

Hytan

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<http://www.hytan.biz>
<http://www.hankookmetal.co.kr>

Hytan

WE OPEN A NEW CHAPTER OF THE 21ST CENTURY IN STEEL INDUSTRY.



From C.E.O.

HANKUM is a flat roll steel producer of an annual rolling capability of 360,000 metric tons since 1966 and has major production operations in Yangsan and Pohang Korea.

The company manufactures a wide range of carbon, special, alloy steel strip and strapping for the automotive parts, appliance, construction, machine parts, and packaging industry

We' ve been processing steel for more than 40 years and operations are efficient and high tech, and always with an eye to solve our customer's needs in the most cost-efficient ways possible.

We are proud of ourselves on being a leader in both process and product technology and also R&D with highly skilled engineers dedicated to advancing the boundaries of steel processing.

To be competitive in an increasingly global marketplace together with our customer, HANKUM continually looks for opportunities to strengthen our existing presence in the global steel industry .

We'd greatly appreciate your continual support and concerns.

Ho Chang Ryu
C.E.O.
HANKUM CO., LTD.





NEW TAKEOFF

Specialized accomplishments were done in the steel industry through past 40 years. Now we are proud to announce NEW TAKEOFF together with a new name brand, HYTAN. It stands for unlimited development, solid growth and confidence.

Hytan

History

1966~1980

Early days

1966



1966.11.8
Mr. Ji-Youn Ryu. Established Hankook Metal Ind. Co., Ltd. in Busan

1966.2
Began plant construction in Busan.

1967~1970



1967.8
Signed strategic alliance with Specialized Metal Ind. Co., Ltd. in Japan.

1966.7
Completed plant in Busan and began manufacturing.

1968.10
Began selling strapping products and stainless steel strip.

1971~1975



1972.1
Started selling cold rolled steel strip products.

1972.8
Facilitated one 6-HI Mill and two 4-HI Mills.

1973.11
The first amount exported to Philippines of US\$ 35,196(100MT) with steel strapping products.

1975.6
Increased capital to US\$ 100,000.

1976~1980



1979.5
Increased capital to US\$ 250,000.

1980.12
Began plant construction in Yangsan.

1981~1990

Takeoff

1981~1986



1981. 2
Moved into Yangsan Industrial Complex.

1984. 11
Mr. Chang-Mok Ryu was inaugurated as president.

1986. 9
Completed Extension of CR plant.

1987~1990



1987. 3
Opened a new office in Daegu.

1987. 3
Facilitated new pickling line.

1987. 7
Jointly established Hankook Signode Co., Ltd.

1988. 1
Completed steel strapping plant in Yangsan.

1988. 7
Increased capital to US\$ 1million.

1988. 8
Established Hankum Co., Ltd. (Capital of \$500,000)

1988. 3~8
Facilitated 18", 13" Z-Mill.

1989. 5
Established Hankum Sales Co., Ltd.

1990. 5
Increased capital to US\$ 8million.

1990. 5
Moved into Pohang Steel Industrial Complex and completed plant.

1990. 6
Listed in stock market.

1991~2000

Growth

1991~1995



1991. 3
Increased capital to US\$ 10.4million.

1994. 8
Completed steel strapping line in Pohang and began manufacturing.

1996~2000



1996.9
Extended completed pickling line and began manufacturing P/O products.

1998. 2
M&A with Hankum Sales Co., Ltd.

1998. 6
Facilitated additional Mill and BA furnace.

2001~2006

Renovation

2001~2005



2001. 11
Facilitated Internal Groupware System.

2002. 6
Mr. Ho-Chang Ryu was inaugurated as president.

2003. 1
Unified manufacturing plant.

2003. 5
Established BA and a new office building. Extended SL-1, RM2, TM lines in Yangsan.

2005. 1
ISO 9001 certified.

2005. 7
Opened a new laboratory at Hankum Co., Ltd.

2005. 9
Extended H-BA facility.

2005. 11
Won \$50 million Export Record Award on 45th Anniversary of Trade Day.

2006 ~



2006. 1
Initiated a new Global-IMC 2006 Award project.

2006. 2
Newly organized sales division.

2006. 5
Won Global-IMC 2006 Award.

2007. 3
ISO / TS16949 certified.

“

We do our best to meet customer's needs.

Hankum provide quality products and service on delivery to meet various customer's need. Our engineers and staffs support client's advanced requirement professionally.

”

HANKUM CO., LTD.
YANGSAN PLANT



HANKUM CO., LTD.
POHANG PLANT



PRODUCT

- Cold Rolled Low Carbon Steel Strip
- Cold Rolled Special Steel Strip
 - Carbon Steel
 - High Carbon Steel
 - Alloy Steel
- Cold Rolled Stainless Steel Strip
- Strapping
 - Steel Strapping
 - PET Strapping



○ We produce Cold Rolled steel strip of low carbon, high carbon, special and alloy grade,

○ We are well equipped with various mills such as 4-Hi mill, 6-Hi mill and Sendzimir mill. All specialized mill is quite adequate to serve for each customer's need,

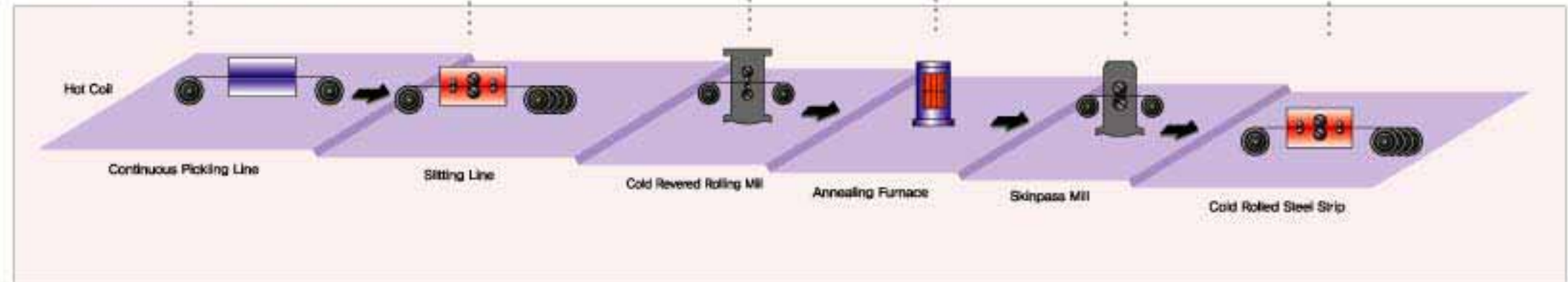
○ High carbon steel pass through Bell-type annealing furnace, Stainless steel is heated by continuous Bright Annealing Furnace. It accomplish best surface and condition for client's processing,

○ Skin pass mill gives excellent flatness and brightness on the surface,

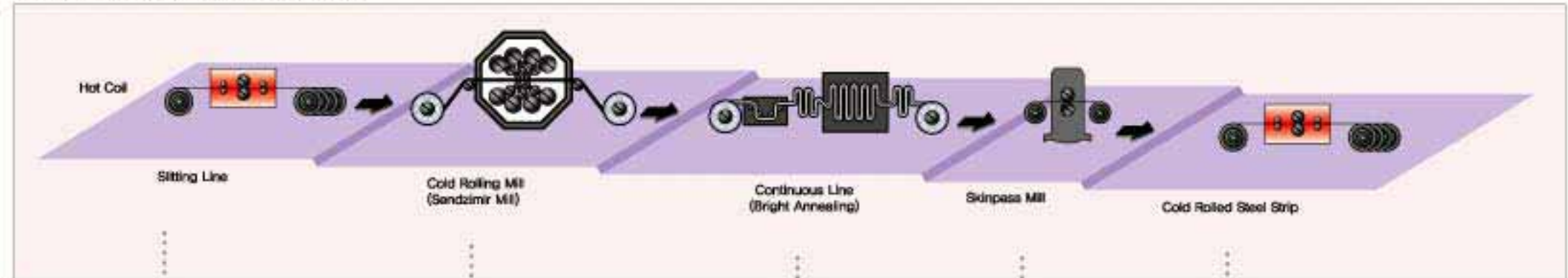
○ We maintain best condition in the production line and meet customer's advanced need,



Manufacturing Process of Low & High Carbon Steel Strip



Manufacturing Process of Stainless Steel Strip





• Pickling Line

Cold Rolling Mills—Automatic Gauge Control

AGC system offers excellent performance on thickness tolerances using a combination of proven design together with the latest control techniques. Separate control functions are included to provide fast feed-back and feed-forward corrections. The controls, where possible, include self-tuning features to optimize strip thickness from the edge of coil to the center. Controller gains are automatically optimized using carbon measured models for each type of product and mill rolling mode. AGC system offers the latest features, including mass flow control using x-ray gauge and active compensation for roll thickness eccentricity.



