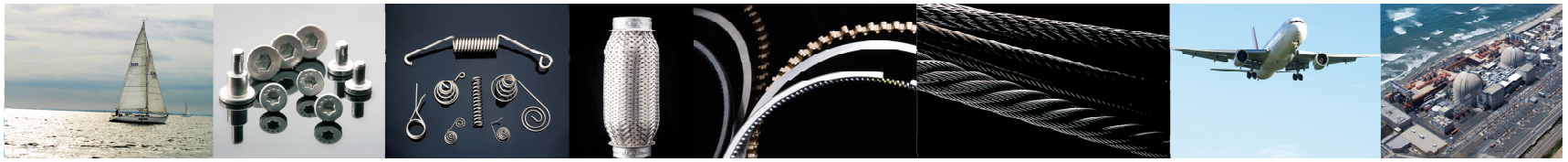
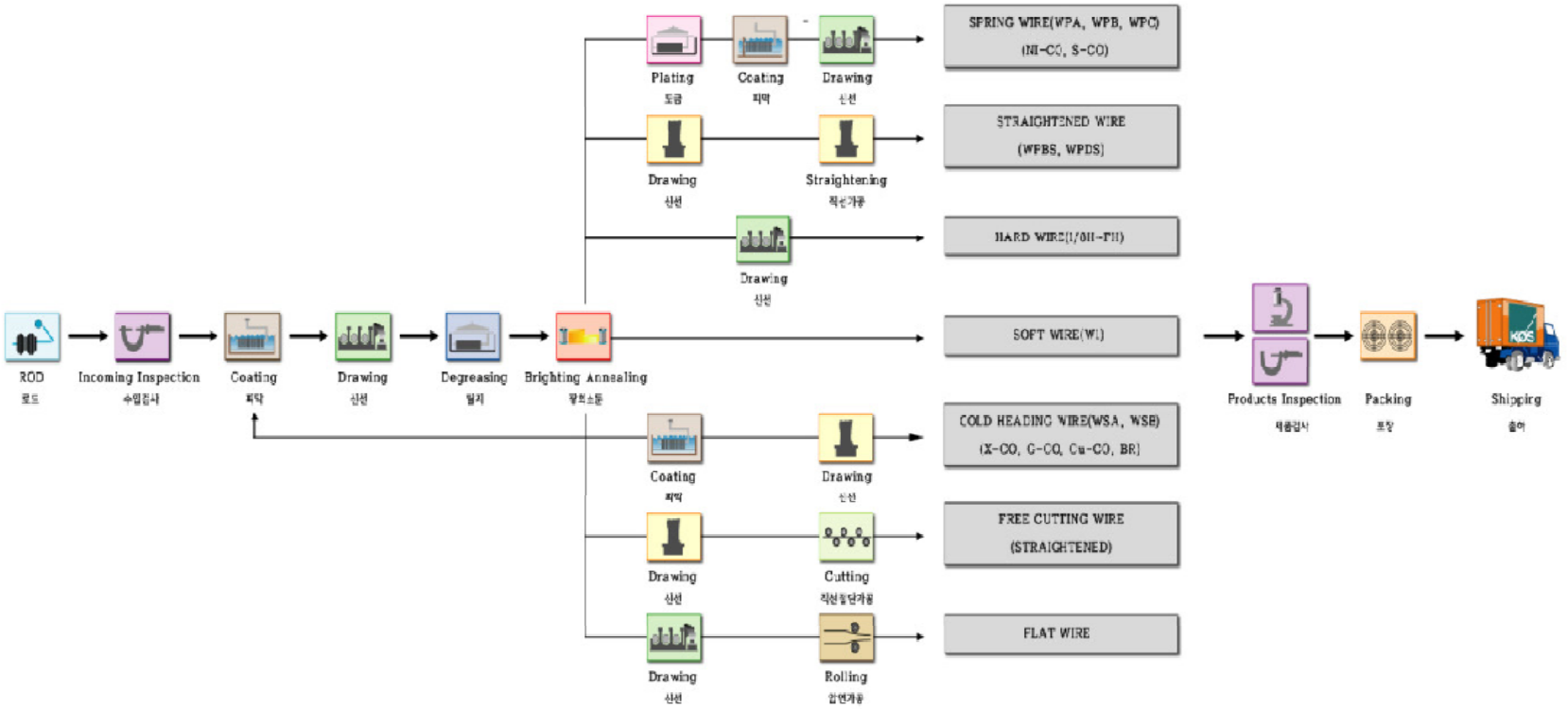
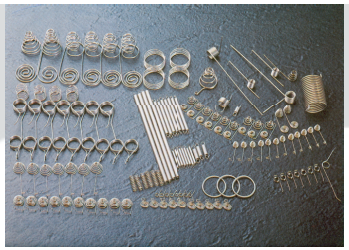
KOS Products

