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Shunan Works



Kinuura Works





1 Uniform Quality

Our products are manufactured by an integrated quality control process from melting to finishing.

2 High Dimensional Precision and Flatness

The state-of-the-art production facilities offer high sheet thickness precision and flatness.

Wide Variety of Types of Steel and Finish

Our produces a variety of unique NSS steel types in addition to the JIS standard steels to meet diversified customer needs.

Our products are supplied in various types of surface finishes.

4 Wide Range of Sizes

Our products are available in a wide range of thicknesses, lengths, and widths.

5 Prompt After-Sales Service System

Our stands ready to give technical services suitable for users' needs, maximizing our rich experience in the field of steel production.



LD Converter (Shunan Works)



Continuous casting equipment (Shunan Works)



Hot strip mill (Kure Works)



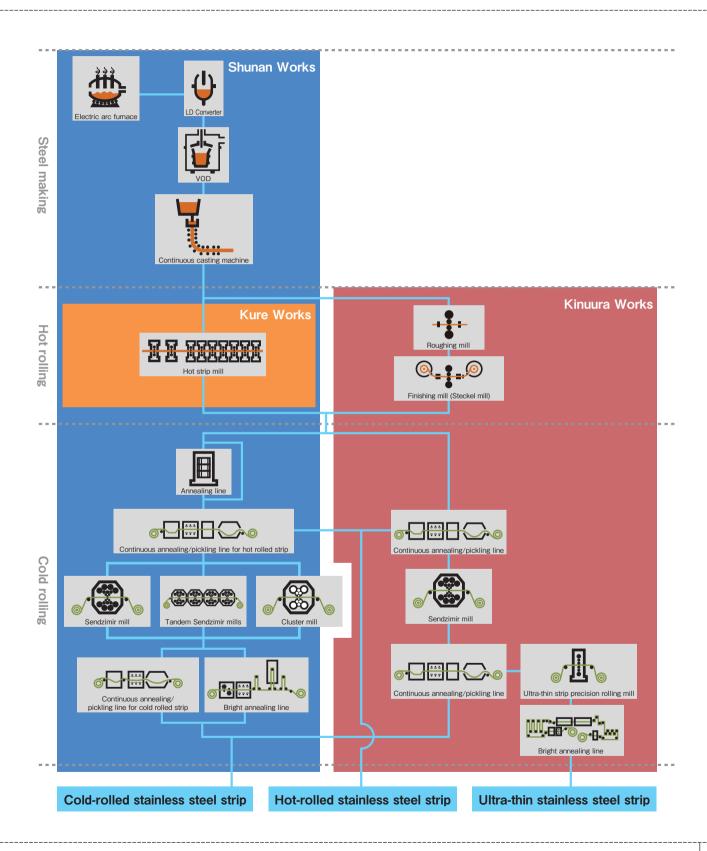
Steckel mill (Kinuura Works)



Tandem Sendzimir cold rolling mills (Shunan Works)



## Production Process





# Types of Stainless Steel Available

### 1. Austenitic and two-phase stainless steels

			i i	tation hardening stainle	1 1	
	Reduction in chromium and nickel content	SUS301	Addition of aluminum	SUS631	Addition of silicon, molybdenum, and copper	NSS HT2000
	Increased work hardenability	17Cr-7Ni	Increased age hardenability	17Cr-7Ni-1AI	Ultra-high hardness	14Cr-8Ni-2Mo-3S
	Reduction a	in carbon content, addition of nitrogen	Addition of		1	
		SUS301L	Addition of nitrogen	SUS304N1		
		17Cr-7Ni-N-low C	Increased strength	18Cr-8Ni-N		
S304	Reduction in carbon content, increase in nickel content	SUS304L	Addition of titanium	SUS321		
Cr-8Ni	Increased intergranular corrosion resistance	18Cr-9Ni-low C		18Cr-9Ni-Ti		
≦0.08		Addition of silicon, anese, and copper season cracking resist			J	
		NSS 304M2	Increase in nickel and copper content	NSS 304ES		NSS D-8
		16Cr-7Ni-1.5Si-2Mn-2Cu	Extreme softness	17Cr-8Ni-1.6Mn-3Cu		16Cr-12Ni-3.5Cu
						Increase in nickel and copper content
	Increase in nickel content	NSS D-5	Addition of manganese and copper	NSS 304S	Increase in copper content	NSS XM-7
	Enhanced workability	18Cr-9Ni	Softness	18Cr-9Ni-1.5Mn-1Cu	Low magnetism	18Cr-9Ni-1.6Mn-30
	Increase in nickel content	SUS305	Addition of manganese	NSS 305M1	Addition of nitrogen	NSS 305M3
	Non-magnetism	18Cr-12Ni	Soft non-magnetism	16Cr-12Ni-3Mn	High strength, non-magnetism	19Cr-12Ni-3Mn-0.1
	Addition of molybdenum	SUS316	Reduction in carbon content	SUS316L	Increase in molybdenum content	SUS317L
	Increased corrosion resistance	18Cr-12Ni-2Mo	Increased intergranular corrosion resistance	18Cr-12Ni-2Mo-low C	High corrosion resistance	18Cr-12Ni-3Mo-low
	Addition of silicon, molybdenum, and copper	NSS M1C/SCR-M	Increase in nickel and silicon content	NSS SCR		
	Increased stress corrosion cracking resistance	18Cr-10Ni-1.5Si-1Mo-3Cu		18Cr-12Ni-3Si-1Mo-2Cu		
	Addition of silicon	NSS 302B	Increase in silicon content, addition of niobium	NSS ER-1	Addition of molybdenum	NSS ER-4
	Increased oxidation resistance	18Cr-9Ni-2.5Si	High strength at high temperature	19Cr-13Ni-3Si-Nb	High temperature salt damage resistance	17Cr-13Ni-2.5Si-2.5
	Increase in chromium and nickel content	SUS309S	Addition of silicon, increase in nickel content	NSS 309B	Increase in chromium and nickel content	SUS310S
	Increased oxidation resistance	22Cr-12Ni		23Cr-15Ni-2Si		25Cr-20Ni
	Reduction in nickel content, addition of manganese and copper	NSS D-21				
	Saving of nickel, enhanced workability	17Cr-6.5Ni-5Mn-2.5Cu				
ustenitic						
wo-phase	Increase in chromium content, reduction in nickel content	NSS R-4	Increase in molybdenum, addition of nitrogen	NSS R-3	Increase in chromium	SUS329J4L
	High corrosion		addition of hitrogen		and monor content	