• 4H—Reversing Mill (Wide Width)



• 6H—Senzimir Mill



• 4H—Mill Housing (Narrow Width)



• 6H—Senzimir Mill



• 4H—Mill Housing (Wide Width)

04 Heating Furnace



Bell type annealing furnace

We keep top class engineers and advanced equipments and provide proper quality to meet client's use.



• Wide Sifter



• Rewinder



• Bright Annealing Furnace



• Build up Line

05 STEEL STRAPPING LINE

We offer superior quality steel strapping in improved production line and experienced technical knowhow



* Rawinder



* Spool Uncoiler & Welder



* Deburring Unit



* Slitter



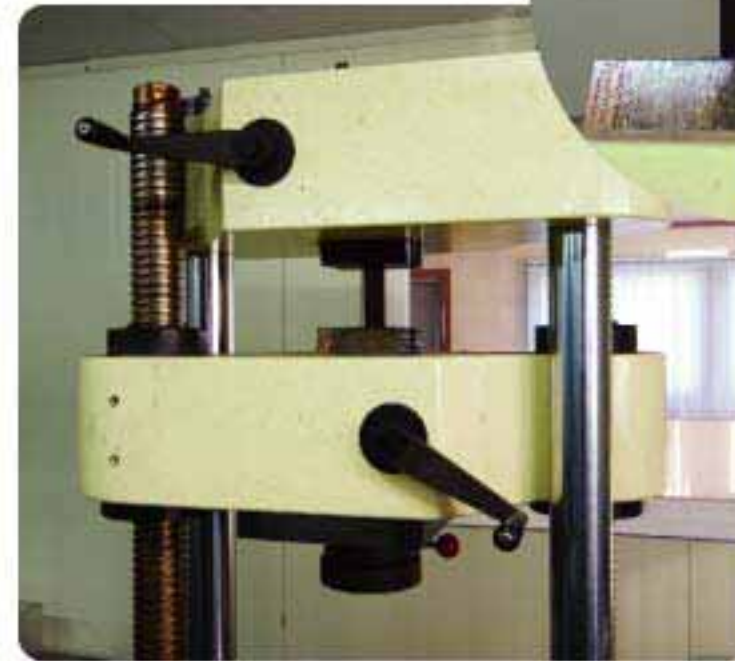
* Automatic Packing Line

06 QUALITY INSPECTION

All products are examined by QA system before shipment. Various testers are well equipped such as universal material tester, metal microscope, spectroscopy analyzer and hardness tester. It enables to maintain stable quality level.



* Metal Microscope & Hardness Tester



* Universal Material Tester



* Spectroscopy Analyzer

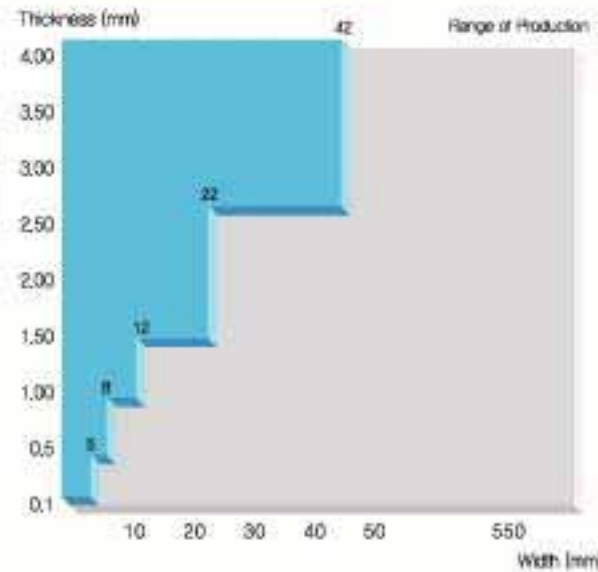


PRODUCT

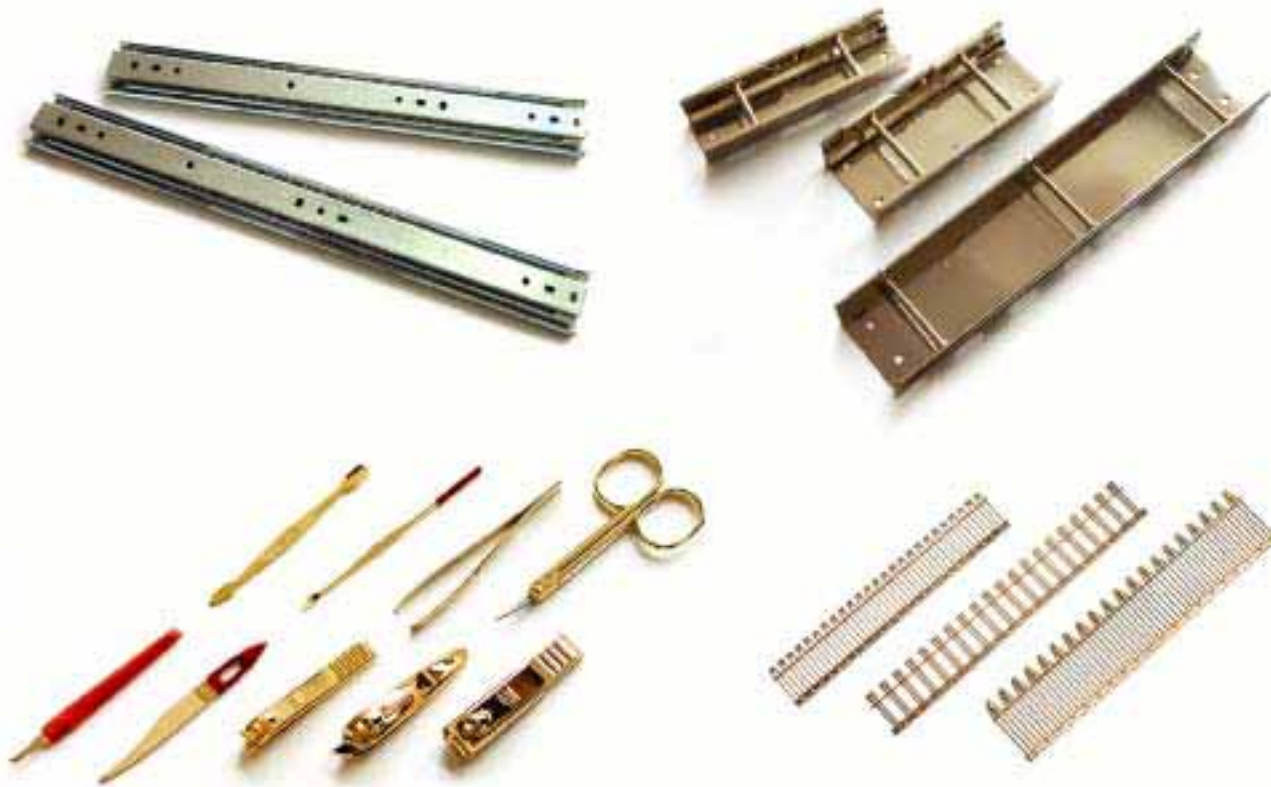
We provide best quality and invest in research & development to support client's development.

