



**PLANT PURCHASING  
SPECIFICATION  
HYDERABAD**

**HY10786**

**REV. NO. 00**

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**AUSTENITIC STAINLESS STEEL PLATE, SHEET & STRIP  
GRADE: AISI 304 L**

**1.0 GENERAL:**

This specification governs the requirements for Austenitic stainless steel plates, sheets & strips of grade AISI 304 L.

**2.0 APPLICATION:**

This material is used in Gas Turbines, Heat Exchangers.

**3.0 CONDITION OF DELIVERY:**

Hot Rolled and solution annealed and pickled condition.

**4.0 COMPLIANCE WITH NATIONAL STANDARDS:**

This material complies, in general, with American Standard ASTM A240 Gr. 304L.

**5.0 DIMENSIONS AND TOLERANCES:**

**5.1 Sizes:** Material shall be supplied to the dimensions specified on the order.

**5.2 Tolerances:** The tolerances on material shall comply with the following:

**5.2.1 Sheets & Plates:**

**5.2.1.1 Flatness\*:**

Width, mm	Length, mm	Maximum deviation from flatness, mm
Upto & exclud. 1000	Upto & incld. 2000	15
	Over 2000	20
1000 and above	Upto & incld. 2000	20
	Over 2000	20

\* Maximum deviation from a horizontal flat surface.

**Revisions:**

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**5.2.1.2 Thickness:**

Thickness, mm		Tolerance on thickness for width, mm			
From	Below	Below 1000	From 1000 to below 1250	From 1250 to below 1600	From 1600 to below 2000
1.0	1.5	± 0.15	± 0.15	± 0.20	--
1.5	2.0	± 0.20	± 0.20	± 0.25	--
2.0	2.5	± 0.20	± 0.25	± 0.30	--
2.5	3.0	± 0.25	± 0.30	± 0.30	--
3.0	4.0	± 0.30	± 0.30	± 0.35	--
4.0	5.0	± 0.40	± 0.40	± 0.45	--
5.0	6.0	± 0.50	± 0.50	± 0.55	± 0.70
6.0	8.0	± 0.60	± 0.60	± 0.60	± 0.75
8.0	10.0	± 0.65	± 0.65	± 0.65	± 0.80
10.0	16.0	± 0.70	± 0.70	± 0.70	± 0.85
16.0	25.0	± 0.80	± 0.80	± 0.80	± 0.95
25.0	40.0	± 0.90	± 0.90	± 0.90	± 1.10
40.0	50.0	± 1.00	± 1.00	± 1.00	± 1.20

**5.2.1.3 Width and Length:**

Thickness, mm	Tolerance, mm	
	On width	On length
Less than 10	+ 5	+ 10
	- 0	- 0
From 10 and upto & incld. 25	+ 10	+ 15
	- 0	- 0
Above 25 and upto & incld. 40	+ 15	+ 25
	- 0	- 0
Above 40 and upto & incld. 50	+ 20	+ 30
	- 0	- 0



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**5.2.2 Strips:**

**5.2.2.1 Thickness:**

Thickness, mm		Tolerance on thickness for width, mm			
From	Below	Below 250	From 250 to below 500	From 500 to below 1000	From 1000 to below 1250
1.00	1.50	± 0.12	± 0.12	± 0.15	± 0.15
1.50	2.00	± 0.15	± 0.18	± 0.20	± 0.20
2.00	2.50	± 0.16	± 0.18	± 0.20	± 0.25
2.50	3.00	± 0.18	± 0.20	± 0.25	± 0.30
3.00	4.00	± 0.20	± 0.25	± 0.30	± 0.30
4.00	5.00	± 0.25	± 0.30	± 0.40	± 0.40

**5.2.2.2 Width (Strip of thickness upto & incl. 5 mm):**

Width, mm		Tolerance, mm	
From	Below	Plus	Minus
-	250	5	0
250	500	5	0
500	1000	10	0
1000	1250	10	0

**5.2.2.3 Camber:**

Width, mm		Maximum value of Camber for any 2000 mm length, mm
From	Below	
-	250	10
250	500	8
500	1000	5
1000	1250	5

**6.0 MANUFACTURE:**

The steel shall be made by basic electric process.

**7.0 HEAT TREATMENT:**

The recommended heat treatment is as follows:

**Solution annealing:** Heating to 1040°C minimum for sufficient time followed by water quenching or rapid cooling by other means.

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**8.0 FREEDOM FROM DEFECTS:**

The material shall be of uniform quality consistent with the good manufacturing and inspection practice. The steel shall have no defects of a nature or a degree that will be detrimental to the stamping, forming, machining or fabrication of finished parts.

**9.0 CHEMICAL COMPOSITION:**

The Melt analysis of material shall be as follows:

Element	C	Si	Mn	Ni	Cr	P	S	N
% Min.	-	-	-	8.00	18.00	-	-	-
% Max.	0.030	1.00	2.00	12.00	20.00	0.045	.030	0.10
Permissible variation in Product Analysis	+0.005	+0.05	+0.04	+0.15 -0.10	±0.20	+0.005	+0.005	+0.01

**10.0 TEST SAMPLES:**

**10.1 Chemical Analysis:** One sample shall be taken per melt.

**10.2 Mechanical Testing:** One sample shall be taken per melt per heat treatment batch per thickness.

**10.3 Intergranular Corrosion Test:** One sample per melt per heat treatment batch per thickness.

**11.0 MECHANICAL PROPERTIES:**

The mechanical properties of the material shall be as follows:

Tensile Strength N/mm <sup>2</sup> (min.)	0.2% Yield Stress N/mm <sup>2</sup> (min.)	% Elongation L= 50 mm min.	Hardness BHN
482	172	45	183

**Note:** Tensile test shall be conducted as per IS:1608 or any reputed international standard.

**12.0 INTERGRANULAR CORROSION:**

This test shall be conducted in accordance with practice of ASTM A262. It shall be on sensitized specimens. This test is applicable to all thicknesses.



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**13.0 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 or charge. He may also witness the sampling, testing and marking called for in this specification.

**14.0 TEST CERTIFICATES:**

Five copies of the test certificate giving the following details shall be furnished.

- a. BHEL Order No.
- b. BHEL Specification No. HY 10786
- c. ASTM A 240, TP 304L
- d. Melt/Heat No.
- e. Size
- f. Heat treatment details and batch No.
- g. Results of Heat & Product analysis
- h. Results of Hardness test.
- i. Results of Mechanical test.
- j. Results of Intergranular corrosion test.

**15.0 PACKING AND MARKING:**

**15.1** The material shall be suitably packed to prevent corrosion and damage during transit.

**15.2** Sheets and strips shall be bundled together and each bundle shall have details of Purchase Order No., Specification, Size, Melt No., Weight and Manufacturer's Name etc.

**15.3** Plates shall be individually identified by hard punching of the details like Melt No., Size, Specification and Manufacturer's Name/Emblem.

**16.0 REJECTION AND REPLACEMENT:**

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