

SeAH Changwon
Integrated Special Steel



SeAH CSS



**STAINLESS STEEL
WIRE RODS**



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SeAH CSS’s constant mission:
Creating new value from steel
for the world

Our constant mission is to open a door to the future of the global special steel industry.

From high-tech industries including power generation, petrochemicals and semiconductors to futuristic industries such as nuclear power and aerospace, SeAH CSS is growing into a leader in Stainless steel, Tool steel, and Ni-alloys.

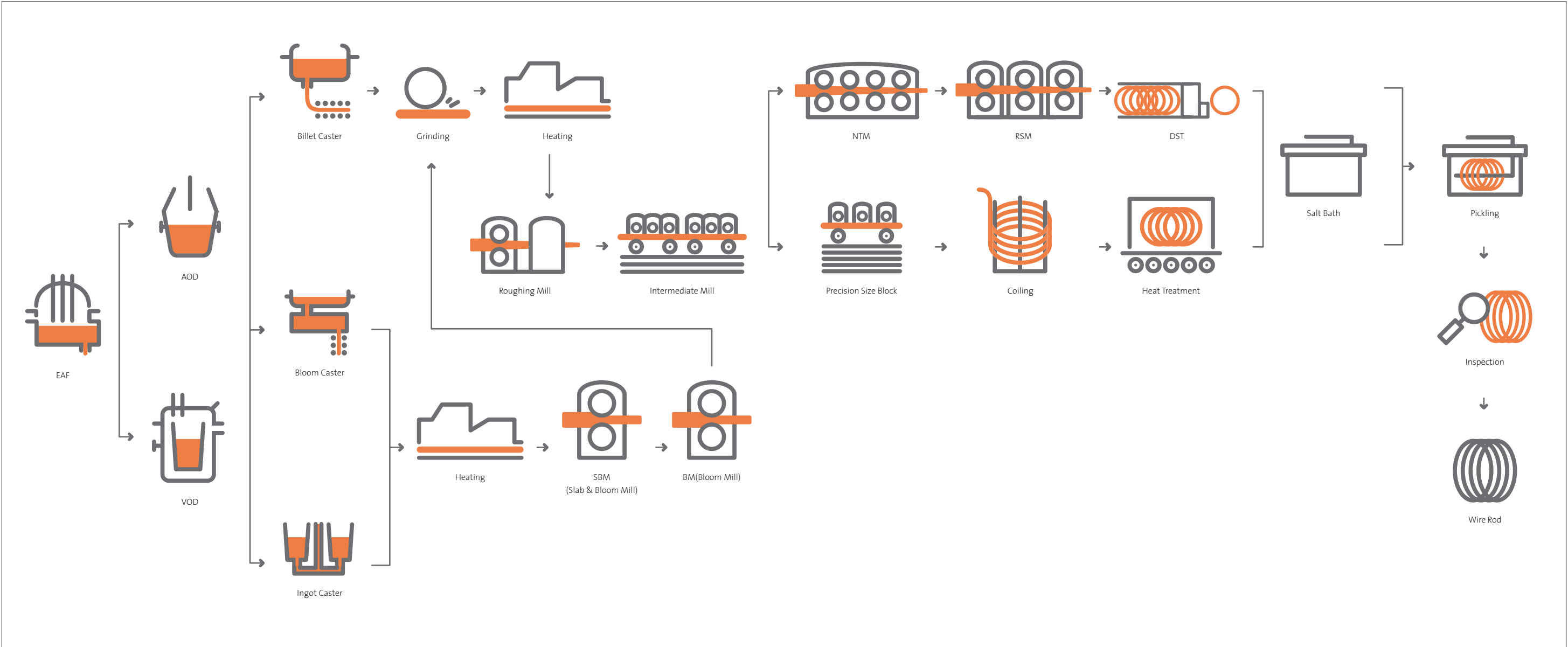
With our products, we aim to raise the level of customer satisfaction and set up the new industry standard by constantly challenging ourselves.



History

04/1966	Founded as Samyang Special Steel Co., Ltd.
12/1977	Completed a general special steel plant as Korea Specialty Steel Co., Ltd (for round bars, steel pipes and plates)
06/1982	Changed its name to SAMMI General Special Steel Co., Ltd
04/1991	Opened its second special steel plant (for steelmaking, rolling, processing)
02/1997	Annexed to POSCO Group (for round bars and pipe business)
10/2006	Completed the 1st phase of its facility rationalization (AOD, HV Mill, Second acid cleaning plant and more)
02/2007	Renamed Changed its name to POSCO Specialty Steel Co., Ltd
04/2012	Completed the 2nd phase of its facility rationalization (60ton EAF, Bloom Caster, SBM and more)
03/2015	Acquired by SeAH Group and changed its name to SeAH Changwon Integrated Special Steel Co., Ltd

Manufacturing Process



EAF



AOD



Bloom Caster



Billet Caster



RSM



DST



Heat Treatment



Pickling



Classification of Stainless Steel

Austenitic

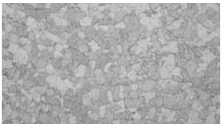


304 18Cr-8Ni C≤0.08	Cutting (S Added)	303 17Cr-8Ni-0.15S	S↓	303F 17Cr-8Ni-0.3S	Cu↑ (Freshness)	303C 17Cr-8Ni-0.15S-1.5Cu	
	Cold Rolling Making (Cu Added)	304J3 17Cr-8Ni-2Cu	Cr↓	304HC 18Cr-8Ni-2Cu	Ni,Cu↑	XM7 17Cr-8.5Ni-3Cu	
	Cold Rolling Manufacturability (Ni Increase)	304S 18Cr-10Ni	Ni↑ (Nonmagnetic)	305 17Cr-10.5Ni			
	Strength (C Increase)	304M 0.04C-18Cr-9Ni	C↑	304H 0.06C-18Cr-8Ni	C↑	304H1 0.07-18Cr-8Ni	302 0.08C-17Cr-8Ni
	(N Added)	304N 18Cr-8Ni-0.08N	Ni↓	304N1 18Cr-7Ni-0.1N	N↑	304N2 18Cr-7.5Ni-0.15N	
	Corrosiveness (Low C)	304L 18Cr-9Ni C≤0.03	Ti Added	321 17Cr-9Ni-Ti	Nb Added	347 17Cr-9Ni-Nb	
	Welding/Heatproof (Cr, Ni Increase)	Y308 19.5Cr-9Ni	C↓	Y308L 19.5Cr-9Ni C≤0.03	Si↓	308LDSI 19.5Cr-9Ni-0.25Si C≤0.03	
		309 23Cr-12Ni	Cr,Ni↑	310S 24Cr-19Ni	Si↑	314 23Cr-19Ni-1.5Si	
	Ni Economic Type (Ni Decrease, Mn, Ni Increase)	201Cu 13Mn-13Cr-1.5Cu	Cu Added (Freshness, Anti-corrosive)	204Cu 7Mn-1.5Ni-16Cr-1Cu	Ni,Mn↑ (High Strength, Nonmagnetic)	201H 0.07C-15Mn-11.7Cr	

