SPECIAL STEELS

Special Steels

ALLOY STEELS PLANT

Billet Products

RCS Blooms (mm)	:	160, 180, 195, 200, 218, 240, 250, 287, 300, 340 and 300 x 400
Length	:	2 to 6 M with 10% shorts down to 1 M
RCS Billets (mm)	:	95, 100, 110, 125, 140 and 150
Length	:	4 to 6 M with 10% shorts down to 1 M
A/F Billets (mm)	:	96, 100, 105, 120, and 140
Length	:	4 to 6 M with 10% shorts down to 1 M
Rounds (mm)	:	80, 90, 95, 100, 105, 110, 117, 120, 125, 131, 135,140, 145, 150, 160, 170, 180, 190 and 200
Length	:	4 to 6 M with 10% shorts down to 1 M
Square Flats	:	Min. thickness - 80 mm Min. width - 120 mm Max. thickness - 125 mm Max. width - 250 mm

Flat 60 x 220 and 65 x 195 can also be rolled with bulging edges. Any other special sizes may be developed on request.

Plate Products

Hot Rolled Plates

Grade : Hadfield

Thickness (mm)	Width (mm)	Length (mm)
6, 8,	900 to 1100	1800 to 2500
10, 12	1000 to 1300	2000 to 3500
16	1000 to 1320	1800 to 2200
20, 25	1000 to 1320	1500 to 1800
30	1000 to 1320	1100 to 1200

Other sizes can be done after contract review.

Forged products

Die Blocks

Max. width	:	460 mm
Min. thickness	:	100 mm
For Rounds (Dia)	:	100 mm to 500 mm
Max cross - sectional area	:	1,84,000 sq.mm
Max. weight	:	Single piece forging 6.4 MT

Other sizes can be done after contract review.

Rounds

Hammer Products	:	100 - 250 mm (all grades)
Press	:	251 - 625 mm (for Alloy & CC grades) 251 - 500 mm (SS grades & DB-6)

Squares

Hammer	:	101 - 250 mm (for All grades)
Press	:	251 - 550 (AC & CC grades) 251 - 425 mm (SS grades) upto 250 mm (with contract review)

Step Forging

Max. weight per piece : 7.5 MT

Flats

Hammer Products

Flats and Discs can be produced on specific enquiry and acceptance by plant.

ASP std. length for Forge Product

Hammer	:	1.5 m to 4.0 m, 10% Shorts down to 1.0 m
Press	:	2.0 m to 5.0 m, 10% Shorts down to 1.5 m

CCS Products

Slabs

Thickness (mm)	Width (mm)	Length (mm)
170 + 0 – 5 mm Straightness Camber Wedge Twist	800 - 1290 + 5 mm – 5 mm : 10 mm/m : 30 mm up to 8 m Length 40 mm over 8 m Length : 1 mm (max) between two parallel edges. : 2^{o} max.	2000 - 9900 + 25 mm – 25 mm

Blooms (Non-EMS)

Thickness (mm)	Width (mm)	Length (mm)
250 + 0 – 5 mm Straightness Twist	350 – 500 + 5 mm – 5 mm : 10 mm/M : 2^{o} max.	2000 – 6000 + 25 mm – 0

Slab Blooms

Thickness (mm)	Width (mm)	Length (mm)
250 + 0 – 5 mm Straightness Twist	800 – 950 + 5 mm – 5 mm : 10 mm/M : 2^{o} max.	2000 – 8000 + 25 mm – 25 mm

VISVESVARAYA IRON & STEEL PLANT

Standard Rolling & Forging Sizes

The following sizes are in our regular line of production:

I. ROLLED PRODUCTS

A. Primary Mill

1.	Rounds	60, 63, 65 to 140 mm in steps of 5 mm	
2.	Billets	60, 63, 65 to 140 mm in steps of 5 mm	
3.	Special Sections	64, 96, 100, 105, 120 & 140 mm billets for Defence units	
4.	Flats	126 to 240 mm Width x 20 to 50 mm Thickness (Low carbon steels)	
		155 to 300 mm width x 50 to 100 mm Thickness (Carbon steels)	
5.	Blooms	150 to 250 mm (Without guarantee for internal soundness)	

B. Bar Mill

1.	Rounds	20, 22, 22.7, 23, 23.5, 24, 25, 25.7, 26, 27, 27.5, 28, 28.5, 30, 30.5, 32, 32.5, 33, 34, 34.5, 35, 36, 36.5, 37, 37.5, 38, 38.5, 39, 39.5, 40, 42, 42.5, 43, 43.5, 45, 45.5, 48, 48.5, 50, 50.5, 52, 55, 56 and 58 mm	
2.	Billets	40, 44, 45, 50, 52, 53, 55 and 56 mm RCS 36 and 46 mm SCS	
3.	Flats	40 to 120 mm Width x 6 to 20 mm Thickness	

II. CONTINUOUS CAST PRODUCTS

	Blooms	130, 180, 200, 300 and 350 mm	

III. FORGE PRODUCTS

A. Press

1.	Tool Steels	200 to 600 mm Rounds	
2.	Die Steels	200 mm and above square, and rectangular sizes up to 2,50,000 sq. mm cross section area, one of the sides limited to 600 mm Max. Maximum weight per piece: 2.50 Tns.	
3.	Carbon and Alloy constructional steels	200 to 660 mm Rounds 200 to 500 mm Squares	
4.	Flats		
	a. Carbon and Alloy consructional steels	Minimum Thickness Minimum Width Maximum Width	150 mm 200 mm 500 mm
		One of the sides limited to 500 mm max. Width to thickness ratio: 3:1 Max.	
	b. Tool steels	Minimum Thickness Minimum Width Maximum Width Width to Thickness ratio	150 mm 200 mm 400 mm 3:1 Max

Note: Other than the above, shapes like stepped shafts, rolls, discs can be accepted against specific enquires.

B. Long Forging Machine

Maximum weight per piece 1.00 Tns.

