BRIGHT DRAWN STAINLESS STEEL WIRES

(GRADE: X22CrMoV121KG)

1.0 GENERAL:

This specification governs the requirements of bright drawn stainless steel round wires of grade X22CrMoV121KG.

2.0 APPLICATION:

For steam turbine LP blade lacing.

3.0 CONDITION OF DELIVERY:

3.1 Following conditions of delivery will be applicable according to size.

3.1.1 For dia upto 6.0 mm (inclusive): Cold drawn / rolled, stress relieved & pickled.

3.1.2 For dia above 6.0 mm : Cold drawn / rolled & stress relieved or hot rolled & ground / pickled.

3.1.3 The material shall be heat treated suitably to achieve the Mechanical properties as per clause 9.0 of this specification.

3.2 The wires shall be supplied in the following form.

Wire dia, mm	Form in which/supplied
0 – 3	Coils wound on reels
3 – 8	Open coils
Above 8	Straight lengths

The weight per coil shall be approximately 5 kg. The minimum diameter of the coils shall be maintained at 300 mm. Straight lengths shall be 2.5 to 3 metres.

4.0 DIMENSIONS AND TOLERANCES:

4.1 **Dimensions:** As specified in the order.

Revisions: Revised clause 3.0 to include hot rolling & cold rolling with suitable heat treatment.			Issued : STANDARDS ENGINEERING & IPR COORDINATION DEPARTMENT		
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PLANT PURCHASING SPECIFICATION
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4.2 Tolerances: The tolerances on round wires shall conform to all class of tolerance, reproduced below:

Diameter, mm From	upto & including	Tolerance, mm
1	3	0 - 0.060
3	6	0 - 0.075
6	10	0 - 0.090
10	18	0 - 0.110

5.0 MANUFACTURE:

The steel shall be manufactured by basic electric furnace process, and shall be fully killed.

6.0 FREEDOM FROM DEFECTS:

The wires shall be free from cracks, seams, cupping or other harmful defects. The surface shall be metallically clean and free from any scales.

7.0 CHEMICAL COMPOSITION:

The analysis of the material shall be as follows:

Element	C	Si	Mn	Cr	Mo	Ni	V	P	S
% Min.	0.20	0.10	0.30	11.0	0.80	0.30	0.25	-	-
% Max.	0.26	0.50	0.80	12.5	1.20	0.80	0.35	0.035	0.035

8.0 TEST SAMPLES:

8.1 For chemical analysis: One test sample shall be taken from each melt for chemical analysis

8.2 For Mechanical Tests: One tensile test shall be conducted per melt and heat treatment batch for each 25 kg of the wire or part thereof.

9.0 MECHANICAL PROPERTIES:

The material shall comply with the following mechanical properties, at room temperature, when tested in accordance with IS:1608 or any reputed national standard.

Tensile strength	:	780-930 N/mm² (80-95 Kgf/mm²)
0.2% Proof Stress, min.	:	590 N/mm² (60 Kgf/mm²)
Elongation, min. (L=5.65√So)	:	14%

10.0 INSPECTION AT SUPPLIER'S WORKS:

The representative of BHEL shall have free access to the supplier's works at all times during the execution of the order, to satisfy himself that the material is produced as per the quality requirements of this specification. All reasonable facilities shall be extended to him, free of charge. He may also witness the sampling, testing and marking called for in this specification.

11.0 TEST CERTIFICATE:

Five copies of the test certificate shall be furnished with the following details:

a) BHEL Order No.
b) BHEL Specification No. HY10776 (X22CrMoV121KG)
c) Manufacturer's Name
d) Melt No. & Heat treatment batch no.
e) Heat treatment condition and details.
f) Size and dimensional check
g) Results of chemical analysis and mechanical tests.

12.0 PACKING & MARKING:

12.1 Marking: Each coil shall be provided with metal lable bearing the following punch details.

a) Material Specification No. HY10776 (X22CrMoV121KG)
b) Melt No. & Heat treatment batch No.
c) Size & Weight
d) Manufacturer's Trade mark.

12.2 Packing: The wires shall be suitably packed to protect against damage during handling and transport.

13.0 REJECTION:

In the event of any material proving defective during the course of further processing or testing, such materials shall be rejected and the supplier shall make immediate arrangements to replace the same free of cost.