

※ CONTENTS

1. Terminology.....	4
2. Standard Sizes.....	5
3. Standard Gauges.....	5
4. Gauge Ranges Available.....	7
4.1. Cold Rolled Coil.....	7
4.2. Cold Rolled Sheet.....	8
4.2.1. Sheets in Grade/Size.....	8
5. Gauge Tolerances.....	10
6. Pack Masses.....	11
6.1. Coil Mass.....	11
6.2. Sheet Mass.....	11
7. Grade/Chemical Composition.....	11
8. Finish.....	12
9. End Use.....	13
10. Inner Diameter of Coils.....	13
11. Slitting/Shearing.....	13
12. Packing.....	14
12.1. Cold Rolled Sheet.....	14
12.1.1. Domestic/Export Packing.....	14
12.2. Cold Rolled Coil.....	14
12.2.1. Domestic/Export Packing.....	14
12.3. Paper Interleaving.....	14
12.4. Protect Film.....	15
13. Coil Quality.....	15
14. Certification.....	16
14.1. KOREAN INDUSTRIAL STANDARDS (KS).....	16
14.2. JAPANESE INDUSTRIAL STANDARDS (JIS).....	17
14.3. TECHNISCHER UBERWACHUNGS VEREIN (TÜV).....	17
14.4. ISO 9001: 2000.....	18
14.5. U-MARK.....	18
15. Coil Supplied for Cutting to Sheet or Slitting.....	19
16. Marking.....	19
16.1. Cold Rolled Sheet Marking and Location.....	19
16.2. Cold Rolled Coil Marking and Location.....	20

1. Terminology

Terminology	Definition
Cold Rolling	A process by which sheet or strip can be worked with accuracy under recrystallization temperature. In annealing line as the next process involving high-temperature heating, previously worked material is become softer and more formed. After that, the material is re-rolled with precise gauge tolerance.
Cold Rolled Sheet	Materials cut flat from cold rolled coil.
Cold Rolled Coil	Coiled-up materials with cold-rolled steel in length.
Width	The distance across something from one side of steel coils or sheets to the other side of steel coils or sheets. Our standard widths are 1000mm, and 1219(1220)mm.
Length	The perpendicular measurement of width. Our standard lengths are 2000mm, 2438mm, and 3000mm.
Protect Film	Coated on the surface of stainless steel materials for protection against handling or processing damage.
ASTM	Standing for American Society for Testing and Material.
EN	Standing for European Norm.
Mill Edge	The normal edge of steel produced in rolling, without side-trimming operation right after rolling process. This does not conform to any definite contour. Mill edge products contain cracked edges, and damaged edges due to handling or processing. The width of mill edge products is larger than that of standard products, varying a lot according to the points measured and the types of products.
Side Trimming	The process by which cracked edges of a steel strip with the inequality of widths are trimmed.
Interleaving Paper	Located between steel strips.
Slitting	The operation by which steel coils are cut across in a specified width by a metal disc cutter. It is the opposite term of shearing.

2. Standard Sizes

Width		Length		Length		Length	
mm	inches	mm	inches	mm	inches	mm	inches
1000	39.37	2000	78.740	3000	118.11	4000	157.48
1219	47.99	2438	95.98	3048	120.00		

Notes:

1. BNG can supply products in various sizes other than the above mentioned, please contact us. We are capable of covering a wide diversity of sizes.
2. Width, length and flatness tolerances are normally to KS D 3698, JIS G 4305

3. Standard Gauges

Metric Gauges			
mm	Equivalent inches	mm	Equivalent inches
0.05	0.0020	1.50	0.0591
0.10	0.0039	1.80	0.0709
0.15	0.0056	2.00	0.0787
0.20	0.0079	2.50	0.0984
0.25	0.0098	3.00	0.1181
0.30	0.0118	3.50	0.1378
0.40	0.0157	4.00	0.1575
0.50	0.0197	4.50	0.1772
0.60	0.0236	5.00	0.1969
0.80	0.0276	6.00	0.2362
0.90	0.0315	7.00	0.2756
1.00	0.0394	8.00	0.3150
1.20	0.0472		