## Types of Stainless Steel Available

## 2. Ferritic, martensitic, and multi-phase stainless steels

SUS410   SUS400   S								
SUS410 Rediction carbon covered SUS410S Rediction carbon covered SUS410S Rediction carbon covered Rediction carbon Rediction Redicition Rediction Rediction Rediction Rediction Rediction Redictio						SUS420J2		NSS WR-1
SUS-410   SUS-4108   SUS-4108   Compared workshilly   13Cr-0.06C   Checked planting statistics   SUS-630   Susker 1999   Susker 1			Enhanced hardenability			13Cr-0.3C		13Cr-0.3C-Nb
The content of the c	SUS410			SUS410S		NSS 410M4		NSS 410M5
**Martensitic**  **I Martensitic**  **I Martensitic			Increased workability	13Cr-0.06C		12.5Cr-0.7Mn-0.07C		13Cr-0.7Mn-0.8Cu-0.05C
Martensitic   Transcot designation of incident   Transcot designation	C≧0.15		'		. Precipita	ation hardening stainles	s steels" "	
TMartensitic J. Ferritic (Multi-phase)  Addition of aluminum SUS405 Bicreased werkplashing 13Cr-4Ni-Ti  Addition of aluminum SUS405 Bicreased werkplashing 13Cr-0.2AI Susceptible Reduction in carbon NSS 410M1 Addition of Increased workplashing Increased				NSS HT980	Increase in chromium content Addition of copper and niobium		Increase in nickel content Compound addition of	NSS HT1770
Ferritic (Multi-phase)				13Cr-4Ni-Ti	Increased age	17Cr-4Ni-4Cu-Nb		15Cr-7Ni-1.5Si-Cu-Ti
Ferritic (Multi-phase)	† Marter	neitic			*			
Addition of aluminum  SUS405  Increased workability  Increased workability  Increased workability  Addition of nicket  NSS 410M1  Addition of nicket  NSS 431DP-2  Entranced sterepth, two or	Iviaitei	isitic						
Addition of aluminum  SUS405  Increased workability  Increased workability  Increased workability  Addition of nicket  NSS 410M1  Addition of nicket  NSS 431DP-2  Entranced sterepth, two or	Ferrition	r			Reduction in carbon content		Increase in chromium	
Reduction in carbon content Increased workability Increased intergrandary Increased attergrandary Increased intergrandary Increased inte	•	_	Addition of aluminum	SUS405	Increase in aluminum content,	NCA-2	and aluminum content	NCA-1
Reduction in carbon content   Comment of the properties			Increased weldability	13Cr-0.2Al		13Cr-1.5Si-1Al-low C	resistance	18Cr-3Al-Ti-low C
Addition of nickel  Restanced strength, two or more phases  Addition of nickel  Restanced strength, two or more phases  Addition of nickel  Restanced strength, two or more phases  Addition of nickel  Restanced strength, two or more phases  Addition of nickel  Restanced strength, two or more phases  Addition of nickel  Restanced strength, two or more phases  Addition of nickel  Restanced strength, two or more phases  Addition of nickel  Restance distinguishing increased more phases  Addition of nickel  Restance distinguishing increased more phases  Addition of nickel  Restance distinguishing increased more phases  Addition of titanium NSS 430M2  Restance distinguishing increased worksability  17Cr-Nb-low C  Restance distinguishing increased worksability  17Cr-0.2Ti-low C  Restance distinguishing increased worksability  17Cr-0.3Ti-low C  Restance distinguishing increased worksability  17Cr-0.3Ti-low C  Restance distinguishing increased worksability  17Cr-0.3Ti-low C  Restance distinguishing increased more phases and transpared worksability  17Cr-0.3Ti-low C  Restance distinguishing increased worksability				NSS 410M1		NSS 409M1	Addition of niobium, silicon,	NSS HR-1
Enhanced strength, two or more phases  Addition of niobium  NS 430M4  Increased intergranular corrosion resistance  Increased workability  Increased workability				12Cr-low C		11Cr-Ti-low C	temperature	14Cr-1Si-1Mn-Nb-low C
Enhanced strength, two or more phases  Addition of niobium  NS 430M4  Increased intergranular corrosion resistance  Increased workability  Increased workability								
Addition of Included in Control of Management (Control of Management) (Contro			Addition of nickel	NSS 431DP-2				NSS EM-2
Addition of niobium  NSS 430M4  Increased intergranular corresion resistance  Increased workability  Increased wor				17Cr-2Ni				18Cr-2Mo-Mn-Nb-extremely low C
Addition of niobium  NSS 430M4  Increased intergranular corrosion resistance  Increased intergranular corrosion resistance  Increased corrosion resistance  Increased corrosion resistance  Increased corrosion resistance  Increased workability  Increase								
Addition of inipitum  Increased intergranular content, addition of trainium  Increased workability  Increased wor								molybdenum
SUS430 Reduction in carbon and through content and through conten			Addition of niobium	NSS 430M4		NSS 442M3		NSS EM-C
Addition of transium content   NSS 430MZ   Increased workability   17Cr-0.2Ti-low C   Increased workability   17Cr-0.2Ti-low C   Increased workability   17Cr-0.2Ti-low C   Increased workability   17Cr-0.3Ti-low C   Increased workability   Addition of transium and nicibium   NSS 432   Addition of transium and nicibium   NSS 432T				17Cr-Nb-low C		19Cr-0.5Cu-Nb-extremely low C		17Cr-1.4Cu-Ti-Nb-extremely low C
Addition of 0.5 molybdenum	SUS430		Addition of titanium	NSS 430M2		NSS ID-1		NSS 439
Corrosion resistance  18Cr-0.5Mo-Nb-extremely low C  Addition of 1 molybdenum, niobium and titanium  Corrosion resistance  18Cr-0.5Mo-Nb-extremely low C  18Cr-1Mo-Ti-extremely low C  18Cr-1Mo-Ti-extremely low C  Increased workability  18Cr-1Mo-Ti-Nb-extremely low C  Addition of 2 molybdenum			Increased workability	17Cr-0.2Ti-low C		17Cr-Ti-Nb-low C		17Cr-0.3Ti-low C
Addition of 1 molybdenum, niobium and titanium  Corrosion resistance  18Cr-1Mo-Ti-extremely low C  Addition of 2 molybdenum				NSS 432		NSS 432T		
niobium and titanium  Corrosion resistance  18Cr-1Mo-Ti-extremely low C  Addition of 2 molybdenum and niobium  NSS 444N  High corrosion resistance  19Cr-2Mo-Nb-extremely low C  Increase in chromium content, addition of molybdenum and niobium  NSS U-1  18Cr-2Mo-Ti-extremely low C  Increase in chromium content, addition of molybdenum and niobium  NSS U-22  Compound addition of titanium and niobium  NSS U-1  Increase in chromium content, addition of molybdenum content, addition of molybdenum content resistance  22Cr-2Mo-Nb-extremely low C  Increase in chromium content, addition of molybdenum content resistance at welds  18Cr-1Mo-Ti-extremely low C  Increase in chromium content, addition of molybdenum content resistance at welds  24Cr-0.5Mo-Ti-Nb-extremely low C  Ultra-high corrosion  30Cr-2Mo-Ti-Nb-extremely low C			Corrosion resistance	18Cr-0.5Mo-Nb-extremely low C		18Cr-0.5Mo-Ti-extremely low C		
Addition of 2 molybdenum and niobium  NSS 444N  High corrosion resistance  19Cr-2Mo-Nb-extremely low C  Increase in chromium content, addition of molybdenum and niobium  NSS U-22  Compound addition of titanium and niobium  NSS 445M2  Increase in chromium content, molybdenum content, addition of molybdenum and niobium  NSS WCR  22Cr-2Mo-Nb-extremely low C  Increase in chromium content, addition of molybdenum con						NSS 436		NSS 436M1
and niobium  NSS 444N  High corrosion resistance  19Cr-2Mo-Nb-extremely low C  Increase in chromium content, addition of molybdenum and niobium  NSS U-22  Compound addition of trainium and niobium  NSS 445M2  Increase in chromium content, reduction in molybdenum content, molybdenum content molybde			Corrosion resistance			18Cr-1Mo-Ti-extremely low C		18Cr-1Mo-Ti-Nb-extremely low C
High corrosion resistance  19Cr-2Mo-Nb-extremely low C  Increase in chromium content, addition of molybdenum and nicbium  NSS U-22  Compound addition of trainium and nicbium  NSS 445M2  Increase in chromium content, reduction in molybdenum content, addition of molybdenum content in molybdenum content, addition of molybdenum content, addition				NSS 444N	titanium	NSS U-1		
Increase in chromium content, addition of molybdenum and niobium  High corrosion resistance  22Cr-2Mo-Nb-extremely low C  Increase in chromium content, addition of molybdenum content resistance  22Cr-2Mo-Nb-extremely low C  Increase in chromium content, addition of molybdenum content,				19Cr-2Mo-Nb-extremely low C		18Cr-2Mo-Ti-extremely low C		
resistance 22CF-2MO-ND-extremely low C Increase in chronium content, addition of nolybdenum Compound addition of nolybdenum Compound addition of than and nichium Ultra-high corrosion 30Cr-2Mo-Ti-Nb-extremely low C				NSS U-22		NSS 445M2	content, reduction in	NSS WCR
addition of molybdenum Compound addition of that the state of the stat				22Cr-2Mo-Nb-extremely low C	Increase in chromium content.	22Cr-1Mo-Ti-Nb-extremely low C		24Cr-0.5Mo-Ti-Nb-extremely low C
					addition of molybdenum Compound addition of	NSS 447M1		
						30Cr-2Mo-Ti-Nb-extremely low C		

# **Example 2** Characteristics and Applications

### 1.Characteristics and Applications

	Stee	I type			Major Chem	ical Composition	ı (%)	
Classification	Nisshin (NSS)	JIS (SUS)	С	Ni	Cr	Мо	Others	
		SUS301	≦0.15	6.00~ 8.00	16.00~18.00			
		SUS301L	≦0.030	6.00~ 8.00	16.00~18.00		N≦0.20	
		SUS304	≦0.08	8.00~10.50	18.00~20.00			
		SUS304N1	≦0.08	7.00~10.50	18.00~20.00		N: 0.10~0.25	
		SUS304L	≦0.030	9.00~13.00	18.00~20.00			
	NSS 304M2		≦0.03	6.50~ 8.50	15.50~17.50		Cu: 1.50~2.50	
	NSS 304M3		≦0.06	6.40~ 8.00	15.00~17.00		Cu: 1.50~2.50	
	NSS 304ES		≦0.03	7.00~ 9.00	16.00~18.00		Cu: 2.80~3.80	
	NSS D-5	(SUS304)	≦0.08	9.00~10.50	18.00~20.00		S≦0.030	
	NSS 304S		≦0.08	8.00~10.50	18.00~20.00			
	NSS XM7		≦0.05	8.50~10.00	18.00~20.00		Cu: 2.50~4.00	
	NSS D-8		≦0.06	11.50~13.50	15.50~19.00		Cu: 3.00~4.00	
		SUS305	<b>≦</b> 0.12	10.50~13.00	17.00~19.00			
	NSS 305M1		≦0.08	11.00~13.00	15.00~17.00		Mn: 2.00~4.00	
Austenitic type	NSS 305M3		≦0.08	11.00~13.50	18.00~20.00		Mn: 2.00~4.00 N: 0.10~0.20	
		SUS316	≦0.08	10.00~14.00	16.00~18.00	2.00~3.00		
		SUS316L	≦0.030	12.00~15.00	16.00~18.00	2.00~3.00		
		SUS317L	≦0.030	11.00~15.00	18.00~20.00	3.00~4.00		
	NSS M1C NSS SCR-M		C≦0.05	9.50~10.50	17.00~18.00	0.70~1.50	Si: 0.50~2.50 Cu: 2.50~3.50	
	NSS SCR		≦0.07	11.50~13.50	18.00~19.50	0.50~1.50	Si: 2.50~4.00 Cu: 1.50~2.50	
		SUS321	≦0.08	9.00~13.00	17.00~19.00		Ti≧5×C	
	NSS 302B		≦0.15	8.00~10.00	17.00~19.00		Si: 2.00~3.00	
	NSS ER-1		≦0.07	12.00~13.50	18.50~20.00		Nb: 0.05~0.20 Si: 3.00~4.00	
	NSS ER-4		≦0.07	12.00~13.50	16.00~18.00	2.00~3.00	Si: 2.00~3.00	
		SUS309S	≦0.08	12.00~15.00	22.00~24.00			
	NSS 309B		≦0.15	14.00~16.00	22.00~24.00		Si: 1.50~2.50	
		SUS310S	≦0.08	19.00~22.00	24.00~26.00			
	NSS D-21	(SUS304J2)	≦0.08	6.00~ 9.00	15.00~18.00		Mn: 3.00~5.00 Cu: 1.00~3.00	
	NSS R-4	(SUS329J1)	≦0.08	3.00~ 6.00	23.00~28.00	1.00~3.00		
Two-phase type	NSS R-3	(SUS329J3L)	C≦0.030	4.50~ 6.50	22.00~23.00	3.00~3.50	N:0.14~0.20	
		SUS329J4L	C≦0.030	5.50~ 7.50	24.00~26.00	2.50~3.50	N:0.08~0.30	

When both NSS and SUS apply, the NSS standards (composition, characteristics) are shown preferentially.

