



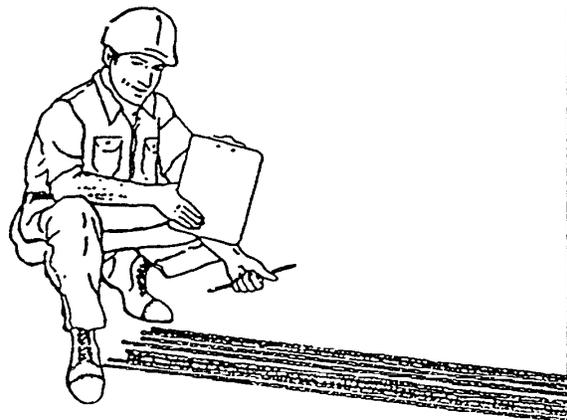
field identification  
guide for  
reinforcing bars



# CONCRETE REINFORCING STEEL INSTITUTE

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field identification  
guide for  
reinforcing bars



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**U.S. MANUFACTURERS OF GRADE 60 [420]  
CONCRETE REINFORCING BARS**

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CONTACT INFORMATION FOR CRSI MILL MEMBERS

**GERDAU AMERISTEEL**

Charlotte Steel Mill Division  
6601 Lakeview Road  
Charlotte, NC 28213  
Tel: 704-596-0361  
Fax: 704-597-5031  
Web: [www.ameristeel.com](http://www.ameristeel.com)

**GERDAU AMERISTEEL**

Jacksonville Steel Mill Division  
Highway 217 & Yellow Water Road  
Baldwin, FL 32234  
Tel: 904-266-4261  
Fax: 904-266-4244  
Web: [www.ameristeel.com](http://www.ameristeel.com)

**GERDAU AMERISTEEL**

Knoxville Steel Mill Division  
1919 Tennessee Avenue  
Knoxville, TN 37950  
Tel: 865-546-5472  
Fax: 865-637-8293  
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**GERDAU AMERISTEEL**

West Tennessee Steel Mill Division  
801 AmeriSteel Road  
Jackson, TN 38305  
Tel: 901-424-5600  
Fax: 901-422-4247  
Web: [www.ameristeel.com](http://www.ameristeel.com)

**GERDAU AMERISTEEL**

St. Paul Mill  
1678 Red Rock Road  
St. Paul, MN 55164  
Tel: 651-731-5600  
Fax: 651-731-5699  
Web: [www.cargillsteel.com/carnss](http://www.cargillsteel.com/carnss)

**AUBURN STEEL COMPANY, INC.**

Auburn Division  
25 Quarry Road  
Auburn, NY 13021  
Tel: 315-253-4561  
Fax: 315-253-5377  
Web: [www.austeel.com](http://www.austeel.com)

**NUCOR STEEL BIRMINGHAM, INC.**

Alabama Steel Division  
2301 Shuttlesworth Drive  
Birmingham, AL 35234  
Tel: 205-252-8777  
Fax: 205-250-7465  
Web: [www.birminghamsteel.com](http://www.birminghamsteel.com)

**NUCOR STEEL KANKAKEE, INC.**

Illinois Steel Division, Kankakee Plant  
972 East 4500 North Road  
Bourbonnais, IL 69014  
Tel: 815-937-3131  
Fax: 815-939-5599  
Web: [www.birminghamsteel.com](http://www.birminghamsteel.com)

**NUCOR STEEL JACKSON, INC.**

Mississippi Steel Division  
3630 Fourth Street  
Jackson, MS 39208  
Tel: 601-939-1623  
Fax: 601-936-6200  
Web: [www.birminghamsteel.com](http://www.birminghamsteel.com)

**NUCOR STEEL SEATTLE, INC.**

Seattle Washington Steel Division  
2424 SW Andover  
Seattle, WA 98106  
Tel: 206-933-2222  
Fax: 206-933-2207  
Web: [www.birminghamsteel.com](http://www.birminghamsteel.com)

**CASCADE STEEL ROLLING MILLS, INC.**

3200 Northeast Highway 99W  
McMinnville, OR 97128  
Tel: 503-472-4181  
Fax: 503-434-5739  
Web: [www.schn.com](http://www.schn.com)

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**U.S. MANUFACTURERS OF GRADE 60 [420]  
CONCRETE REINFORCING BARS**

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CONTACT INFORMATION FOR CRSI MILL MEMBERS

**AUBURN STEEL COMPANY, INC.**

Lemont Division  
New Avenue at Ceco Road  
Lemont, IL 60439  
Tel: 630-243-0012  
Fax: 630-243-0031  
Web: [www.austeel.com](http://www.austeel.com)

