	58
4 x 4 – W1.4 x W1.4	4 x 4 – 10 x 10	.042	.042	31
4 x 4 – W2.0 x W2.0	4 x 4 – 8 x 8	.060	.060	43
4 x 4 – W2.9 x W2.9	4 x 4 – 6 x 6	.087	.087	62
4 x 4 – W4.0 x W4.0	4 x 4 – 4 x 4	.120	.120	85
Sheets				
6 x 6 – W1.4 x W1.4	6 x 6 – 10 x 10	.028	.028	21
6 x 6 – W2.9 x W2.9	6 x 6 – 6 x 6	.06	.06	42
6 x 6 – W4.0 x W4.0	6 x 6 – 4 x 4	.08	.08	58
6 x 6 – W5.5 x W5.5	6 x 6 – 2 x 2(c)	.11	.11	80
4 x 4 – W4.0 x W4.0	4 x 4 – 4 x 4	.12	.12	86

(a) W=number = Cross-sectional area of the wire (b) Exact W-number for 8-gauge is W2.1. (c) Exact W-number for 2-gauge is W5.4.