	Physical <sub> </sub>	oroperties			Mechanical	properties	
0 '" ''	E1 .: (C: )	Average thermal	Thermal conductivity		Tension test		Hardness test
Specific gravity kg/(mm·m²)	Elastic coefficient ×10 <sup>3</sup> N/mm <sup>2</sup>	expansion coefficient ×10°cm/cm/°C 20~100°C	W/m·°C 100°C	Durability N/mm²	Tensile strength N/mm²	Elongation %	HV
7.93	194	16.9	16.3	≧205	≧520	≧40	≦218
7.93	194	16.9	16.3	≧215	≥550	≥45	≦218
7.93	194	17.3	16.3	≧205	≧520	≧40	≦200
7.93	194	16.9	16.3	≧275	≥550	≧35	≦220
7.93	194	17.3	16.3	≥175	≧480	≧40	≦200
7.93	187	17.3	16.3	≦335	≦660	≥50	≦175
7.93	187	17.3	16.3	≥180	≥500	≧40	≦200
7.93	199	17.2	15.1	≥155	≧450	≧40	<b>≦</b> 170
7.93	193	17.0	17.0	≥205	≧520	≧40	≦200
7.93	194	17.3	16.3	≥205	≧520	≧40	≦200
7.93	194	17.3	16.7	≥205	≥510	≧40	≦200
7.93	193	17.0	16.7	≥175	≧450	≧40	<b>≦</b> 150
7.93	197	17.3	16.3	≥175	≧480	≧40	≦200
7.93	194	17.3	16.3	≧175	≧480	≧40	≦200
7.93	193	16.5	16.3	≧275	≥550	≧35	≦220
7.98	194	16.0	16.0	≥205	≧520	≧40	≦200
7.98	193	16.0	16.0	≥175	≧480	≧40	≦200
7.98	193	16.0	17.0	≧175	≧480	≧40	≦200
7.98	193	16.0	17.0	≧205	≧520	≧40	≦200
7.75	194	16.7	16.0	≧255	≧520	≧45	≦220
7.93	193	16.7	22.0	≧205	≧520	≧40	≦200
7.93	193	16.2	15.8	≧205	≧520	≧40	≦220
7.75	204	15.5	14.6	≧255	≥520	≥45	≦220
7.95	182	14.5	14.3	≧205	≥520	≧40	≦220
7.98	200	15.0	14.0	≧205	≥520	≧40	≦200
7.98	193	15.0	15.0	≥205	≥560	≥40	≦218
7.98	205	14.4	14.1	≧205	≧520	≧40	≦200
7.93	190	17.0	16.0	≧155	≧450	≧40	≦200
7.80	193	12.8	21.0	≧390	≧590	≧18	≦292
7.80	190	11.5	19.0	≧450	≧620	≧18	≦320
7.80	190	11.5	19.0	≧450	≧620	≧18	≦320

## 2.Characteristics and Applications

	Steel	type			Major Chem	cal Composition	(%)	
Classification	Nisshin (NSS)	JIS (SUS)	С	Ni	Cr	Мо	Others	
		SUS405	≦0.08	≦0.60	11.50~14.50		AI:0.10~0.30	
		SUH409	≦0.08	≦0.60	10.50~11.75		Ti:6×C~0.75	
	NSS 409M1		≦0.030	≦0.50	10.50~12.00		Ti:5× (C+N) ~0.75	
	NSS 409M1S		≦0.030	≦0.50	10.50~12.50		Si≦0.30 Ti:5×(C+N)~0.75	
	NSS 410M1	(SUS410L)	≦0.030	≦0.60	11.50~13.50			
	NSS HR-1		≦0.030	≦0.60	13.55~15.50		Si:0.70~1.50 Nb:0.20~0.80 N≤0.025	
	NCA-2		≦0.050	≦0.60	11.50~13.50		AI:0.50~2.00 Si:1.00~2.00 Ti≦0.30	
	NCA-1		≦0.030	≦0.60	17.00~19.00		AI:2.00~4.00 Ti≦0.50	
	NSS EM-C		≦0.030	≦0.60	16.00~19.00		Cu:1.30~1.70 Ti:0.10~0.30 Nb:0.40~0.65 N≤0.020	
	NSS EM-2		≦0.020	≦0.60	17.50~20.00	1.75~2.50	Mn:0.70~1.50 Nb:0.30~0.55 N≦0.020	
		SUS430	≦0.12	≦0.60	16.00~18.00			
	NSS 430M2		≦0.050	≦0.60	16.00~18.00		Ti:5(C+N)~1.00	
	NSS ID-1		≦0.030	≦0.60	16.00~19.00		Ti:0.10~0.50 Nb:0.10~0.50 N≤0.025	
Ferritic type	NSS 439		≦0.030	≦0.60	17.00~18.00		Ti:10× (C+N) ~0.80	
	NSS 430M4	(SUS430LX)	≦0.030	≦0.60	16.00~18.00		Nb:0.20~0.65	
	NSS 442M3		≦0.030	≦0.60	18.00~20.00		Cu:0.30~0.80 Nb:7×(C+N)+0.15~0.80	
	NSS 432	(SUS436J1L)	≦0.025	≦0.60	17.00~19.00	0.45~0.65	Nb:8×(C+N)~0.80 N≤0.020	
	NSS 432T		≦0.025	≦0.60	17.00~19.00	0.45~0.65	Ti:8×(C+N)~0.80 N≤0.020	
	NSS 436		≦0.025	≦0.60	17.00~19.00	0.50~1.50	Ti:8×(C+N)~0.80 N≤0.025	
	NSS 436M1		≦0.025	≦0.60	17.00~19.00	0.50~1.50	Ti:0.05~0.50 Nb:0.10~0.50 N≤0.025	
	NSS 444N	(SUS444)	≦0.020	≦0.60	17.50~20.00	1.75~2.50	Nb:10×(C+N)~0.80 N≦0.020	
	NSS U-1		≦0.025	≦0.60	17.00~20.00	1.75~2.50	Ti:8× (C+N) ~0.80 N≤0.025	
	NSS 445M2	(SUS445J1)	≦0.020	≦0.60	21.00~23.00	1.00~1.50	Ti:0.05~0.50 Nb:0.10~0.60 N≤0.025	
	NSS U-22	(SUS445J2)	≦0.025	≦0.60	21.00~24.00	1.50~2.50	Nb:8× (C+N) ~0.80 N≤0.025	
	NSS WCR		≦0.020	≦0.80	23.00~25.00	0.30~0.80	Ti:0.05~0.50 Nb:0.05~0.50 N≤0.025	
	NSS 447M1		≦0.020	≦0.50	28.50~32.00	1.50~2.50	N≦0.020	
		SUS403	≦0.15	≦0.60	11.50~13.00		Si≦0.50	
		SUS410	≦0.15	≦0.60	11.50~13.50			
		SUS410S	≦0.08	≦0.60	11.50~13.50			
	NSS 410M4		0.04~0.10	≦0.60	11.50~13.50		Si:0.10~0.40 Mn:0.50~1.00 Cu≦0.50 N:0.005~0.050	
Martensitic type	NSS 410M5		0.03~0.06	≦0.60	11.50~12.10	Mo≦0.50	Cu:0.70~0.90	
		SUS420J2	0.26~0.40	≦0.60	12.00~14.00			
	NSS WR-1		0.20~0.40	≦0.50	12.00~14.00	Mo≦0.50	Cu≦0.50 Nb:0.30~0.50	
	NSS HT980		0.03~0.06	3.00~5.00	12.00~14.00		Ti:0.15~0.50 N≦0.020	
		SUS630	≦0.07	3.00~5.00	15.00~17.50		Cu:3.00~5.00 Nb:0.15~0.45	
Precipitation		SUS631	≦0.09	6.50~7.75	16.00~18.00		AI:0.75~1.50	_
hardening type	NSS HT1770		≦0.09	6.50~7.75	13.50~15.50		Si:1.00~2.00 Cu:0.40~1.00 Ti:0.20~0.65	_
	NSS HT2000		0.050~0.100	7.80~8.80	13.00~14.00	1.80~2.70	Si:2.20~3.20 Cu≦0.50	
Multi-phase type	NSS 431DP-2		≦0.08	1.00~3.00	16.00~18.00			_

When both NSS and SUS apply, the NSS standards (composition, characteristics) are shown preferentially.

	Physical	properties	Mechanical properties				
0 10 1	E1	Average thermal	Thermal conductivity		Tension test		Hardness test
Specific gravity kg/(mm·m²)	Elastic coefficient ×10°N/mm²	expansion coefficient ×10°cm/cm/°C 20~100°C	W/m·℃ 100℃	Durability N/mm²	Tensile strength N/mm²	Elongation %	HV
7.75	202	10.8	23.8	≥175	≥410	≧20	≦200
7.75	202	9.9	23.8	≧175	≧360	≧22	≦175
7.75	202	9.9	23.8	≧195	≧360	≧25	≦170
7.75	202	9.9	23.8	≧175	≧360	≧25	≦150
7.75	202	9.9	23.8	≧195	≧360	≧25	≦170
7.75	211	11.0	21.9	≧195	≧360	≧22	≦230
7.65	201	10.0	23.8	_	≧490	≧20	≦220
7.35	201	10.0	18.8	_	≧490	≧20	≦220
7.75	210	10.9	20.6	≧245	≧410	≧25	≦215
7.70	206	9.9	21.9	≧245	≧410	≧20	≦230
7.70	201	10.4	26.2	≧205	≧420	≧22	≦200
7.70	197	10.4	26.2	≦360	≧410	≧28	≦170
7.70	197	10.4	26.2	≧175	≧360	≧22	≦200
7.70	197	10.4	26.2	≧205	≧390	≧25	≦200
7.70	201	10.4	26.0	≧205	≥450	≧22	≦200
7.70	201	10.4	26.2	≧205	≧450	≧22	≦200
7.70	202	10.4	26.2	≧205	≧390	≧25	≦170
7.70	202	10.4	26.2	≧205	≧390	≧25	≦170
7.70	202	10.4	26.2	_	≧410	≧22	≦200
7.70	202	10.4	26.2	≧210	≧410	≧22	≦200
7.75	199	10.0	22.5	≧205	≥450	≧22	≦200
7.75	200	10.4	25.0	≧245	≧410	≧20	≦230
7.75	199	10.0	22.5	≥205	≧450	≧22	≦220
7.73	206	10.6	21.0	≧245	≧410	≧20	≦230
7.65	213	10.1	19.4	≧205	≧450	≧22	≦220
7.64	210	9.7	17.8	≧295	≧450	≧22	≦220
7.75	202	9.9	23.8	≧205	≧440	≧20	≦210
7.75	202	9.9	23.8	≧205	≧440	≧20	≦210
7.75	202	9.9	23.8	≧205	≧410	≧20	≦200
7.75	202	9.9	23.8	≧205	≧410	≧20	≦200
7.75	203	10.1	24.3	≧205	≧410	≧20	≦200
7.75	202	10.3	23.8	≧225	≥540	≧18	≦247
7.75	201	10.3	24.9	≧225	≥540	≧18	≦247
7.75	203	10.8	20.5	≧735	≧880	≧3	≧290
7.80	196	11.6	18.0	_	_	_	_
7.93	200	16.5	16.0	≦380	≦1030	≧20	≦200
7.75	207	10.9	24.9	_	_	_	_
7.80	200	14.0	20.8	_	_	_	_
7.73	201	10.5	19.9	_	_	_	340~400