**MARION STEEL COMPANY**

912 Cheney Avenue  
Marion, OH 43302  
Tel: 740-383-4011  
Fax: 740-383-6429  
Web: [www.marionsteel.com](http://www.marionsteel.com)

**NORTH STAR STEEL COMPANY**

Beaumont Mill  
PO Box 2390  
Beaumont, TX 77704  
Tel: 409-768-1211  
Fax: 409-769-1978  
Web: [www.cargillsteel.com/carnss](http://www.cargillsteel.com/carnss)

**SHEFFIELD STEEL CORP.**

2300 South Highway 97  
Sand Springs, OK 74063  
Tel: 918-245-1335  
Fax: 918-245-9343  
Web: [www.sheffieldsteel.com](http://www.sheffieldsteel.com)

**NORTH STAR STEEL COMPANY**

Kingman Mill  
3000 Highway 66 South  
Kingman, AZ 86413  
Tel: 520-718-0119  
Fax: 520-718-7093  
Web: [www.cargillsteel.com/carnss](http://www.cargillsteel.com/carnss)

**STRUCTURAL METALS, INC.**

Arkansas Mill  
PO Box 1147  
Magnolia, AR 71753  
Tel: 870-234-8703  
Fax: 870-234-8706  
Web: [www.steelnet.org/cmc](http://www.steelnet.org/cmc)

**NORTH STAR STEEL COMPANY**

Monroe Mill  
3000 East Front Street  
Monroe, MI 48161  
Tel: 734-243-2446  
Fax: 734-243-2751  
Web: [www.cargillsteel.com/carnss](http://www.cargillsteel.com/carnss)

**STRUCTURAL METALS, INC.**

South Carolina Mill  
310 New State Road  
Cayce, SC 29033  
Tel: 803-936-3700  
Fax: 803-936-3711  
Web: [www.steelnet.org/cmc](http://www.steelnet.org/cmc)

**NORTH STAR STEEL COMPANY**

St. Paul Mill  
1678 Red Rock Road  
St. Paul, MN 55164  
Tel: 651-731-5600  
Fax: 651-731-5699  
Web: [www.cargillsteel.com/carnss](http://www.cargillsteel.com/carnss)

**STRUCTURAL METALS, INC.**

Texas Mill  
PO Box 911  
Seguin, TX 78156  
Tel: 830-372-8200  
Fax: 830-379-9873  
Web: [www.steelnet.org/cmc](http://www.steelnet.org/cmc)

**NORTH STAR STEEL COMPANY**

Wilton Mill  
Highway 38 Greens Road  
Wilton, IA 52778  
Tel: 319-732-3231  
Fax: 319-732-4575  
Web: [www.cargillsteel.com/carnss](http://www.cargillsteel.com/carnss)

**TAMCO**

12459 Arrow Highway  
Rancho Cucamonga, CA 91739  
Tel: 909-899-0660  
Fax: 909-899-1910

## MATERIAL SPECIFICATIONS FOR REINFORCING BARS

### Identification Marks\*—ASTM Standard Rebars

The ASTM specifications for billet-steel, rail-steel, axle-steel and low-alloy reinforcing bars (A615, A616, A617 and A706, respectively) require identification marks to be rolled into the surface of one side of the bar to denote the Producer's mill designation, bar size, type of steel, and minimum yield designation. Grade 60 bars show these marks in the following order:

- 1st—Producing Mill (usually a letter)
- 2nd—Bar Size Number (#3 through #11, #14, #18)
- 3rd—Type of Steel:

**S** for Billet (A615)

**W** for Low-Alloy (A706)

**I** for Rail (A616)

**I R** for Rail meeting Supplementary Requirements S1 (A616)

**A** for Axle (A617)

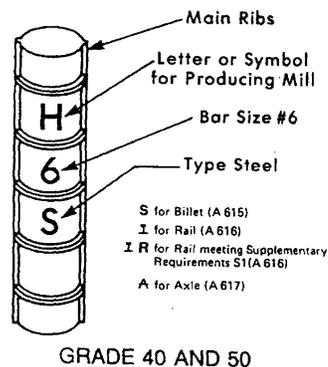
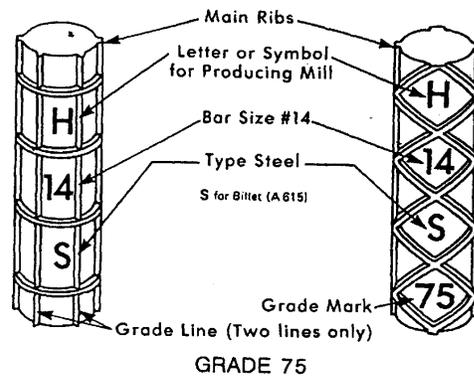
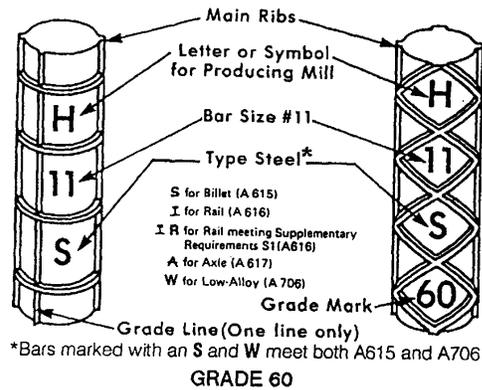
#### 4th—Minimum Yield Designation