1.	70 to 199 mm Rounds
2.	100 to 150 mm Squares

Size Tolerances for rolled products

A. Permissibe deviations in size for 20 mm to 140 mm Dia. Round Bars (Reference IS 3739–1987 Gr. 1 RA 1998)

Nominal Size, mm		Tolerance, mm	
Over	Upto & including	Permissible Deviation	Out of round
19	22	± 0.20	0.30
22	25	± 0.24	0.35
25	28	± 0.25	0.40
28	31	± 0.28	0.45
31	34	± 0.30	0.50
34	38	± 0.36	0.60
38	50	± 0.40	0.60
50	64	+ 0.8, - 0	0.80
64	80	+ 1.2, - 0	0.80
80	89	+ 1.2, - 0	0.80
89	100	+ 1.6, - 0	1.20
100	114	+ 1.6, - 0	1.20
114	125	+ 2.0, - 0	1.50
125	139	+ 2.0, - 0	1.50
139	140	+ 3.2, - 0	2.00

B. Permissibe deviations in Hot Rolled Round Cornered Squares from 40 mm to 140 mm. RCS (Reference IS 3739–1987 Gr. 1 RA 1998)

Nominal Size, mm		Tolerance, mm	
Over	Upto & including	Permissible Deviation	Out of round
39	50	± 0.60	0.60
50	64	± 1.20	0.80
64	89	+ 1.80, - 0	1.30
89	100	+ 0.240, - 0	1.80
100	114	+ 2.40, - 0	1.80
114	140	+ 3.00, - 0	2.50

Note: Material other than the above tolerances can also be supplied as mutually agreed upon.

C. Blooms: 150 mm to 250 mm (Without guarantee for internal soundness)

i. Blooms 150 to 240 mm sizes
Permissible deviations in size: + 5, - 0 mm

ii. 250 mm Blooms
Permissible deviations in size: + 8, - 0 mm

D. Flats from Primary Mill

i	Blooming Mill	
	Thickness	50 mm to 100 mm ± 10% of Nominal size
	Width	155 mm to 300 mm ± 4% of Nominal size
	Grades	Carbon Steel
		The flats produced at Blooming Mill will have slight concavity of 2 to 3 mm
ii	Finishing Mill	
	Thickness	20 mm to 50 mm ± 5% of Nominal size
	Width	126 mm to 240 mm ± 5% of Nominal size (in low carbon steels)
	Grades	Carbon Steel
		The flats produced at Finishing Mill will have convexity, the radius of which can not be well defined. The convexity would vary from 5 to 7 mm radius at edges.

E. Flats from Bar Mill

Thickness	10 mm to 20 mm ± 0.5 mm
Width	70 mm to 120 mm ± 1.0 mm

F. Supply Length

20 to 140 mm Dia.	3 to 6* metres with 10% shorts down to 1 metre
40 to 140 mm RCS	3 to 6* metres with 10% shorts down to 1 metre
Flats	3 to 6* metres with 10% shorts down to 1 metre
	4* metres maximum if supply condition is Hardened & Tempered.
	*5 metres maximum if supply condition is Spheroidised annealed.

Specific length with cutting tolerance and multiples of unit lengths with cutting tolerance can also be supplied with mutual agreement

150 mm to 160 mm	500 mm to 6.0 metres
165 mm to 195 mm	500 mm to 5.0 metres
200 mm to 225 mm	500 mm to 4.0 metres
230 mm to 250 mm	500 mm to 3.0 metres

Standard size tolerances for forged products

A. Forged tolerances for rounds and squares

Size in mm	Tolerance in mm	
	(+)	(–)
Upto 75	2.0	Nil
76 to 125	4.0	Nil
126 to 175	6.0	Nil
176 to 275	12.5	Nil
Over 275	16.0	Nil

Note: Size denotes diameter for rounds and side for squares and distance between parallel faces for other sections.

Special tolerances can also be mutually agreed.

B. Forged tolerances for Flats

Width of Flats in mm	Tolerance on Width in mm		Tolerance on thickness in mm, for thickness 100 mm & above	
	(+)	(–)	(+)	(–)
LFM				
100 to 150	8.0	Nil	6.0	Nil
PRESS				
150 to 250	12.5	Nil	6.0	Nil
251 to 400	25.0	Nil	8.0	Nil
400 & above	25.0	Nil	8.0	Nil

C. Forged tolerances for Die Blocks

Size in mm	Tolerance in mm	
	(+)	(–)
200 to 375	8.0	Nil
376 to 500	15.0	Nil
Tolerance on length	20.0	Nil

Note: Size denotes Thickness or Width

D. Size tolerances for Die Blocks in proof machined condition

On Width and Thickness	+ 5.0 mm, - 0
On Length	+ 20.0 mm, - 0

E. Size tolerances for Forged Discs

Disc diameter in mm	Out side diameter in mm		Tolerance on thickness in mm, (distance between parallel faces)	
	(+)	(–)	(+)	(–)
250 to 300	10.0	Nil	10.0	Nil
301 to 400	15.0	Nil	15.0	Nil
401 to 600	20.0	Nil	20.0	Nil
601 to 750	25.0	Nil	25.0	Nil
751 to 850	30.0	Nil	30.0	Nil.

Note: Size denotes outside diameter or thickness

F. Size tolerances for proof machined rounds

On Diameter	+ 5.0 mm, - 0
On Length	+ 20.0 mm, - 0

G. Cutting tolerances for specific lengths for all sections (Forged Products)

Size range in Dia. or Width in mm	Tolerance over specified lengths, in mm	
	(+)	(–)
70 to 100	10.0	0
101 to 160	10.0	0
161 to 250	15.0	0
251 to 400	20.0	0
401 to 600	25.0	0

H. Machining allowance for forged products

For Round Diameter in mm	Machining allowance on Dia. in mm
70 to 75	4.5
76 to 100	6.0
101 to 125	7.5
126 to 150	9.0
151 to 175	16.0
176 to 275	20.0
276 to 400	25.0
401 to 600	30.0

Note: Maximum limit of Decarburisation is 80% of the machining allowances.

Above tolerances are exclusive of forged tolerance.

I. Machining allowances for forged squares and flats

Minimum machining allowance per side in mm

Width in mm	Tolerance in mm					
	100 to 125		126 to 150		Over 150	
	Thickness	Width	Thickness	Width	Thickness	Width
100 to 125	5.0	5.0	-	-	-	-
126 to 150	5.0	5.0	5.0	5.0	-	-
151 to 175	5.0	5.0	5.0	5.0	5.0	5.0
176 to 225	-	-	-	-	8.0	8.0
226 to 250	-	-	-	-	8.0	8.0
251 to 350	-	-	-	-	10.0	10.0
351 to 500	-	-	-	-	10.0	10.0

Note: Maximum Decarburisation limit is 80% of machining allowance per side

J. Machining allowances for forged discs

Outer diameter		Thickness	
Size in mm	Machining allowance in mm	Size in mm	Machining allowance in mm
250 to 300	10.0	100 to 300	6.5
301 to 400	15.0	301 to 500	12.5
401 to 500	18.0	-	-
501 to 600	20.0	501 to 750	20.0
601 to 750	25.0	Over 751	25.0
751 to 850	40.0	Over 751	25.0

Note: The above allowances are exclusive of forging allowances.