Metric Gauges (mm)	U.S Gauges		
	Gauge Number	Equivalent (inches)	Equivalent (mm)
0.358	USG 29	± 0.002	0.308 - 0.408
0.396	USG 28	± 0.002	0.346 - 0.447
0.437	USG 27	± 0.002	0.387 - 0.487
0.473	USG 26	± 0.002	0.427 - 0.528
0.556	USG 25	± 0.002	0.506 - 0.607
0.635	USG 24	± 0.002	0.585 - 0.685
0.714	USG 23	± 0.002	0.663 - 0.764
0.795	USG 22	± 0.002	0.745 - 0.845
0.874	USG 21	± 0.002	0.823 - 0.924
0.927	USG 20	± 0.002	0.877 - 0.977
1.270	USG 18	± 0.003	1.194 - 1.346
1.588	USG 16	± 0.003	1.512 - 1.663
1.786	USG 15	± 0.003	1.710 - 1.861
1.984	USG 14	± 0.004	1.883 - 2.085
2.779	USG 12	± 0.004	2.678 - 2.880
3.175	USG 11	± 0.004	3.074 - 3.276
3.571	USG 10	± 0.004	3.470 - 3.672

Notes:

1. BNG is capable of producing items with a variety of thickness and tolerances as well, in accordance with customer's goals. Customer's can obtain what they want by contacting us.

4. Gauge Ranges Available

4.1. Cold Rolled Coil

BNG TYPES		Gauges (mm)	Width (mm)
GRADES	FINISH		
201 202	1D	3.0 ~ 8.0	1000 ~ 1219
	2D	0.4 ~ 5.0	1000 ~ 1219
301(L) 304(L) 316(L)	2B	0.4 ~ 5.0	1000 ~ 1219
	BD	0.1 ~ 0.3	1000
		0.3 ~ 2.0	1000 ~ 1219
321 304J1	BB	0.2 ~ 0.3	1000
		0.3 ~ 2.0	1000 ~ 1219
430 436L	BA	0.2 ~ 0.3	1000
		0.3 ~ 2.0	1000 ~ 1219
439 444	#4	0.4 ~ 2.0	1000 ~ 1219
		0.8 ~ 2.0	1000 ~ 1219
430J1L 429 409L	HL	0.6 ~ 2.0	1000 ~ 1219
		HD	0.1 ~ 0.3
	0.3 ~ 4.5		1000 ~ 1219
	EM	0.2 ~ 0.3	1000
		0.3 ~ 2.5	1000 ~ 1219

Notes:

1. The items shown above are illustrated as materials that are normally commercially available. There can be many variations in the types

and surfaces of items that we can supply, meeting customer's enquiry. Please contact us for more information.

4.2. Cold Rolled Sheet

4.2.1. Sheets in Grade/Size

Grade	STS 304 (Density 7.93)							
Size	1m x 2m		1m x 3m		1m x 4m		1219 x 2438(mm)	
Gauge	Weight (kg)	Sheet of Ton	Weight (kg)	Sheet of Ton	Weight (kg)	Sheet of Ton	Weight (kg)	Sheet of Ton
0.30	4.76	210	7.14	140	9.52	105	7.07	141
0.40	6.34	158	9.52	105	12.69	79	9.43	106
0.45	7.14	140	10.71	93	14.27	70	10.61	94
0.50	7.93	126	11.91	84	15.86	63	11.78	85
0.55	8.72	115	13.08	76	17.45	57	12.93	77
0.60	9.52	105	14.27	70	19.03	52	14.14	71
0.70	11.10	90	16.65	60	22.20	45	16.50	61
0.80	12.69	79	19.03	53	25.38	39	18.85	52
0.90	14.27	70	21.41	47	28.55	35	21.21	47
1.00	15.86	63	23.79	42	31.72	32	23.57	42
1.20	19.03	53	28.55	35	38.06	26	28.28	35
1.50	23.79	42	35.69	28	47.58	21	35.35	28
1.70	26.96	37	40.44	25	53.92	19	40.06	25
1.80	29.55	35	42.82	23	57.10	18	42.42	24
2.00	31.72	32	47.58	21	63.44	16	47.13	21
2.20	34.89	29	52.34	19	69.78	14	51.85	19
2.50	39.64	25	59.48	17	79.30	13	58.92	17
2.80	44.41	23	66.61	15	88.82	11	65.99	15
3.00	47.58	21	71.37	14	95.14	11	70.70	14
3.20	50.75	20	76.13	13	101.50	10	75.42	13
3.50	55.51	18	83.27	12	111.02	9	82.49	12
3.80	60.27	17	90.40	11	120.54	8	89.56	11
4.00	63.44	16	95.06	11	126.88	8	94.27	11
4.20	66.61	15	99.92	10	133.22	8	98.98	10