Mo Added
(High Pitting Potential)

316 16Cr-10Ni-2Mo	Corrosiveness (C↓)	316L 16Cr-12Ni-2Mo C≤0.03C	C↓	316UL 16Cr-12Ni-2Mo ≤0.02C	
	(Ti Added)	316Ti 16Cr-10Ni-2Mo-Ti			
	Cutting (S Added)	316F 16Cr-10Ni-2Mo S≥0.1	C↓	316LF 16Cr-10Ni-2Mo C≤0.03, S≥0.1	
	Strength (N Added)	316N 16Cr-10Ni-2Mo N≥0.1			
	Pitting Potential (Mo↑)	317 18Cr-11Ni-3Mo		317L 18Cr-11Ni-3Mo C≤0.03	

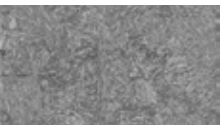
Ferritic



430 16Cr C≤0.12	Corrosiveness (Cr,C↓)	410L 0.03C-11.5Cr			
	Strength (C Regulation)	430H 16Cr C≥0.035			
	Cutting (S Added)	430F 16Cr S≥0.15			
	Mo Added				
	Corrosiveness (Mo, Cu Added)	434 16Cr-0.75Mo			
	Cu Added	434A 16Cr-0.75Cu			
	Al Added (Heatresistant/Antioxidant)	FCA2 14Cr-3Al	Cr↑	FCA2-1 17Cr-2Al	Cr↑,Al
	Corrosiveness (Cr Increase)	446 23Cr	Cr↑	446M 27Cr	
					FCA1 18Cr-4Al

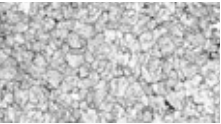
In development

Martensitic



410 11.5Cr C≤0.15	Tension (Si Decrease)	403 11.5Cr Si≤0.5			
	Cutting (S Added)	416 12Cr-0.15S	(High Strength)	420F 12Cr-0.26C S≥0.15	
	Strength (C Increase)	420J1 0.16C-12Cr	C↑	420J2 0.26C-12Cr	C↑,Mo Added
	Strength/Tension (Cr↑,Ni Added)	431 15Cr-1.25Ni			
	High Strength (Cr,C Added)	440A 16Cr-0.6C	C↑	440B 16Cr-0.75C	C↑
					440C 16Cr-0.9C

Precipitation Hardened



630 15Cr-3Ni-3Cu-0.15Nb	631 16Cr-6.5Ni-0.75Al	631H 16Cr-7Ni-0.75Al
660 13.5Cr-24Ni-1Mo-Ti,V,B		

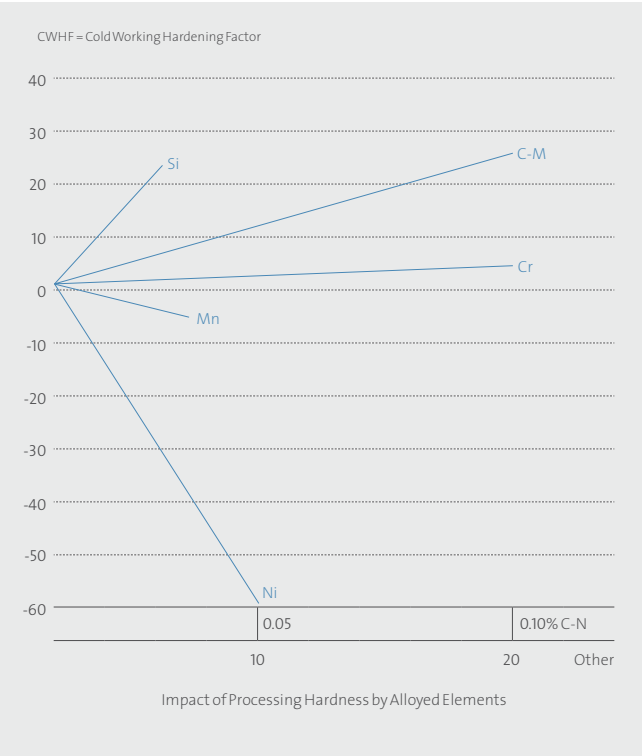
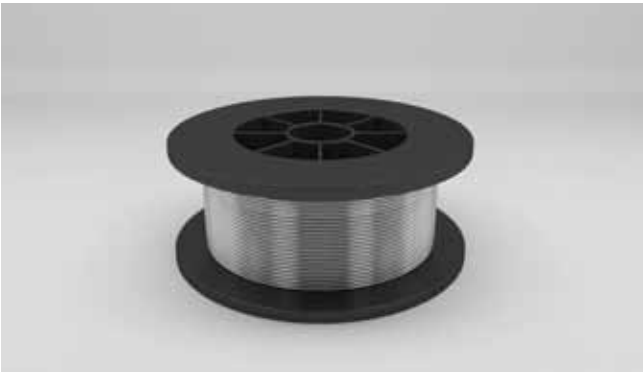
300 Series

Product Characteristics

Corrosion Resistant	Non-magnetic	Free cutting	Reliable Weldability	Excellent Cold workability
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Metal Nets / Fine Wire

Grade	Chemical composition(aim)	Applications
304M	0.04C-9Ni-18Cr	General use, general fine wire
S304MD	0.03C-9Ni-18Cr	High quality fine wire
304S	0.03C-10Ni-18Cr	Ultra fine wires
316	0.04C-10Ni-16Cr-2Mo	High corrosion resistant to seawater
316UL	0.02C-12Ni-16Cr-2Mo	High corrosion resistant, extremely low carbon



