

ORDNANCE FACTORY KHAMARIA 482 005	STEEL TO SPECIFICATION TY-14-1-2232-77 (FOR MANUFACTURING GUIDANCE)	No. : 003 SHT. : 1 of 1
ML		DATED: 17-08-91

ITEM DESCRIPTION

Steel Rod 32+ 0.00/-0.10mm dia steel 53 I m 10 to specn Ty-14-1-2232-77.

CHEMICAL COMPOSITION

C=0.49-0.55%, Mn= 0.50- 0.80% Si= 0.17-0.37%, Ni = 0.3%max,
Cu=0.3%max, S=0.03 max P=0.03% max, Cr=1.00-1.4%, Mo=0.15- 0.30%
Al=0.02% to 0.045% Boron - 0.001% - 0.003% Titanium 0.03% to 0.05%.

PHYSICAL PROPERTIES-

1. Hardness not more than 217 HB
2. One test sample from each lot should satisfy the following properties after heat treatment. (Hardening 870-890°C in oil at 30-80°C. Tempering 620-670°C, heating for 1 hour, cooling in oil)
 - Ultimate Tensile Strength - 100 Kgf/mm² (min)
 - Relative Reduction - 35% (min)
 - Impact Strength - 5 Kg f/ cm² (min)
3. Surface defect - Material should be free from harmful external and internal surface defect. Surface of calibrated steel must be clean, smooth, light or matt without cracks, flaws rolling laps and scales and depending on quality of surface (Ref-Gost-1051-73)
4. Non metallic impurities - Contents in steel of non-metallic inclusion of each kind (sulphides) oxides OC and OT Silicates CX. CH & C. Aluminium Nitrides HA should not exceed 3.5 points by GOST 1778-70. Result of control of non metallic inclusion are facultative on 20 meltings (Ref-Ty-1-2884-80).
5. Macrostructure - Steel should not contain shrinking cavities, porosities, blow holes, startings, blisters cracks, separations slag and other impurities, ripped surface, ghost flacks visible to unarmd eye. Presence of con choidal and silky fractures is not allowed. 100% macro examination of steel rods is required.
6. One separate test piece from every lot should be suitably heat treated to acheive hardness HRC 53 to 58.
7. Material should be supplied in hot rolled and annealed and peeled condition.
8. Material is required to be 100% magnetic/ultrasonic crack detection.
9. Material to be supplied with following colourcode. Base colour -yellow, 1st Band-Black to specn- IS-2049-78 (Table - 7)

REFERENCE - Steel to specification - Ty-14-1-2232-77

PREPARED BY QPC
JVM/QPC

APPROVED BY
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SUPERSEDES SPECN REVISION