Spring Wire



Manufacturing process





General Spring Wire

Product Properties

- Mass Quantity & Various Packing Types (Spool, Carrier, Coil)
- Strict Diameter Tolerance Management (½of Int'l Spec)
- Uniform T/S that meets customers' needs
- Coating : Superior Adhesion & Uniformly Coated
- Uniform and excellent surface roughness
- Ni- Co : Very Low Temper Color Discoloration
- Cu- Co : Differentiates Temper Color
  - Various Temper Colors can be made
- Excellent Cast & Helix
- Supply of all BR, NI- BR, S- CO, NI- CO

Coiling Properties

- Uniform Coiling is Possible
- Improved Spring Fatigue Life
- Unattended Operation for a Long Time is Possible
- Eco- Friendly Coating : Free from Dust
- Highly Reduced Coiling Setting Lead Time
- Higher Operation Efficiency
- Ni- Co : Good Coiling Properties

(Good especially for precision or high speed spring manufacturing)

General Spring Wire

Production : Diameter

Surface	Rod Type	Diameter (㎜)	
		Min.	Max.
S- CO Ni- CO	302/304	0.14	6.00
	631J1	0.20	5.00
BR NI- BR	302/304	0.08	6.00
	631J1	0.02	5.00
CU- BR	302/304	0.30	6.00
	631J1	0.30	5.00
BAT	302/304	0.30	1.80

Diameter Tolerance (Maker)

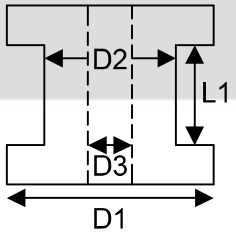
Diameter (㎜)	Min.	Max.
0.079 ~ 0.200	0	0.003
0.201 ~ 0.400	0	0.005
0.401 ~ 0.500	0	0.006
0.501 ~ 0.750	0	0.007
0.751 ~ 1.200	0	0.009
1.201 ~ 1.550	0	0.012
1.551 ~ 2.500	0	0.015
2.501 ~ 4.000	0	0.020
4.001 ~ 5.000	0	0.025

General Spring Wire

Tensile Strength (Maker Spec)

Diameter (㎜)	***WPA***	***WPB***	***WPC***
	302, 304 304N1, 316	***302, 304 304N1***	***631J1***
0.080~ 0.090	1650~ 1900	-	2150~ 2400
0.091~ 0.200		1950~ 2200	
0.201~ 0.400	1600~ 1850	1930~ 2180	2050~ 2300
0.401~ 0.600		1850~ 2100	1950~ 2200
0.601~ 1.000	1530~ 1780	1800~ 2050	1850~ 2100
1.001~ 1.400	1450~ 1700	1700~ 1950	1750~ 2000
1.401~ 2.000	1400~ 1650	1600~ 1850	1650~ 1900
2.001~ 2.600	1320~ 1570	1500~ 1750	1550~ 1800
2.601~ 4.000	1230~ 1480	1400~ 1650	1450~ 1700
4.001~ 6.000	1100~ 1350	1300~ 1550	1350~ 1600