o Description

Cold Rolled Commercial Steel Strip include carbon content 0.15% maximum. It requires control of dimensional tolerance, stable microstructure and fine surface condition. Final product is applied to drawing, forming, bonding, plating process. Continuous investment in production line, R&D, QA system enables to meet client's advanced need- low yield steel strip, Inner Shield of TV Brown Tube, Lead Frame e.t.c.



o MAIN APPLICATION



o MECHANICAL PROPERTIES

• Hardness & Tensile Strength

Classification	Symbol	Temper Grade		Tension Test	Hardness	Bending Test	
		Distinction of Refining	Distinction of Refining	Tensile Strength kgf/mm ²	(Hv)	Bending Angle	Inside Radius
Grade 1	SCP 1	as annealed	A	28 min	105 max	180°	Close contact
		skin passed	S	28 min	115 max	180°	Close contact
		1/8 hard	1/8 H	30-42	95-130	180°	Close contact
		1/4 hard	1/4 H	38-50	115-150	180°	Thickness x0.5
		1/2 hard	1/2 H	45-60	135-185	180°	Thickness x1.0
		Full hard	H	56 min	170 min	-	-
Grade 2	SCP 2	skin passed - annealed	S, A	28 min	110 max	180°	Close contact
Grade 3	SCP 3	skin passed - annealed	S, A	28 min	110 max	180°	Close contact

Tension test is applied to a material with thickness above 0.25mm and width above 30mm.

• Elongation

Spec	Thickness (mm)	Elongation (%)						Test Piece
		0.25~0.40	0.40~0.60	0.60~1.0	1.0~1.6	1.6~2.5	2.5 min	
SPOC	(32 min)	(34 min)	(36 min)	(37 min)	(38 min)	(39 min)	No.5, Rolling Direction	
SPOD	34 min	36 min	38 min	39 min	40 min	41min		
SPCE	36 min	38 min	40 min	41 min	42 min	43 min		

We do not apply elongation test to SPOC material, but in case of customer's request, the figure of () is applied.

• Erichsen (Er)

Unit : mm

Spec	Thickness	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.4	1.6
		Class 1	SCP 1	7.2	7.8	8.4	8.8	9.1	9.4	9.6	10.0
Class 2	SCP 2	7.8	8.2	8.8	9.2	9.5	9.8	10.0	10.4	10.7	10.9
Class 3	SCP 3	8.0	8.6	9.2	9.6	9.9	10.2	10.4	10.8	11.1	11.3

1. Respecting to intermediate thickness in range from 0.4mm to 1.6mm, value will be rounded off to the nearest tenth.
2. 3 pieces will be tested and its average will be applied as a result.

• Camber

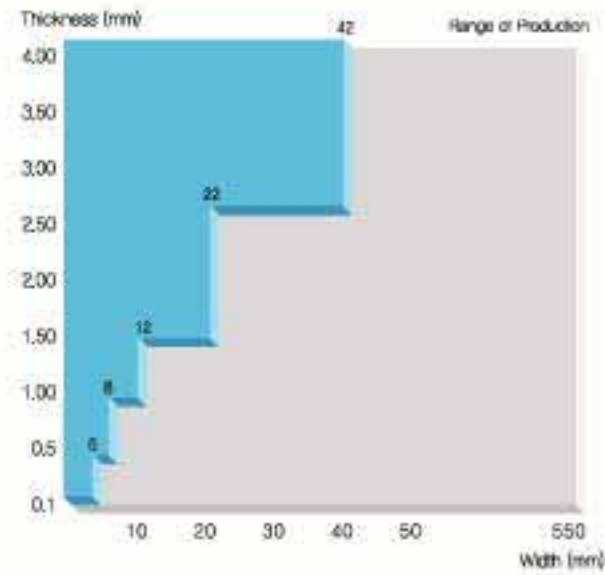
Unit : mm

Width	Classification	Standard Tolerance	Special Tolerance (S)	Remark
		As per 2000mm length		
20 under		-	16	
20 over 30 under		-	12	
30 over 60 under		8	6	
60 over		4	3	

Camber for progressive die will be tested, upon request.

◦ Description

Cold Rolled Special Steel Strips include High Carbon Steel Strip (Carbon 0.30-1.20%), Special Alloy Steel Strip (Mo, Mn, Cr, V, Ni). It requires precise control of chemistry, non-metallic inclusion, stable microstructure after special heat treatment. Final product is applied to precise machine parts like automobile clutch parts, safety belt buckle parts, saw, parts of computer hard disk, hose clamps, e.t.c.



◦ MAIN APPLICATION



◦ MECHANICAL PROPERTIES

● Thickness Tolerance

Unit : mm

Thickness	Standard Tolerance		Special Tolerance	
	Width 200 Below	Width 200 Over	S	SS
0.10 Over 0.15 Excl	±0.010	—	±0.008	±0.005
0.15 Over 0.25 Excl	±0.015	±0.020	±0.010	±0.008
0.25 Over 0.40 Excl	±0.020	±0.025	±0.015	±0.010
0.40 Over 0.60 Excl	±0.025	±0.030	±0.020	±0.010
0.60 Over 0.90 Excl	±0.030	±0.040	±0.020	±0.015
0.90 Over 1.20 Excl	±0.040	±0.050	±0.030	±0.020
1.20 Over 1.60 Excl	±0.050	±0.060	±0.040	±0.030
1.60 Over 2.10 Excl	±0.055	±0.070	±0.040	±0.030
2.10 Over 3.00 Excl	±0.065	±0.080	±0.050	±0.040
3.00 Over 4.00 Excl	±0.080	±0.090	±0.065	±0.050

Remark Check point for thickness must be more than 10mm on any edge to the center and below 20mm width will be measured the center.

● Width Tolerance

Unit : mm

Thickness	Standard Tolerance		Special Tolerance	
	Width 200 Below	Width 200 Over	Width 200 Below	Width 200 Over
0.25 Over 0.60 Excl	±0.15	±0.25	±0.10	±0.15
0.60 Over 1.20 Excl	±0.20	±0.30	±0.15	±0.20
1.20 Over 4.00 Excl	±0.25	±0.40	±0.20	±0.25

Remark Special tolerance can be negotiated upon customer's request.

● Temper

Distinction	Temper Symbol	Remark
Cold Rolled	R	As cold reduced condition
Annealing	A	Annealed after cold reduced
Skin Passed	S	Skin passed after annealed

● Camber

Unit : mm

Width	Distinction	Standard Tolerance	Special Tolerance	Remark
		Length : 2000		
20 Excl Under		—	12	
20~40 Excl		—	8	
40~80 Excl		—	4	
80 and Over		4	2	