K. Supply Length of LFM Products

Grade of Steel	Size/Shape	Supply length
Tool Steels	70 to 199 mm Rounds	1.0 to 5.0 metres (*) with 10% shorts down to 0.5 metre *For supplies in H&T condition, the maximum length is 4 metres
Other than Tool Steels	70 to 199 mm Rounds	2.0 to 5.0 metres (*) with 10% shorts down to 1.0 metre *For supplies in H&T condition, the maximum length is 4 metres
Other than Tool Steels	100 to 150 mm Flats	1.0 to 4.0 metres

L. Supply Length of Press Products

Grade of Steel	Size/Shape	Supply length
Tool Steels	200 mm & above Rounds	1.0 to 4.0 metres (*) with 10% shorts down to 0.5 metre
Other than Tool Steels	i. 200 to 399 Rounds	2.0 to 5.0 metres (*) with 10% shorts down to 1.0 metre *For supplies in H&T condition, the maximum length is 4 metres
	ii. 400 & above Rounds	1.5 to 4.0 metres with 10% shorts down to 1.0 metre
Other than Tool Steels	Sharp corner & Broken corner squares, 200 mm & above	2.0 to 5.0 metres (*) with 10% shorts down to 1.0 metre * For supplies in H&T condition, the maximum length is 4 metres
Tool Steels	Sharp corner squares, Rectangular blocks, & Flats	1.0 to 2.0 metres
Other than Tool Steels	Sharp corner squares, Rectangular blocks, & Flats	1.0 to 3.0 metres

VISP manufactures various grades of alloy and special steels conforming to IS and international specifications like DIN, EN, BS, AFNOR, GOST, SAE, AISI, ASTM, JIS, etc., as well as tailor-made grades to meet the specific requirements of customers.

Categories of steels produced:

- Carbon and alloy constructional steels
- Case hardening steels
- Free cutting steels
- Spring steels
- Ball bearing steels
- Tool and die steels
- Soft magnetic iron
- High temperature steels

Products:

- Rolled alloy & special steels
- Forged alloy and special steels
- As cast alloy and special steels concast blooms
- As cast alloy and special steels ingots
- Pig iron
- Granulated slag
- Liquid nitrogen

Alloy and special steels are supplied in as rolled/as forged condition, with or without heat treatment.

Heat treatment of rolled/forged products:

- Annealing
- Spheroidised annealing
- Normalising
- Hardening & tempering

SALEM STEEL PLANT

Product Range : Hot Rolled Products

The hot rolled products include austentic, ferritic and low nickel grades of stainless steel and carbon steels of drawing quality, structural quality, high strength-low alloy steels and weathering steels.

Hot Rolled Coil/Sheet*

	Carbon Steel	Stainless Steel
Thickness	1.6 - 12.7 mm	2.0 - 10.0 mm
Width	1000 - 1275 mm	1000 - 1275 mm
*Length	2000 - 10000 mm	2000 - 10000 mm
ID (For coil)	762 / 610 mm	762 / 610 mm
Edge	As rolled (Mill Edge)	As rolled (Mill Edge)

***Length of Plates/Sheets**

Thickness range (mm)	Maximum length (mm)
<2.0	3000
≥2.0 - 6.0	6000
>6.0 - 12.0	10000

Dimensional Tolerances

Carbon Steel

- Specific thickness, width and length tolerance as per customers' requirement.
- Standard tolerance, if not specified.
- Standard product tolerance
  - (a) Width Tolerance : + 30 mm, –0 mm (For all width ranges)
  - (b) Length Tolerance : + (0.005 x Length) mm, –0 mm
  - (c) Thickness Tolerances**

Width (mm)	Thickness Range				
	1.6-2.0	>2.0-3.0	>3.0-5.0	>5.0-8.0	>8.0-10.0
≤1250	±0.18	± 0.20	± 0.25	± 0.30	± 0.35
>1250	± 0.20	± 0.25	±0.30	± 0.35	± 0.40

Thickness tolerance for thickness range >10 - 12.7 mm

Width (mm)	Thickness Tolerance (mm)
>1000 - 1275	±5% nominal thickness

** Thickness measurements are taken at 25 mm from the edges.

Stainless Steel

- Specific thickness, width and length tolerance as per customers' requirement.
- Standard tolerance, if not specified.

- Standard product tolerance
  (a) Width Tolerance : + 30 mm, –0 mm (For all width ranges)
  (b) Length Tolerance : + (0.005 x Length) mm, –0 mm
  (c) Thickness Tolerances

Unit : mm

Thickness	Tolerance (±)
2.00	0.18
2.25	0.20
2.50	0.23
3.00	0.25
3.50	0.30
4.00	–0.25, +0.47
5.00	–0.25, +0.47
6.00	–0.25, +0.51
8.00 & above	–0.25, +0.75

Note :

(1) For specified thickness other than those shown, the tolerance for next higher thickness shall apply.

(2) Thickness measurements are taken at least 25 mm from the edges for ME products.

Standard Packet Weight

All the coils in stainless steel and carbon steel will be supplied normally in weight range of 10.0 to 17.0 MT.

Marking & Packing

All Coils/Packets will have marking/stickers containing Coil Number/Packet Number, Grade, Thickness & Weight.

All coils are strapped with 3 straps along the eye of the coil and 3 straps along the circumference. All sheet packets are strapped with 3 straps along the width and 2 straps along the length.