General Spring Wire Packaging



Spool	Material	Flange (D1)	Barrel (D2)	Traverse (L1)	Arbor Hole (D3)	Weight/Package (Kg)
DIN 160	Plastic	160	100	128	22	5
DIN 200		200	125	160	22	12
DIN 250		250	160	160	22	20
DIN 355		355	224	160	36	30
460		460	319	91	305	35
560	Wood	560	355	240	35	100
	Steel	560	360	233	33	150
760(N)	Steel	760	430	241	48	300
760(O)		760	430	330	58	400
760(W)		760	430	450	58	500
760 Reelless	-	760	380	235	355	400
940 Reelless	-	940	345	500	90	1,000
24” Carrier	Steel	-	-	-	-	400
27” Carrier	Steel	-	-	-	-	500
32” Carrier	Steel	-	-	-	-	1,000

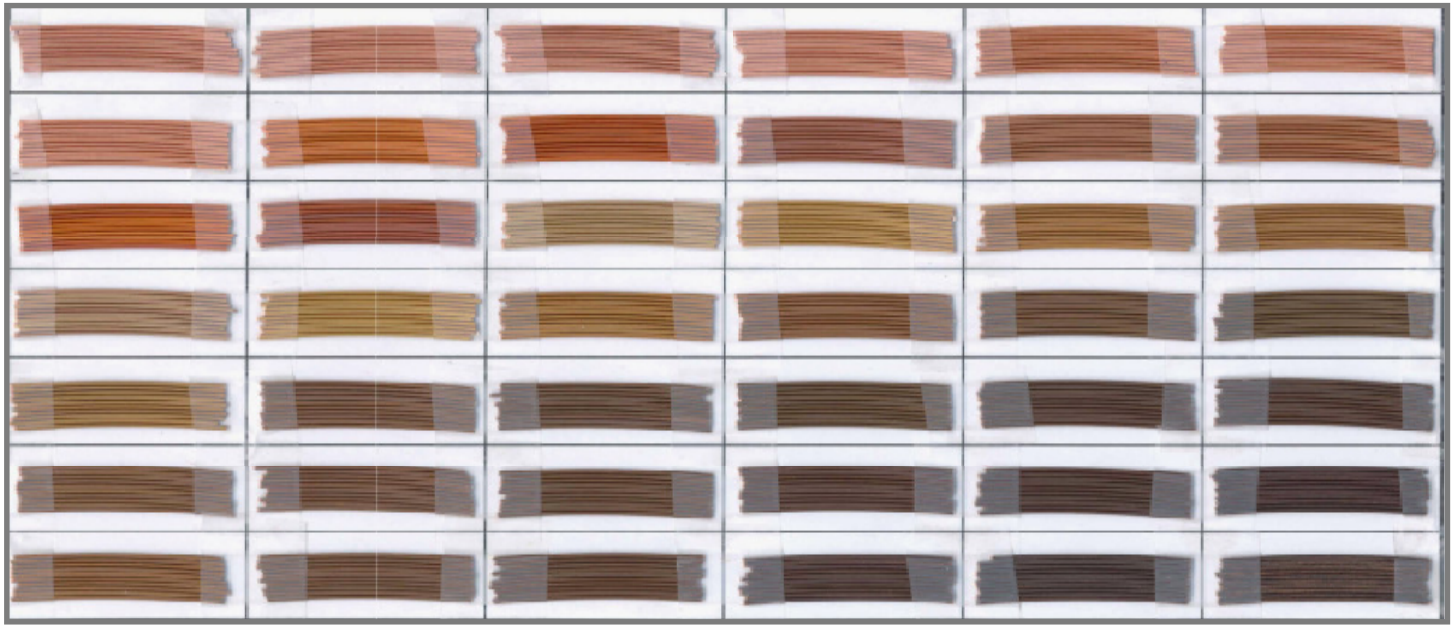
General Spring Wire (Rod Properties)

Rod Type	C	Si	Mn	P	S	Ni	Cr	Others	Equivalent Spec
1.4310	- 0.15	- 1.00	- 2.00	- 0.045	- 0.030	8.00 10.00	17.00 19.00	-	AISI 302
1.4301	- 0.08	- 1.00	- 2.00	- 0.045	- 0.030	8.00 10.50	18.00 20.00	-	AISI 304
1.4401	- 0.08	- 1.00	- 2.00	- 0.045	- 0.030	10.0 14.0	16.00 18.00	-	AISI 316
1.4568	- 0.09	- 1.00	- 1.00	- 0.040	- 0.030	7.00 8.50	16.00 18.00	Al 0.75~ 1.50	631J1 17- 7 PH