## 3.Characteristics and Applications

	Stee	type		
Classification	Nisshin (NSS)	JIS (SUS)	Characteristics	Applications
		SUS301	High strength can be obtained by cold rolling.	Steel belts, metal gaskets, springs
		SUS301L	Lower carbon content than type 301, high resistance to intergranular corrosion, high weldability	Railway vehicles
		SUS304	Typical austenitic stainless steel widely used as heat resistant steel	Receptacles, kitchen equipment, food equipment, building materials, general chemical equipment
		SUS304N1	Strength increased by adding nitrogen to type 304 while keeping its ductility	Structural strengthening members, Hume pipe collars
		SUS304L	Lower carbon content than type 304, high resistance to intergranular corrosion	Parts that cannot be subjected to heat treatment after welding
	NSS 304M2		Deep drawability, stretchability, and season cracking resistance increased by adding silicon and copper to type 304L	Receptacles, doorknobs, sink bowls
	NSS 304M3		Superior to type 304M2 in terms of high-speed bulging formability	Gas burner parts, intricately-shaped workpieces
	NSS 304ES		Extremely soft and superior in deep drawability, cold forgeability, and shape fixability	Deep drawing sensor cases, fine blanking materials
	NSS D-5	(SUS304)	Suitable for harsh processing with hole expandability made better than type 304	Receptacles
	NSS 304S		High softness and good workability obtained by adding copper to type 304	Coins, western tableware
	NSS XM7		Low magnetic material with high cold workability obtained by adding copper to type 304	Cold forging
	NSS D-8		Less cold work hardenability than type XM7, non-magnetic, suitable for cold closed die forging, etc. $ \\$	Deep drawing sensor cases
		SUS305	Less work hardenability than type 304, suitable for spinning, etc.	Cold forging
	NSS 305M1		Extremely deep drawing is possible. In addition, non-magnetism is maintained even after processing.	Electronic parts
Austenitic type	NSS 305M3		High-strength non-magnetic steel with high spring characteristics which remains non- magnetic even after processing	Non-magnetic springs, electronic parts
radionale type		SUS316	More corrosion resistant than type 304 to seawater and other solutions	Chemical and papermaking industries
		SUS316L	Lower in carbon content and more intergranular corrosion resistant than type 316	Chemical, papermaking, dye, and fertilizer industries
		SUS317L	Lower in carbon content than type 317, more corrosion resistant than type 316, superior in intergranular corrosion resistance	Chemical plants
	NSS M1C NSS SCR-M		Molybdenum saving stainless steel superior in stress corrosion cracking resistance, and equal in corrosion resistance with type 316	Hot water boilers, electric water heaters
	NSS SCR		Superior in stress corrosion cracking resistance, equal in crevice corrosion resistance with type 316	Hot water boilers, interior piping
		SUS321	Intergranular corrosion resistance and heat resistance increased by adding titanium to type 304. Not suitable for decorative parts.	Welding structural elements
	NSS 302B		Equal in oxidation resistance and strength with type 310S at temperatures not higher than 900°C	Automobile exhaust manifolds, flexible tubes
	NSS ER-1		Equal in oxidation resistance with type 310S	Automobile exhaust manifolds, burning parts
	NSS ER-4		High temperature salt corrosion resistance and chloride molten salt corrosion resistance	Automobile flexible tubes, incinerators
		SUS309S	Superior to type 304 in terms of high temperature oxidation resistance and corrosion resistance	Heating furnace parts, heat treatment vessels
	NSS 309B		Higher silicon content than type 309S. Higher than or equal to type 310S in terms of high temperature oxidation resistance	Plate tile firing jigs, heat treatment vessels
		SUS310S	Superior in oxidation resistance to type 309S. Used as heat-resistant steel in many cases.	Combustion chamber parts, nitric acid tanks
	NSS D-21	(SUS304J2)	As low in cold work hardenability and magnetism as type XM7	Western tableware, receptacles, spinning artifacts
	NSS R-4	(SUS329J1)	Superior in pitting corrosion resistance in chloride environment and in corrosion resistance in urea, phosphoric acid, and sour gas environments.	Chemical fertilizers, seawater heat exchangers
Two-phase type	NSS R-3	(SUS329J3L)	Superior in pitting corrosion resistance in chloride environment. Higher in molybdenum and nitrogen content, in strength, and in corrosion resistance than type R-4	Seawater desalination units
		SUS329J4L	Superior in pitting corrosion resistance in chloride environment. Higher in chromium and nickel content and in corrosion resistance than type R-3.	Water storage tanks, chemical fertilizers, seawater heat exchangers