Test Certificate

Test certificate will be issued as per the following system

Grades/Class of Product	Details in Test Certificate
IS 1079 HR 1/HR 2/HR 3/HR 4 IS 2062 E250 A/BR/BO/C, E 410A/BR/BO/C, E450A/BR, IS 5986 165/205/235/255/325/355, IS 10748 Gr-1, Gr-2	Test Certificate will be issued under BIS Certification of Licence for tested quality. Test certificate will indicate dimensions, chemical composition and mechanical properties.
SAILCOR, IRS M 41-97, SS 4012 A E 34/E 38, SAILMA 350, 350 Hi, SAILMA 410, 410 Hi, SAILMA 450, 450 Hi, SALEM B	Test Certificate will be issued as per grade requirement for tested quality. Test certificate will indicate dimensions, chemical composition and mechanical properties.
Stainless Steel SSLN, 300 and 400 series	Test certificate will indicate dimensions and chemical composition.
Conversion Material	Test certificate will indicate dimensions and chemical composition. Mechanical properties will be certified for Carbon steel if required by the customer with remarks as "Mechanical Properties as Rolled"

Chemical Composition: IS 1079/2009

Quality			Constituent, Percent, Max			
Designation	Old Designation	Name	Carbon	Manganese	Phosphorus	Sulphur
HR0	(New)	Ordinary	0.25	1.70	0.050	0.045
HR1	O	Commercial	0.15	0.60	0.050	0.035
HR2	D	Drawing	0.10	0.45	0.040	0.035
HR3	DD	Deep Drawing	0.08	0.40	0.035	0.030
HR4	EDD	Extra Deep Drawing	0.08	0.35	0.030	0.030
HR5	(New)	Micro-alloyed	0.16	1.6	0.020	0.020

Notes:

1. Steel of these grades can be supplied with the addition of micro-alloying elements like Boron, Titanium, Niobium and vanadium. The micro-alloying elements shall not exceed 0.008 percent in case of Boron and 0.20 percent in case of other elements.
2. The Nitrogen content of the steel not be more than 0.007 percent. For Aluminium killed or Silicon-Aluminium killed, the Nitrogen content shall not exceed 0.012 percent. This has to be ensured by the manufacturer by occasional check analysis.
3. Grade HR4 and HR5 shall be supplied in fully Aluminium killed condition or Aluminium with stabilising elements.
4. When the steel is Aluminium killed, the total Aluminium content shall not be less than 0.02 percent. When the steel is Silicon killed, the Silicon content shall not be less than 0.10 percent. When the steel is Aluminium-Silicon killed, the Silicon content shall not be less than 0.03 percent and total Aluminium content shall not be less than 0.01 percent.
5. When Copper bearing steel is required the Copper content shall be between 0.20 and 0.35 percent. In case of product analysis, the Copper content shall be between 0.17 and 0.38 percent.
6. Restricted chemistry may be mutually agreed to between the purchaser and the supplier.

Mechanical Properties : IS 1079/2009

	Quality		Tensile Strength Rm2 max MPa	Percentage Elongation after Fracture A, min			
				t≤3		t>3	
Desi-gnation	Old Desi-gnation	Name		Gauge length Lo=80	Gauge length Lo=50	Gauge length Lo=5.65 √So	Gauge length Lo=50
HR0	(New)	Ordinary	*	*	*	*	*
HR1	O	Commercial	440	23	24	28	20
HR2	D	Drawing	420	25	26	30	31
HR3	DD	Deep Drawing	400	28	29	33	34
HR4	EDD	Extra Deep Drawing	380	31	32	36	37
HR5	SAIL FORM 34	YS 340	400-500	*	*	26	27
	SAIL FORM 38	YS 380	450-570	*	*	24	25
	SAIL FORM 45	YS 450	500-620	*	*	20	21

Notes:

1. 1 MPa = 1 N/mm^2
2. Minimum tensile strength for qualities HR1, HR2, HR3 and HR4 would normally be expected to be 270 MPa. Where minimum tensile is required, the value of 270 MPa may be specified. All tensile strength values are determined to the nearest 10 MPa.
3. The non proportional test with a fixed original gauge length (50 mm) up to 6 mm thick sheet can be used in conjunction with a conversion table. In case of dispute, however, only the results obtained on a proportional test piece will be valid for material 3 mm and over in thickness.
4. Where 't' is thickness of steel sheet, in mm.
5. Tensile testing is not mandatory for HR1, unless agred to between the purchaser and manufacturer.

* Proper on mutual agreement between the purchaser and manufacturer.

Chemical Composition : IS 10748/2004

Grade	C % max	Mn % max	P % max	S % max
I	0.10	0.50	0.040	0.040
II	0.12	0.60	0.040	0.040
III	0.16	1.20	0.040	0.040
IV	0.20	1.30	0.040	0.040
V	0.25	1.30	0.040	0.040
CE:0.45 max for grades IV and V				

Notes:

1. CE based on ladle analysis $= C + \frac{Mn}{6} + \frac{(Cr+Mo+V)}{5} + \frac{(Ni+Cu)}{15}$
2. For semi-killed quality silicon content shall be 0.08 percent, maximum.
3. When the steel is killed by aluminium alone, the total aluminium content shall not be less than 0.02 percent. When the steel is killed by silicon alone, the silicon content shall not be less than 0.10 percent. When the steel is silicon-aluminium killed, the silicon content shall nto be less than 0.03 percent and total aluminium content shall not be less than 0.01 percent.
4. Micro-alloying may be allowed subject to mutual agreement between the purchaser and the supplier Micro-alloying elements like Nb, V or Ti, when used individually or in combination, the total content shall not exceed 0.20 percent.
5. Nitrogen content of steel shall not exceed 0.012 percent, which shall be ensured by the manufacturer by occasional check analysis.
6. Closer limits of composition may be agreed to between the supplier and the purchaser.

Mechanical Properties : IS 10748/2004

Grade	Yield Strength	Ultimate Tensile Strength	Elongation% GL=5.65 √So	Internal Diameter of bend
	MPa min	MPa min		
I	170	290	30	T
II	210	330	28	2T
III	240	410	25	2T
IV	275	430	20	3T
V	310	490	15	3T

* Supplied on basis of chemical composition for IS10748

Chemical Composition : IS 5986/2011

Grade	Constituents, Percent, Max				
	Carbon	Manganese	Phosphorus	Sulphur	Carbon Equivalents
165	0.12	0.60	0.040	0.040	–
205	0.15	0.80	0.040	0.040	–
235	0.17	1.00	0.040	0.040	–
255	0.20	1.30	0.040	0.040	0.42
325	0.20	1.30	0.040	0.040	0.42
355	0.20	1.50	0.035	0.035	0.45
420	0.20	1.50	0.035	0.035	0.45
490	0.20	1.50	0.035	0.030	0.45
560	0.20	1.50	0.035	0.030	0.45

Notes:

1. The nitrogen content of the steel shall not be more than 0.009 percent. For aluminium killed or aluminium silicon killed the nitrogen content shall not exceed 0.012 percent. This shall be ensured by ensured by occasional checking.
2. When the steel is killed by aluminium the total aluminium content should not be less than 0.02 percent. When steel is silicon content shall not be less than 0.03 percent and total aluminium content shall not be less than 0.01 percent.
3. The material may be supplied in the copper bearing quality in which case the coper shall be between 0.20 and 0.35 percent on analysis.
4. The steel can be made with micro-alloying element like Nb, V, Ti and B either individually or in combination on mutual agreement. In which case the total micro-alloying elements should nto exceed 0.2 percent in ladle analysis. However, in case of boron, he limit shall be 0.001 percent.
5. As the form of sulphide inclusions may have certain influence on the cold forming properties, steel may be treated with elements like Ce or Ca, if agreed to between the manufacturer and purchaser.