4.50	71.37	14	107.06	9	142.74	7	106.05	9
5.00	79.30	13	118.95	8	158.60	6	117.84	8

Grade	STS 430 (Density 7.70)				STS 410 (Density 7.70)		STS 316 (Density 7.98)	
	1m x 2m		1219 x 2438 (mm)		1m x 2m		1m x 2m	
Gauge	Weight (kg)	Sheet of Ton	Weight (kg)	Sheet of Ton	Weight (kg)	Sheet of Ton	Weight (kg)	Sheet of Ton
0.30	4.62	216	6.87	146	4.65	215	4.79	209
0.40	6.16	162	9.15	109	6.20	161	6.38	157
0.45	6.93	144	10.30	97	6.98	143	7.18	139
0.50	7.70	130	11.44	87	7.75	129	7.98	125
0.55	8.47	118	12.59	79	8.52	117	8.78	114
0.60	9.24	108	13.73	73	9.30	108	9.58	104
0.70	10.78	93	16.02	62	10.85	92	11.17	90
0.80	12.32	81	18.31	55	12.40	81	12.77	78
0.90	13.88	72	20.60	49	13.95	72	14.36	70
1.00	15.40	65	22.88	44	15.50	65	15.96	63
1.20	18.48	54	27.46	36	18.60	54	19.15	52
1.50	23.10	43	34.33	29	23.25	43	23.94	42
1.70	26.18	39	39.90	26	26.35	38	27.13	37
1.80	27.72	36	41.19	24	27.90	36	28.73	35
2.00	30.80	32	45.77	22	31.00	32	31.92	31
2.20	33.88	30	50.34	20	34.10	29	35.11	28
2.50	38.50	26	57.21	17	38.75	26	39.90	25
2.80	43.12	23	64.07	16	43.40	23	44.69	22
3.00	46.20	22	68.65	15	46.50	22	47.88	21
3.20	49.28	20	73.23	14	49.60	20	42.07	20
3.50	53.90	19	80.09	12	54.25	18	55.86	18
3.80	58.52	17	86.96	11	58.90	17	60.65	16
4.00	61.60	16	91.54	11	62.00	16	63.84	16
4.20	64.68	15	96.11	10	65.10	15	67.03	15
4.50	69.30	14	102.98	10	69.75	14	71.82	14
5.00	77.00	13	114.42	9	77.50	13	79.80	13

5. Gauge Tolerances

Material can be ordered to the gauge tolerances listed below:

- KS D 3698
- JIS G 4305
- ASTM A480 / ASTM A 480M
- EN 10259

Material can be rolled to either of the tolerances listed below – the required tolerance must be specified when ordering.