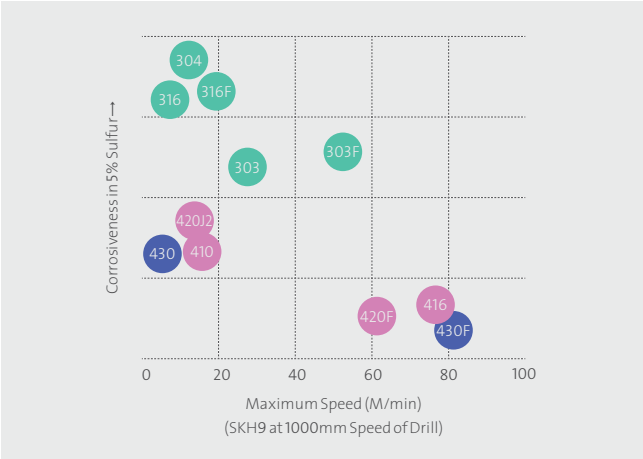
Products with excellent machinability and corrosion resistance.
Mainly manufactured into metal nets, fine wires for a general/redrawing purpose.

Free cutting

Grade	Chemical composition(aim)	Applications
303	0.20S-8Ni-17Cr	Corrosion Resistance, Free Cutting
303C	0.25S-8.5Ni-17Cr-2.5Cu	Non-magnetism, Cold Drawing, Free Cutting
303F	0.30S-8.5Ni-18Cr	Increased machinability by increasing Sulfur



Increased machinability by adding Sulfur.
Mainly used for precision machinery such as OA devices, and other free cutting shafts

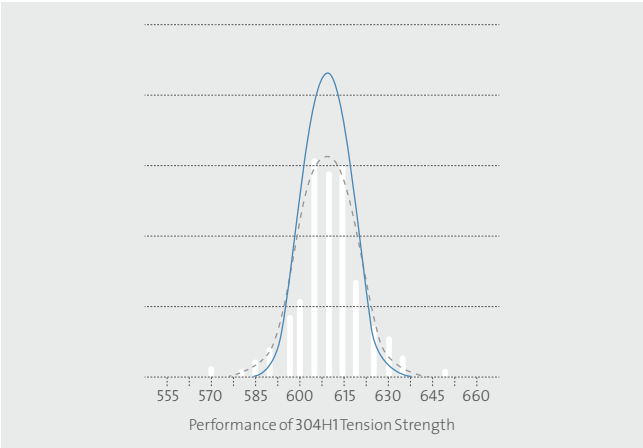


Springs

Grade	Chemical composition(aim)	Applications
304H1	0.07C-1.3Mn-8Ni-18Cr	Precision springs
302	0.07C-8Ni-1.7Mn	High strength springs



Can be utilized in various spring products with minimization of mechanical property deviations. Mainly used for high quality springs, precision springs, chains, and etc.



300 Series

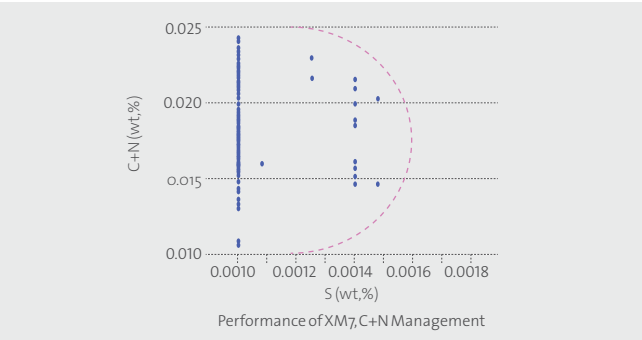
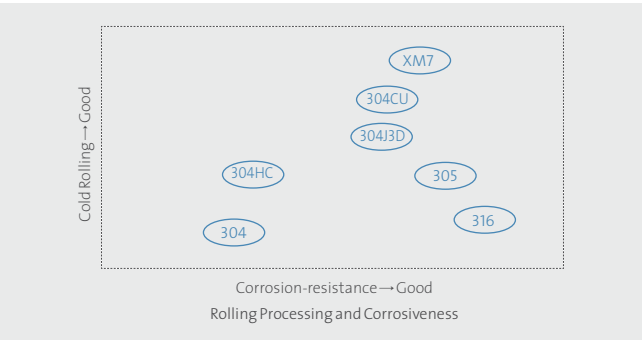
Fasteners (for cold heading)

(CHQ : Cold Heading Quality)

Grade	Chemical composition(aim)	Applications
XM7(302HQ)	0.015C-9.5Ni-17Cr-3Cu	Extremely low carbon cold heading
304Cu	0.015C-8Ni-17Cr-3Cu	Middle-class cold heading
304J3D	0.3C-9Ni-17.4Cr-2.5Cu	Middle-class cold heading
304HC	0.03C-8Ni-18Cr-2Cu	General cold heading
304J3	0.03C-8Ni-17Cr-2Cu	General cold heading

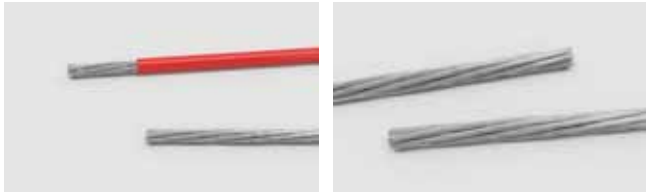


Mainly manufactured into cold heading fasteners such as bolts, screws, and nuts.



Wire Ropes/Springs

Grade	Chemical composition(aim)	Applications
304H	0.07C-1.3Mn-8Ni-18Cr	Wire rope
316	1.6Mn-10.5Ni-17Cr-2Mo	Rope for seawater



Manufactured into wire ropes with outstanding strength by adding carbon. These wire rope are used for seawater related products and various crains.