   Carbon equivalent (CE) based on ladle analysis $= C + \frac{Mn}{6} + \frac{(Cr+Mo+V)}{5} + \frac{(Ni+Cu)}{15}$

Mechanical Properties

Specification	Grade	Yield Strength MPa, Min	Ultimate Tensile Strength, MPa, Min	Elongation% min GL5.65 $\sqrt{S_o}$	Internal Diameter of bend	
				> 3 mm	≤12 mm	> 12 mm
IS:5986:2011	165	165	290-400	30	Close	t
	205	205	330-440	28	t	2t
	235	235	360-470	26	t	2t
	255	255	410-520	24	t	2t
	325	325	420-530	19	2t	3t
	355	355	420-530	18	2t	3t
	420	420	480-590	15	2t	3t
	490	490	540-650	12	2t	3t
	560	560	610-720	10	2t	3t

Grade 165 may be supplied based on chemical composition only, if agreed to

Chemical Composition IS: 2062/2011

Grade	Quality	Ladle Aaalysis, wt % Max					Carbon Equi-valent, Max	Mode of Deoxidation
		C	Mn	S	P	Si		
E 250	A	0.23	1.50	0.045	0.045	0.40	0.42	Semi Killed/Killed
	BR, BO	0.22	1.50	0.045	0.045	0.40	0.41	Semi Killed/Killed
	C	0.20	1.50	0.040	0.040	0.40	0.39	Killed
E 275	A	0.23	1.50	0.045	0.045	0.40	0.43	Semi Killed/Killed
	BR, BO	0.22	1.50	0.045	0.045	0.40	0.42	Semi Killed/Killed
	C	0.20	1.50	0.040	0.040	0.40	0.41	Killed
E 300	A, BR, BO	0.20	1.50	0.045	0.045	0.45	0.44	Semi Killed/Killed
	C	0.20	1.50	0.040	0.040	0.45	0.44	Killed
E 350	A, BR, BO	0.20	1.55	0.045	0.045	0.45	0.47	Semi Killed/Killed
	C	0.20	1.55	0.040	0.040	0.45	0.45	Killed
E 410	A, BR, BO	0.20	1.60	0.045	0.045	0.45	0.50	Semi Killed/Killed
	C	0.20	1.60	0.040	0.040	0.45	0.50	Killed
E 450	A, BR	0.22	1.65	0.045	0.045	0.45	0.52	Semi Killed/Killed
E 550	A, BR	0.22	1.65	0.020	0.025	0.50	0.54	Semi Killed/Killed
E 600	A, BR	0.22	1.70	0.020	0.025	0.50	0.54	Semi Killed/Killed

Notes:

1. New grade designation system based on minimum yield stress has been adopted.
2. For semi-killed steel, silicon shall be less than 0.10 percent. For killed steel, when the steel is killed by aluminium alone, the total aluminium content shall nto be less than 0.02 percent. When the steel is killed by silicon alone, the silicon content shall not be less than 0.10 percent. When the steel is silicon-aluminium killed, the silicon content shall not be less than 0.03 percent and total aluminium content shall not be less than 0.01 percent.
3. Steels of qualities A, BR, BO and C are generally suitable for welding processes. The weldability increases from quality A to C for grade designation E 250 and E 275.
4. Carbon equivalent (CE) would be calculated based on ladle analysis, only

$$CE = C + \frac{Mn}{6} + \frac{(C + Mo + V)}{5} + \frac{(Ni + Cu)}{15}$$

5. Micro-alloying elements like No. V and Ti may be added singly or in combination. Total micro-alloying elements shall not be more than 0.25 percent.

Chemical Composition IS: 2062/2011

6. Alloying elements such as Ci, Ni, Mo and B may be added under agrement between the purchaser and the manufacturer. In case of E 600 and E 650 the limit of Ci and Ni either singly or in combination, shall not exceed 0.50 percent and 0.60 percent respectively.
7. Copper may be present between 0.20 to 0.35 percent as mutually agreed to between the purchaser and the manufacturer. The copper bearing quality shall be designated with a suffix Cu, for example E 250 Cu. In case of product analysis the copper content shall be between 0.17 and 0.38 percent.
8. Incidental element - Elements not quoted in Table 1 shall not be intentionally added to steel without the agrement of the purchaser, other than for the purpose of finishing the heat. All reasonable precautions shall be takent to prevent the addition from scrap or other materials used in manufacturer of such elements which affect the hardenability, mechanical properties and applicability.
9. Nitrogen content of steel shall not exceed 0.012 percent which shall be ensured by the manufacturer by occasional check analysis.
10. The steel, if required, may be treated with calcium based compound or rate earth element for better formability.
11. Lower limits for carbon equivalent and closer limits for other elements may be mutually agreed to between the purchaser and the manufacturer.

Mechanical Properties : 2062/2011

Grade Designation	Quality	Tensile Strength R_m Min MPa	Yield Stress Min MPa			Percentage Elongation A, at Gauge Length, $L=5.65\sqrt{S_0}$ Min	Internal Bend Diameter Min		Charpy Impact Test	
			≤ 20	20-40	>40		<25	>25	Temp ^0C	J, Min
E-250	A	410	250	240	230	23	2t	3t	-	-
	BR								RT	27
	BO								0	27
	C								(-) 20	27
E-275	A	430	275	265	256	22	2t	3t	-	-
	BR								RT	27
	BO								0	27
	C								(-) 20	27
E-300	A	440	300	290	280	22	2t	-	-	-
	BR								RT	27
	BO								0	27
	C								(-) 20	27
E-350	A	490	350	330	320	22	2t	-	-	-
	BR								RT	27
	BO								0	27
	C								(-) 20	27
E-410	A	540	410	390	380	20	2t	-	-	-
	BR								RT	25
	BO								0	25
	C								(-) 20	25
E-450	A	570	450	430	420	20	2.5t	-	-	-
	BR								RT	20
E-550	A	650	550	530	520	12	3.0t	-	-	-
	BR								RT	15
E-600	A	730	600	580	570	12	3.5t	-	-	-
	BR								RT	15