Classification  Nisshin (NSS)		Steel	l type		
SUH409	Classification			Characteristics	Applications
NSS 409MI (SUS401)  NSS EM-C (Molydeam-free 18C-15-CM-H-M-bt steel with superior high temperature oxidation resistance than type NCA-2  NSS EM-C (Molydeam-free 18C-15-CM-H-bt steel with superior hemal fatigue characteristics and the characteristics of the steel with superior high temperature oxidation resistance than type NCA-2  NSS EM-C (Molydeam-free 18C-15-CM-H-bt seel with superior hemal fatigue characteristics and the characteristics of the steel darkers, estitive elements that characteristics and the steel darkers with superior high temperature oxidation resistance than type NCA-2  NSS EM-C (Molydeam-free 18C-15-CM-H-bt seel with superior hemal fatigue characteristics and the characteristics of the steel darkers and the steel developed by removing molydeam inform type 432. Highly corrosion resistance and salt corrosion  NSS 400MI (SUS400). Developed by adding steel with high corrosion resistance and salt corrosion resistance in the value of the steel steel steel superior in corrosion resistance in the value of the steel stee			SUS405	Weldability and workability increased by adding aluminum to type 410	Oil refining distillation column trays
NSS 409MIS   Formability increased by reducing silicon content in type 40MI   SUS410L   Developed by reducing carbon content in type 410 for increased weld   Developed by reducing carbon content in type 410 for increased weld   NSS 410MI   SUS440L   Developed by reducing carbon content in type 410 for increased weld   Property			SUH409		Automobile exhaust pipes
NSS 410M		NSS 409M1		Lower carbon content than type 409 with improved intergranular corrosion resistance, oxidation resistance, and radio-frequency weldability	Automobile exhaust pipes
NSS 41M1   SUSHILU   Dendability and workability   Dendability and workability   NSS HR-1   High host resistant 14-Or-Si-Mr-Nb steel with superior high temperature oxidation resistance   NaCA-1   13C1-15S-H steel with superior high temperature oxidation resistance   Heat chambers, resistave elements   NSS EM-2   13C1-15S-H steel with superior high temperature oxidation resistance   Heat chambers, resistave elements   NSS EM-2   NoS EM		NSS 409M1S			Automobile exhaust pipes
NSS Pin-1  NCA-2  13C1-13S-14 Islated with superior high temperature oxidation resistance  NCA-1  13C-343 steel with superior high temperature oxidation resistance  NSS EM-C  NSS EM-C  NoS EM-C  NoS EM-C  13C-248-04N-No steel with superior high temperature excidation resistance than type NCA-C  NSS EM-C  13C-248-04N-No steel with superior high temperature strength and scale peeling resistance  SUS430  Typical all-purpose ferritic stainless steel with high corrosion resistance  NSS 10-1  NSS 430M2  NSS 10-1  NSS 430M2  Developed by adding titarium to type 430 for increased workability and comosion resistance  NSS 430M2  NSS 430M3  VA stainless steel developed by removing molybdenum from type 432. Highly Automobile exhaust manifolds  NSS 430M3  NSS 430M4  (SUS430, believe the widelility to type 430M and 430M due to compound addition of nichium and trianum) are related appliance parts  NSS 430M4  NSS 442M3  NSS 442M3  NSS 442M3  Developed by adding inclumin to type 430 for increased workability.  NSS 442M3  NSS 442M3  NSS 443M4  NSS 443M4  NSS 444M3  NSS 444M4  NSS 444M3  NSS 445M2  NSS 445M2  NSS 445M2  NSS 447M1  NSS 447M2  NSS 447M1  NSS 447M2  NSS		NSS 410M1	(SUS410L)	bendability and workability	Construction materials, receptacles
NCA-1 18C-A3I steel with superior high temperature oxidation resistance than type NCA-2 Note that chambes, residive elements, flexible heating sheets NSS EM-C Molybdenum-free 18C-15Cu-Nb-T steel with superior thermal fatigue characteristics. Automobile exhaust manifolds NSS EM-2 SUS430 Typical all-purpose ferritic stainless steel with high corrosion resistance NSS 430W2 Developed by adding filtanium to type 440 for increased workability and corrosion resistance Policy in whichility to be compound addition of inclinal and tribural interiors, household appliances, the provision resistance of the corrosion resistance or the corrosion resista		NSS HR-1			Automobile exhaust manifolds
NSS EM-C   Molybdenum-free 18Cr-1.5Cu-Nb-Ti steel with superior thermal fatigue characteristics   Automobile exhaust manifolds		NCA-2		13Cr-1.5Si-1Al steel with superior high temperature oxidation resistance	Heat chambers, resistive elements
NSS EM-2   180-2Mc-Mn-Nb steel with superior high temperature strength and scale peeling resistance   Automobile exhaust manifolds		NCA-1		18Cr-3Al steel with superior high temperature oxidation resistance than type NCA-2	Heat chambers, resistive elements, flexible heating sheets
Ferritic type  RS 430M2  Developed by adding trianium to type 430 for increased workability and consolon resistance by RS 250 specific in workability to type 430M2 and 430M4 due to compound addition of nicibum and trianium on the part of the property of				Molybdenum-free 18Cr-1.5Cu-Nb-Ti steel with superior thermal fatigue characteristics	Automobile exhaust manifolds
Ferritic type  Ferrit		NSS EM-2		18Cr-2Mo-Mn-Nb steel with superior high temperature strength and scale peeling resistance	
Ferritic type    NSS ID-1   Superior in workability to types 430M2 and 430M4 due to compound addition of nicbium and titanium NSS 4399   VA stainless steel developed by removing monity document from type 432. Highly NSS 430M4   SUS430M2   Developed by adding nicbium to type 430 for increased workability, well-developed by adding nicbium to type 430 for increased workability. Well-developed by adding nicbium to type 430 to provide corrosion resistance enough to replace type 304   NSS 432M3   SUS430M1   SUS430M2			SUS430	Typical all-purpose ferritic stainless steel with high corrosion resistance	
Ferritic type  NSS 439  NSS 439M  NSS 430MA  NSS 430MA  NSS 430MA  NSS 430MA  NSS 430MA  NSS 430MA  NSS 442M3  Poeveloped by adding noblum to type 430 for increased workability, welfability, and corrosion resistance and orrosion resistance and salt corrosion resistance entrolle exhaus types and automobile exh				Developed by adding titanium to type 430 for increased workability and corrosion resistance	Burners, home electrical appliance parts
Ferritic type  NSS 430M4 (SUB430LX)  Developed by adding incibium to type 430 for increased workability, weldability, and corrosion resistance  NSS 442M3  Developed by adding incibium to type 430 for increased workability, weldability, and corrosion resistance  NSS 442M3  Developed by adding copper and niobium to type 430 to provide corrosion resistance enough to replace type 304.  NSS 432  (SUS4361L)  ISC-0.5M-0.5H bete with high corrosion resistance and salt corrosion resistance in an exhaust gas condensation environment NSS 432  NSS 432  ISC-0.5M-0.5H bete with high corrosion resistance and salt corrosion resistance in an exhaust gas condensation environment NSS 436  Superior in corrosion resistance and salt corrosion resistance in an exhaust gas condensation environment NSS 436M1  SUS444M1  NSS 436M1  SUS444M1  Free from stress corrosion resistance to type 436. Superior in workability due to compound addinion of titanium and niobium NSS 445M2  NSS 445M2  NSS 445M2  (SUS445,1)  SUS443,1)  SUS44		NSS ID-1			Sensor cases, sockets and other deep drawing products
NSS 442M3 Developed by adding copper and niobium to type 430 to provide corrosion resistance enough to replace type 304  NSS 432 (SUS436J1L)  NSS 436 Superior in corrosion resistance and salt corrosion resistance in an exhaust gas condensation environment or resistance in an exhaust gas condensation environment of the standard processor in the standard	Ferritic type	NSS 439		corrosion resistant in an exhaust gas condensation environment	Automobile mufflers, elevators
resistance enough to replace type 304  NSS 432 (SUS436J1L)  ISC-0.5Mo-Nb steel with high corrosion resistance and salt corrosion resistance in an exhaust gas condensation environment claddings, oil tanks  ISC-0.5Mo-Nb steel with high corrosion resistance and salt corrosion resistance in an exhaust gas condensation environment  NSS 436 Superior in corrosion resistance to type 436. Superior in workability due to compound addition of titanium and niobium  NSS 436M1 Superior in corrosion resistance to type 436. Superior in workability due to compound addition of titanium and niobium  NSS 444N (SUS444)  NSS 444N (SUS444)  NSS 445M2 (SUS444)  NSS 445M2 (SUS445J1)  NSS 445M2 (SUS445J1)  NSS 445M2 (SUS445J1)  Excellent in corrosion resistance and weather resistance. In particular, this type of steel is superior to type 444 in terms of corrosion resistance to type 444 (SUS445J1)  NSS WCR (SUS445J1)  Superior in corrosion resistance and weather resistance to type 445 corrosion		NSS 430M4	(SUS430LX)	weldability, and corrosion resistance	, ,
NSS 432 (SUS43041L)  NSS 432T		NSS 442M3		resistance enough to replace type 304	automobile exhaust pipes
NSS 4321 resistance in an exhaust gas condensation environment Automobile muliflers, hot water heater claddings, oil tanks Superior in corrosion resistance to type 432. Superior in workability due to compound addition of titanium and nicibium SS 444N (SUS444) Free from stress corrosion cracking. Equal in corrosion resistance to type 436. Superior in workability due to compound addition of titanium and nicibium SS 444N (SUS444) Free from stress corrosion cracking. Equal in corrosion resistance to type 304.  NSS U-1 18Cr-2Mo steel with extremely low carbon content. Superior in corrosion resistance to type 304.  NSS 445M2 (SUS445J1) Sexeellent in corrosion resistance and weather resistance. In particular, this type of steel is superior to type 444N in terms of corrosion resistance in hot water.  NSS WCR Excellent in corrosion resistance and weather resistance to type 444 Again to the water heater bodies. The water heater bodies water heater bodies water heater bodies. The water heater bodies water heater bodies water heater bodies water heater bodies. The water heater bodies and bodies of the heater bodies water heater bodies water heater bodies		NSS 432	(SUS436J1L)	resistance in an exhaust gas condensation environment	
NSS 436M1   Equal in corrosion resistance to type 436. Superior in workability due to compound addition of titanium and niobium		NSS 432T			Automobile mufflers
Compound addition of titanium and niobium   filling members		NSS 436			
NSS U-1 18Cr-2Mo steel with extremely low carbon content. Superior in corrosion resistance to type 304.  NSS U-1 18Cr-2Mo steel with extremely low carbon content. Superior in corrosion resistance in the water heater superior in corrosion resistance and weather resistance. In particular, this type 404.  NSS U-22 (SUS445J2) fixed is superior to type 444N in terms of corrosion resistance in hot water.  NSS U-22 (SUS445J2) High-purity ferritic stainless steel superior in weather resistance to type 444 Roof/exterior building materials water heater bodies. Water heater bodies roof/exterior building materials water host gas as all omitted.  NSS WCR Excellent in corrosion resistance at welds. Welding can be carried out with a back gas seal omitted. Water heater bodies water heater bodies. Water heater bodies water host gas all omitted. Water heater bodies water host gas all omitted. Water heater bodies roof/exterior building materials water host gas all omitted. Water heater bodies water heater bodies roof/exterior building materials. Water front exterior building materials automobile fuel gas treatment equipment valve seats.  Super ferritic stainless steel with low hardenability Spoons, forks.  SUS410 Typical 13Cr stainless steel with low hardenability Spoons, forks.  SUS410 Typical 13Cr stainless steel with low hardenability Spoons, forks.  SUS410 Developed by reducing carbon content in type 410 to 0.08% or less for increased or superior resistance and workability and work hardening properties than 410.  NSS 410M5 Developed by adding copper to type 410M4 for increased shape stability after hardening. Sic brakes  SUS420J2 Higher in carbon content and greater in both hardenability and work hardening properties than 410.  NSS WR-1 Developed by adding niobium to type 420J2 for increased workability and corrosion resistance after hardening seel (17-74PH) developed by the addition of copper. Equal in corrosion resistance and superior in abrasion resistance to type 304.  Precipitation hardening steel (17-74PH) developed by		NSS 436M1		Equal in corrosion resistance to type 436. Superior in workability due to compound addition of titanium and niobium	filling members
