

**HOT ROLLED RINGS FROM  
CONTINUOUS CASTING OF STEEL  
OF GRADES 45 XH AND 45XHM FOR RACES**

**TECHNICAL SPECIFICATIONS**

**TY 14-102-182-98**

**EXTRACT**

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These technical specification pertains to trial batch of hot rolled rings from continuous casting of alloyed steel of grades 45 XH and 45 XHM, meant for manufacturing of races.

Example of conventional designation of ring with outer diameter 1310 mm, inner diameter 1060 mm, height 110 mm, code 331 as per dimensional specifications P101-97 from steel of grade 45 XHM as per TY 14-102-182-98.

Ring 1310x1060x110, 301 P 101-976, 45XHM TY 14-102-182-98.

## 1. TECHNICAL REQUIREMENTS

- 1.1. The rings should comply with requirements of these technical specification.
- 1.2. The form, dimensions of the rings should comply with the dimensional specifications or to the drawing, which have been agreed by customer and manufacturer.
- 1.3. The chemical composition of steel as per heat analysis of scoop sample should comply with standards, given in the table 1.

Table 1

Grade of steel	Fraction of total weight of elements, %							
	Carbon	Manga-nese	Silicon	Chromi-um	Nickel	Molybd-enum	Phosph-orus	Sulphur
							Not more than	
45XH	0.41-0.49	0.50-0.80	0.17-0.75	0.45-0.75	1.00-1.40	-	0.035	0.035
45XHM	0.42-0.50	0.50-0.80	0.17-0.37	0.45-0.75	1.00-1.40	0.15-0.25	0.035	0.035

### Notes :

1. Permitted deviations for carbon  $\pm 0.01$  %, for chromium  $\pm 0.02$  %, for nickel - 0.05 %.
2. Residual composition of copper should not be more than 0.4 %.
3. The deviation regarding content of phosphorus, sulphur, manganese, silicon and molybdenum is permitted as per the agreement with the customer.

- 1.4. The rings are manufactured in heat treated state (hardening with subsequent tempering). Modes of heat treatment are specified by the manufacturer.
- 1.5. The mechanical properties and hardness of heat treated rings should comply with standards, given in table 2.

Table 2

Grade of steel	Ultimate strength, $\sigma_B$ , N/mm <sup>2</sup> (kgf/mm <sup>2</sup> )	Yield point $\sigma_T$ , N/mm <sup>2</sup> (kgf/mm <sup>2</sup> )	Elongation $\delta$ , %	Reduction of area, $\Psi$ %	Specific viscosity KF.J/cm <sup>2</sup> (kgf.m/m <sup>2</sup> )	Hardness, HB
	Not less than					
45XH	780 (80)	590(60)	12.0	45.0	69 (7.0)	320-241
45XHM	780 (80)	590(60)	12.0	45.0	69 (7.0)	321-255

- 1.6. In the macrostructure of rings the following are not permitted, flakes, cracks, delamination and crusts. Liquation/segregation not more than 3 numbers is permitted.  
Gas blisters, sponginess, porosity and other rarely encountered defects, which are located at depth within the limits of allowance for machining, are not the basis for rejection.
- 1.7. Surface defects and unevenness of lapping more than 75 %, of actual one side allowance for machining in not permitted.
- 1.8. Each ring on the side surface is marked with number of melt, grade of steel, serial number of the ring and designation of profile (by code).