	Usable Temp.	Magnetism	Anti-Corrosion	Tempering Condition	Uses
1.4310 1.4301	~ 290℃	Magnetic	Normal	250~ 425℃ (30min~ 4hrs)	Electronic Devices, Automobile
1.4401	~ 290℃	Less- Magnetic	High	〃	Tape Recorder, High Anti- Corrosion Required products
1.4568	~ 340℃	High- Magnetic	Little Low	450~ 480℃ (30min~ 1hr)	Automobile, Antennas

Colored Spring Wire

- Cu- Coated
- Same Quality as General WPB Spring Wire
- After Coiling, Various Color can be made based on Tempering conditions (Temperature, Time, etc.)
- Springs can be differentiated by different color



631J1 Stainless Steel Wire

- Diameter Tol.: Strict Diameter Tolerance Management (1/2 of Int'l Spec.)
- T/S : Uniform T/S(low deviation) that meets the customers' requirements
- Surface : All of BR, NI- BR, S- CO, NI- CO, Uniform and excellent surface roughness, Less Dust.
- Special Quality Management : ROD roughness & During Production
  - Improved Fatigue Life
- Tempering Properties: 480℃ 1hr – more than 300N/㎟ of T/S increases.
  (1.4301, 1.4310 - approx.150N/㎟ increase)

Standard	Grade	C	Si	Mn	P	S	Cr	Ni	Al
JIS G 4314	SUS 631J1	- 0.09	- 1.00	- 1.00	- 0.040	- 0.030	16.00 18.00	7.00 8.50	0.75 1.50
A313/A313M	AISI 631 17- 7PH	- 0.09	- 1.00	- 1.00	- 0.040	- 0.030	16.00 18.00	6.50 7.80	0.75 1.50
EN 10270- 3	X7CrNiAl17 1.4568	- 0.09	- 0.70	- 1.00	- 0.040	- 0.015	16.00 18.00	6.50 8.30	0.70 1.50