resistance to type 304.  NSS 445M2 (SUS445J1)   Resistance and weather resistance. In particular, this type of steel is superior to type 444N in terms of corrosion resistance in hot water.  NSS U-22 (SUS445J2)   High-purity ferritic stainless steel superior in weather resistance to type 444   Roof/exterior building materials   NSS WCR   Excellent in corrosion resistance at welds. Welding can be carried visit a back gas seal omitted.  NSS WCR   Excellent in corrosion resistance to type 445 22Cr steel   Water heater bodies   NSS 447M1   Superior in corrosion resistance to type 445 22Cr steel   Water heater bodies   NSS 447M1   Superior in corrosion resistance to type 445 22Cr steel   Water front exterior building materials   Superior ferritic stainless steel are superior in corrosion resistance to type 445 22Cr steel   Water front exterior building materials   Water front exterior building materials   Water heater bodies   Water front exterior building materials   Water front exterior building materials   Water heater bodies   Water front exterior building materials   Water front exterior building materials   Water heater bodies   Water heater bodies   Water heater bodies   Water front exterior building materials   Water front exterior building materials   Water heater bodies   Water front exterior building materials   Water front exterior building materials   Water heater bodies   Water front exterior building materials   Water front exterior building materials   Water heater bodies   Water front exterior building materials   Water front exterior building materials   Water front exterior building materials   Water heater bodies   Water front exterior building materials   Water front exterior building materials   Water heater bodies   Water front exterior building materials   Water front exterior building m		NSS 444N	(SUS444)		
NSS U-22 (SUS445J2) of steel is superior to type 444N in terms of corrosion resistance in hot water."  NSS U-22 (SUS445J2) High-purity ferritic stainless steel superior in weather resistance to type 444 Roof/exterior building materials  NSS WCR Excellent in corrosion resistance at welds. Welding can be carried out with a back gas seal omitted.  NSS WCR Succellent in corrosion resistance at welds. Welding can be carried out with a back gas seal omitted.  Water front exterior building materials.  Water heater bodies  Water food on thich  Water heater bodies  Water front exterior building materials  Pacer backer  Valve seats  Valve seats  Valve seats  Paceptacles, distillatio		NSS U-1		resistance to type 304.	Hot water heaters
NSS WCR Excellent in corrosion resistance at welds. Welding can be carried out with a back gas seal omitted.  NSS 447M1 Super ferritic stainless steel far superior in corrosion resistance to type 445 22Cr steel suttomobile fuel gas treatment equipment valve seats  SUS403 Developed by reducing silicon content in type 410 so as to be suited for high temperature strength parts  SUS410 Typical 13Cr stainless steel with low hardenability Spoons, forks  SUS410S Developed by reducing carbon content in type 410 to 0.08% or less for increased corrosion resistance and workability  NSS 410M4 The maximum hardness of HRC35 can be obtained by hardening over a wide range of temperatures.  NSS 410M5 Developed by adding copper to type 410M4 for increased shape stability after hardening Disc brakes  SUS420J2 Higher in carbon content and greater in both hardenability and work hardening properties than 410.  NSS WR-1 Developed by adding niobium to type 420J2 for increased workability and properties than 410.  NSS HT980 High strength is achieved by hardening statel (17-4PH) developed by the addition of copper. Equal in corrosion resistance and superior in abrasion resistance to type 304  Precipitation hardening steel (17-4PH) developed by the addition of aluminum. Superior in spring characteristics due to ageing treatment after cold rolling  NSS HT1770 Capable of being subjected to stamping and given high strength through ageing treatment  Ultra-high strength and superior in ductility and fatigue characteristics due to combination of work hardening and precipitation hardening.  Developed by adding niobium to type 420J2 for increased workability and fatigue retarment after cold rolling  NSS HT2000 Ultra-high strength and superior in ductility and fatigue characteristics due to combination of work hardening and precipitation hardening.  Developed by the addition of aluminum. Sheet sensor parts, punching springs  Sheet sensor parts, punching springs  Sheet sensor parts, punching springs		NSS 445M2	(SUS445J1)		Water heater bodies, roof/exterior building materials
NSS 447M1 Super ferritic stainless steel far superior in corrosion resistance to type 445 22Cr steel  SUS403 Developed by reducing silicon content in type 410 so as to be suited for high temperature strength parts  SUS410 Typical 13Cr stainless steel with low hardenability Superior for increased corrosion resistance and workability  NSS 410M5 Developed by reducing carbon content in type 410 to 0.08% or less for increased corrosion resistance and workability  NSS 410M5 Developed by adding copper to type 410M4 for increased shape stability after hardening Disc brakes  Developed by adding copper to type 410M4 for increased shape stability after hardening Disc brakes  SUS420J2 Higher in carbon content and greater in both hardenability and work hardening properties than 410.  NSS WR-1 Developed by adding niobium to type 420J2 for increased workability and corrosion resistance after hardening  NSS HT980 High stength is achieved by hardening starting from 750°C or higher. Little reduction in strength at welds.  Precipitation hardening steel (17-7PH) developed by the addition of aluminum. Superior in abrasion resistance to type 304  Precipitation hardening steel (17-7PH) developed by the addition of aluminum. Superior in spring characteristics due to ageing treatment after cold rolling  NSS HT1770 Capable of being subjected to stamping and given high strength through ageing treatment  Ultra-high strength and superior in ductility and fatigue characteristics due to combination of work hardening and precipitation hardening.  ID saw blades		NSS U-22	(SUS445J2)	High-purity ferritic stainless steel superior in weather resistance to type 444	Roof/exterior building materials
SUS403   Developed by reducing silicon content in type 410 so as to be suited for high temperature strength parts		NSS WCR		Excellent in corrosion resistance at welds. Welding can be carried out with a back gas seal omitted.	**** **** ****
SUS410   Typical 13Cr stainless steel with low hardenability   Spoons, forks		NSS 447M1			
Martensitic type    SUS410S   Developed by reducing carbon content in type 410 to 0.08% or less for increased corrosion resistance and workability			SUS403		Valve seats
Martensitic type    NSS 410M4   The maximum hardness of HRC35 can be obtained by hardening over a wide range of temperatures.			SUS410		Spoons, forks
Precipitation hardening type    NSS HT2000   Developed by adding copper to type 410M4 for increased shape stability after hardening both hardenability and work hardening properties than 410. Table knives, vernier calipers, rulers, scissors   NSS WR-1   Developed by adding niobium to type 420J2 for increased workability and corrosion resistance after hardening   Flat steel heald and other loom parts, edged tools   Steel belts, high-strength materials for welding   Precipitation hardening steel (17-4PH) developed by the addition of copper. Equal in corrosion resistance and superior in abrasion resistance to type 304   Precipitation hardening steel (17-7PH) developed by the addition of aluminum   Superior in spring characteristics due to ageing treatment after cold rolling   Springs, washers, meter gauge parts   Sheet sensor parts, punching springs   Sheet sensor parts, punching springs   ID saw blades   I			SUS410S	Developed by reducing carbon content in type 410 to 0.08% or less for increased corrosion resistance and workability	Receptacles, distillation column trays
SUS420J2 Higher in carbon content and greater in both hardenability and work hardening properties than 410.  NSS WR-1 Developed by adding niobium to type 420J2 for increased workability and corrosion resistance after hardening  NSS HT980 High strength is achieved by hardening starting from 750°C or higher. Little reduction in strength at welds.  SUS630 Precipitation hardening steel (17-4PH) developed by the addition of copper. Equal in corrosion resistance and superior in abrasion resistance to type 304  Precipitation hardening steel (17-7PH) developed by the addition of aluminum Superior in abrasion resistance to type 304  SUS631 Sus631 Precipitation hardening steel (17-7PH) developed by the addition of aluminum Superior in spring characteristics due to ageing treatment after cold rolling  NSS HT1770 Capable of being subjected to stamping and given high strength through ageing treatment  Ultra-high strength and superior in ductility and fatigue characteristics due to combination of work hardening and precipitation hardening.  I able knives, vernier calipers, rulers, scissors  Flat steel heald and other loom parts, edged tools  Steel belts, high-strength materials for welding  Press plates, steel belts  Springs, washers, meter gauge parts  Sheet sensor parts, punching springs  Ultra-high strength and superior in ductility and fatigue characteristics due to combination of work hardening and precipitation hardening.  I able knives, vernier calipers, rulers, scissors	Martensitic type	NSS 410M4		The maximum hardness of HRC35 can be obtained by hardening over a wide range of temperatures.	Disc brakes
NSS WR-1  Developed by adding niobium to type 420J2 for increased workability and corrosion resistance after hardening  NSS HT980  High strength is achieved by hardening starting from 750°C or higher. Little reduction in strength at welds.  Steel belts, high-strength materials for welding  Precipitation hardening steel (17-4PH) developed by the addition of copper. Equal in corrosion resistance and superior in abrasion resistance to type 304  Precipitation hardening steel (17-7PH) developed by the addition of aluminum Superior in spring characteristics due to ageing treatment after cold rolling  NSS HT1770  Capable of being subjected to stamping and given high strength through ageing treatment  Ultra-high strength and superior in ductility and fatigue characteristics due to combination of work hardening and precipitation hardening.  ID saw blades	•	NSS 410M5		Developed by adding copper to type 410M4 for increased shape stability after hardening	Disc brakes
NSS HT980   High strength is achieved by hardening starting from 750°C or higher. Little reduction in strength at welds.  SUS630   Precipitation hardening steel (17-4PH) developed by the addition of copper. Equal in corrosion resistance and superior in abrasion resistance to type 304   Precipitation hardening steel (17-7PH) developed by the addition of aluminum. Superior in spring characteristics due to ageing treatment after cold rolling   NSS HT1770   Capable of being subjected to stamping and given high strength through ageing treatment   NSS HT2000   Ultra-high strength and superior in ductility and fatigue characteristics due to combination of work hardening and precipitation hardening.			SUS420J2		Table knives, vernier calipers, rulers, scissors
Precipitation hardening steel (17-4PH) developed by the addition of copper. Equal in corrosion resistance and superior in abrasion resistance to type 304 Precipitation hardening steel (17-7PH) developed by the addition of aluminum. Superior in spring characteristics due to ageing treatment after cold rolling NSS HT1770 NSS HT2000  Precipitation hardening steel (17-7PH) developed by the addition of aluminum. Superior in spring characteristics due to ageing treatment after cold rolling Capable of being subjected to stamping and given high strength through ageing treatment Ultra-high strength and superior in ductility and fatigue characteristics due to combination of work hardening and precipitation hardening.  Press plates, steel belts Springs, washers, meter gauge parts Sheet sensor parts, punching springs ID saw blades		NSS WR-1		Developed by adding niobium to type 420J2 for increased workability and corrosion resistance after hardening	Flat steel heald and other loom parts, edged tools
Precipitation hardening type  NSS HT2000  NSS HT2000  NSS HT2000  Requal in corrosion resistance and superior in abrasion resistance to type 304 Precipitation hardening steel (17-7PH) developed by the addition of aluminum. Superior in spring characteristics due to ageing treatment after cold rolling treatment after cold rolling Superior in spring characteristics due to ageing treatment after cold rolling Superior in ductility and fatigue characteristics due to Combination of work hardening and precipitation hardening.  Press plates, steel belts  Springs, washers, meter gauge parts  Sheet sensor parts, punching springs  ID saw blades		NSS HT980			Steel belts, high-strength materials for welding
Precipitation hardening type  NSS HT12000  NSS HT2000			SUS630	Equal in corrosion resistance and superior in abrasion resistance to type 304	Press plates, steel belts
NSS HT2000 Ultra-high strength and superior in ductility and fatigue characteristics due to combination of work hardening and precipitation hardening.			SUS631		Springs, washers, meter gauge parts
combination of work hardening and precipitation hardening.	nardening type	NSS HT1770			Sheet sensor parts, punching springs
Multi-phase type NSS 431DP-2 Multi-phase steel with high strength that can replace type 301 and 304 spring materials Finishing hardware, press plates, brakes		NSS HT2000			ID saw blades
	Multi-phase type	NSS 431DP-2		Multi-phase steel with high strength that can replace type 301 and 304 spring materials	Finishing hardware, press plates, brakes