Nominal Gauge (mm)	Normal Tolerance	
	+	-
	(mm)	(mm)
≤ 0.28	0.013	0.013
0.28 < 0.36	0.015	0.015
0.36 to < 0.5	0.025	0.025
0.5 to < 0.6	0.030	0.030
0.6 to < 0.8	0.035	0.035
0.8 to < 1.0	0.040	0.040
1.0 to < 1.1	0.045	0.045
1.1 to < 1.2	0.020	0.020
1.2 to < 1.5	0.020	0.020
1.5 to 1.6	0.020	0.020
1.6 to < 2.0	0.055	0.055
2.0 to < 2.5	0.090	0.090
2.5 to < 3.0	0.110	0.110
3.0 to < 4.0	0.130	0.130
4.0 to < 5.0	0.140	0.140
5.0 to 8.0	0.150	0.150

Notes:

1. Different and Variable Gauges may be considered to based on agreement between BNG Steel and customers.

2. Not all the thicknesses shown above will be available for all the various types, widths and finishes (See section 3.1 for more details)
3. All Cold Rolled material will comply with the relevant specification, but will be rolled in accordance with the above aims, unless otherwise agreed.

6. Pack Masses

6.1. Coil Mass

The standard coil mass is 300kg ~ 16000kg. A coated coil is kept to be less than 3000kg in weight.

6.2. Sheet Mass

The standard Sheet Mass is 1000kg.

Notes:

1. All products may be available to be changed by customer's enquiry.

7. Grade / Chemical Composition

Austenitics		Ferritics	
Grades	Chemical Composition	Grades	Chemical Composition
202	18Cr-5Ni-8Mn-N	409L	11Cr-0.5Ti
301	17Cr-7Ni	429	16Cr
301L	17Cr-7Ni-LC-N	430	18Cr
304	18Cr-8Ni	430J1L	18Cr-0.5Cu-Nb-EL(C,N)
304L	18Cr-9Ni-LC	436L	18Cr-1Mo-Ti, Nb, Zr-EL(C,N)
304J1	17Cr-7Ni-2Cu	444	19Cr-2Mo-Ti, Nb, Zr-EL(C,N)

316	18Cr-12Ni-2.5Mo	439	19Cr-Mn-Ti-LC
316L	18Cr-12Ni-2.5Mo-LC		
321	18Cr-9Ni-Ti		

8. Finish

BNG	KS	JIS	ASTM	EN	Finishing Processes
Steel	D 3698	G 4305	A 480	10088-2	BNG Steel
1D	-	No. 1	No. 1	1D	A heat rolled product that has undergone heat treatment and pickling treatment.
2D	No. 2D	No. 2D	No. 2D	2D	A non-glossy cold-rolled product that has undergone heat treatment and pickling treatment after hot rolling.
2B	No. 2B	No. 2B	No. 2B	2B	Skin-pass Performed on No.2D.
BD	-	-	-	-	A product that has undergone cold rolling, bright annealing.
BB	-	-	-	-	A product with light skin pass that has undergone cold rolling and bright annealing
BA	BA	BA	Bright Annealed	2R	A product that has undergone cold rolling. Bright annealing and skin pass. Its surface is highly reflective and lustrous.
#4	No. 4	No. 4	No. 4	2J	Polished with a 150~180 mesh abraide.
#8	-	-	No. 7	2P	Highly polished with a more than 800 mesh abraide and by gray pig iron buff. This product has a finer abrasion condition and its surface is highly lustrous.

HL	HL	HL	-	2M	A product with continuous abrasive pattern acquired on No.4
HD	-	-	TR	2H	Cold rolled products worked with dimensional hardness.
EM	-	-	-	-	Cold-Rolled product which transcribes the repeated irregularity pattern by cold-rolled roll.

Notes:

1. Within each finish description the surface characteristics may vary and more specific requirements may need to be agreed between BNG Steel and customers (e.g. Grade of grit or surface roughness)

9. End Use

Cold Rolled products are produced to suit customer's end use as far as possible. It is essential therefore when ordering that the end use is stated. Customers are encouraged to consult with BNG Steel's Quality Innovation Department to obtain the material which best suits their purpose. Should no end use be supplied any claims relating to the material will be handled accordingly.

10. Inner Diameter of Coils

All Coils will have an internal diameter of 508mm. 610mm may be available on enquiry.