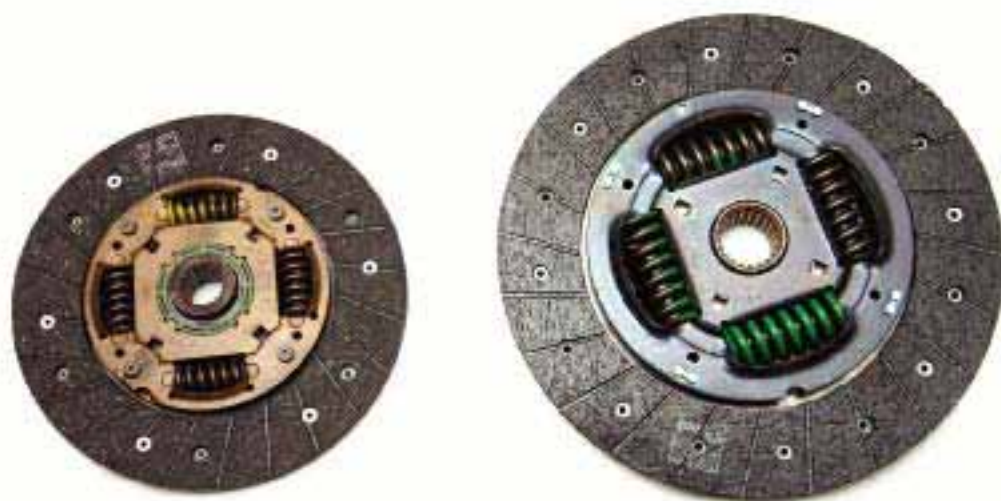
MECHANICAL PROPERTIES

High Carbon Tool Steel Strip

Properties Grade	A(Annealed)			S	R
	Hardness (Hv)	Tensile Strength (kgf/mm ²)	Elongation (%)	Hardness (Hv)	Hardness (Hv)
SK 2M	180 ~ 220	60 ~ 70	15 Min	210 Max	210 ~ 300
SK 3M	180 ~ 220	60 ~ 70	15 Min	210 Max	210 ~ 300
SK 4M	180 ~ 220	50 ~ 70	20 Min	200 Max	200 ~ 290
SK 5M	170 ~ 200	50 ~ 70	20 Min	200 Max	200 ~ 290
SK 6M	160 ~ 190	50 ~ 65	25 Min	195 Max	195 ~ 280
SK 7M	150 ~ 190	50 ~ 60	25 Min	190 Max	190 ~ 280

High Carbon Steel Strip for Machine & Structural Use

Properties Grade	A(Annealed)			S	R
	Hardness (Hv)	Tensile Strength (kgf/mm ²)	Elongation (%)	Hardness (Hv)	Hardness (Hv)
S30CM	130 ~ 150	45 Max	30 Min	150 Max	150 ~ 270
S35CM	130 ~ 150	45 Max	27 Min	150 Max	150 ~ 270
S45CM	135 ~ 160	50 Max	27 Min	160 Max	160 ~ 280
S50CM	135 ~ 160	50 Max	27 Min	160 Max	160 ~ 280
S55CM	150 ~ 170	55 Max	27 Min	170 Max	170 ~ 290
S60CM	150 ~ 170	55 Max	25 Min	170 Max	170 ~ 290



Alloy Steel Strip

Type	Grade	Hardness (Hv)		Applications
		Annealing	Rolling	
Spring Steel	SUP 6M	200 Max	200 ~ 290	Spring
	SUP 9M	200 Max	200 ~ 290	Special spring
	SUP 10M	200 Max	200 ~ 290	Special spring
Manganese Steel	SMn 420M	150 Max	150 ~ 260	Parts for chain, safety buckle
	SMn 433M	160 Max	160 ~ 270	Parts for chain
Chromium Molybdenum Steel	SCM 415M	160 Max	160 ~ 250	Parts for typewriter, parts for calculator
	SCM 420M	170 Max	170 ~ 260	Parts for chain
	SCM 430M	180 Max	180 ~ 270	Parts for chain, safety buckle
	SCM 435M	190 Max	190 ~ 280	Parts for chain, office machinery
	SCM 440M	200 Max	200 ~ 290	Parts for chain, cutter