Exhaust Bellows

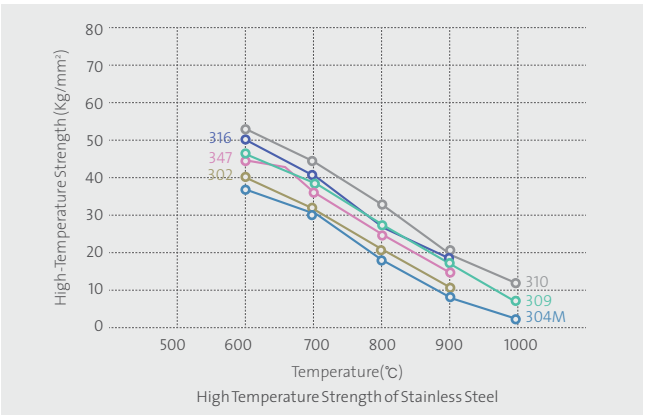
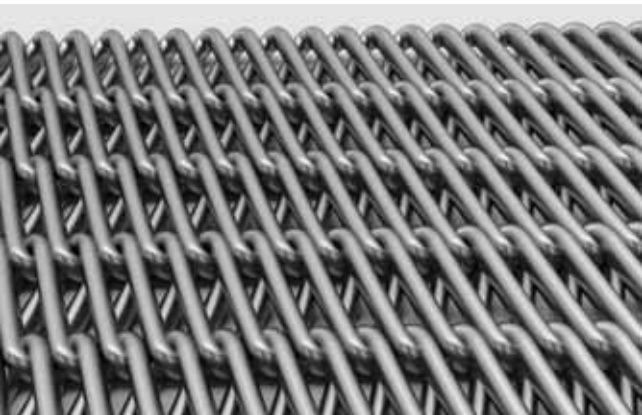
Grade	Chemical composition(aim)	Applications
316Ti	10Ni-16.6Cr-0.25Ti	Automobile exhaust systems



Products with outstanding intergranular corrosion resistance. Capable of heat resisting and oxidation resisting with addition of Ti. Mainly used for automotive exhaust bellows.

Heat Resistant Meshes / Bolts

Grade	Chemical composition(aim)	Applications
310S	0.03C-0.6Si-20Ni-24.5Cr	Heat resisting mesh (Parts for heat treatment furnaces)
314	0.02C-2Si-19.5Ni-24Cr	Heat resisting mesh (Parts for heat treatment furnaces)
660	13.5Cr-24Ni-Mo-2Ti-V,B	Heat resisting bolts (Automotive engines)



Excellent oxidation resistant products with high Ni and Cr. Mainly used for heat resisting mesh, bolt, heat treatment furnace conveyorbelt, etc.

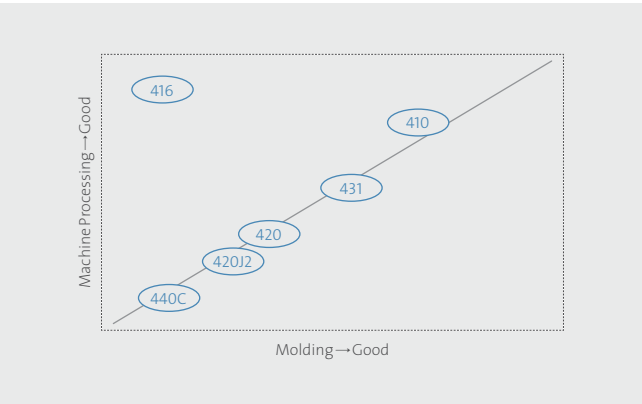
400 Series

General Characteristics

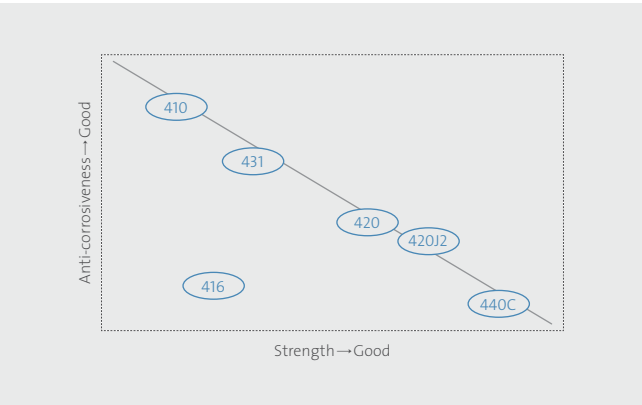
Type	Grade	Chemical composition(aim)	Characteristics	Applications
Martensitic	410 series	0.1C-12Cr	Corrosion resistance Good machinability Hardened through-heat treatment	Machinery,shaft,bolt,nut
	420 series	0.3C-13Cr		
Ferritic	430 series	0.3C-17Cr	Cold workability Corrosion resistance magnetism	Automotive parts,home appliances,parts for construction

High Strength Martensitic Stainless Steel

Grade	Chemical composition(aim)	Applications
410	0.1C-12Cr	General shaft, bolt, nut
420J2	0.3C-13Cr	High strength shaft
440C	0.96C-16Cr-0.45Mo	High strength shafts with higher strength
SHP4A	0.6C-0.5Ni-12.5Cr-1Mo	High strength,corrosion resistant shaft



Hardened through heat treatment,composed of martensite tissues,used for products that tend to require higher strengths. Mainly manufactured into products such as,knives,fish hooks,and shafts for machinery,electronics.



High Corrosion Resistant Ferritic Stainless Steels

Grade	Chemical composition(aim)	Applications
409Nb	11Cr-0.35Nb-0.03C	Muffler hangers for vehicles
430	0.03C-17Cr	Bolts,nuts
446	23Cr	Electrode pins (of compressors)



Outstanding cold workability and corrosion resistance. Mainly used for CHQ(Cold Heading Quality),and automotive parts.