11. Slitting / Shearing

A mill edge coil that has been cold rolled is operated by side-trimming process, resulting in having a standard width. It can be cut in a width and a length of such a size that a customer needs, so as to save the cost of manufacturing and get a good yielding.

12. Packing

12.1. Cold Rolled Sheet

12.1.1. Domestic/Export Packing

BNG places a plank (hard boards or plywood boards) on top of both sides corrugated cardboard on a fully enclosed export box. BNG also lay more corrugated cardboards in addition.

Notes:

The product No.1D is exceptional.

12.2. Cold Rolled Coil

12.2.1. Domestic/Export Packing

1. Products are rolled up with waterproof paper, using suitable sizes of paper.
2. For export packing, we attach a protector round the exterior of coils to protect edges of steel coils.
3. Exports can be packed with plywood boards instead of hard boards.

Notes:

BNG can customize packing in accordance with customers' wishes about package.

12.3. Paper Interleaving

Every product is placed with white or yellow interleaving paper on one side or two sides, being placed between.

12.4. Protect Film

Types of Film	Mark	Thickness (mm)	Color	Logo		Finish	Characteristics of Film
				BNG STEEL	Type		
P.V.C (Poly Vinyl Chloride)	WO	100	White	Printable	Logo	BA, #8	Easily cut and bent/ for light drawing
					Logo	EM, #4	
	BO	80	Blue	Not Printable (Translucent)		2B	General usage/ For Forming
P.E (Poly Ethylene)	PO	50	Azure	Not Printable (Translucent)		2B	Surface protective

Notes:

The protective film hardens over long periods of time; customers need to remove the film as soon as possible. It must be kept at room temperature, away from sunlight.

13. Coil Quality

Note that trimmed coils are guaranteed with 97% of the surface as prime. Untrimmed coils may be available on enquiry, with 97% of the surface guaranteed as prime after trimming to final width by the customer.

14. Certification

Cold rolled products can be certified to the following specifications:

- KOREAN INDUSTRIAL STANDARDS (KS)
- JAPANESE INDUSTRIAL STANDARDS (JIS)
- TECHNISCHER UBERWACHUNGS VEREIN (TüV)
- ISO 9001 : 2000
- U-MARK

14.1. KOREAN INDUSTRIAL STANDARDS (KS)

Certification Organization	KOREAN STANDARD ASSOCIATION
LIST	Cold Rolled Stainless Coil and Sheet (KS D 3698)
A P P R O V A L S C O P E	<ul style="list-style-type: none"> ◆ Sheet <ul style="list-style-type: none"> - Type: STS304, 316, 410, 430 - Gauge: 0.4 ~ 6.0mm ◆ Coil <ul style="list-style-type: none"> - Type: STS304 - Gauge: 0.4 ~ 6.0mm ◆ Chang-Won Factory (Korea) <hr/> <ul style="list-style-type: none"> ◆ Sheet <ul style="list-style-type: none"> - Type and Gauge * STS304: Over than 0.3mm * STS316: Over than 1.0mm * STS430: Over than 0.3mm ◆ Coil <ul style="list-style-type: none"> - Type: STS304 - Gauge: Over than 0.3mm ◆ Ulsan Factory (Korea)
Date of approval (Approval Number)	<ul style="list-style-type: none"> ◇ Chang-Won: 1979. 5. 24 (No. 1775) ◇ Ulsan: 1979. 5. 24 (No. 1777)

14.2. JAPANESE INDUSTRIAL STANDARDS (JIS)

Certification Organization	Japanese Ministry of Economy, Trade, and Industry
LIST	Cold Rolled Stainless Coil and Sheet (JIS G 4305)
Approval Scope	<ul style="list-style-type: none"> ◆ Coil, Sheet <ul style="list-style-type: none"> - Type: All Type - Gauge: 0.3 ~ 5.0mm ◆ Chang-Won Factory (Korea)
Date of approval (Approval Number)	1988. 4. 12 (KR8853)