CHEMICAL COMPOSITION

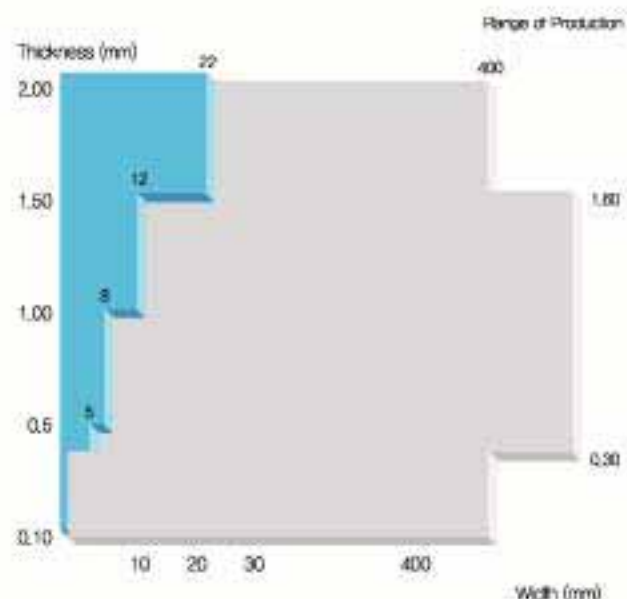
Type	Grade	Chemical Composition(%)											Application	
		C	Si	Mn	P	S	Cu	N	Cr	N+Cr	Mo	W		V
Carbon Steel	S30CM	0.27~0.33	0.15~0.35	0.60~0.90	0.030 Max	0.035 Max	0.030 Max	0.020 Max	0.020 Max	0.035 Max	-	-	-	Retainer
	S35CM*	0.32~0.38	0.15~0.35	0.60~0.90	0.030 Max	0.035 Max	0.030 Max	0.020 Max	0.020 Max	0.035 Max	-	-	-	Office machinery parts
	S45CM*	0.42~0.48	0.15~0.35	0.60~0.90	0.030 Max	0.035 Max	0.030 Max	0.020 Max	0.020 Max	0.035 Max	-	-	-	Clutch part, chain parts, umbrella ribs, retainer
	S50CM*	0.47~0.53	0.15~0.35	0.60~0.90	0.030 Max	0.035 Max	0.030 Max	0.020 Max	0.020 Max	0.035 Max	-	-	-	Components and parts for camera, chain, springs, umbrella ribs, clutch, washers
	S55CM*	0.52~0.58	0.15~0.35	0.60~0.90	0.030 Max	0.035 Max	0.030 Max	0.020 Max	0.020 Max	0.035 Max	-	-	-	Springs, safety shoes, can openers, thompson blade, hand saw for woodworking
	S60CM*	0.55~0.65	0.15~0.30	0.60~0.90	0.030 Max	0.035 Max	0.030 Max	0.020 Max	0.020 Max	-	-	-	-	Parts for chain, hand saw for woodworking, blinds, safety shoes, parts for office machinery, washer
	S65CM*	0.60~0.70	0.15~0.30	0.60~0.90	0.030 Max	0.035 Max	0.030 Max	0.020 Max	0.020 Max	-	-	-	-	Parts for safety shoe, clutch, springs
	S70CM*	0.65~0.75	0.15~0.30	0.60~0.90	0.030 Max	0.035 Max	0.030 Max	0.020 Max	0.020 Max	-	-	-	-	Washer, hand saw for woodworking, springs
	S75CM	0.70~0.80	0.15~0.30	0.60~0.90	0.030 Max	0.035 Max	0.030 Max	0.020 Max	0.020 Max	-	-	-	-	Parts for clutch, springs
Carbon Tool Steel	SK2M	1.10~1.30	0.35 Max	0.50 Max	0.030 Max	0.030 Max	0.025 Max	0.025 Max	0.030 Max	-	-	-	-	Razor blades, cutlery, hacksaws, shutters, spiral springs
	SK3M*	1.00~1.10	0.35 Max	0.50 Max	0.030 Max	0.030 Max	0.025 Max	0.025 Max	0.030 Max	-	-	-	-	Hacksaws, cutlery, springs
	SK4M	0.90~1.00	0.35 Max	0.50 Max	0.030 Max	0.030 Max	0.025 Max	0.025 Max	0.030 Max	-	-	-	-	Pen ribs, spiral, gauges, springs cutlery, knitting needles
	SK5M*	0.80~0.90	0.35 Max	0.50 Max	0.030 Max	0.030 Max	0.025 Max	0.025 Max	0.030 Max	-	-	-	-	Spiral springs, cutlery, knitting needles, gauges springs, cutlery, clutch parts, washers
	SK6M	0.70~0.80	0.35 Max	0.50 Max	0.030 Max	0.030 Max	0.025 Max	0.025 Max	0.030 Max	-	-	-	-	Shoe steel shank, horns, round saw, parts for office machinery and clutch
	SK7M	0.60~0.70	0.35 Max	0.50 Max	0.030 Max	0.030 Max	0.025 Max	0.025 Max	0.030 Max	-	-	-	-	Springs, cutlery, horns hand saw for woodworking, shoe steel shank, parts for clutch
Alloy Tool Steel	SKS11M	1.20~1.30	0.35 Max	0.50 Max	0.030 Max	0.030 Max	0.025 Max	0.025 Max	0.20~0.50	-	-	3.00~4.00	0.10~0.30	Band saw
	SKS2M	1.00~1.10	0.35 Max	0.08 Max	0.030 Max	0.030 Max	0.025 Max	0.025 Max	0.50~1.00	-	-	1.00~1.50	0.20 Max	Band saw, hacksaw, cutlery
	SKS7M	1.10~1.20	0.35 Max	0.50 Max	0.030 Max	0.030 Max	0.025 Max	0.025 Max	0.20~0.50	-	-	2.00~2.50	0.20 Max	Band saw, hacksaw, cutlery
	SKS5M	0.75~0.85	0.35 Max	0.50 Max	0.030 Max	0.030 Max	0.025 Max	0.70~1.30	0.20~0.50	-	-	-	-	Cutlery, circular saws for woodworking bandsaws for woodworking and lumbering
	SKS51M	0.75~0.85	0.35 Max	0.50 Max	0.030 Max	0.030 Max	0.025 Max	1.30~2.00	0.20~0.50	-	-	-	-	Cutlery, circular saws for woodworking bandsaws for woodworking and lumbering
Nickel Chromium Steel	SNC631M	0.27~0.30	0.15~0.35	0.35~0.65	0.030 Max	0.030 Max	0.030 Max	2.50~3.00	0.60~1.00	-	-	-	-	Parts for office machinery
	SNC836M	0.32~0.40	0.15~0.35	0.35~0.65	0.030 Max	0.030 Max	0.030 Max	3.00~3.50	0.60~1.00	-	-	-	-	Parts for machinery
	SNC415M	0.12~0.18	0.15~0.35	0.35~0.65	0.030 Max	0.030 Max	0.030 Max	2.00~2.50	0.20~0.50	-	-	-	-	Parts for machinery
Manganese Steel	SMn420M*	0.17~0.23	0.15~0.35	1.20~1.50	0.030 Max	0.030 Max	0.030 Max	0.25 Max	(0.35 Max)	-	-	-	-	Parts for chain
	SMn433M	0.30~0.36	0.15~0.35	1.20~1.50	0.030 Max	0.030 Max	0.030 Max	0.25 Max	(0.35 Max)	-	-	-	-	Safety buckles, parts for chain
Chromium Molybdenum Steel	SCM415M	0.13~0.18	0.15~0.35	0.60~0.85	0.030 Max	0.030 Max	0.030 Max	0.25 Max	0.90~1.20	-	0.15~0.30	-	-	Parts for chain
	SCM420M	0.18~0.23	0.15~0.35	0.60~0.85	0.030 Max	0.030 Max	0.030 Max	0.25 Max	0.90~1.20	-	0.15~0.30	-	-	Parts for chain, thompson blades
	SCM430M	0.28~0.33	0.15~0.35	0.60~0.85	0.030 Max	0.030 Max	0.030 Max	0.25 Max	0.90~1.20	-	0.15~0.30	-	-	Parts for chain, office machinery parts
	SCM435M*	0.33~0.38	0.15~0.35	0.60~0.85	0.030 Max	0.030 Max	0.030 Max	0.25 Max	0.90~1.20	-	0.15~0.30	-	-	Parts for chain, office machinery parts
	SCM440M	0.38~0.43	0.15~0.35	0.60~0.85	0.030 Max	0.030 Max	0.030 Max	0.25 Max	0.90~1.20	-	0.15~0.30	-	-	Parts for chain, office machinery parts
Spring Steel	SUP6M	0.56~0.64	1.50~1.80	0.70~1.00	0.035 Max	0.035 Max	0.030 Max	-	-	-	-	-	-	Springs
	SUP9M	0.52~0.60	0.15~0.35	0.65~0.95	0.035 Max	0.035 Max	0.030 Max	-	0.65~0.95	-	-	-	-	Special springs
	SUP10M*	0.47~0.55	0.15~0.35	0.65~0.95	0.035 Max	0.035 Max	0.030 Max	-	0.80~1.10	-	-	-	0.15~0.25	Special springs

1. Special items can be restricted to delivery and minimum ordered quantity. (* -Marked item are general items)
2. Other specification can be negotiable, upon request.

CHARACTERISTICS

We manage size tolerance, surface condition, and processing to produce a high-end cold rolled stainless steel products. We do utmost effort to satisfy our customers' requirement with quality and delivery.

To enhance requirement, accuracy, speed, quality of surface, and shape stability, we facilitate consistent processing system, which includes Sendzimir Mill, 2-Hi Skin Pass Mill, and Bright Annealing furnaces. We slit various size as our customer requests.



MAIN APPLICATION



DIMENSION TOLERANCE

Thickness Tolerance

Thickness	Width	Under 160	160-250 Excl	250-400 Excl	400 Over
0.10 Over ~ 0.16 Excl		±0.015	±0.020	—	—
0.16 Over ~ 0.25 Excl		±0.020	±0.025	±0.030	±0.030
0.25 Over ~ 0.40 Excl		±0.025	±0.030	±0.035	±0.035
0.40 Over ~ 0.60 Excl		±0.035	±0.040	±0.040	±0.040
0.60 Over ~ 0.80 Excl		±0.040	±0.045	±0.045	±0.045
0.80 Over ~ 1.00 Excl		±0.040	±0.05	±0.05	±0.05
1.00 Over ~ 1.25 Excl		±0.05	±0.05	±0.05	±0.05
1.25 Over ~ 1.60 Excl		±0.05	±0.06	±0.06	±0.06
1.60 Over ~ 2.00 Excl		±0.06	±0.07	±0.08	±0.08
2.00 Over ~ 2.50 Excl		±0.07	±0.08	±0.08	±0.09
2.50 Over		±0.08	±0.09	±0.09	±0.10

Remark: Check point for thickness must be more than 10mm on any edge to the center and below 30mm width will be measured the center.

Width Tolerance

Thickness	Width	Under 160	160-250 Excl	250-400 Excl	400 Over
0.60 Excl		±0.15	±0.20	±0.25	±0.30
0.60 Over ~ 1.00 Excl		±0.20	±0.25	±0.25	±0.30
1.00 Over ~ 1.60 Excl		±0.20	±0.30	±0.30	±0.40
1.60 Over ~ 2.50 Excl		±0.25	±0.35	±0.35	±0.50
2.50 Over		±0.30	±0.40	±0.40	±0.50

Camber

Width	Thickness	Standard Tol.	Special Tol.	Remark
		Length : 2000		
10~20mm Excl		—	8	
20~40mm Excl		—	6	
40~80mm Excl		8	4	
80 Over		4	2	

* Tolerances under 40mm width has to be negotiated, upon customer's request.