Free Cutting Shafts

Grade	Chemical composition(aim)	Characteristic / Applications
416	0.12C-0.26S-12Cr	Free cutting,other general use of 400 series
420F	0.32C-0.2S-12Cr	High strength,free cutting
430F	0.10C-0.17S-16Cr	Free cutting,corrosion resistance
S410FST	0.02C-0.9Si-0.1S-13Cr	Free cutting, harmlessness
S430FSM	0.02C-1.3Si-0.15S-18Cr-1.5Mo-0.05Nb	Free cutting,corrosion resistance,soft magnetism



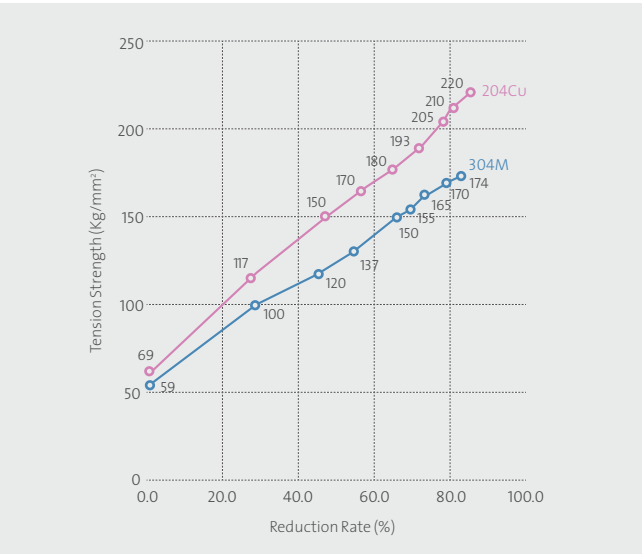
Added Sulfur(S) and Selenium(Se) to enhancemachinability with high strength. Mainly used in free cutting shaft,hard disk motor pin,and ball pen tip products.

200 Series·Welding Rods·Special Alloy

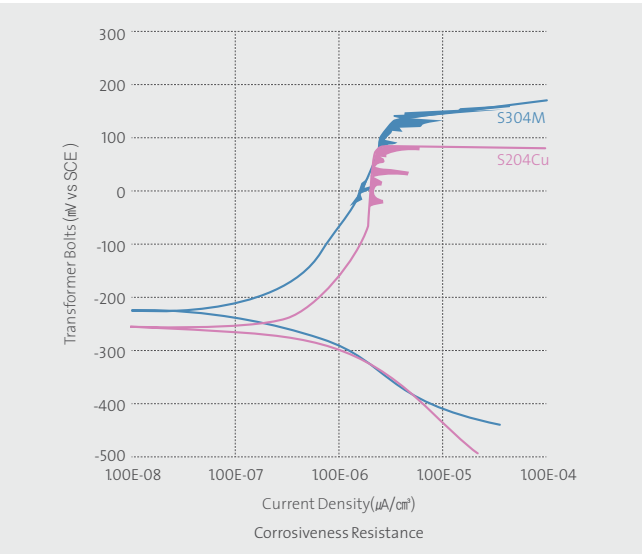
200 Series

200 series’ overall characteristics are relatively similar to the 300 series, but instead of Ni (due to its expensive cost), low cost substitute elements such as Mn and N are added. 200 series’ mechanical and hardening characteristics are similar to the 300series. With its lack of Ni content, 200 series has a lower corrosion resisting ability than the 300series.

Grade	Chemical composition(aim)	Applications
204Cu	8.0Mn-2.0Ni-15.5Cr-2.0Cu-0.15N	General drawing, kitchen appliance
201Cu	13.6Mn-0.7Ni-13.6Cr-2.0Cu-0.12N	General drawing, anchor bolt
201H	15.1Mn-0.55Ni-11.7Cr-0.6Cu-0.16N	



Austentic stainless steel- low cost substitute elements such as Mn and N are added due to Ni’s expensive cost. Mainly used for anchor bolts, and general kitchen appliances.

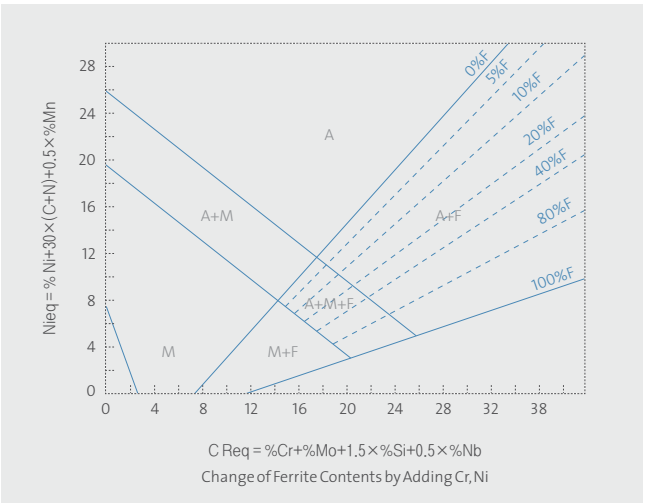


Wire Rod for Welding

Grade	Chemical composition(aim)	Applications
308	1.9Mn-9.7Ni-19.7Cr-0.03N	Welding for shaft/valve
308LDSI	0.1Si-1.9Mn-9.85Ni-20.3Cr	For ultra-low carbon welding
309	1.7Mn-13.6Ni-23.4Cr-0.06N	For cast steel/wrought steel welding
316L	1.6Mn-11.6Ni-18Cr-2Mo	For 316 series welding
430LNB	0.02C-18Cr-0.4Nb-0.02N	For exhaust valve welding



Suitable for 300 and 400 series welding.
Used for stainless steel welding rods (MIG, TIG).



Special Alloy (Ni-base Alloy)

Grade	Chemical composition(aim)	Characteristics / Applications
CIMA35	Fe-36Ni-0.5Cr-2.5Mo-0.7Co	Low co-efficient of thermal expansion Used as reinforcement for high voltage transmission wires
INVAR36	Fe-36Ni	Precision nuts/screws for electronic devices
COVAR29-18	Fe-28Ni-17Co	Used as power inlets for acrysal oscillator. Similar thermal expanding co-efficient to the glass.



Used for products such as high voltage transmission wires and crystal oscillators with a special purpose by adding Ni, Co, and etc.

