

 TSD 6206 A	PLANT PURCHASING SPECIFICATION BHOPAL	BP 19594 REV NO. 02 PAGE 1 OF 4 SUPERSEDES BP 19594 Rev.01
<u>1.5% Ni-Cr-Mo-PRECISION STEEL CASTINGS</u> <u>HEAT – TREATED</u>		
1. GENERAL: This specification governs the quality of high tensile, 1.5% chromium, precision steel castings. 2. APPLICATION: Suitable for applications where wear resistance properties are essential. Manufacture of Trip Trigger, used in free Handle Lever Assembly of MLG-I, BOCB, Switchgear. 3. CONDITION OF DELIVERY: The castings shall be supplied in the hardened and tempered condition. 4. COMPLIANCE WITH NATIONAL STANDARDS: There is no Indian standard covering this type of castings. 5. DIMENSIONS AND TOLERANCES: All dimensions, unless otherwise specified, shall be maintained within ± 0.25 mm from the dimensions specified on the drawing accompanying the order. 6. MANUFACTURE: The steel for the casting shall be produced by the electric process. The casting shall be prepared by any Investment Casting process suitable to produce precision steel casting such as "Lost Wax Process". 7. FINISH: All castings shall be properly fettled and dressed and all surfaces shall be thoroughly cleaned. The machined surfaces shall have the surface finish as indicated in the drawing. The castings shall not be painted.		
Revision :		Issued by : <i>Alhoda</i>
Reviewed & updated.		STANDARDS AND MATERIALS GROUP TECHNICAL SERVICES DEPARTMENT
Rev. 02	Date : 11.09.07	Date of first Issue : July' 1972



TSD 6206 A

PLANT PURCHASING SPECIFICATION BHOPAL

BP 19594

REV NO. 02

PAGE 2 OF 4

8. FREEDOM FROM DEFECTS:

The castings shall be smooth, sound, properly fettled and free from hard spots, flaws, shrinkage, cracks and blow holes. They shall be free from local segregation and other impurities. No attempt shall be made to fill or hide cracks or holes.

At the discretion of BHEL (Bhopal) the castings may be subjected to Radiographic Examination or any other suitable tests to detect any of the above defects.

9. CHEMICAL COMPOSITION:

The melt analysis of steel and the permissible variation in the composition of the castings from the melt analysis shall be as follows.

Element	Percent		Permissible Variation in Percent
	Min.	Max.	
Carbon	0.36	0.44	± 0.03
Silicon	0.10	0.35	+ 0.05-0.03
Manganese	0.45	0.70	± 0.04
Nickel	1.30	1.70	± 0.05
Chromium	1.00	1.40	± 0.06
Molybdenum	0.20	0.35	± 0.03
Sulphur	-	0.035	+ 0.005
Phosphorus	-	0.035	+ 0.005

10. TEST SAMPLES:

The tensile test bars shall be cast along with the castings from the same melt. The test bars shall be heat-treated together with the castings they represent.

11. HEAT TREATMENT:

Harden in oil from a temperature of 820-850°C. Temper at a suitable temperature not exceeding 660°C so as to obtain the mechanical properties specified in Clause 12.

12. MECHANICAL PROPERTIES:

12.1 Tensile:

The tensile test specimen shall be prepared in accordance with the standard proportional round test piece specified in IS:1608.

Tensile Strength : 700-850 N/mm²

Elongation on }
5.65 √So Gauge } 11 percent Minimum
Length }

12.2 Hardness (Brinell):

When tested in accordance with IS:1500/B.S. 240 the castings shall have a hardness of 201-255 HB.

Note: For thin sections a hardness around 313 HB is acceptable for BHEL(Bhopal) applications.



TSD 6206 A

PLANT PURCHASING SPECIFICATION BHOPAL

BP 19594

REV NO. 02

PAGE 3 OF 4

13. REPAIR OF CASTINGS:

Rectification of faulty castings shall be carried out, only with the previous sanction of BHEL (Bhopal) Inspector. A record shall be furnished by the supplier showing the position and extent of any rectification carried out.

14. TEST CERTIFICATE:

Three copies of test certificates, shall be supplied unless otherwise stated on the order, in the test certificate formate annexed to this specification (Annexure-I).

In addition, the supplier shall ensure to enclose one copy of the test certificate alongwith their despatch documents for quick clearance of the material.

15. PACKING AND MARKING:

The casting shall be suitably packed to prevent damage during transit.

Machined surface shall be properly protected with anticorrosive compounds. Each castings shall be legibly marked with the following information.

BP 19594 : 1.5% Ni-Cr-Mo Precision Steel Castings

Our Order No.

Supplier's Name

Melt No.

Identification Number (P.C).

Weight.



TSD 6206 A

PLANT PURCHASING SPECIFICATION
BHOPAL

BP 19594

REV NO. 02

PAGE 4 OF 4

ANNEXURE-1 RECOMMENDED TEST CERTIFICATE FORMAT FOR CASTINGS

SUPPLIERS'S NAME AND ADDRESS													
1. Customer :							6. Cast No. & Date :						
2. TC No. & Date :							7. Batch No. :						
3. PO No. :							8. Heat Code :						
4. Process of Melting :							9. Spec. No. :						
5. Deoxidisation Process							10. Test Bar Size						
II. CASTING COVERED BY T.C.													
Sl. No.		Drawing No. & Item No.					Description					Quantity & Weight	
12. CHEMICAL COMPOSITION (PERCENT)													
Element		C	Si	Mn	S	P							
As per Min.													
Spec. Max.													
Actual Values.													
13. HEAT TREATMENT (To be accompanied by Recorder Chart, wherever called for)													
Condition		Temp. °C				Soaking Time, Hrs.				Cooling Medium			
14. MECHANICAL PROPERTIES													
		T.S. N/mm ²	Y.S. 0.5% 0.2% Proof N/mm ²	% E on GL 5.65 SO	% R.A. Mn	Hardness DHN Mn. 3 Values		Impact Value, Joules		Bend			
As per Min.													
Spec. Max.													
Actual Values.													
15. Surface Finish (When called for in the order/dwg)													
16. DIMENSIONAL INSPECTION													
17. NON-DESTRUCTIVE TESTS													
Nature of Test		Acceptance Level		Instrument used		Range		Results		Any other details			
Ultrasonic													
Radiographic													
Dye Penetrant/ Magnetic Particle													
18. OTHER TESTS, IF ANY (MICRO- Scope, Hydraulic, Etc.)													
19. IDENTIFICATION ON CASTING AS PER CPS.													
We hereby certify that the items mentioned above have been tested and inspected in our presence and are found to be in accordance with the drawings, specifications and purchase order.													
Signature & Seal of the Inspecting Officer (Purchase Representative)							Signature and Seal of the Chief of Quality Control Chief Metallurgist of the Supplier.						
Date :							Date :						
INSTRUCTION:													
a) If steel is produced by LD or Oxygen process, Nitrogen content should be furnished and shall not exceed 0.008%													
b) Test Certificates are to be furnished as per Purchase Order and Specifications, in A4 Size transparent paper.													
c) All the entries including signature should be in black ink.													
d) If testing is done by outside agencies, the original TCs shall be furnished.													
e) The actual Test Certificate may run into more than one A4 size paper, if needed, to facilitate filling up of details.													