Minimum yield designation is used for Grade 60 and Grade 75 bars only. Grade 60 bars can either have one single longitudinal line (grade line) or the number 60 (grade mark). Grade 75 bars can either have two grade lines or the grade mark 75.

A grade line is smaller and is located between the two main ribs which are on opposite sides of all bars made in the United States. A grade line must be continued through at least 5 deformation spaces, and it may be placed on the same side of the bar as the other markings or on the opposite side. A grade mark is the 4th mark on the bar.

Grade 40 and 50 bars are required to have only the first three identification marks (no minimum yield designation).

**VARIATIONS:** Bar identification marks may also be oriented to read horizontally (at 90° to those illustrated). Grade mark numbers may be placed within separate consecutive deformation spaces to read vertically or horizontally.



\*See Appendix A for complete identification marks of Grade 60 concrete reinforcing bars produced by all U.S. Manufacturers. The marks, listed alphabetically by producing mill, include the identification requirements of ASTM and the deformation pattern used by each mill.

**ASTM STANDARD REINFORCING BARS**

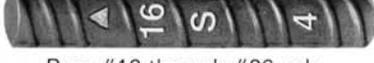
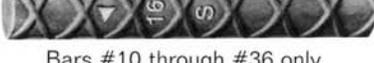
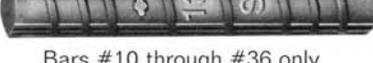
English Bar Size	Diameter (inches)	Metric Bar Size	Diameter (mm)
#3	0.375	#10	9.5
#4	0.500	#13	12.7
#5	0.625	#16	15.9
#6	0.750	#19	19.1
#7	0.875	#22	22.2
#8	1.000	#25	25.4
#9	1.128	#29	28.7
#10	1.270	#32	32.3
#11	1.410	#36	35.8
#14	1.693	#43	43.0
#18	2.257	#57	57.3

**ASTM STANDARD REINFORCING CONVERSION BAR SIZE & GRADE CHARTS**

<u>SIZE</u>		<u>GRADE</u>	
<u>English</u>	=	<u>English</u>	<u>Metric</u>
#3	=	Grade 40	300 MPa
#4	=	Grade 60	420 MPa
#5	=	Grade 75	520 MPa
#6	=		
#7	=		
#8	=		
#9	=		
#10	=		
#11	=		
#14	=		
#18	=		

## U.S. MANUFACTURERS OF GRADE 60 [420] CONCRETE REINFORCING BARS

ASTM and AASHTO Specifications require that all reinforcing bars be identified by permanent, mill imprinted markings.