CHEMICAL COMPOSITION

Type	Grade	Chemical Composition									Application
		C	Si	Mn	P	S	Ni	Cr	Mo	Others	
Austenite	STS201	0.15MAX	1.00MAX	5.50~7.50	0.060MAX	0.030MAX	3.50~5.50	16.00~18.00	-	N:0.25 MAX	Railway vehicle
	STS202	0.15MAX	1.00MAX	7.50~10.00	0.060MAX	0.030MAX	4.00~6.00	17.00~18.00	-	N:0.25 MAX	Automotive parts
	STS301	0.15MAX	1.00MAX	2.00MAX	0.045MAX	0.030MAX	8.00~8.00	16.00~18.00	-		Tank frame, bolt, nut
	STS304 *	0.08MAX	1.00MAX	2.00MAX	0.045MAX	0.030MAX	8.00~10.50	18.00~20.00	-		General chemical equipment
	STS304L *	0.03MAX	1.00MAX	2.00MAX	0.045MAX	0.030MAX	9.00~13.00	18.00~20.00	-		Chemical industry
	STS309S	0.08MAX	1.00MAX	2.00MAX	0.045MAX	0.030MAX	12.00~15.00	22.00~24.00	-		Boiler parts, exhaust system
	STS310S	0.08MAX	1.50MAX	2.00MAX	0.045MAX	0.030MAX	19.00~22.00	24.00~26.00	-		Furnace components
	STS316	0.08MAX	1.00MAX	2.00MAX	0.045MAX	0.030MAX	10.00~14.00	16.00~18.00	2.00~3.00		Paper manufacturing
	STS316L	0.03MAX	1.00MAX	2.00MAX	0.045MAX	0.030MAX	12.00~15.00	16.00~18.00	2.00~3.00		Oil refinery
	STS321	0.08MAX	1.00MAX	2.00MAX	0.045MAX	0.030MAX	9.00~13.00	17.00~19.00	-	Ti:0.05~0.10	Chemical plant
Ferrite	STS347	0.08MAX	1.00MAX	2.00MAX	0.045MAX	0.030MAX	9.00~13.00	17.00~19.00	-	Nb:0.05~0.10	Parts requiring welding
	STS405	0.08MAX	1.00MAX	1.00MAX	0.040MAX	0.030MAX	(1)	11.50~14.50	-	Al: 0.10~0.30	Parts for quenching
	STS430 *	0.12MAX	0.75MAX	1.00MAX	0.040MAX	0.030MAX	(1)	16.00~18.00	-		House hold utensil
	STS434	0.12MAX	1.00MAX	1.00MAX	0.040MAX	0.030MAX	(1)	16.00~18.00	0.75~1.25		Exterior parts for automobile
Martensite	STS444	0.025MAX	1.00MAX	1.00MAX	0.040MAX	0.030MAX	(1)	17.00~22.00	1.75~2.50	(3)	Burners
	STS410	0.15MAX	1.00MAX	1.00MAX	0.040MAX	0.030MAX	(1)	11.50~13.50	-		General purposes
	STS410S	0.08MAX	1.00MAX	1.00MAX	0.040MAX	0.030MAX	(1)	11.50~13.50	-		Blade
	STS420J2	0.26~0.40	1.00MAX	1.00MAX	0.040MAX	0.030MAX	(1)	12.00~14.00	-		Nozzle, valve
Hardening	STS440A	0.60~0.75	1.00MAX	1.00MAX	0.040MAX	0.030MAX	(1)	16.00~18.00	(2)		Cutlery, gauges, bearings
	STS631	0.05MAX	1.00MAX	1.00MAX	0.040MAX	0.030MAX	6.50~7.75	16.00~18.00	-	Al: 0.75~1.00	Washers, parts for instruments

SURFACE FINISH

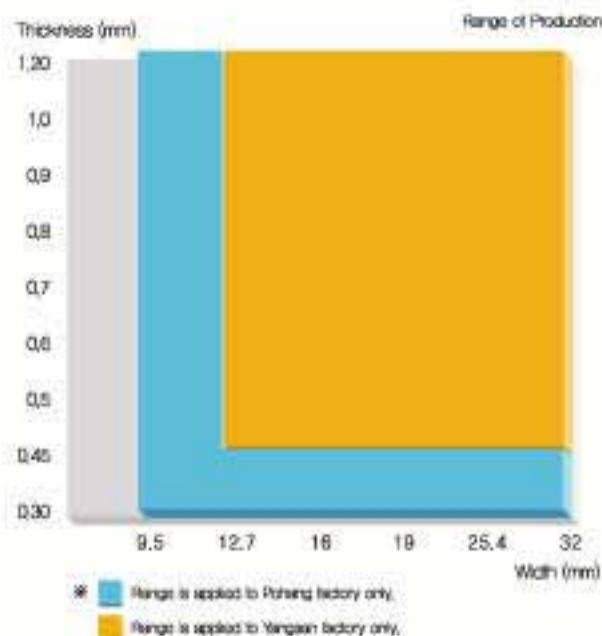
Type	Designation	Remark
BA	BA (A)	Bright annealed after cold rolling Suitable for high degree processing
Skin Pass	BA (S)	Bright annealed after skin pass Hardness = Slightly high No ST-ST after light drawing
Cold Rolled	H	For obtaining desired hardness after cold rolling Suitable for blankings and spring

MECHANICAL PROPERTIES

Type	Grade	Tension Test			Hardness Test		
		Yield Strength (kgf/mm ²)	Tensile Strength (kgf/mm ²)	Elongation (%)	H _B	H _v	
Austenite	STS 201	25 and over	65 and over	40 and over	100 and under	253 and under	
	STS 202	25 and over	60 and over	40 and over	95 and under	218 and under	
	STS 301	21 and over	53 and over	40 and over	90 and under	200 and under	
	STS 304	21 and over	53 and over	40 and over	90 and under	200 and under	
	STS 304L	18 and over	49 and over	40 and over	90 and under	200 and under	
	STS 309S	21 and over	53 and over	40 and over	90 and under	200 and under	
	STS310S	21 and over	53 and over	40 and over	90 and under	200 and under	
	STS 316	21 and over	53 and over	40 and over	90 and under	200 and under	
	STS 316L	18 and over	49 and over	40 and over	90 and under	200 and under	
	STS 321	21 and over	53 and over	40 and over	90 and under	200 and under	
	STS 347	21 and over	53 and over	40 and over	90 and under	200 and under	
	Ferrite	STS 405	180 and over	42 and over	20 and over	88 and under	200 and under
		STS 430	2 and over	46 and over	22 and over	88 and under	200 and under
		STS 434	21 and over	46 and over	22 and over	88 and under	200 and under
STS 444		25 and over	42 and over	20 and over	96 and under	230 and under	
Martensite	STS 410	21 and over	45 and over	20 and over	93 and under	210 and under	
	STS 410S	21 and over	42 and over	20 and over	88 and under	200 and under	
	STS 420J2	23 and over	55 and over	18 and over	99 and under	247 and under	
	STS 440A	25 and over	60 and over	15 and over	H _B C25 and under	269 and under	
Hardening	STS 631	39 and under	105 and under	20 and over	92 and under	200 and under	

DESCRIPTION

We are one of the biggest steel strapping manufacturer in Asia and meet our customer's demand for various kinds of product, which covers for general use up to special purpose. Especially, for high quality, we improve corrosion resistance & fine surface condition by various coating of blued, painted, and zinc painted and provide smooth edge for safety. Moreover, we develop winding system for our customer's production efficiency in mill wound, jumbo wound, and ribbon wound.