1. In case of product thickness/diameter more than 100 mm, lower minimum limit of tensile strength may be mutually agreed to between the purchaser and the manufacturer/supplier

Chemical Composition : SAILMA Grades

Grade	C max.	Mn max.	S max.	P max.	AI min.	Si max.	CE max.	MAE (Nb+V+Ti) max.
SAILMA 300	0.20	1.50	0.045	0.045	0.02	0.45	0.44	≤ 0.25
SAILMA 300 HI	0.20	1.50	0.040	0.040	0.02	0.45	0.43	≤ 0.25
SAILMA 350	0.20	1.55	0.045	0.045	0.02	0.45	0.46	≤ 0.25
SAILMA 350 HI	0.20	1.55	0.040	0.040	0.02	0.45	0.45	≤ 0.25
SAILMA 410	0.20	1.60	0.045	0.045	0.02	0.45	0.48	≤ 0.25
SAILMA 410 HI	0.20	1.60	0.040	0.040	0.02	0.45	0.48	≤ 0.25
SAILMA 450	0.20	1.65	0.045	0.045	0.02	0.45	0.50	≤ 0.25
SAILMA 450 HI	0.20	1.65	0.040	0.040	0.02	0.45	0.50	≤ 0.25
SAILMA 550	0.20	1.65	0.020	0.025	0.02	0.50	0.54	≤ 0.25
SAILMA 550 HI	0.20	1.65	0.015	0.025	0.02	0.50	0.54	≤ 0.25
SAILMA 600	0.22	1.70	0.015	0.025	0.02	0.50	0.54	≤ 0.25

For Hot Rolled coils, S is maintained below 0.030%

Mechanical Properties : SAILMA Grades

Grade	YS, MPa min			UTS Mpa, min	% EI min Std GL	Internal Bend Diameter, min		Charpy Impact Test	
						≤25mm	>25 mm	Temp^{0}C	J, min
	<25 mm	25-40 mm	>40 mm						
SAILMA 300	300	290	280	440	24	2t	-	-	-
SAILMA 300 HI	300	290	280	440	24	2t	-	0	40
SAILMA 350	350	330	320	490	24	2t	-	-	-
SAILMA 350 HI	350	330	320	490	24	2t	-	0 -20	40 30
SAILMA 410	410	390	380	540	22	2t	-	-	-
SAILMA 410 HI	410	390	380	540	22	2t	-	0 -20	35 25
SAILMA 450	450	430	420	570	22	2.5t	-	-	-
SAILMA 450 HI	450	430	420	570	22	2.5t	-	0 -20	30 20
SAILMA 550	550	530	520	650	14	3t	-	-	-
SAILMA 450 HI	550	530	520	650	14	3t	-	0 -20	25 15
SAILMA 600	600	580	570	730	14	3.5t	-	-	-

Impact will be given for any one temperature. For 450 HI & above impact is for < 10 mm. For < 12 mm impact to be given only if specified.

Chemical Composition : SAILCOR

Specification	Grade	C % max	Mn % max	P % max	S % max	Si % max	Al % min
IS:11513 CR 4	SAIL SOFT	0.06	0.25	0.025	0.025	0.04	0.020
SAIL COR	IRSM 41	0.10	0.25-0.45	0.75-0.140	0.030	0.28-0.72	
	Cr 0.35-0.60, Ni 0.20-0.47, Cu 0.30-0.60, Al 0.03 max						

Mechanical Properties : SAILCOR

Specification	Grade	Yield Strength MPa min	Ultimate Tensile Strength MPa min	Elongation% Std GL	Internal Diameter of bend
SAILCOR	HR	340	480	22	t

Cold Rolled Stainless Steels (CRSS)

Salem Steel Plant produces a wide range of cold rolled coils and cut lengths (sheets) in austenitic, ferritic and martensitic grades of stainless steel conforming to ASTM and various other specifications in a variety of sizes and finishes.

Product Specifications

Coil	**Sizes (mm)**	
Dimension	Range	Standard sizes
Thickness	0.3 to 6.0	0.30, 0.40, 0.50, 0.55, 0.63, 0.70, 0.80, 0.90, 1.00, 1.25, 1.50, 1.60, 2.00, 2.50, 2.80, 3.00, 3.15, 3.60, 4.00, 5.00, 6.00
Width (mm)	50 to 1250	1000, 1250
Inner Diameter		406, 508 or 610
Sheet/Plate		
Dimension	Range	Standard sizes
Thickness	0.5 to 6.00	0.50, 0.55, 0.63, 0.70, 0.80, 0.90, 1.00, 1.25, 1.50 1.60, 2.00, 2.50, 2.80, 3.00, 3.15, 3.60, 4.00, 5.00, 6.00
Width (mm)	600 to 1250	1000, 1250
Length (mm)	500 to 4000	1500, 2000, 2500, 3000, 3500, 4000

– Supply of Non-standard and higher thickness by mutual discussion.

– Hot rolled, annealed, shot blasted and pickled stainless steel (No. 1 finish) coils/sheets/plates are available in thicknesses of 2.00 - 8.00 mm.

Surface Finishes – Stainless Steels

Finish	Description	Remarks
No. 1	Hot rolled, annealed, shot blasted and pickled	Used where surface finish is not critical
CR	Work hardened	Used where higher hardness & strength is required
2D	Cold rolled, annealed and pickled	Uniform dull finish for general applications
2B	Cold rolled, annealed, pickled & skin passed	Bright smooth finish for general applications
No. 3	Cold rolled, annealed, pickled & polished with 100 to 120 grit abrasive	For decorative applications
No. 4	Cold rolled, annealed, pickled & polished with 120 to 150 grit abrasive	For decorative applications
No. 8	Cold rolled, annealed, pickled, skin passed & polished	As-pressed plates, electronic equipment frames and decorative applications
Special Finishes	Cold rolled with special rolls, annealed, pickled and skin passed	For decorative applications
Dull Finish	Cold rolled, annealed and skin passed with 24 grit abrasive	For decorative applications

Coils and sheets can be supplied with surface protection film.
Please contact for more information.