Specifications

Type	Grade	DIN	Chemical composition (Wt,%)								Mechanical Property(Avr.)				Applications	
			C	Si	Mn	P	S	Ni	Cr	Mo	Others	Y.S	T.S	EL		HRB
300 series	302	1.6900	≤0.15	≤1.0	≤2.0	≤0.045	≤0.03	8.0~10	17.0~19.0		Cu : ≤1.0	248	627	62	76	High quality spring
	302IA		≤0.15	≤1.0	≤2.0	≤0.045	≤0.03	8.0~10	17.0~19.0			227	600	55		Rope
	303	1.4305	≤0.15	≤1.0	≤2.0	≤0.2	≥0.15	8.0~10	17.0~19.0	≤0.6		240	620	55	81	Free cutting, bolt, nut, shaft
	303C		≤0.15	≤1.0	≤3.0	≤0.2	≥0.15	8.0~10	17.0~19.0	≤0.6	Cu : 1.5~3.5	270	575	48	76	Non-magneticshaft, free cutting
	303C1		≤0.15	≤1.0	≤3.0	≤0.2	0.2~0.33	8.0~10	17.0~19.0		Cu : 0.5~1.0	280	575	55	84	Free cutting, non-magnetism
	303F		≤0.15	≤1.0	≤3.5	≤0.2	0.3~0.37	8.0~10	17.0~19.0	≤0.6	N : ≤0.08	265	620	56	77	Shaft
	303FA		≤0.15	≤1.0	≤2.0	≤0.2	0.3~0.4	8.0~10	17.0~19.0		N : ≤0.10	255	600	56	80	Free cutting
	304	1.4301	≤0.08	≤1.0	≤2.0	≤0.045	≤0.03	8.0~10.5	18.0~20.0			220	586	63	69	Kitchen appliances, general use
	304M		≤0.06	≤1.0	≤2.0	≤0.040	≤0.03	9.0~10.0	18.0~20.0	≤0.6	N : ≤0.08	225	560	55	72	Soft wires, kitchen appliances, nuts, meshes
	304MD		≤0.03	≤1.0	≤2.0	≤0.045	≤0.03	9.0~10.0	18.0~20.0	≤0.6		210	575	62	72	DDM
	304MA		≤0.08	≤1.0	≤2.0	≤0.045	0.01~0.03	8.0~10.5	18.0~20.0		Cu : 1.0~3.0	225	590	75	79	Non-magnetic products
	304MN		0.03 ~ 0.06	0.2 ~ 0.6	1.8 ~ 2.5	≤0.040	≤0.012	9.0~10.0	18.0~19.0	≤0.50	Cu : ≤0.6					Enhanced Mn
	304CU		≤0.03	≤1.0	≤2.0	≤0.04	≤0.03	8.0~10	17.0~19.0		Cu : 3.0~4.0	190	505	56		Cross bolt, screw
	304H		0.06 ~ 0.08	≤1.0	≤2.0	≤0.040	≤0.03	8.0~9.0	18.0~20.0	≤0.6	Cu : ≤0.6, N : ≤0.08	312	590	55	72	Strong wire, spring, rope, chain
	304H1		0.06 ~ 0.08	≤1.0	≤2.0	≤0.040	≤0.03	8.0~9.0	18.0~20.0	≤0.6	Cu : ≤0.6	235	610	64	75	Strong wire, spring, rope, chain
	304HD		≤0.05	0.25 ~ 0.55	1.6 ~ 2.0	≤0.035	≤0.015	8.5~8.9	18.0~18.5	≤0.6	Cu : 0.5~2.0, ToI Ai : ≤0.015	212	540	75	85	Heading
	304HC		≤0.06	≤1.0	≤2.0	≤0.045	≤0.03	8.0~10.5	18.0~20.0	≤0.6	Cu : 1.0~3.0, N : ≤0.08	225	510	62	65	Cold heading (hexagon bolt)
	XM7(302HQ)	1.4587	≤0.08	≤1.0	≤2.0	≤0.045	≤0.03	8.5~10.5	17.0~19.0		Cu : 3.0~4.0	180	480	56	60	Cross bolt, screw
	304J3D		≤0.03	≤1.0	≤2.0	≤0.03	≤0.003	8.5~10.5	17.0~19.0		Cu : 2.0~4.0, N : ≤0.04	200	495	60	60	Cross bolt, screw
	304J3		≤0.08	≤1.0	≤2.0	≤0.045	≤0.03	8.0~10.5	17.0~19.0		Cu : 1.0~3.0	215	515	63	60	Cold heading (hexagon bolt)
304/304L		≤0.03	≤1.0	≤2.0	≤0.045	≤0.03	8.0~10.0	18.0~20.0		Cu : ≤0.6, N : ≤0.10	214	593	58	72	General use	
304L (JIS)	1.4306	≤0.03	≤1.0	≤2.0	≤0.045	≤0.03	9.0~13.0	18.0~20.0		N : ≤0.08	215	560	50	64	Fine wire, mesh	
304L		≤0.03	≤1.0	≤2.0	≤0.045	≤0.03	8.0~12.0	18.0~20.0		N : ≤0.10	215	540	60	69	Fine wire, mesh	
304N		≤0.08	<0.075	≤2.0	≤0.045	≤0.03	8.0~10.5	18.0~20.0		N : 0.1~0.16						
304N1	1.4306	≤0.08	≤1.0	≤2.5	≤0.045	≤0.03	7.0~10.5	18.0~20.0		N : 0.1~0.25	320	635	55	82	Non-magnetic products, spring washers, High strength structures	