Dimension Tolerance

Dimension	Tolerance	Remark
Thickness	$\pm \begin{matrix} 0.05 \\ 0.03 \end{matrix}$ mm	
Width	± 0.127 mm	
Camber	12.7 / 2400mm MAX	
CURL	25.4 / 2400mm MAX	
TWIST	30° / 2400mm MAX	

Surface

Designation	Surface Condition	Corrosion Resistance	Remark
B	BLUED & WAXED	-	Templer Color
P	PAINTED & WAXED	16Hr Min	Coating Thickness : $6 \pm 5 \mu$
Z	ZINC PAINTED & WAXED	56Hr Min	Coating Thickness : $10 \pm 5 \mu$

Coil Winding

Designation	Winding Method	Winding Width	Remark
RW	RIBBON WOUND	Same as strap's width	LD : 300Φ(12"), 400Φ(16")
MW	MILL WOUND (OSCILLATED WOUND)	67 ± 3 mm	LD : 400Φ(16")
JW	JUMBO WOUND	192 ± 3 mm	LD : 400Φ(16")

Usage

- **STANDARD STRAPPING** : For light weight product
- **HIGH TENSILE STRAPPING** : For heavy weight product such as pipe, baby coil
- **SUPER GRADE STRAPPING** : For heavy coil

MECHANICAL PROPERTIES

GRADE	THICKNESS (mm)	T/S (kgf/mm ²)		EL. (%)		REMARK
		min	Average	min	Average	
STANDARD	0.5	75	85	2	2-3	Welded joint in a coil provide 75% tensile strength at minimum
SBW	0.6	75	83	2	2-4	
SPW	0.7	75	82	2	3-5	
SZW	0.8	73	80	2	4-6	
	0.9	73	78	4	5-7	
	1.0	73	78	4	7-8	
HI-TENSILE (Untempered)	0.5	90	105	2	2-3	"
	0.6	90	100	2	2-4	
HBW(N)	0.7	90	95	2	3-5	
HPW(N)	0.8	90	93	2	4-6	
HZW(N)	0.9	85	90	5	5-7	
	1.0	85	87	5	7-8	
HI-TENSILE	0.5	85	87	5	5-7	"
HBW	0.6	85	87	6	7-8	
HPW	0.7	85	87	6	7-9	
HPW	0.8	85	87	6	7-9	
HZW	0.9	85	87	6	9-10	
	1.0	85	87	6	9-10	
SUPER 95	0.5	95	100	7	7-8	
SUB 95	0.6	95	100	7	7-8	
SUB 95	0.7	95	100	7	8-9	
SUP 95	0.8	95	100	7	8-9	
SUZ 95	0.9	95	100	7	8-10	
	1.0	95	100	7	8-10	
SUPER 120	0.5	120	125	5	6-7	
SUB 120	0.6	120	125	5	6-7	
SUB 120	0.7	120	125	5	6-7	
SUP 120	0.8	120	125	5	6-7	
SUZ 120	0.9	120	125	5	6-7	
	1.0	120	125	5	6-7	
SUPER 140	0.5	138	145	4	5-6	
SUB 140	0.6	138	145	4	5-6	
SUB 140	0.7	138	145	4	5-6	
SUP 140	0.8	138	145	4	5-6	
SUZ 140	0.9	138	145	4	5-6	
	1.0	138	145	4	5-6	
USLM	0.8	108	120	9	12	
	0.12	108	120	9	12	
	1.27	108	120	9	12	

* Test area = 50mm length

Strap Length Of Feet Per Pound (meter Per Kilogram)

Width inch(mm)	Thickness, inch (mm)									
	0.020 (0.5)	0.024 (0.61)	0.025 (0.64)	0.028 (0.71)	0.031 (0.78)	0.035 (0.89)	0.039 (0.99)	0.044 (1.12)	0.050 (1.27)	
1/2 (12.7)	29.3 (19.7)	24.5 (16.4)	23.3 (15.7)	21.0 (14.1)	18.9 (12.7)	16.8 (11.3)	15.1 (10.1)	3.3 (9.0)	11.8 (7.9)	
5/8 (15.88)	23.4 (15.7)	19.6 (13.2)	18.7 (12.5)	16.8 (11.3)	15.1 (10.2)	13.4 (9.0)	12.1 (8.1)	10.7 (7.2)	9.4 (6.3)	
3/4 (19.05)	19.5 (13.1)	16.3 (11.0)	15.5 (10.4)	14.0 (9.4)	12.6 (8.5)	11.2 (7.5)	10.1 (6.8)	8.9 (6.0)	7.8 (5.3)	
1.0 (25.4)	14.6 (9.8)	12.2 (8.2)	11.7 (7.8)	10.5 (7.1)	9.4 (6.3)	8.4 (5.6)	7.5 (5.1)	6.7 (4.5)	5.9 (3.9)	
1 1/4 (31.75)	11.7 (7.9)	9.8 (6.6)	9.3 (6.3)	8.4 (5.7)	7.6 (5.1)	6.7 (4.5)	6.0 (4.1)	5.3 (3.6)	4.7 (3.2)	

Conversion Table

Conversion Table	Conversion Table
	Breaking Strength (Load) : kgf = thickness(mm) × Width(mm) × Tensile Strength(kg/m ²) 1 lbf = 0.4536kgf (1kgf = 2.2046 lbf) Tensile Strength : 1kg/mm ² = 9.8 Mpa Weight : 1 lb = 0.4536kg (1kg = 2.2046 lb) Length : 1 feet = 12"(inch) = 0.3048m (1m = 3.2808 feet) 1"(inch) = 25.4mm (0.0254m) $m/kg = 1 + (t(mm) \times w(mm) \times 7.85(g/cm^3)) \times 1000$ 1 m/kg = 1.488 Feet/lb (1 feet/lb) = 0.672m/kg

SELF LOCKING HIGH TENSILE STEEL STRAPPING

Easy to use, Notched holes fit together and lock. This is our most popular type for agricultural and industrial use strapping. Length can be customized according to client's request.



MECHANICAL PROPERTIES OF SELF LOCKING STRAPPING

• SIZE - 0.5~1.0MM(THICKNESS), 19MM(WIDTH)

Grade	Symbol	Tensile Strength (kgf/mm ²)	Joint Part Tensile Strength (kgf/mm ²)
STANDARD SELF LOCKING (BLUED, PAINTED, ZINC coated)	SELF 1-1	75 min	62.3
HI-TENSILE SELF LOCKING (BLUED, PAINTED, ZINC coated)	SELF 1-2	85 min	70.5
SUPER SELF LOCKING (BLUED, PAINTED, ZINC coated)	SELF 2-2	138 min	114.5