<p><b>1 A.B. STEEL MILL, INC.</b>  <small>(Cincinnati, OH)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #3 and #4 only                  Grade mark line used for #3 (same side)</p>	<p><b>2 GERDAU AMERISTEEL</b> <b>CRSI</b>  <small>(West Tennessee Steel Mill Division in Jackson, TN)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #43 and #57 only</p>
<p><b>1 A.B. STEEL MILL, INC.</b>  <small>(Cincinnati, OH)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #5 through #8 only</p>	<p><b>2 GERDAU AMERISTEEL</b> <b>CRSI</b>  <small>(West Tennessee Steel Mill Division in Jackson, TN)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #10 through #36 only</p>
<p><b>2 GERDAU AMERISTEEL</b> <b>CRSI</b>  <small>(Charlotte Steel Mill Division in Charlotte, NC)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #13 through #25 only</p>	<p><b>2 GERDAU AMERISTEEL</b> <b>CRSI</b>  <small>(West Tennessee Steel Mill Division in Jackson, TN)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #43 and #57 only</p>
<p><b>2 GERDAU AMERISTEEL</b> <b>CRSI</b>  <small>(Charlotte Steel Mill Division in Charlotte, NC)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #13 through #25 only</p>	<p><b>3 AUBURN STEEL COMPANY, INC.</b> <b>CRSI</b>  <small>(Auburn Division in Auburn, NY)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #13 through #43 only</p>
<p><b>2 GERDAU AMERISTEEL</b> <b>CRSI</b>  <small>(Jacksonville Steel Mill Division in Baldwin, FL)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #10 through #36 only (#10 through #16 coiled)</p>	<p><b>3 AUBURN STEEL COMPANY, INC.</b> <b>CRSI</b>  <small>(Auburn Division in Auburn, NY)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #13 through #43 only</p>
<p><b>2 GERDAU AMERISTEEL</b> <b>CRSI</b>  <small>(Jacksonville Steel Mill Division in Baldwin, FL)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #10 through #36 only (#10 through #16 coiled)</p>	<p><b>3 AUBURN STEEL COMPANY, INC.</b> <b>CRSI</b>  <small>(Lemont Division in Lemont, IL)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #13 through #36 only</p>
<p><b>2 GERDAU AMERISTEEL</b> <b>CRSI</b>  <small>(Knoxville Steel Mill Division in Knoxville, TN)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #13 through #36 only</p>	<p><b>3 AUBURN STEEL COMPANY, INC.</b> <b>CRSI</b>  <small>(Lemont Division in Lemont, IL)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #13 through #36 only</p>
<p><b>2 GERDAU AMERISTEEL</b> <b>CRSI</b>  <small>(Knoxville Steel Mill Division in Knoxville, TN)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #13 through #36 only</p>	<p><b>4 BAYOU STEEL CORP.</b>  <small>(Harriman, TN)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #10 through #36 only</p>
<p><b>2 GERDAU AMERISTEEL</b> <b>CRSI</b>  <small>(West Tennessee Steel Mill Division in Jackson, TN)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #10 through #36 only</p>	<p><b>5 NUCOR STEEL BIRMINGHAM, INC.</b> <b>CRSI</b>  <small>(Alabama Steel Division in Birmingham, AL)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #10 through #36 only</p>

Note: CRSI mill members are in boldface with the CRSI logo at the top right corner.

## U.S. MANUFACTURERS OF GRADE 60 [420] CONCRETE REINFORCING BARS

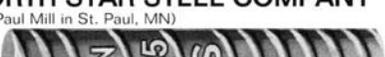
ASTM and AASHTO Specifications require that all reinforcing bars be identified by permanent, mill imprinted markings.

<p><b>5 NUCOR STEEL BIRMINGHAM, INC.</b> <b>CRSI</b>  <small>(Alabama Steel Division in Birmingham, AL)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #10 through #36 only</p>	<p><b>6 BORDER STEEL, INC.</b>  <small>(El Paso, TX)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #10 through #36 only</p>
<p><b>5 NUCOR STEEL KANKAKEE INC.</b> <b>CRSI</b>  <small>(Illinois Steel Division, Kankakee Plant in Bourbonnais, IL)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #10 through #36 only</p>	<p><b>6 BORDER STEEL, INC.</b>  <small>(El Paso, TX)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #43 and #57 only</p>
<p><b>5 NUCOR STEEL KANKAKEE, INC.</b> <b>CRSI</b>  <small>(Illinois Steel Division, Kankakee Plant in Bourbonnais, IL)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #10 through #36 only</p>	<p><b>6 BORDER STEEL, INC.</b>  <small>(El Paso, TX)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #43 and #57 only</p>
<p><b>5 NUCOR STEEL JACKSON, INC.</b> <b>CRSI</b>  <small>(Mississippi Steel Division in Jackson, MS)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #13 through #36 only</p>	<p><b>7 CASCADE STEEL ROLLING MILLS, INC.</b> <b>CRSI</b>  <small>(McMinnville, OR)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #10 through #19 only (#10 through #19 coiled)</p>
<p><b>5 NUCOR STEEL JACKSON, INC.</b> <b>CRSI</b>  <small>(Mississippi Steel Division in Jackson, MS)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #13 through #36 only</p>	<p><b>7 CASCADE STEEL ROLLING MILLS, INC.</b> <b>CRSI</b>  <small>(McMinnville, OR)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #16 through #22 only</p>
<p><b>5 NUCOR STEEL SEATTLE, INC.</b> <b>CRSI</b>  <small>(Seattle Washington Steel Division in Seattle, WA)</small></p> <p><b>S</b> </p> <p style="text-align: center;">All bar sizes</p>	<p><b>7 CASCADE STEEL ROLLING MILLS, INC.</b> <b>CRSI</b>  <small>(McMinnville, OR)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #25 through #57 only</p>
<p><b>5 NUCOR STEEL JACKSON, INC.</b> <b>CRSI</b>  <small>(Seattle Washington Steel Division in Seattle, WA)</small></p> <p><b>W</b> </p> <p style="text-align: center;">All bar sizes</p>	<p><b>7 CASCADE STEEL ROLLING MILLS, INC.</b> <b>CRSI</b>  <small>(McMinnville, OR)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #13 through #19 only (#13 through #19 coiled)</p>
<p><b>5 NUCOR STEEL JACKSON, INC.</b> <b>CRSI</b>  <small>(Seattle Washington Steel Division in Seattle, WA)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #16 through #22 only</p>	<p><b>7 CASCADE STEEL ROLLING MILLS, INC.</b> <b>CRSI</b>  <small>(McMinnville, OR)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #16 through #22 only</p>

