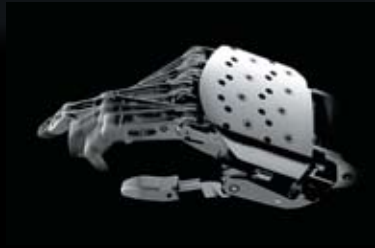
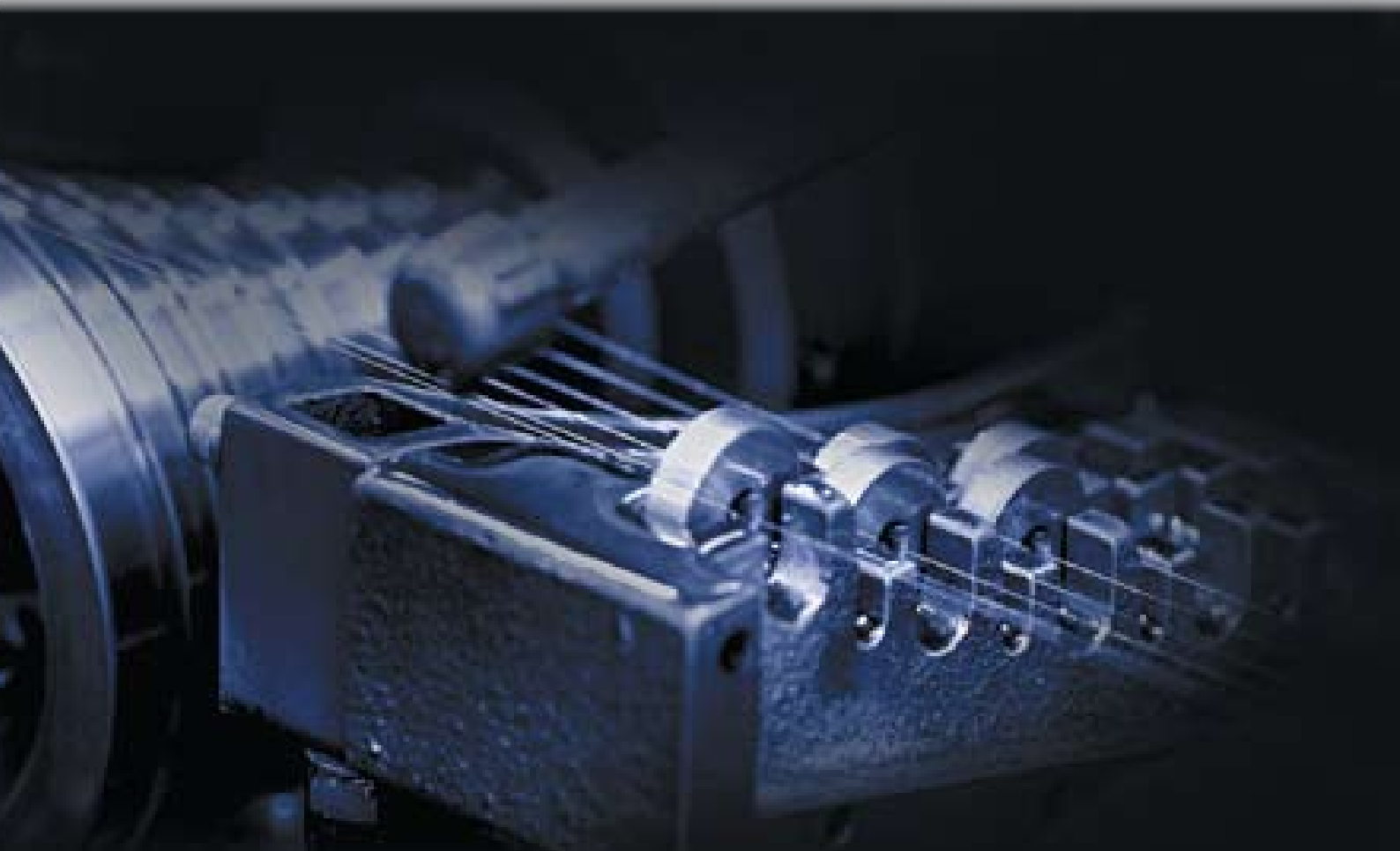