LENGTH TOLERANCE

• ±5 mm MAX

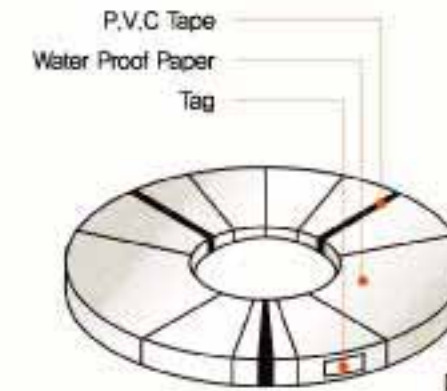
STRAPPING SEAL

Seal Type

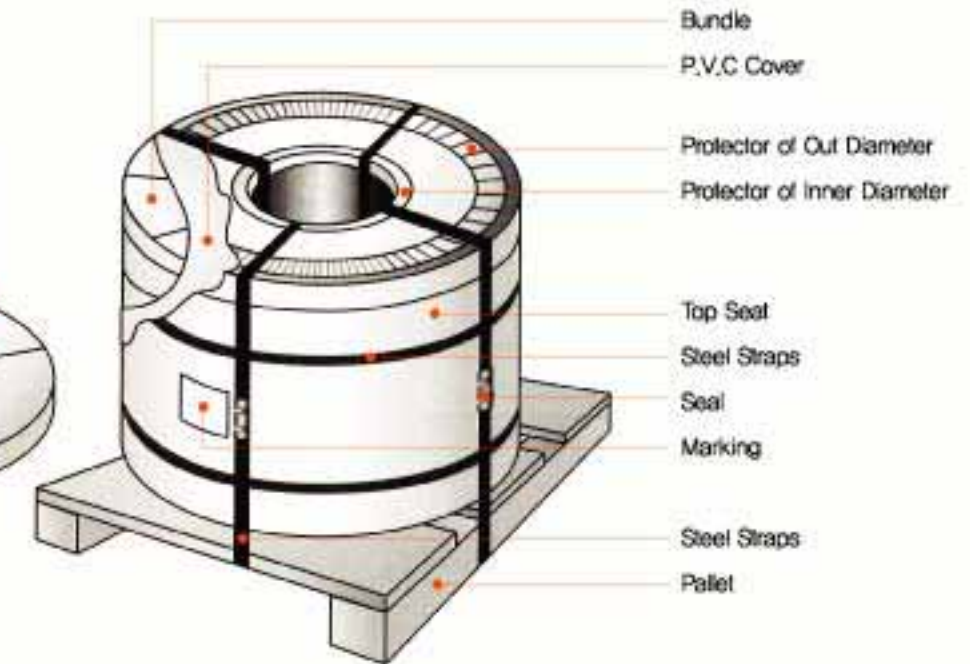
Unit : mm

Type	OPEN TYPE		CLOSED TYPE		OVERLAP TYPE		MAGAZINE TYPE	
	(SNAP ON)		(THREAD ON)		(PUSH)		(NESTACK)	
Classification	Strap Width	Seal Length	Strap Width	Seal Length	Strap Width	Seal Length	Strap Width	Seal Length
Size	12.7 (1/2)	28.8 (1 1/8)	16 (5/8)	31.8 (1 1/4)			12.7 (1/2)	19 (3/4)
	16 (5/8)	31.8 (1 1/4)	19 (3/4)	31.8 (1 1/4)	16 (5/8)	22.2 (7/8)		
	19 (3/4)	31.8 (1 1/4)		57.2 (2 1/4)			19.0 (3/4)	28.8 (1 1/8)
			25 (1)	57.2 (2 1/4)	19 (3/4)	22.2 (7/8)		
			31.8 (1 1/4)	57.2 (2 1/4)		57.2 (2 1/4)		
					25 (1)	57.2 (2 1/4)		
				31.8 (1 1/4)	57.2 (2 1/4)			
Application	Placed over the overlapping strap-ends either during or after tensioning the strapping. Eliminates pre-threading, and speeds up the process.		Must be threaded over the overlapping strap ends before tensioning the strap. Generally use on bales, bundles, and goods with wide width.		Must be threaded over the overlapping strap-ends before tensioning the strap. Pushing and tightening the seal by tensioner and withstand high pressure.		Applies to automatic power strap locking machine and continuous automation process.	

Coil



Pallet



Bundle Packaging

Coil	Width (mm)					
	20 Excl Under	20 ~ 40 Excl	40 ~ 80 Excl	80 ~ 100 Excl	100 Over	
1 Coil / 1 Bundle	×	○	⊙	⊙	⊙	
2 Coil / 1 Bundle	⊙	○	△	×	×	
3 Coil / 1 Bundle	⊙	△	×	×	×	

※ Remark : Standard ⊙ , Available ○ , Available upon Request △ , Impossible ×

Pallet Weight

Under 1coil 200kg – MAX 2ton/pallet
 Under 1coil 400kg – MAX 3ton/pallet
 1coil 400kg and Over – MAX 5ton/pallet

Coil Weight

Thickness	Width (mm)					
	20 Excl Under	20 ~ 40 Excl	40 ~ 80 Excl	80 ~ 100 Excl	100 Over	
All size (0.3t Over)	Standard	1.5~2	1.5~2.5	2.0~3.0	2.0~3.0	2.5~3.5
kg/mm	MAX	4	8	10	16	16

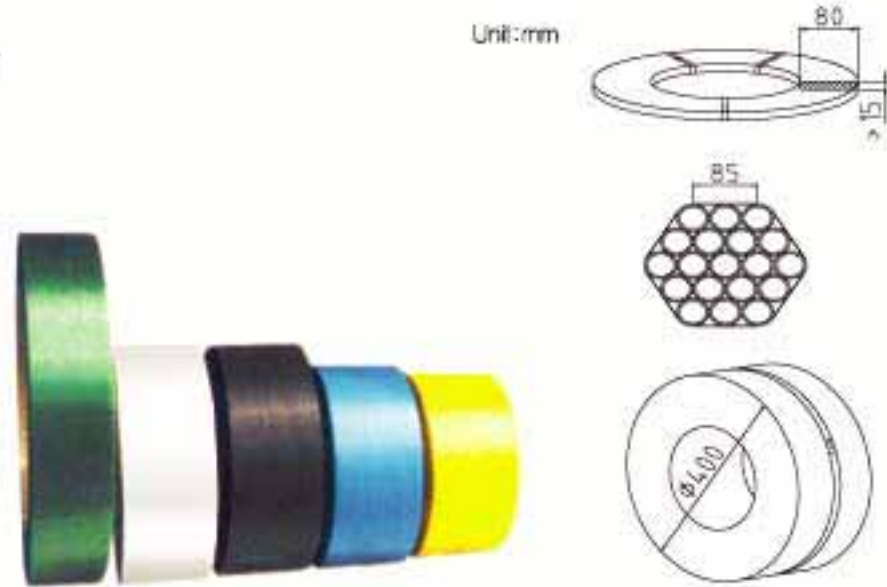
REMARK Under 0.3mm in thickness, needs to be discussed.

Description

PET Strapping absorbs high impacts and stretch just slightly, to absorb shock loads and recover. Polyester's greater elasticity enables to compensate for possible loss of tension due to settling. Polyester strap is virtually unaffected by weather, environment and rust. Polyester strap coils weigh only 22kg and each coil contains 3~4 times as many meters compared to a coil of ribbon wound steel strap, reducing the frequency of coil changes, saving the cost substantially.

Application

1. Baling Industry
2. Construction Materials Industry
3. Wood and Timber Industry
4. Printing Industry
5. Corrugated Industry
6. Can & Bottle Industry



Width (mm)	Thickness (mm)	Coil Weight (kg)	Tensile Strength (Min kgf/mm ²)	Color	Winding Face (mm)
6	0.50	22/80/128	STD:35 HTD:45	BLUE, GREEN, BLACK, WHITE	152/190/305
9	0.50	22/80/128	STD:35 HTD:45	BLUE, GREEN, BLACK, WHITE	152/190/305
12.5	0.50	22/80/128	STD:35 HTD:45	BLUE, GREEN, BLACK, WHITE	152/190/305
15	0.65	22/80/128	STD:35 HTD:45	BLUE, GREEN, BLACK, WHITE	152/190/305
16	0.65	22/80/128	STD:35 HTD:45	BLUE, GREEN, BLACK, WHITE	152/190/305
19	0.9(1.3)	22/80/128	STD:35 HTD:45	BLUE, GREEN, BLACK, WHITE	152/190/305
25.4	1.0(1.3)	22/80/128	STD:35 HTD:45	BLUE, GREEN, BLACK, WHITE	152/190/305
32	1.3	22/80/128	STD:35 HTD:45	BLUE, GREEN, BLACK, WHITE	152/190/305

HARDNESS CONVERSION TABLE

Rockwell		Superficial					Rockwell		Superficial				
B	F	15-N	30-N	45-N	60-N	90-N	B	F	15-T	30-T	45-T	60-T	90-T
100kg	50kg	15kg	30kg	45kg	60kg	90kg	100kg	50kg	15kg	30kg	45kg	60kg	90kg
135	53.5	113.0	60.0	77.5	95.0	112.5	135	53.5	113.0	60.0	77.5	95.0	112.5
134	53.0	112.5	59.5	77.0	94.5	112.0	134	53.0	112.5	59.5	77.0	94.5	112.0
133	52.5	112.0	59.0	76.5	94.0	111.5	133	52.5	112.0	59.0	76.5	94.0	111.5
132	52.0	111.5	58.5	76.0	93.5	111.0	132	52.0	111.5	58.5	76.0	93.5	111.0
131	51.5	111.0	58.0	75.5	93.0	110.5	131	51.5	111.0	58.0	75.5	93.0	110.5

Relation table between coil inner diameter and coil out diameter