Note: CRSI mill members are in boldface with the CRSI logo at the top right corner.

## U.S. MANUFACTURERS OF GRADE 60 [420] CONCRETE REINFORCING BARS

ASTM and AASHTO Specifications require that all reinforcing bars be identified by permanent, mill imprinted markings.

<p><b>7 CASCADE STEEL ROLLING MILLS, INC.</b> <b>CRSI</b>                      (McMinnville, OR)</p> <p><b>W</b>                       Bars #25 through #57 only</p>	<p><b>13 MARION STEEL COMPANY</b> <b>CRSI</b>                      (Marion, OH)</p> <p><b>S</b>                       Bars #13 through #36 only                      Grade mark line opposite side, "I" may be under "S" for #13 or #16</p>
<p><b>8 CHICAGO HEIGHTS STEEL</b>                      (Chicago Heights, IL)</p> <p><b>I</b>                       Bars #4 through #8 only</p>	<p><b>13 MARION STEEL COMPANY</b> <b>CRSI</b>                      (Marion, OH)</p> <p><b>W</b>                       Bars #13 through #36 only                      Grade mark line on opposite side</p>
<p><b>9 CONNECTICUT STEEL CORP.</b>                      (Wallingford, CT)</p> <p><b>S</b>                       Coiled bars #10 and #13 only</p>	<p><b>14 NORTH STAR STEEL COMPANY</b> <b>CRSI</b>                      (Beaumont Mill in Beaumont, TX)</p> <p><b>S</b>                       Coiled bars #10 through #16 only</p>
<p><b>10 GERDAU AMERISTEEL</b>                      (Perth Amboy, NJ)</p> <p><b>S</b>                       Coiled bars #10 through #19 only</p>	<p><b>14 NORTH STAR STEEL COMPANY</b> <b>CRSI</b>                      (Kingman Mill in Kingman, AZ)</p> <p><b>S</b>                       All bar sizes (#10 through #16 coiled)</p>
<p><b>10 GERDAU AMERISTEEL</b>                      (Perth Amboy, NJ)</p> <p><b>W</b>                       Coiled bars #10 through #19 only</p>	<p><b>14 NORTH STAR STEEL COMPANY</b> <b>CRSI</b>                      (Kingman Mill in Kingman, AZ)</p> <p><b>W</b>                       Bars #10 through #36 only (#10 through #16 coiled)</p>
<p><b>11 GERDAU AMERISTEEL</b>                      (Sayreville, NJ)</p> <p><b>S</b>                       All bar sizes</p>	<p><b>14 NORTH STAR STEEL COMPANY</b> <b>CRSI</b>                      (Monroe Mill in Monroe, MI)</p> <p><b>S</b>                       Bar #13 only                      Grade mark line on opposite side</p>
<p><b>11 GERDAU AMERISTEEL</b>                      (Sayreville, NJ)</p> <p><b>W</b>                       All bar sizes</p>	<p><b>14 NORTH STAR STEEL COMPANY</b> <b>CRSI</b>                      (Monroe Mill in Monroe, MI)</p> <p><b>W</b>                       Bar #13 only                      Grade mark line on opposite side</p>
<p><b>12 GST STEEL COMPANY</b>                      (Kansas City, MO)</p> <p><b>S</b>                       Coiled bars #3 and #4 only</p>	<p><b>14 NORTH STAR STEEL COMPANY</b> <b>CRSI</b>                      (St. Paul Mill in St. Paul, MN)</p> <p><b>S</b>                       Bars #13 through #36 only                      Grade mark line on opposite side</p>
<p><b>12 GST STEEL COMPANY</b>                      (Kansas City, MO)</p> <p><b>W</b>                       Coiled bars #3 and #4 only</p>	<p><b>14 NORTH STAR STEEL COMPANY</b> <b>CRSI</b>                      (St. Paul Mill in St. Paul, MN)</p> <p><b>S</b>                       Bars #43 and #57 only                      Grade mark line on opposite side</p>

Note: CRSI mill members are in boldface with the CRSI logo at the top right corner.