Dimensional Tolerances

1.0 Thickness Tolerance – Cold Rolled Stainless Steel

1.1 Normal tolerance

Unit : mm

Thickness Range	Permitted Tolerance on Thickness for specified width	
	≤ 1000	>1000 to ≤ 1275
≤ 0.30	± 0.030	–
> 0.30 to ≤ 0.40	± 0.040	± 0.04
> 0.40 to ≤ 0.50	± 0.045	± 0.050
> 0.50 to ≤ 0.80	±0.050	±0.050
> 0.08 to ≤ 1.00	±0.055	± 0.060
> 1.00 to ≤ 1.50	±0.080	±0.080
> 1.50 to ≤ 2.00	±0.10	±0.10
> 2.00 to ≤ 2.50	± 0.10	± 0.11
> 2.50 to ≤ 3.00	± 0.13	± 0.13
> 3.00 to ≤ 4.00	± 0.17	± 0.17
> 4.00 to ≤ 5.00	± 0.17	± 0.17
> 5.00 to ≤ 6.00	± 0.17	± 0.20

1.2 Customer Specification Tolerance

Any thickness closer than precision tolerance agreed by mutual discussion.

2.0 Thickness Tolerance for No. 1

Applicable Width: All Widths

Unit : mm

Thickness	Permitted Tolerance (±) on Thickness
2.00	0.18
2.25	0.20
2.50	0.23
3.00	0.25
3.50	0.30
5.00	–0.25, + 0.47
6.00	–0.25, + 0.51
8.00-10.00	–0.25, + 0.75

For specified thickness other than shown in the Table, the tolerance for the next higher thickness shall apply.

3.0 Tolerances on width

3.1 Normal Tolerance for sheets and coils - CRSS Trimmed Edge

Unit : mm

Thickness	Permitted Tolerance on Width for specified width			
	≤≤ 250	>250 to ≤ 600	>600 to ≤ 1000	>1000 to 1250
≤ 1.00	+0.50, –0	+0.70, –0	+1.50, –0	+2.00, –0
>1.0 to ≤1.50	+0.70, –0	+1.00, –0	+1.50, –0	+2.00, –0
>1.5 to ≤2.50	+1.00, –0	+1.20, –0	+2.00, –0	+2.50, –0
>2.50 to ≤3.50	+1.20, –0	+1.50, –0	+3.00, –0	+3.00, –0
>3.50 to ≤6.00	+2.00, –0	+2.00, –0	+4.00, –0	+4.00, –0

3.2 Normal Tolerance for Mill Edge, –0,+30mm (for ≥1000mm)

–0,+25mm (for <1000mm)

3.3 Precision Tolerance on width (Trimmed Edge) CRSS coils

Any width tolerance stricter than normal tolerance agreed by mutual discussion.

3.4 Normal Tolerance for sheets and coils (Code 'N') - No. 1 Trimmed Edge

Unit : mm

Thickness Range	Width	Permitted Tolerance on width
≥≤ 5.00	<1200	+2,-0
≤≤ 5.00	≥ 1200	+6,-0
>5.00 to ≤ 6.00	<1200	+4,-0
>5.00 to ≤ 6.00	≥ 1200	+9,-0

3.5 Normal Tolerance for Mill Edge, –0,+30mm (for ≥1000mm)

–0,+25mm (for <1000mm)

3.6 Precision Tolerance on width (Trimmed Edge) No. 1 coils

Any width tolerance stricter than normal tolerance agreed by mutual discussion.

4.0 Tolerance on Length

4.1 Normal Tolerance (Code 'N') – CRSS

Applicable Width: All Widths

Unit : mm

Specified Length	Permitted Tolerance on length
≤ 2000	+5, –0
>2000	+0.0025 x L, –0

4.2 Normal Tolerance (Code 'N') – No. 1

Applicable Width: All Widths

Unit : mm

Specified Length	Permitted Tolerance on length
<3000	+12, –0
≥ 3000	+0.005 x L, –0

4.3 Precision Tolerance - CRSS and No. 1 Sheets

Any length tolerance stricter than normal tolerance agreed by mutual discussion.

5.0 Flatness for Sheets / Plates (Maximum deviation from a horizontal flat surface)

5.1 Tolerance for CRSS

10 mm max for all thicknesses and widths – not tension levelled

7.0 mm max for thickness ≤ 2.00 mm – tension levelled sheets

5.2 Tolerance for No.1

Unit : mm

Specified Thickness	Specified width	Permitted Tolerance on flatness
<5.0	< 900	13
<5.0	900–1275	19
≥ 5.0	≤ 1275	23

Standard Packet Weight

Coil Packets : 0.8 - 5 Kg/mm of width / 6 t maximum

Sheet Packets : 1.7 - 5 Kg/mm of width / 3 t maximum

Certificate

Test certificates will be issued as per following system:

Class	Grades	Details in Test Certificates
CRSS & NO1	300 Series, 400 Series & SSLN Series	Chemical Composition, Dimensions and Mechanical Properties
Special Finish	304, 430, SSLN Series.	Chemical Composition and Dimensions
CR Finish	300 Series, 400 Series, SSLN Series	Chemical Composition, Hardness, Dimensions and any other mechanical properties on mutual agreement
Mint Arising	430	Chemical composition, Hardness and Dimensions.

Standard grades and chemical composition

Grade	% Chemical Composition (Ladle)								
	C (max)	Si (max)	Mn	Cr	Ni	P (max)	S (max)	N	Other Elements
301	0.15	1.00	2.00 max	16.00-18.00	6.00-8.00	0.045	0.030	0.10 max	-
301L	0.03	1.00	2.00 max	16.00-18.00	6.00-8.00	0.045	0.030	0.20 max	-
304	0.07	0.75	2.00 max	17.5- 19.5	8.00-10.50	0.045	0.030	0.10 max	-
304L	0.03	0.75	2.00 max	17.5- 19.5	8.00-12.00	0.045	0.030	0.10 max	-
310S	0.08	1.50	2.00 max	24.00-26.00	19.00-22.0	0.045	0.030	-	-
316	0.08	0.75	2.00 max	16.00-18.00	10.00-14.00	0.045	0.030	0.10 max	Mo 2.0-3.0
316L	0.03	0.75	2.00 max	16.00-18.00	10.00-14.00	0.045	0.030	0.10 max	Mo 2.0-3.0
321	0.08	0.75	2.00 max	17.00-19.00	9.00-12.00	0.045	0.030	0.10 max	Ti=5x(C+N) Min/0.70 max
SSLNA	0.13	0.75	9.00- 10.50	14.00- 15.50	0.20- 0.50	0.090	0.030	0.1-0.25	Cu 0.70-1.00
SSLNB	0.13	0.75	9.00- 10.50	15.00- 16.50	0.45- 0.80	0.085	0.030	0.1-0.25	Cu 1.95-2.50
SSLNQ	0.13	0.75	9.00- 10.50	14.00- 16.00	0.25-0.60	0.085	0.030	0.1-0.25	Cu 1.50-2.50
SSLN1	0.12	0.75	8.50- 10.00	14.00-16.00	0.90-1.70	0.085	0.030	0.20 max	Cu 1.50-2.0
SSLN4	0.10	0.75	6.00 - 8.00	15.00-17.00	3.90-4.70	0.075	0.030	0.15 max	Cu 1.50-2.0
201	0.15	1.00	5.50-7.50	16.0-18.0	3.50-5.50	0.060	0.030	0.25 max	-
204Cu	0.15	1.00	6.50-9.00	15.5 - 17.5	1.50-3.50	0.060	0.030	0.25 max	Cu 2.0-4.0
409	0.03	1.00	1.00 max	10.50-11.70	0.50 max	0.04	0.02	0.03 max	Ti=6x(C+N) min/ 0.5 Max Nb 0.17 max
SS 409M	0.03	1.00	0.50-1.50	10.80-12.50	1.50 max	0.040	0.030	0.03 max	-
410S	0.08	1.00	1.00 max	11.50-13.50	0.60 max	0.040	0.030	-	-
420	0.15	1.00	1.00 max	12.00-14.00	0.75 max	0.040	0.030	-	Mo 0.5 max
430	0.12	1.00	1.00 max	16.00-18.00	0.75 max	0.040	0.030	-	-
439	0.03	1.00	1.00 max	17.00-19.00	0.50 max	0.040	0.030	0.03 max	Ti[0.2+4 (C+N)] Min / 1.1 max Al 0.15 max