Specifications

Type	Grade	DIN	Chemical composition (Wt,%)									Mechanical Property(Avr.)				Applications
			C	Si	Mn	P	S	Ni	Cr	Mo	Others	Y.S	T.S	EL	HRB	
300 series	304S		≤0.05	≤1.0	≤2.0	≤0.045	≤0.03	10.0~10.5	18.0~20.0	≤0.6	Cu : ≤0.6, N : ≤0.08	215	560	55	66	Ultra finewire, mesh, precision filter
	304CS		≤0.035	≤1.0	≤2.0	≤0.045	≤0.03	8.0~10.5	18.0~20.0		N : ≤0.10	235	585	60	77	Machine processing bar
	304E		≤0.06	≤1.0	≤2.0	≤0.045	≤0.03	9.0~10.0	18.0~20.0	≤0.6	N : ≤0.08	220	570	60	73	Kitchen devices, food and chemical facilities, electrolysis grindings
	305	14303	≤0.12	≤1.0	≤2.0	≤0.045	≤0.03	10.5~13.0	17.0~19.0			212	552	55		Cold heading
	314		≤0.25	1.5~3.0	≤2.0	≤0.045	≤0.03	19.0~22.0	23.0~26.0			278	610	48	70	Heat-resistant part (Mesh)
	310S		≤0.08	≤1.5	≤2.0	≤0.045	≤0.03	19.0~22.0	24.0~26.0			237	545	55	69	Heat-resistant part (Conveyor)
	316	14436	≤0.08	≤1.0	≤2.0	≤0.045	≤0.03	10.0~14.0	16.0~18.0	2.0~3.0		240	580	64	71	Seawater rope (Bolts, Nuts)
	316(ROPE)		≤0.053	0.400	1.500	0.035	0.010	10.8	17.0	2.200		227	551	58	74	Seawater rope
	316C		≤0.08	≤1.0	≤2.0	≤0.040	≤0.03	10.0~14.0	16.0~18.0	2.0~3.0	Cu : 2.8~3.8	250	610	55	87	Seawater Rope
	316L	14404	≤0.03	≤0.75	≤2.0	≤0.045	≤0.03	10.0~14.0	16.0~18.0	2.0~3.0	N : ≤0.10		549	62		Fine wires, chemicals
	316L(JIS)	14435	≤0.08	≤1.0	≤2.0	≤0.045	≤0.03	12.0~15.0	16.0~18.0	2.0~3.0	N : ≤0.10	213	560	55	79	Fine wire
	316N		≤0.08	≤1.0	≤2.0	≤0.045	≤0.03	10.0~14.0	16.0~18.0	2.0~3.0	N : 0.10~0.16	212	560	55		High strength barbed-wire
	316NB		0.03~0.05	0.4~0.7	1.4~1.6	≤0.040	0.02~0.03	12.0~13.0	17.5~18.0	2.0~3.0	Ti : 0.005~0.05, Nb : 0.04~0.06	220	540	70		
	316F		≤0.08	≤1.0	≤2.0	≤0.045	≥0.10	10.0~14.0	16.0~18.0	2.0~3.0		230	570	58	70	For rolling(watch bands, kitchen appliances)
	316LF		≤0.03	≤1.0	≤2.0	≤0.045	≥0.10	10.0~14.0	16.0~18.0	2.0~3.0		225	565	46	66	For rolling(watch bands, kitchen appliances)
	316Ti	14571	≤0.08	≤1.0	≤2.0	≤0.045	≤0.03	10.0~14.0	16.0~18.0	2.0~3.0	Ti : ≤0.7	214	565	65	79	Automotive exhaust system(bellows skin)
	316UL		≤0.02	≤1.0	≤2.0	≤0.045	≤0.03	12.0~15.0	16.0~18.0	2.0~3.0	Cu : ≤0.6, N : ≤0.08	212	539	58		For weaving
	316/316L		≤0.03	≤1.0	≤2.0	≤0.045	≤0.03	10.0~14.0	16.0~18.0	2.0~3.0	N : ≤0.10	227	551	66	72	General use, corrosion resistance
	317		≤0.08	≤1.0	≤2.0	≤0.045	≤0.03	11.0~15.0	18.0~20.0	3.0~4.0		278	610	48	80	Higher heat resistance than 316s
	317L		≤0.03	≤1.0	≤2.0	≤0.045	≤0.03	11.0~15.0	18.0~20.0	3.0~4.0		280	600	55		High corrosion resistance
304 series	321	14541	≤0.08	≤1.0	≤2.0	≤0.045	≤0.03	9.0~13.0	17.0~19.0		Ti : ≤0.8	220	565	52	65	Automotive exhaust system (bearing)
	347		≤0.08	≤1.0	≤2.0	≤0.045	≤0.03	9.0~13.0	17.0~19.0	3.0~4.0	Nb : ≤10 X C					
	347H		0.04~0.10	≤1.0	≤2.0	≤0.040	≤0.03	9.0~12.0	17.0~19.0		Nb : ≤1.0					
	630		≤0.07	≤1.0	≤1.0	≤0.040	≤0.03	3.0~5.0	15.0~17.5		Cu : 0.3~0.5, Nb : 0.15~0.45					
	SUH660		≤0.08	≤1.0	≤2.0	≤0.040	≤0.03	24.0~27.0	13.5~16.0	1.0~1.5	V : 0.1~0.5, Ti : 1.9~2.35 B : 0.001~0.01	590	900	15	101	Heat-resistant Valves