## U.S. MANUFACTURERS OF GRADE 60 [420] CONCRETE REINFORCING BARS

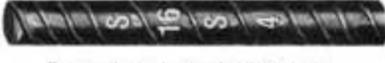
ASTM and AASHTO Specifications require that all reinforcing bars be identified by permanent, mill imprinted markings.

<p><b>14 NORTH STAR STEEL COMPANY</b> <b>CRSI</b>                      (St. Paul Mill in St. Paul, MN)</p> <p><b>W</b>  <b>W</b>                      Bars #13 through #36 only                      Grade mark line on opposite side</p>	<p><b>16 NUCOR STEEL</b>                      (Utah Mill in Plymouth, UT)</p> <p><b>S</b>  <b>S</b>                      Bars #10 through #25 only (#10 through #16 coiled)</p>
<p><b>14 NORTH STAR STEEL COMPANY</b> <b>CRSI</b>                      (St. Paul Mill in St. Paul, MN)</p> <p><b>W</b>  <b>W</b>                      Bars #43 and #57 only                      Grade mark line on opposite side</p>	<p><b>16 NUCOR STEEL</b>                      (Utah Mill in Plymouth, UT)</p> <p><b>S</b>  <b>S</b>                      Bars #19 through #25 only</p>
<p><b>14 NORTH STAR STEEL COMPANY</b> <b>CRSI</b>                      (St. Paul Mill in St. Paul, MN)</p> <p><b>S</b>  <b>S</b>                      Bars #19 through #57 (Patented)                      Long. groove one side only, marking system not per ASTM</p>	<p><b>16 NUCOR STEEL</b>                      (Utah Mill in Plymouth, UT)</p> <p><b>S</b>  <b>S</b>                      Bars #19 through #36 only</p>
<p><b>14 NORTH STAR STEEL COMPANY</b> <b>CRSI</b>                      (Wilton Mill in Wilton, IA)</p> <p><b>S</b>  <b>S</b>                      Bar #13 only                      Grade mark line on opposite side - "I" is first mark (shown) or under S</p>	<p><b>16 NUCOR STEEL</b>                      (Utah Mill in Plymouth, UT)</p> <p><b>S</b>  <b>S</b>                      Bars #43 and #57 only</p>
<p><b>15 NORTHWESTERN STEEL &amp; WIRE CO.</b>                      (Sterling, IL)</p> <p><b>S</b>  <b>S</b>                      Coiled bars #10 through #16 only                      Inch-pound markings on opposite side</p>	<p><b>16 NUCOR STEEL</b>                      (Utah Mill in Plymouth, UT)</p> <p><b>W</b>  <b>W</b>                      Bars #10 through #25 only (#13 and #16 coiled)</p>
<p><b>15 NORTHWESTERN STEEL &amp; WIRE CO.</b>                      (Sterling, IL)</p> <p><b>S</b>  <b>S</b>                      Coiled bars #10 through #16 only                      Inch-pound markings on opposite side</p>	<p><b>16 NUCOR STEEL</b>                      (Utah Mill in Plymouth, UT)</p> <p><b>W</b>  <b>W</b>                      Bars #19 through #36 only</p>
<p><b>16 NUCOR STEEL</b>                      (South Carolina Mill in Darlington, SC)</p> <p><b>S</b>  <b>S</b>                      Bars #13 through #19 only (#16 coiled)</p>	<p><b>17 RIVERVIEW STEEL CORP.</b>                      (Glassport, PA)</p> <p><b>S</b>  <b>S</b>                      Bars #10 through #19 only</p>
<p><b>16 NUCOR STEEL</b>                      (South Carolina Mill in Darlington, SC)</p> <p><b>S</b>  <b>S</b>                      Bars #22 through #36 only</p>	<p><b>18 ROCKY MOUNTAIN STEEL MILLS</b>                      (Pueblo, CO)</p> <p><b>S</b>  <b>S</b>                      Coiled bars #3 through #5 only</p>
<p><b>16 NUCOR STEEL</b>                      (Texas Mill in Jewett, TX)</p> <p><b>S</b>  <b>S</b>                      Bars #10 through #36 only</p>	<p><b>18 ROCKY MOUNTAIN STEEL MILLS</b>                      (Pueblo, CO)</p> <p><b>S</b>  <b>S</b>                      Coiled bars #3 through #7 only</p>

Note: CRSI mill members are in boldface with the CRSI logo at the top right corner.