Mechanical Properties of Standard Grades in annealed condition

Grade	U.T.S. N/mm²	0.2% Proof Stress/ YS N/mm² Min	% El (GL = 50 mm) Min	Hardness max HRB	Cold Bend
301	515Min	205	40	95	Not required
301L	550 Min	220	45	100	Not required
304	515 Min	205	40	92	Not required
304L	485 Min	170	40	92	Not required
310S	515 Min	205	40	95	Not required
316	515 Min	205	40	95	Not required
316L	485 Min	170	40	95	Not required
321	515 Min	205	40	95	Not required
SSLNA	675 min	375	40	-	Not required
SSLNB	650 Min	350	40	-	Not required
SSLNQ	675 Min	375	40	-	Not required
SSLN1	650 Min	325	40	-	Not required
SSLN4	600 Min	275	40	96	Not required
201	515 min	260	40	95	Not required
204 Cu	650 Min	310	40	100	Not required
409	380 Min	170	20	88	180° 1 t
SS409M	450 Min	275	22	92	180° 1 t
410S	415 Min	205	22.*	89	180° 1 t
420	690 Max	-	15	96	Not required
430	450 Min	205	22 .*	89	180° 1 t
439	415 Min	205	22	89	180° 1 t

.* 20% Min for Thickness less than 1.27 mm

Physical Properties* (Annealed Conditions) CRSS

Details	301	304/304L	316/316L	310S	430	409
Density (gm/cm³)	7.9	7.9	8.0	7.9	7.7	7.7
Modules of Elasticity (kg /mm²)	19700	19700	19700	20300	20300	20300
Specific Heat Capacity (Cal/gm/°C)	0.12	0.12	0.12	0.12	0.11	0.11
Thermal conductivity (Cal/cm²/Sec/°C/cm at 100°C)	0.039	0.039	0.037	0.033	0.0625	0.0595
Specific Electrical Resistance (u.cm³)	72	72	74	80	60	57
Coefficient of thermal expansion (°Cx10-6, 0-500 °C)	19.8	18.4	16.0	16.9	11.34	11.52
Melting Range (°C)	1400-1420	1400-1455	1370-1400	1400-1455	1430-1510	1430-1510

* For Guidance Only

Equivalent Specifications : Stainless steels

GRADE	IS India	AISI USA	DIN Germany	AFNOR France	JIS Japan	BS Britian	SIS Sweden	UNS	UNI Italy
SS 301	X10 Cr 17Ni 7	301	1.4310	Z 12 CN 17-08	SUS 301	301 S 21	142331	S 30100	X12 Cr Ni 1707
SS 304	X04 Cr 19 Ni 9	304	1.4301	Z 6 CN 18-19	SUS 304	304 S 15	142333	S 30400	X5 Cr Ni 1810
SS 304L	X02 Cr 19 Ni 10	304L	1.4306	Z 2 CN 18-10	SUS 304 L	304 S 11	142352	S 30303	X2 Cr Ni 1811
SS 310S	-	310S	1.4845	-	SUS 310 S	-	142361	S 31008	X6 Cr Ni 2520
SS 316	X04 Cr 17 Ni 12 Mo 2	316	1.4401	Z 6 CND 17-11	SUS 316	316 S 31	142343	S 31600	X8 Cr Ni Mo 1713
SS 316L	X02 Cr 17 Ni 12 Mo 2	316L	1.4404	Z 2 CND 17-12	SUS 316 L	316 S 31	142348	S 31603	X2 Cr Ni Mo 1712
SS 321	X04 Cr 18 Ni 10 Ti	321	1.4541	Z 6 CNT 18-12	SUS 321	321 S 31	142337	S 32100	X6 Cr Ni Ti1811
SS 409	-	409	1.4512	-	SUS 409	409 S 19	-	S 40900	-
SS 410S	-	410S	-	-	-	-	-	-	-
SS 430	X07 Cr 17	430	1.4016	Z 8 C 17	SUS 430	430 S 17	142320	S 43000	X8 Cr 17
SS 409M	-	-	-	-	-	HYFAB 3/12	-	-	-

Theoretical Mass : Stainless Steel

Size (1000 x 1000) mm, Unit : Kg

Thick (mm)	300 series (Density: 8g/cc)	400 series (Density: 7.7 g/cc)
0.30	2.40	2.31
0.40	3.20	3.08
0.50	4.00	3.85
0.63	4.00	3.85
0.70	5.04	4.85
0.80	5.60	5.39
0.90	6.4	6.16
1.00	8.00	7.70
1.25	10.00	9.63

Thick (mm)	300 series (Density: 8g/cc)	400 series (Density: 7.7 g/cc)
1.60	12.80	12.32
2.00	16.00	15.40
2.50	20.00	19.25
3.00	24.00	23.10
4.00	32.00	30.80
5.00	40.00	38.50
6.00	48.00	46.20
8.00	64.00	61.60

* These weights are theoretical, for guidance only and are not to be used for commercial purpose, as there is a tolerance on thickness, width and length.