14.3 TECHINISCHER UBERWACHUNGS VEREIN (TüV)

Certification Organization	Rheinland Korea
LIST	PED 97/23/EC, AD-W2, AD-W10 (Cold Rolled Stainless Coil and Sheet)
Approval Scope	<ul style="list-style-type: none"> ◆ Sheet, Coil <ul style="list-style-type: none"> - Type: WNR 1.4301, 1.4306, 1.4401, 1.4404 - Gauge: 0.3 ~ 5.0mm ◆ Chang-Won, Ulsan Factory
Date of approval (Approval Number)	1981. 1. 6 (926/991147)
Note	Material for pressure vessels

14.4. ISO 9001 : 2000

Certification Organization	TÜV CERT
LIST	Plan, Development, Production, and Sale (Cold Rolled Stainless Coil and Sheet)
Approval Scope	<ul style="list-style-type: none"> ◆ Sheet, Coil <ul style="list-style-type: none"> - Type: All Type - Gauge: Produced All Gauge ◆ Chang-Won, Ulsan Factory
Date of approval (Approval Number)	1993. 3. 1 (09 100 99107)
Note	International Standard Material

14.5. U-MARK

Certification Organization	Rheinland Korea
LIST	DIN 17441 (Cold Rolled Stainless Coil and Sheet)
Approval Scope	<ul style="list-style-type: none"> ◆ Sheet, Coil <ul style="list-style-type: none"> - Type: WNR 1.4301, 1.4401, 1.4541, 1.4571, 1.4435 - Gauge: 0.3 ~ 5.0mmT ◆ Chang-Won, Ulsan Factory
Date of approval (Approval Number)	1997. 1. 3 (926/961252)
Note	Construction Material

Notes:

BNG has provided the most liberal warranty offered by the industry through an on-line network based on ERP system. BNG has won recognition from the authorities of developed countries for the best quality of our products through modern process control technology and quality control technology by up-to-the-minute research and experiment.

15. Coil Supplied for Cutting to Sheet or Slitting

Coil purchased for the purpose of cutting to sheet or slitting is supplied on the understanding that it is the converter's responsibility to ensure that the facilities utilized are capable of producing material that conforms to the specification to which it is processed.

16. Marking

This regulates marking on products. Marking can only be done to finally inspected products.

16.1. Cold Rolled Sheet Marking and Location

► Domestic Supply

An ordinary product and KS product are marked manually or by a marking machine at the point of 100mm from the vertical hems and the horizontal center of its surface. It is marked with the types of steels, finish code, and manufacturer.

Notes:

When products are changed from exports to products for domestic supply, marking is done manually.

► Exports

An export is marked manually at the point of 100mm from the vertical hems and the horizontal center of its surface. An ordinary and JIS product are marked with the types of steels, finish, sizes, and other specifications according to marking options. For TÜV products, BNG marks with the name of the manufacturer, the types of steels, melting numbers, finish code, thickness, serial numbers, the names of the inspector, and the name of the tester if the product tested.

Notes:

The marking of TÜV products follows TÜV marking methods.

16.2. Cold Rolled Coil Marking and Location

► Domestic Supply

Marking stickers are attached manually or by a marker at two ends inside of an ordinary products and KS product for protection against damage under loading. BNG marks with the types of steels, finish codes, and the name of the manufacturer.

Notes:


When products are changed from exports to products for domestic supply, marking is done manually.



► Exports

For normal and JIS products, marking stickers are attached manually on two sides of wrapped products for protection against damage under loading. BNG marks with the types of steels finish codes, sizes, and other details according to marking instructions.

Notes:

1. The marking of TÜV products follows TÜV marking methods.
2. Sample of Tag.

	BARCODE			Package Number	
	TYPE	FINISH		LOT NO.	
	Width x Length x Coil			HEAT NO.	
	CASE NO.			NT. MASS	KG
	MADE IN KOREA			GR. MASS	KG

	JIS No.	BARCODE		Package Number	
		TYPE	FINISH	DATE	
		Width x Length x Coil		HEAT NO.	
		CASE NO.		NT. MASS	KG
	KR No.	MADE IN KOREA		GR. MASS	KG