# PRODUCT GUIDE



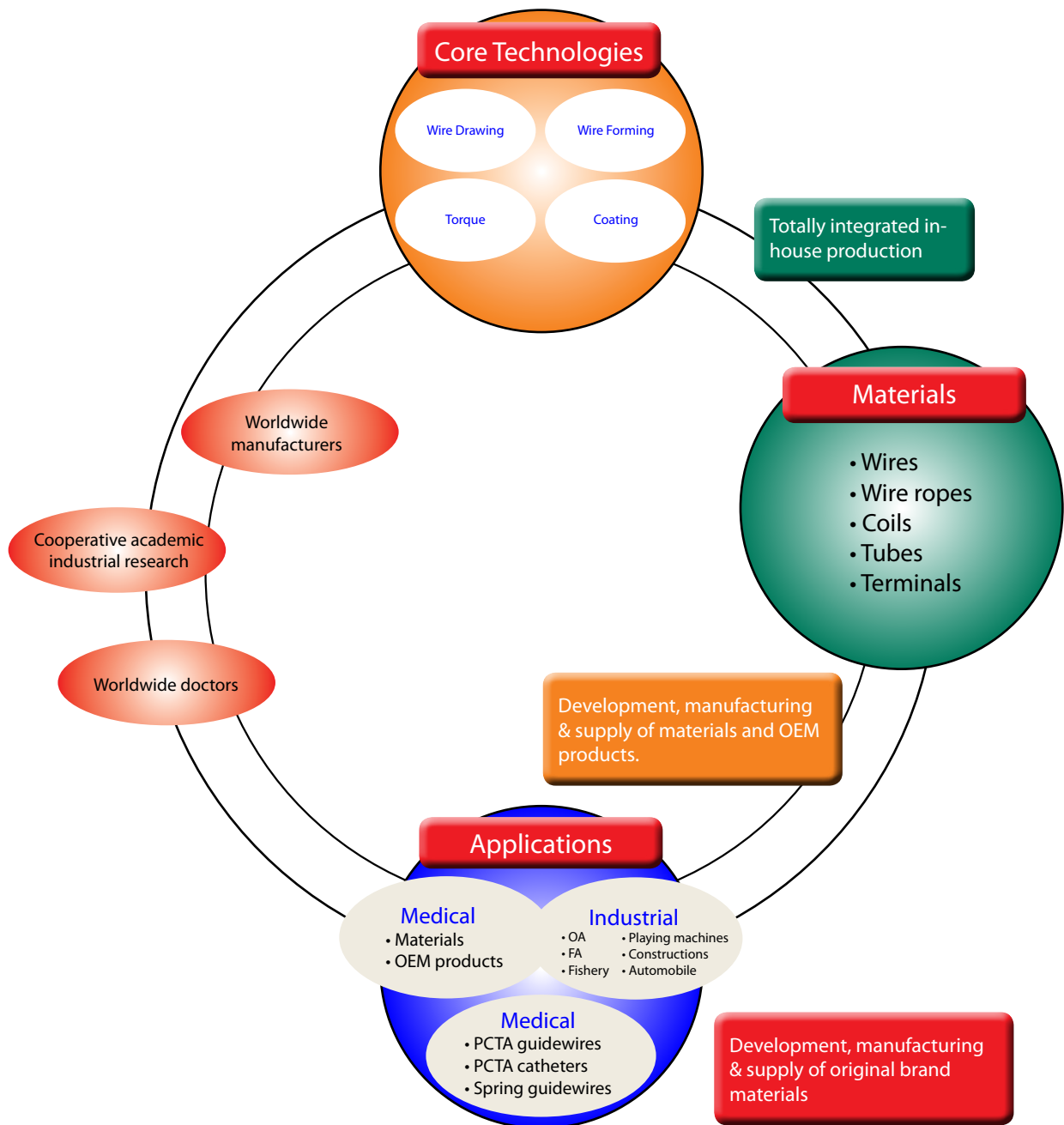
<http://www.steelwire-rope.com/asa->



# Exploring new possibilities in the micron field

Our mission is to create products that perfectly match the vision of the customer. This is reflected in each strand of ultra fine wire rope that we create and each of the final products we manufacture. Our versatile, high performance micro technology is integrated with an intensive, innovative research and development program. Time and time this again has been the source of unique, breakthrough products customised to meet the demands of our customers. With a vertically integrated manufacturing system that covers all production processes from materials to finished products, we are able to rise to the challenges posed by our customers, successfully providing unique and high quality products that set new standards in their fields.