### 1.Hot- and cold-rolled products

### (1) JIS Standards (JIS G 4304, JIS G 4305)

Classification	Finish Symbol	Finish Description
Hot-rolled products	No.1	Subjected to heat treatment and pickling, or other similar treatments after hot rolling
	No.2D	Subjected to heat treatment and pickling, or other similar treatments after cold rolling
	No.2B	Subjected to heat treatment and pickling, or other similar treatment after cold rolling and then lightly cold-rolled so as to obtain appropriate luster surface finish
	No.3	Polished with an endless belt of P100 to P120 specified in JIS R 6010
Cold-rolled	No.4	Polished with an endless belt of P150 to P180 specified in JIS R 6010
products	#240	Polished with an endless belt of P240 specified in JIS R 6010
	#320	Polished with an endless belt of P320 specified in JIS R 6010
	#400	Polished with an endless belt of P400 specified in JIS R 6010
	BA	Subjected to bright heat treatment after cold rolling
	HL	Polished with appropriate abrasives so as to obtain continuous polishing marks

Note: Please refer to the sample books for the standard surface finish and skin sample. Surface finishes other than shown in the above table may be made if agreed between the purchaser and the supplier.

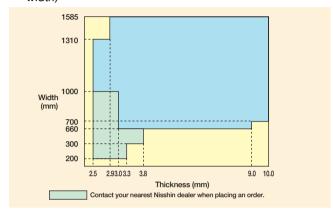
### (2) Nisshin Standards

Classification	Finish Symbol	Finish Description					
Hot-rolled products	CG	Finished by grinding with a grindstone of appropriate grid size stipulated in JIS R 6010 after No.1 finish, but not degreased					
	No.2DR	Heat-treated and pickled after cold rolling and then cold-rolled by dull rolls					
	No.2DR-2	Cold-rolled by rolls coarser than No.2DR					
Cold-rolled	No.2BB	Subjected to bright heat treatment or heat treatment and pickling after cold rolling and then cold-rolled so as to obtain appropriate luster surface finish					
products	#400-N	Buffed so as to obtain reflectivity equivalent to that of #400 finish					
	No.7	Buffed so as to obtain reflectivity higher than that of #400 finish					
	No.9	Polished with an endless belt finer than P320					
	Emboss	Provided with an appropriate uneven design on one side (or on both side) by cold rolling					

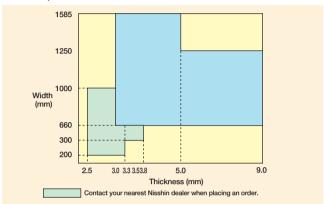
Note: Please refer to the sample books for the standard surface finish and skin sample. The above table shows the surface finishes "to be agreed between the purchaser and the supplier" as defined in JIS.

## Available Sizes

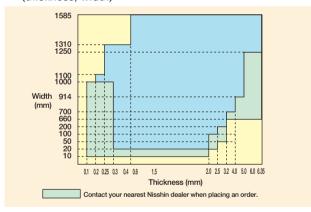
- SUS304, SUS430 (Hot-rolled) Products of sizes other than shown below may be made to order.
- (1) Hot-rolled product Steel strip SUS304/No.1 (thickness, width)



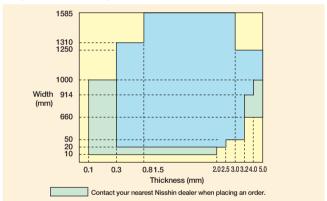
(2) Hot-rolled product – Steel strip SUS430/No.1 (thickness, width)



- SUS304, SUS430 (Cold-rolled) Products of sizes other than shown below may be made to order.
- Cold-rolled product Steel strip SUS304/2B,2D (thickness, width)



(2) Cold-rolled product – Steel strip SUS430/2B,2D (thickness, width)





## **Dimensional Tolerances**

### 1.Hot-rolled products (JIS G 4304)

(1) Thickness (Unit: mm)

Width	Less than 1,000	1,000 or more, less than 1,250	1,250 or more, 1,600 or less
2.50 or more, less than 3.15	±0.30	±0.35	±0.40
3.15 or more, less than 4.00	±0.35	±0.40	±0.45
4.00 or more, less than 5.00	±0.40	±0.45	±0.50
5.00 or more, less than 6.00	±0.50	±0.55	±0.60
6.00 or more, less than 8.00	±0.60	±0.65	±0.65
8.00 or more, 10.00 or less a)	±0.65	±0.65	±0.65

Note: a) Some of the above tolerances may not be achieved, depending on the type of steel and thickness.

### (2) Width (cut edge, machine cutting)

Steel strip (Unit: mm)

Width	Less than 100	100 or more, less than 160	160 or more, less than 250	250 or more, less than 400	400 or more, less than 630	630 or more, less than 1,000	1,000 or more
Less than 6.0	+5, 0	+5, 0	+5, 0	+5, 0	+10, 0	+10, 0	+10, 0
6.0 or more, 9.0 or less	+10, 0	+10, 0	+10, 0	+10, 0	+10, 0	+10, 0	+10, 0

Note: If agreed between the purchaser and the supplier, the value may shift to the negative side within the range identical with the total range of tolerance for width shown in the table.

### (3) Width (mill edge)

(Unit: mm)

Width	630° or more, less than 1,000	1,000 or more
JIS G 4304ª)	+25, 0	+30, 0
Nisshin Standards <sup>b)</sup>	Nisshin Standards <sup>b)</sup> +50, 0	

Notes a) Values not shown in the table may be specified if agreed between the purchaser and the supplier.

b) The Nisshin Standards specify the tolerances "to be agreed between the purchaser and the supplier" as stipulated in Section 9.8 (tolerances for width) of JIS G 4304.

c) Some of the above tolerances may not be achieved, depending on the type of steel.

### Dimensional Tolerances

## 2.Cold-rolled products (JIS G 4305)

### (1) Thickness – ①General

(Unit: mm)

(1) Thiornicos Goriciai		(Onit: Initi)
Width	Thickness	tolerance
Thickness	Less than 1,250	1,250 or more, 1,600 or less
0.16 or more, less than 0.25	±0.03	_
0.25 or more, less than 0.30	±0.04	_
0.30 or more, less than 0.60	±0.05	±0.08
0.60 or more, less than 0.80	±0.07	±0.09
0.80 or more, less than 1.00	±0.09	±0.10
1.00 or more, less than 1.25	±0.10	±0.12
1.25 or more, less than 1.60	±0.12	±0.15
1.60 or more, less than 2.00	±0.15	±0.17
2.00 or more, less than 2.50	±0.17	±0.20
2.50 or more, less than 3.15	±0.22	±0.25
3.15 or more, less than4.00	±0.25	±0.30
4.00 or more, less than 5.00	±0.35	±0.40
5.00 or more, less than 6.00	±0.40	±0.45
6.00	±0.50	±0.50

### Thickness - ②ET

(Unit: mm)

Width	Thickness tolerance						
Thickness	Less than 160	160 or more, less than 250	250 or more, less than 400	400 or more, less than 630	630 or more, less than 1,000	1,000 or more, less than 1,250	1,250 or more, 1,550 or less
0.16 or more, less than 0.25	±0.020	±0.025	±0.030	±0.030	_	_	_
0.25 or more, less than 0.40	±0.025	±0.030	±0.035	±0.035	±0.038	±0.038	_
0.40 or more, less than 0.60	±0.035	±0.040	±0.040	±0.040	±0.040	±0.040	±0.05
0.60 or more, less than 0.80	±0.040	±0.045	±0.045	±0.045	±0.05	±0.05	±0.06
0.80 or more, less than 1.00	±0.040	±0.05	±0.05	±0.05	±0.05	±0.06	±0.07
1.00 or more, less than 1.25	±0.05	±0.05	±0.05	±0.06	±0.06	±0.07	±0.08
1.25 or more, less than 1.60	±0.05	±0.06	±0.06	±0.06	±0.07	±0.08	±0.10
1.60 or more, less than 2.00	±0.06	±0.07	±0.08	±0.08	±0.09	±0.10	±0.12
2.00 or more, less than 2.50	±0.07	±0.08	±0.08	±0.09	±0.10	±0.11	±0.13
2.50 or more, less than 3.15	±0.08	±0.09	±0.09	±0.10	±0.11	±0.12	±0.14
3.15 or more, less than 4.00	±0.09	±0.10	±0.10	±0.11	±0.12	±0.13	±0.16

### Thickness - 3ST

(Unit: mm)

Width	Thickness	tolerance
Thickness	630 or more, less than 1,000	1,000 or more, less than 1,250
Less than 0.25	±0.030	_
0.25 or more, less than 0.40	±0.030	±0.035
0.40 or more, less than 0.60	±0.035	±0.035
0.60 or more, less than 0.80	±0.040	±0.040
0.80 or more, less than 1.00	±0.040	±0.050
1.00 or more, less than 1.25	±0.050	±0.055
1.25 or more, less than 1.60	±0.055	±0.060
1.60 or more, less than 2.00	±0.065	±0.070

### Dimensional Tolerances

### (2) Width (cut edge)

Steel strip in general (Unit: mm)

Width	Less than 1,524	1,524 or more	
6.0 or less	+5, 0	+10, 0	

Note: If agreed between the purchaser and the supplier, the value may shift to the negative side within the range identical with the total range of tolerance for width shown in the table.

Steel strip EW

(Unit: mm)

Width	Width tolerance				
Thickness	Less than 160	160 or more, less than 250	250 or more, less than 400	400 or more, less than 630	630 or more, 1,000 or less
less than 0.60	±0.15	±0.15	±0.30	±0.30	±0.50
0.60 or more, less than 1.00	±0.15	±0.15	±0.30	±0.30	±0.50
1.00 or more, less than 1.60	±0.20	±0.25	±0.35	±0.35	±0.60
1.60 or more, less than 2.50	±0.30	±0.35	±0.45	±0.45	±0.70
2.50 or more, 4.00 or less	±0.40	±0.45	±0.50	±0.50	±0.80

### (3) Width (mill edge)

Steel strip in general

(Unit: mm)

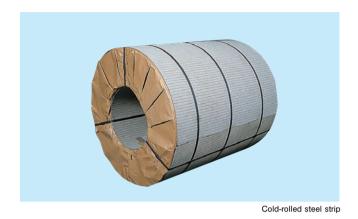
Width	Less than 400	400 or more, less than 630	630 or more, less than 1,000	1,000 or more, less than 1,524	1,524 or more
JIS G 4305a)	±10, 0	±20, 0	±25, 0	±30, 0	±30, 0
Nisshin Standards <sup>b)</sup>				±50, 0	±50, 0

Notes a) Values other than shown in the table may be specified if agreed between the purchaser and the supplier.

b) The Nisshin Standards specify tolerances for width to be agreed between the purchaser and the supplier as stipulated in Section 9.4 (tolerances for width) of JIS G 4305.

## Packaging Examples

The standard packaging is shown below.