## U.S. MANUFACTURERS OF GRADE 60 [420] CONCRETE REINFORCING BARS

ASTM and AASHTO Specifications require that all reinforcing bars be identified by permanent, mill imprinted markings.

<p><b>18 ROCKY MOUNTAIN STEEL MILLS</b>  <small>(Pueblo, CO)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Coiled bars #3 through #5 only</p>	<p><b>21 STRUCTURAL METALS, INC.</b> <b>CRSI</b>  <small>(South Carolina Mill in Cayce, SC)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #43 and #57 only</p>
<p><b>18 ROCKY MOUNTAIN STEEL MILLS</b>  <small>(Pueblo, CO)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Coiled bars #3 through #7 only</p>	<p><b>21 STRUCTURAL METALS, INC.</b> <b>CRSI</b>  <small>(South Carolina Mill in Cayce, SC)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #10 through #36 only</p>
<p><b>18 ROCKY MOUNTAIN STEEL MILLS</b>  <small>(Pueblo, CO)</small></p> <p><b>SW</b> </p> <p style="text-align: center;">Coiled bars #4, #5 only</p>	<p><b>21 STRUCTURAL METALS, INC.</b> <b>CRSI</b>  <small>(Arkansas Mill in Magnolia, AR)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #10 through #19 only</p>
<p><b>18 ROCKY MOUNTAIN STEEL MILLS</b>  <small>(Pueblo, CO)</small></p> <p><b>SW</b> </p> <p style="text-align: center;">Coiled bars #3</p>	<p><b>21 STRUCTURAL METALS, INC.</b> <b>CRSI</b>  <small>(Arkansas Mill in Magnolia, AR)</small></p> <p><b>I</b> </p> <p style="text-align: center;">Bars #10 through #19 only</p>
<p><b>19 SHEFFIELD STEEL</b> <b>CRSI</b>  <small>(Sand Springs, OK)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #13 through #43 only</p>	<p><b>21 STRUCTURAL METALS, INC.</b> <b>CRSI</b>  <small>(South Carolina Mill in Cayce, SC)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #43 and #57 only</p>
<p><b>20 SILVER, INC., W.</b>  <small>(El Paso, TX)</small></p> <p><b>I</b> </p> <p style="text-align: center;">Bar #3 only</p>	<p><b>21 STRUCTURAL METALS, INC.</b> <b>CRSI</b>  <small>(Texas Mill in Seguin, TX)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #10 through #36 only</p>
<p><b>20 SILVER, INC., W.</b>  <small>(El Paso, TX)</small></p> <p><b>I</b> </p> <p style="text-align: center;">Bar #3 only</p>	<p><b>21 STRUCTURAL METALS, INC.</b> <b>CRSI</b>  <small>(Texas Mill in Seguin, TX)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #43 and #57 only</p>
<p><b>20 SILVER, INC., W.</b>  <small>(El Paso, TX)</small></p> <p><b>I</b> </p> <p style="text-align: center;">Bar #3 only                  Grade mark line on opposite side</p>	<p><b>21 STRUCTURAL METALS, INC.</b> <b>CRSI</b>  <small>(Texas Mill in Seguin, TX)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #10 through #36 only</p>
<p><b>21 STRUCTURAL METALS, INC.</b> <b>CRSI</b>  <small>(South Carolina Mill in Cayce, SC)</small></p> <p><b>S</b> </p> <p style="text-align: center;">Bars #10 through #36 only</p>	<p><b>21 STRUCTURAL METALS, INC.</b> <b>CRSI</b>  <small>(Texas Mill in Seguin, TX)</small></p> <p><b>W</b> </p> <p style="text-align: center;">Bars #43 and #57 only</p>

Note: CRSI mill members are in boldface with the CRSI logo at the top right corner.

## U.S. MANUFACTURERS OF GRADE 60 [420] CONCRETE REINFORCING BARS

ASTM and AASHTO Specifications require that all reinforcing bars be identified by permanent, mill imprinted markings.

