

**CDPNS 211:2001**  
**As of 27 June 2001**

**Rerolled steel bars for concrete reinforcement - Specification**

**Rerolled steel bars for concrete reinforcement - Specification****1 Scope and application**

This standard specifies the requirements for hot-rolled deformed rerolled steel bars used for concrete reinforcement.

**2 References**

PNS 49:2000, Specification for Steel Bars for Concrete Reinforcement

JIS Z 2201:1998, Test pieces for tensile test for metallic material

JIS G 3117:1987, Rerolled steel bars for concrete reinforcement

**3 Classification**

Deformed rerolled steel bars shall be classified into grades 170 and 230.

**4 Requirements**

**4.1 Materials** - Rerolled steel bars shall be manufactured by rerolling any of the following materials:

- a) grade 230 and 275 billets
- b) ship plates from classified vessels
- c) structural grade steels
- d) reject steel plates and misrolled steels
- e) Wire rods

**4.2 Mechanical properties** - Rerolled steel bars shall conform to the mechanical requirements specified in table 1.

**Table 1 - Mechanical properties of deformed rerolled steel bars**

Sizes, mm	Yield point, MPa min.	Tensile strength, MPa min.	Test piece	Elongation, Percent, min.	Bending angle, Degree	Pin diameter (d = nominal diameter of specimen)
6 & 7	170	300	#2	18	180	3 d
8	230	390	#2	18	180	3 d

NOTE: Test piece refers to no. 2 of JIS Z 2201

**4.3 Appearance**

**4.3.1** The steel bars shall be free from defects injurious to use.

**4.3.2** Rust, seams, surface irregularities, or mill scale shall not cause rejection, provided the mass, dimensions, cross-sectional area and tensile properties are not less than the requirements of this standard.

**4.4 Dimensions, mass and tolerance**

The surface protrusions, (the axial protrusion among surface protrusions is called a rib and any other, a lug) shape, size, mass and tolerances of deformed steel bars shall conform to the following:

**4.4.1** The lugs shall be distributed over the entire length of the rerolled deformed bar at uniform distances, and shall have the same shape and dimensions. When characters or the like are embossed, the lugs at these locations may be omitted.

**4.4.2** The angle of the lugs to the axis of the bar shall not be less than 45 degrees.

**4.4.3** The spacing between the neighboring lugs of deformed bar shall be 7 mm.

**4.4.4** The sum of the gaps of deformed bar shall not be more than 25% of the nominal perimeter of deformed bar.

NOTE: If the rib and the lug are separated, and the deformed bar has no rib, the width of defect of the lug shall be considered the gap, and if the lug and the rib are connected, the width of the rib shall be considered to be the gap of the lug.

**4.4.5** The minimum height of lug shall be 4.0% of the nominal diameter.

**4.4.6** The size, unit mass and permissible limits of lugs shall conform to table 3.

**Table 2 - Size, unit mass and permissible limits of lugs**

Nominal diameter (d), mm	Unit mass, kg/m	Nominal sectional area (A) mm <sup>2</sup>	Nominal perimeter (P) mm	Permissible limits of lugs			
				Maximum value of average spacing of lugs, mm	Height of lugs		Maximum value of sum of gaps of lugs, mm
					Minimum value mm	Maximum value mm	
6	0.222	28.27	18.8	7.0	0.2	0.4	4.8
7	0.302	38.48	22.0	7.0	0.3	0.6	5.5
8	0.394	50.36	25.1	7.0	0.3	0.6	6.3

NOTES: The values in table 2 are calculated as follows:

$$\text{Nominal cross sectional area (A)} = \frac{78.54 \times d^2}{100}$$

$$\text{Nominal perimeter (P)} = 3.142 \times d$$

Rounded-off to:

4 significant figures

1 significant figure

Unit mass	= 0.00785 x A	3 significant figures
Spacing between lugs	= Value from 4.4.3	1 significant figure
Gap of lugs	= Value from 4.4.4	1 significant figure
Height of lugs	= Value from 4.4.5	1 significant figure

**4.5 Length and mass tolerance mass of steel bar**

**4.5.1** The length of the individual steel bar shall be 6 m and the tolerance shall be ±40 mm.

**4.5.2** The mass tolerance of one piece of steel bar shall be ± 10 percent.

**4.5.3** The mass tolerance of one lot of steel bars shall be ± 7 percent.

**5 Sampling**

Sampling shall be in accordance with annex A of PNS 49.

**6 Test methods**

**6.1** The deformation measurements shall be determined in accordance with annex B of PNS 49.

**6.2** The steel bar shall be tested for mechanical properties in accordance with annex C of PNS 49.

**7 Markings**

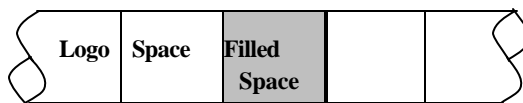
**7.1** Deformed bars shall bear the manufacturer’s mark and bar sizes as follows:

**7.1.1** Name of company - A logo or symbol registered with the Bureau of Product Standards (BPS) and/or the Intellectual Property Office (IPO).

**7.1.2** Bar size - The nominal diameter itself or color code.

**7.1.3** Each bar shall have additional size marking, as follows:

**7.1.3.1** For 6 mm - There shall be one filled space between deformations to be placed beside the logo.



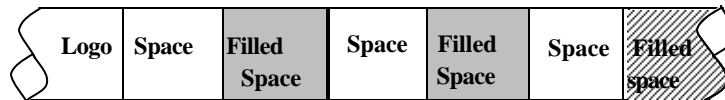
**Figure 1 - Size marking for 6 mm**

**7.1.3.2** For 7 mm, there shall be two filled spaces between deformations to be placed beside the logo.



**Figure 2 - Size marking for 7 mm**

**7.1.3.3** For 8 mm, there shall be three filled spaces between deformations to be placed beside the logo.



**Figure 3 - Size marking for 8 mm**

The height of the filled space shall be the same height as the deformations shown in figures 1, 2, and 3.

Each set of marks shall be placed at a distance not exceeding one meter from each other throughout the active length of each bar.

**7.2** The following color codes for deformed bar sizes shall be painted on the surface of both ends of each bar:

<u>Bar size</u>	<u>Color code</u>
6	blue
7	orange
8	violet

**7.4** Other marks shall be indicated on the tag securely attached to each bundle of bars, each bundle shall be composed of bars of the same size and grade.