Specifications

Type	Grade	DIN	Chemical composition (Wt,%)								Mechanical Property(Avr.)				Applications	
			C	Si	Mn	P	S	Ni	Cr	Mo	Others	Y.S	T.S	EL		HRB
400 series	403		≤0.15	≤0.5	≤1.0	≤0.040	≤0.030	≤0.6	11.5~13.0			300	530	40		Turninebolt, valve
	409NB		≤0.08	≤1.0	≤1.0	≤0.040	≤0.030	≤0.5	10.5~11.7		Nb : ≤0.75				87	Automotive exhaust system (muffler)
	409NBL		≤0.03	≤1.0	≤1.0	≤0.040	≤0.030	≤1.0	10.5~11.7		Nb : ≤0.75	372	530	37	82	Automotive exhaust system (muffler)
	409LTI		≤0.025	0.4~0.6	≤0.5	≤0.030	≤0.005	≤0.3	12.3~12.8	≤0.50	Ti : 0.3~0.4, Nb : 0.25~0.35				82	Welding materials (discharging box)
	410	14006	≤0.15	≤1.0	≤1.0	≤0.040	≤0.030	≤0.6	11.5~13.5			330	580	35	83	Highstrength shafts, bolts, nuts
	410TS		0.17~0.18	0.15~0.35	0.2~0.4	≤0.020	≤0.003	0.3~0.5	9.5~10.5	3.0~3.2	B : 0.002~0.004					Self screws
	410FST		≤0.02	0.7~1.0	≤0.5	≤0.030	0.05~0.15	≤0.5	12.7~13.2		Ai : 0.2~0.25, Se : ≤0.15				75	Ball-pen tips
	416	14005	≤0.15	≤1.0	≤1.25	≤0.06	≥0.15	≤0.6	12.0~14.0	≤0.6		380	640	32	84	Carburetor parts, pump axis, valves
	420		≥0.15	≤1.0	≤1.0	≤0.040	≤0.030		12.0~14.0			300	650	40	92	High strength free cutting shafts
	420B		0.26~0.35	≤1.0	≤1.0	≤0.040	≤0.030	≤1.0	12.0~14.0							High strength free cutting shafts
	420F	14029	0.26~0.4	≤1.0	≤1.25	≤0.06	≥0.15	≤0.6	12.0~14.0	≤0.6		312	700	34	94	High strength free cutting shafts
	420N		0.16~0.23	≤0.4	≤1.0	≤0.04	≤0.03	1.0~2.0	13.0~15.0	1.5~2.5	N : 0.1				97	Bolts for construction
	420N1		0.36~0.38	≤0.35	≤1.0	≤0.03	≤0.005		11.0~12.0		N : 0.08~0.10				89	Corrosion resistant bolts
	420J1	14021	0.16 ~ 0.25	≤1.0	≤1.0	≤0.040	≤0.030	≤0.6	12.0~14.0						93	Shaftsforhome appliances, general use
	420J2	14028	0.26 ~ 0.4	≤1.0	≤1.0	≤0.040	≤0.030	≤0.6	12.0~14.0			540	736	12	90	Shaftsforhome appliances, general use
	440B		0.75 ~ 0.95	≤1.0	≤1.0	≤0.040	≤0.030		16.0~18.0				700	27		High hardness, wear resistant shaft
	440C		0.95 ~ 1.20	≤1.0	≤1.0	≤0.040	≤0.030	≤0.6	16.0~18.0	≤0.75						Extrahardness, wear resistant
	431	14057	≤0.20	≤1.0	≤1.0	≤0.040	≤0.030	1.25~2.5	15.0~17.0						97	Parts fordismantling machines, parts foraircrafts
	SHP4A		0.55~0.65	≤1.0	≤1.0	≤0.040	≤0.030	0.2~0.6	12.5~14.0	1.0~2.0		500	700	20	98	High strength shafts
	430	14016	≤0.12	≤0.75	≤1.0	≤0.040	≤0.030		16.0~18.0			206	451	22		Bolts, nuts
	430H		≤0.12	≤0.75	≤1.0	≤0.040	≤0.030	≤0.6	16.0~18.0	≤0.6	Cu : ≤0.6				81	Weaving machine bodies
	430F	14104	≤0.12	≤1.0	≤1.25	≤0.06	≥0.15		16.0~18.0	≤0.6		220	600	55	75	Shafts, free cutting
	430FSE		≤0.035	≤0.5	≤0.5	≤0.06	≥0.15		16.0~18.0	≤0.6	Cu : 0.3~1.5, Se : 0.05~0.3				88	Valves
	430FST		≤0.05	0.2~0.5	0.7~1.0	≤0.05	0.20~0.28	≤0.5	20.0~21.0	0.9~2.0	Se : 0.05~0.2, N : 0.15~0.25				88	Soft-magnetic ball-pen tips
	430FSM		≤0.025	1.2~1.5	≤0.5	≤0.035	0.18~0.23	≤0.4	17.5~18.0	1.5~2.0	Nb : 0.04~0.06, N : ≤0.015				88	Soft-magnetic materials, hard disk pins
	434A		≤0.12	≤1.0	≤1.0	≤0.040	≤0.030		16.0~18.0		Cu : 0.75~1.25	295	500	36		Wire rivet for vehicles
	446		≤0.20	≤1.0	≤1.5	≤0.040	≤0.030	≤0.25	23.0~27.0		N : ≤0.25				87	Cathode tubes, air-conditioner connecting pins
	446M		≤0.12	≤0.75	≤1.0	≤0.040	≤0.030	≤0.6	27.0~29.0			395			87	Flat monitors, rail materials
SDB7		≤0.12	≤0.75	≤1.0	≤0.040	≤0.030		16.0~18.0							High strength shafts	

Product Size

OD (mm)	Coil Size (mm)	Winding direction
5.5~17 ϕ : at Interval of 0.5 mm 17~34 ϕ : at Interval of 1.0 mm	Outer Diameter: 1,350 Max. Inner Diameter 850 Min. Height: 1,500 Max.	Counter-clockwise

* Contact us for 5.0 ϕ .

Order Standards

1.Weight Tolerance

Category	Scope of permissible errors (%)			
	T < 10	10 < T ≤ 20	20 < T ≤ 50	50 < T
Domestic	±30	±20	±10	±5
Export, Local	±30	±20	±10	±5

* Permissible error per export item and contract number ±10%

2.Minimum Order Quantity and Order Multiple

(In tons)

Outer dia. (mm)	ESR material		Non ESR material	
	Minimum order	Order multiple	Minimum order	Order multiple
~34mm	1.0	1.0	3.0	1.5

* Minimum order for an export item: 1.5 ton

3.Minimum Melting Lot

Ingot: 50 tons / 4 months (1ch), bloom: 110 tons / 4 months (2ch), continuous billets: 270 tons / 3 months (3ch), ESR (5 tons): 40 tons / 4 months (1ch)

4.Coil Weight

0.75–1.7 tons

Packing Types



Bare

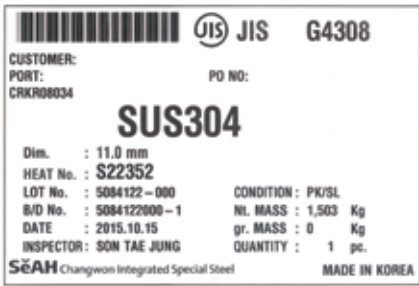
1. Zn-coated Band(4Point Banding)



Hessian

1. Bare Packing
2. Vinyl + Hessian Packing
3. 4~5 Point Banding (Zn-coated Band)

Tag



Tag

Certificates of Approval



ISO 9001:2008
ISO QUALITY
MANAGEMENT
SYSTEM



ISO/TS
16949:2009
ISO QUALITY
MANAGEMENT
SYSTEM



ISO 14001:2004
ISO
ENVIRONMENT
AL
MANAGEMENT
SYSTEM



KOSHA18001
KOSHA SAFE
AND HEALTH
MANAGEMENT
SYSTEM



JAPANESE
INDUSTRIAL
STANDARDS

Order Requirements

We can only provide the right product for you when you fully specify what you need. Be sure to provide detailed information for the line items below.

E-mail : trade@seah.co.kr / Website : www.seahss.co.kr/eng / Tel : +82 2 6970 2374, 2362 for questions

¹⁾Applicable standards: ASTM, JIS, DIN, etc ²⁾Steel grade, surface heat treatment, dimension
³⁾Quantity and delivery ⁴⁾Applications, method of processing ⁵⁾Special requirements (if applicable)