<p><b>22 TAMCO</b> <b>CRSI</b> (Rancho Cucamonga, CA)</p> <p><b>W</b> </p> <p>Bars #13 through #36 only</p>	<p><b>23 TXI CHAPARRAL STEEL</b> (Midlothian, TX)</p> <p><b>S</b> </p> <p>Bars #10 through #36 only Grade mark line on opposite side</p>
<p><b>22 TAMCO</b> <b>CRSI</b> (Rancho Cucamonga, CA)</p> <p><b>W</b> </p> <p>Bars #43 and #57 only</p>	<p><b>23 TXI CHAPARRAL STEEL</b> (Midlothian, TX)</p> <p><b>W</b> </p> <p>Bars #10 through #36 only Grade mark line on opposite side</p>
<p><b>22 TAMCO</b> <b>CRSI</b> (Rancho Cucamonga, CA)</p> <p><b>S</b> </p> <p>Bars #13 through #36 only</p>	
<p><b>22 TAMCO</b> <b>CRSI</b> (Rancho Cucamonga, CA)</p> <p><b>S</b> </p> <p>Bars #43 and #57 only</p>	

Note: CRSI mill members are in boldface with the CRSI logo at the top right corner.

## MATERIAL SPECIFICATIONS FOR REINFORCING BARS

**TABLE 1—MECHANICAL REQUIREMENTS FOR STANDARD ASTM DEFORMED REINFORCING BARS\***

Type of Steel and ASTM Designation	Bar Nos. Range	Grade <sup>1</sup>	Minimum <sup>2</sup> Yield Strength, psi	Minimum Tensile Strength, psi	Minimum Percentage Elongation in 8 in.	Cold Bend Test <sup>3</sup> Pin Diameter (d=nominal diameter of specimen)
Billet-Steel A615	3-6	40	40,000	70,000	#3 ..... 11 #4, #5, #6 ..... 12	#3, #4, #5 ..... 3½d #6 ..... 5d
	3-11, 14, 18	60	60,000	90,000	#3, #4, #5, #6 ..... 9 #7, #8 ..... 8 #9, #10, #11, #14, #18 ..... 7	#3, #4, #5 ..... 3½d #6, #7, #8 ..... 5d #9, #10, #11 ..... 7d #14, #18 (90°) ..... 9d
	6-11, 14, 18	75	75,000	100,000	#6, #7, #8 ..... 7 #9, #10, #11, #14, #18 ..... 6	#6, #7, #8 ..... 5d #9, #10, #11 ..... 7d #14, #18 (90°) ..... 9d
Low-Alloy Steel A706	3-11, 14, 18	60	60,000 <sup>4</sup>	80,000 <sup>5</sup>	#3, #4, #5, #6 ..... 14 #7, #8, #9, #10, #11 ..... 12 #14, #18 ..... 10	#3, #4, #5 ..... 3d #6, #7, #8 ..... 4d #9, #10, #11 ..... 6d #14, #18 ..... 8d

**TABLE 2—DEFORMATION REQUIREMENTS FOR STANDARD ASTM DEFORMED REINFORCING BARS**

Size No.	Maximum Average Spacing, in.	Minimum Average Height, in.	Maximum <sup>1</sup> Gap, in.
3	0.262	0.015	0.143
4	0.350	0.020	0.191
5	0.437	0.028	0.239
6	0.525	0.038	0.286
7	0.612	0.044	0.334
8	0.700	0.050	0.383
9	0.790	0.056	0.431
10	0.889	0.064	0.487
11	0.987	0.071	0.540
14	1.185	0.085	0.648
18	1.58	0.102	0.864

<sup>1</sup>Chord of 12.5% of nominal perimeter

<sup>1</sup>Minimum yield designation.

<sup>2</sup>Yield point or yield strength. See ASTM specifications.

<sup>3</sup>Test bends 180° unless noted otherwise.

<sup>4</sup>Maximum yield strength 78,000 psi (ASTM A706 only).

<sup>5</sup>Tensile strength shall not be less than 1.25 times the actual yield strength (ASTM A706 only).

\*For the mechanical requirements of rail-steel and axle-steel bars, see ASTM specifications A616 and A617, respectively.

**TABLE 3—CHEMICAL COMPOSITION REQUIREMENTS FOR STANDARD ASTM DEFORMED REINFORCING BARS**

Type of Steel and ASTM Designation	Condition*	Element									
		Carbon (C)	Manganese (Mn)	Phosphorus (P)	Sulfur (S)	Silicon (Si)	Copper (Cu)	Nickel (Ni)	Chromium (Cr)	Molybdenum (Mo)	Vanadium (V)
Billet-Steel A615	1	X	X	X	X						
	2			0.06%							
	3			0.075%							
Low-Alloy Steel A706	1	X	X	X	X	X	X	X	X	X	X
	2	0.30%	1.50%	0.035%	0.045%	0.50%					
	3	0.33%	1.56%	0.043%	0.053%	0.55%					

\*CONDITION DEFINITIONS: 1 Analysis required of these elements for each heat.

2 Maximum allowable chemical content for each heat.

3 Maximum allowable chemical content for finished bar.