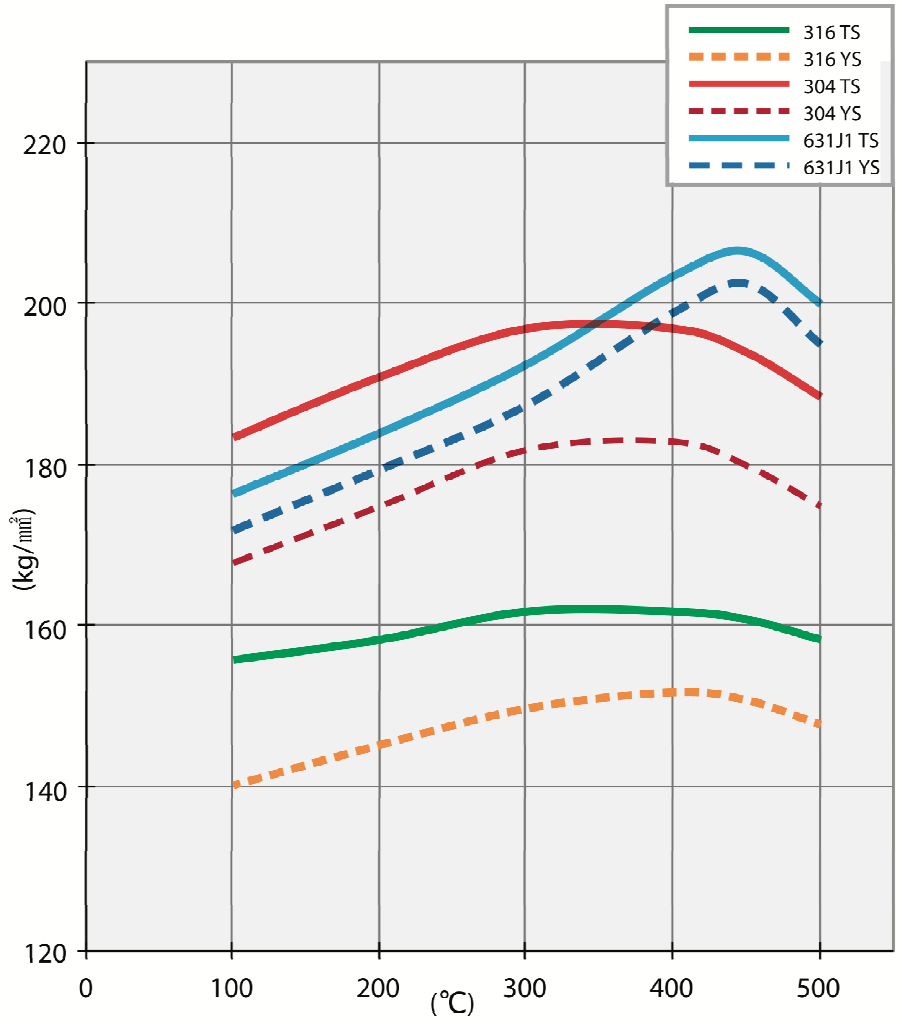
631J1 Stainless Steel Wire

Tensile Strength

Diameter (㎜)	*WPB*	*WPC*
	302, 304	*631J1*
0.080~ 0.090	2150~ 2400	-
0.091~ 0.200		1950~ 2200
0.201~ 0.400	2050~ 2300	1930~ 2180
0.401~ 0.600	1950~ 2200	1850~ 2100
0.601~ 1.000	1850~ 2100	1800~ 2050
1.001~ 1.400	1750~ 2000	1700~ 1950
1.401~ 2.000	1650~ 1900	1600~ 1850
2.001~ 2.600	1550~ 1800	1500~ 1750
4.601~ 5.000	1350~ 1600	1300~ 1550

631J1 Stainless Steel Wire

After Tempering : T/S, Y/S



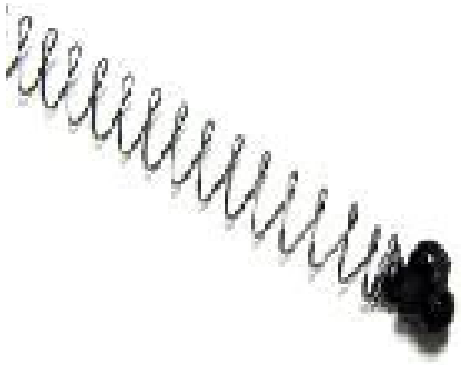
631J1 Stainless Steel Wire

USES

- Automobile

- Antennas

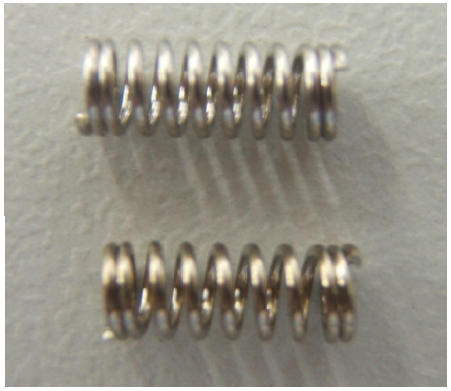
- Bullet Cartridges



Spring Wire for Special Uses

Products for Spring	Product Properties	Spring Properties
High Strength Wire (KOSPLUS)	1. JIS WPB + 250N/㎟ 2. Basically the same as EN HS Spec	1. High Strength, good for High fatigue 2. T/S Comparison 302 < KOSPLUS 〈 KOS SUPERPLUS
Super Higher Strength (KOS SUPERPLUS)	1. JIS WPB + 400N/㎟ 2. EN HS + 200N/㎟	
Textile Wire	1. Extra Fine Surface	1. Loom Spring Lifespan 2. Superior Coiling Process can be made
High Strength 316	1. Similar to T/S of WPB	1. High Anti- Corrosive / Less-Magnetic
Non- Magnetic	1. Magnetism 316 > KOS- 92	1. 316 : Non / Less Magnetic 2. KOS- 92 : Non- Magnetic
Colored Wire (Cu Coated)	1. Cu- Coated	1. Various Colors
Aerosol	1. High Q'ty Spool Packiging (Max 500kg)	1.High Speed Coiling 2. High Efficiency
BATTERY	1. Surface Dust Free	1. Superior Soldering can be made 2. Superior Coiling Process can be made