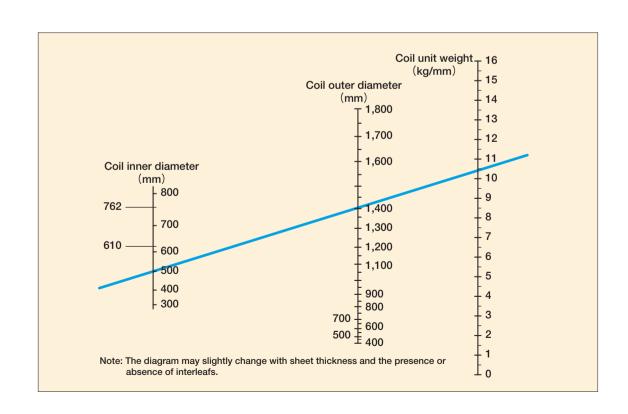




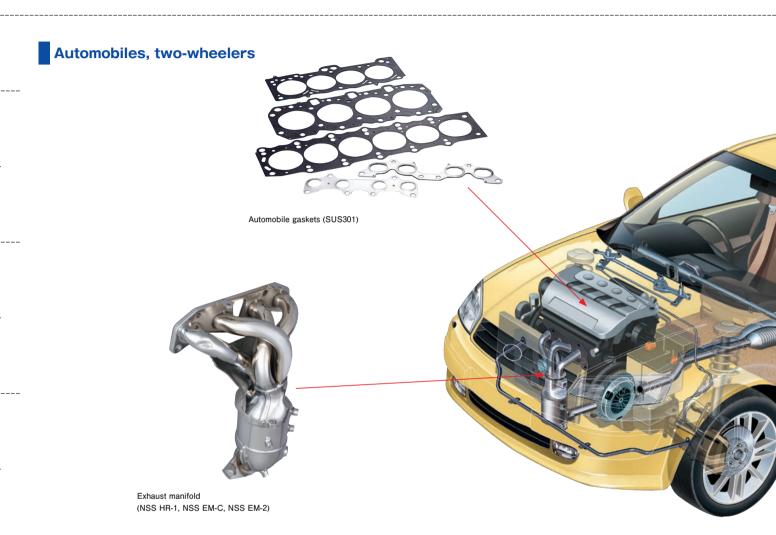
Mill edge with a thickness of 0.5 mm or more



## Relationship among the Inner Diameter, Unit Weight, and Outer Diameter of Steel Strip

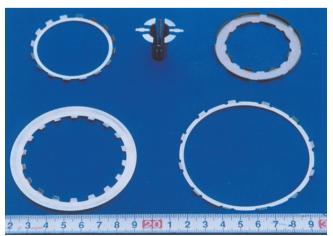


# Applications



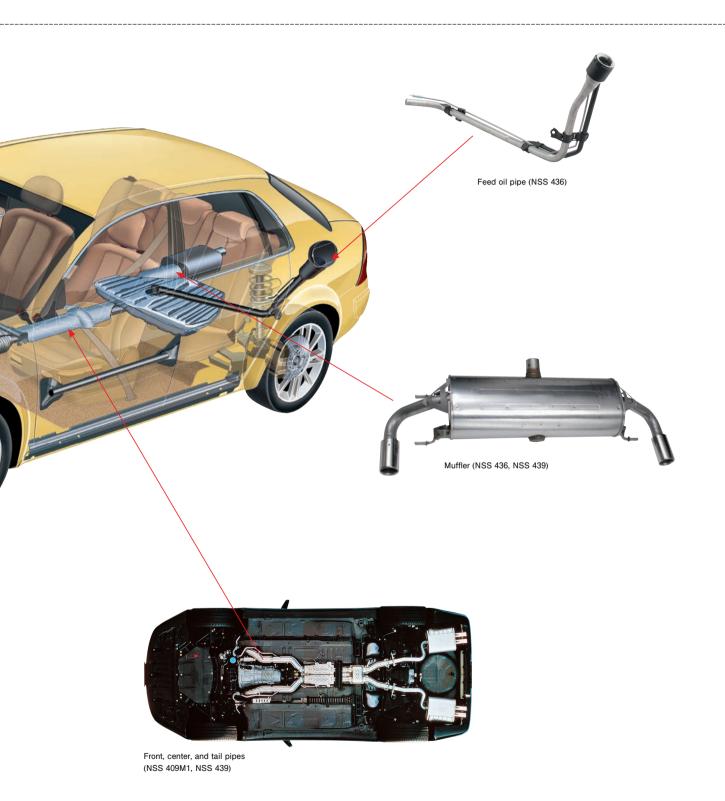






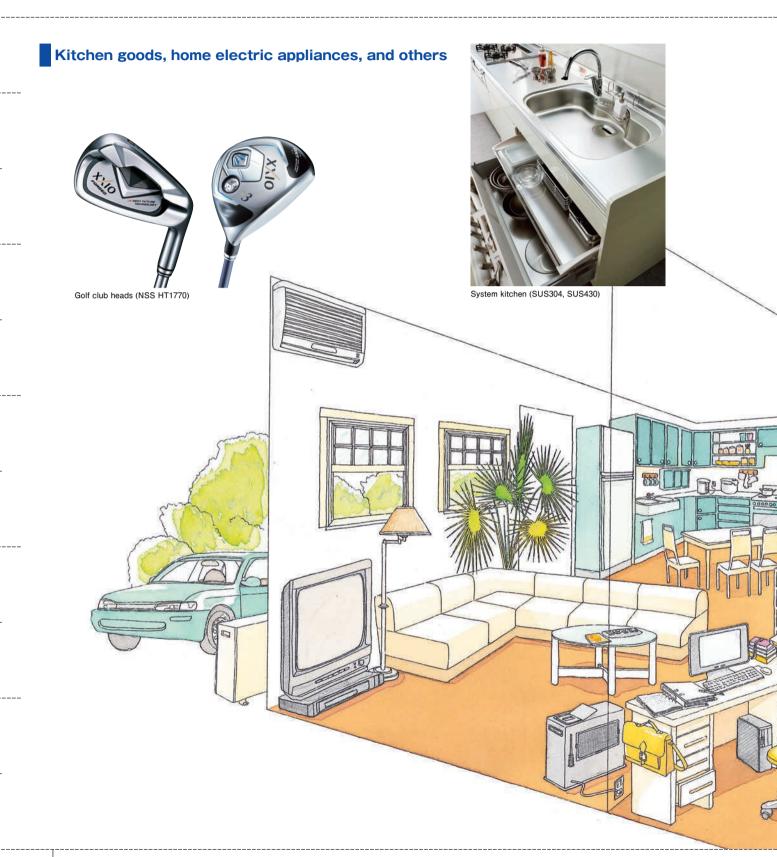
Automobile special washers (NSS 431DP-2)

## | Applications |



20

# Applications



## | Applications |



Edge tool, scissors (NSS WR Series)



IH rice cooker (Pearl-like color clear coat)





EcoCute water heater (NSS 445M2)



Drum-type washer-dryer (NSS 430M2)



Bath scale (SUS403/star light emboss)

# Applications

### Exteriors, building materials, monuments



Terminal 1 of Narita International Airport (Toki no Hana - Flowers reflecting the seasons by N. Sakagami - SUS304, fine color/Tsukiboshi Art Co., Ltd.)



Terminal 1 of Tokyo International Airport (Tsubasa - Niji ni Somatte - Wings - Arriving with the rainbow by N. Sakagami - SUS304, fine color/Tsukiboshi Art Co., Ltd.)



Nakanoshima Mitsui Building (SUS304)

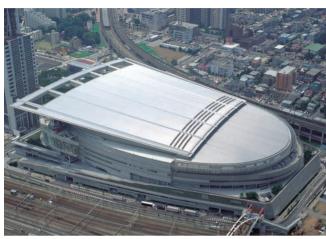


Water tank (NSS 445M2)

## | Applications |



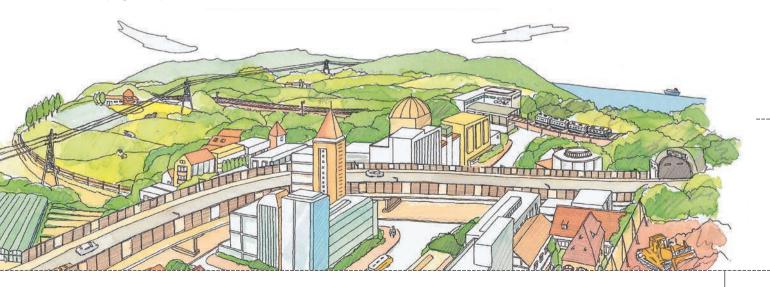
Nagoya City Science Museum (SUS445J1)



Saitama Super Arena (Tough-Tain IU, NSS U-22)



Seibu Dome (Tough-Tain IU)

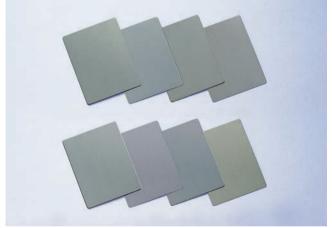




## Other Types of Stainless Steels

Classification	Name	Features
	Moon Star swan color	Stainless steel strip coated by baking with pigmented coating which is superior in weatherability
Precoated stainless steel	W-Coat Stainless	Stainless steel strip coated by baking with a lubricating coating film
0.000	Tough-Tain IU	Stainless steel strip coated by baking with a special resin for the purpose of making the surface free of a protective film (NSS 445M2)
Functional precoated	Clear Coat Stainless	Stainless steel strip coated by baking with polyester, acrylic resin, acrylic silicone, and fluororesin coating films
stainless steel	Pearl-like Color Clear Coat Stainless	Stainless steel strip coated by baking with a special pigment-containing transparent coating film
Plated stainless steel	Coppersoftain	Copper plated stainless steel strip
Flated Stairliess Steel	Alstar Stainless	Aluminum plated stainless steel strip
Stainless steel foil	Stainless Foil	Extremely thin, extra width stainless steel strip (620 mm) with a thickness of 0.25 mm or less
Clad steel	Iron Clad Stainless	Steel strip fabricated by sandwiching common steel with stainless steel under pressure

Note: Please refer to the sample books for the standard finish and skin sample.



Pearl-like Color Clear Coat Stainless





Moon Star swan color

## **Guide for Ordering**

- When placing an order or making an inquiry, provide us with as detailed information as possible on the following items.
  - (1) Type of steel, finish, and dimensions
  - (2) Intended use, processing method
  - (3) Required specifications: thickness, width and length tolerances, packaging unit weight (inner diameter in the case of a coil)
  - (4) Quantity, delivery date
  - (5) Others: items required in particular
- For ordering and making inquiries …

The best performance can be brought out of our stainless steel products by selecting the optimum type of steel, depending on the intended use, design conditions, processing conditions, etc. Please contact your nearest Nisshin dealer when placing an order or making an inquiry.

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### stainless.nipponsteel.com

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### Notice

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