KOSPLUS & KOS SUPERPLUS



Properties

- High T/S Spring Wire
  JIS WPB + 250N/㎟, JIS WPB + 400N/㎟
- High Spring Load
- Superior Fatigue Life
- Uniform Cast/Helix and Excellent Coilability
- Good Relaxation
- Anti- Corossiveness as good as 1.4301

Chemical Composition

ROD Type	*C*	*Si*	*Mn*	*P*	*S*	*Cr*	*Ni*	*Mo*	*Equivalent Spec.*
KOS PLUS ***KOS SUPERPLUS***	0.05 0.15	- 2.00	- 2.00	- 0.045	- 0.015	16.00 19.00	6.00 9.50	- 0.80	1.4310 (302)
**** SUS 301***	- 0.15	- 1.00	2.00	- 0.045	- 0.030	16.00 18.00	6.00 8.00	-	AISI 301

KOSPLUS & KOS SUPERPLUS

Production : Diameter

Product	*Surface*		*Diameter (mm)*	*Package*
KOSPLUS	BR	BR	0.08~ 0.65	Coil & Spool
		NI- BR		
	DU	S- CO	0.18~ 3.00	
		NI- CO		
KOS SUPERPLUS	BR	NI- BR	0.08~ 0.65	Coil & Spool
	DU	S- CO	0.18~ 3.00	
		NI- CO		

Diameter Tolerance (Maker) (㎜)

Diameter	*Min.*	*Max.*
0.079 ~ 0.200	0	- 0.003
0.201 ~ 0.400	0	- 0.005
0.401 ~ 0.500	0	- 0.006
0.501 ~ 0.750	0	- 0.007
0.751 ~ 1.200	0	- 0.009
1.201 ~ 1.550	0	- 0.012
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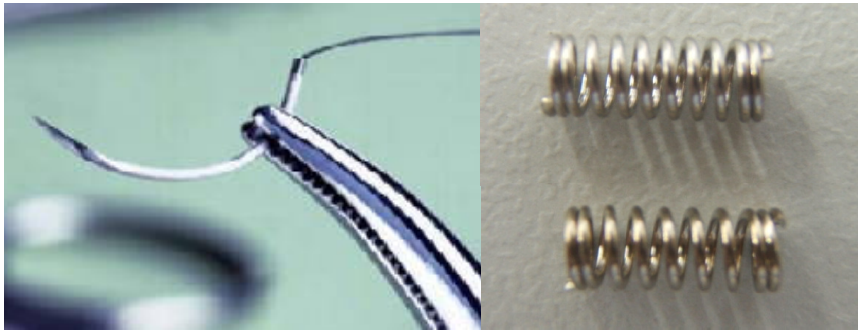
2.501 ~ 3.000	0	- 0.020



Uses

- Electronic Devices
- IT / OA Devices
- Automobile
- Medical(Surgical Needles, etc.)

KOSPLUS & KOS SUPERPLUS

Tensile Strength

Item / Dia.(㎜)	Tensile Strength (N/㎟)		
	KOS PLUS	KOS SUPERPLUS	SUS 304 WPB
0.08~ 0.20	2350~ 2703	2550~ 2850	2150~ 2400
0.29	2300~ 2645	2450~ 2750	2050~ 2300
0.30		2350~ 2650	
0.40	2250~ 2588		
0.50	2200~ 2530	2300~ 2600	1950~ 2200
0.60	2150~ 2473		
0.65		2200~ 2500	1850~ 2100
0.80	2100~ 2415		
1.00	2050~ 2358		
1.20	2000~ 2300	2100~ 2400	1750~ 2000
1.25		2050~ 2350	
1.40	1950~ 2243		
1.50		2000~ 2300	1650~ 1900
1.60	1900~ 2185		
1.75		1950~ 2250	
1.80	1850~ 2128		
2.00		1900~ 2200	
2.30	1750~ 2013	1850~ 2150	1550~ 1800
2.50		1800~ 2100	
2.60	1700~ 1955		
3.00		1750~ 2050	1450~ 1700

KOS Company Profile

Thank you