# Four Core Technologies Rise To New Values.



Production Process and Core Technologies_	4	Torque Coil _____	13
Wire _____	6	ACTONE (Cable Tube) _____	14
Wire Rope _____	8	Braided Tube _____	14
Coating _____	10	Wire Bar _____	15
Syncromesh Wire Rope _____	11	Examples of Design Specifications _	16
Cable Rack _____	12	Charge Wire _____	18
Torque Wire Rope _____	12	Control Cables _____	18
Round-Wire Coil, Flat-Wire Coil _____	13	Optional Parts _____	19

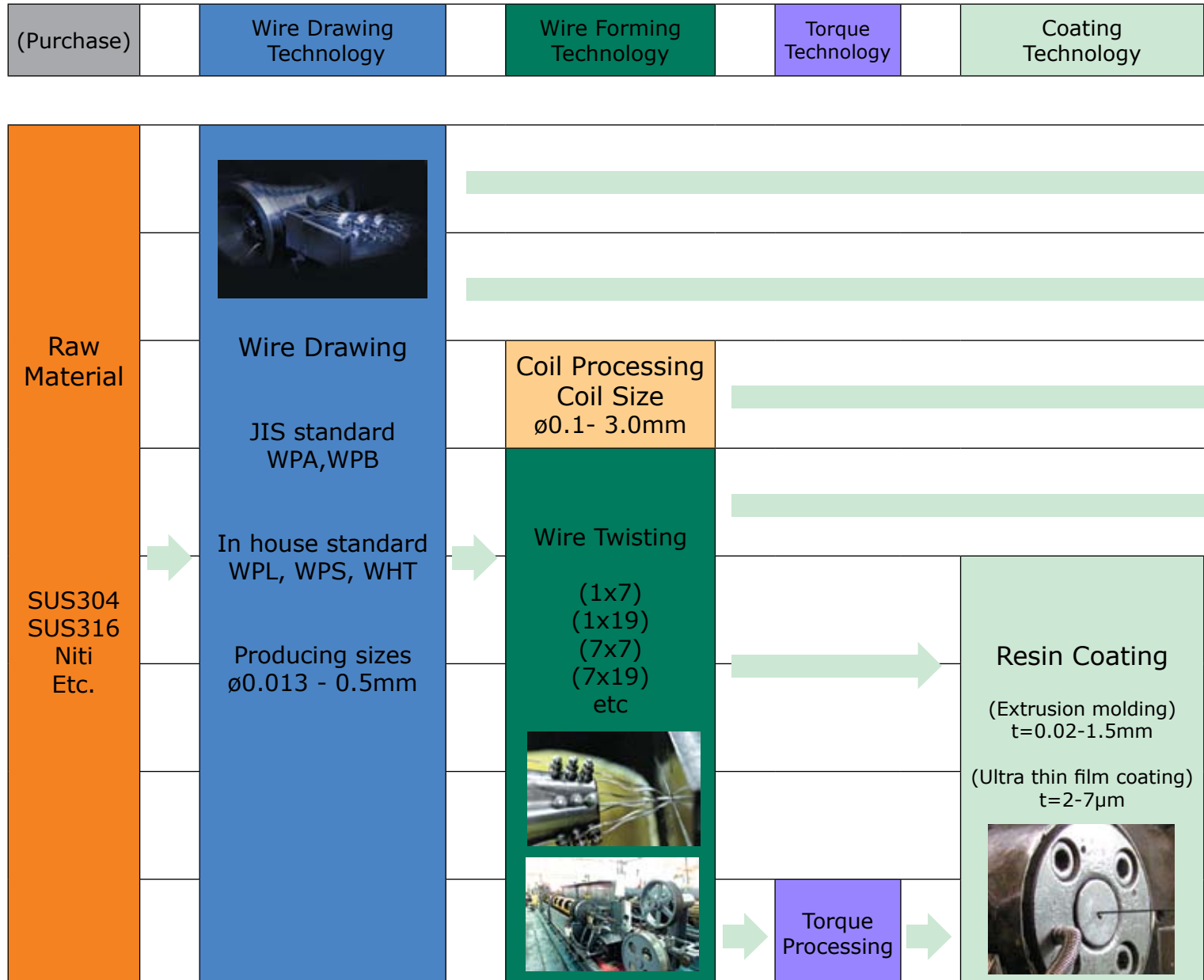
# All Products Start from Wires...

We combine a large variety of technologies at multiple levels to produce everything in-house. Not only do we manufacture the wires that form the basis of all our products, we also form and polish the diamond dies that are key to our wire drawing technology. This fully integrated in-house production system based on multiple technologies makes it possible to offer highly reliable products that meet the individual requirements of our customers.



Measuring Machine

## Production Process at ASAHI INTECC



## Core Technologies from SWR

### Wire drawing technology

Wire drawing technology is used to manufacture ultra fine stainless steel wire with the stiffness and diameter suitable for each particular application. This is achieved by using diamond dies that are formed and polished in-house, ensuring that we are able to offer finished wires with excellent quality and reliability.

### Wire forming technology

Wire forming technology is used to form wire ropes and coils from the various wires (such as stainless steel wire) created by the wire drawing process. Our unique technology and processing machinery facilitate processing with higher precision.



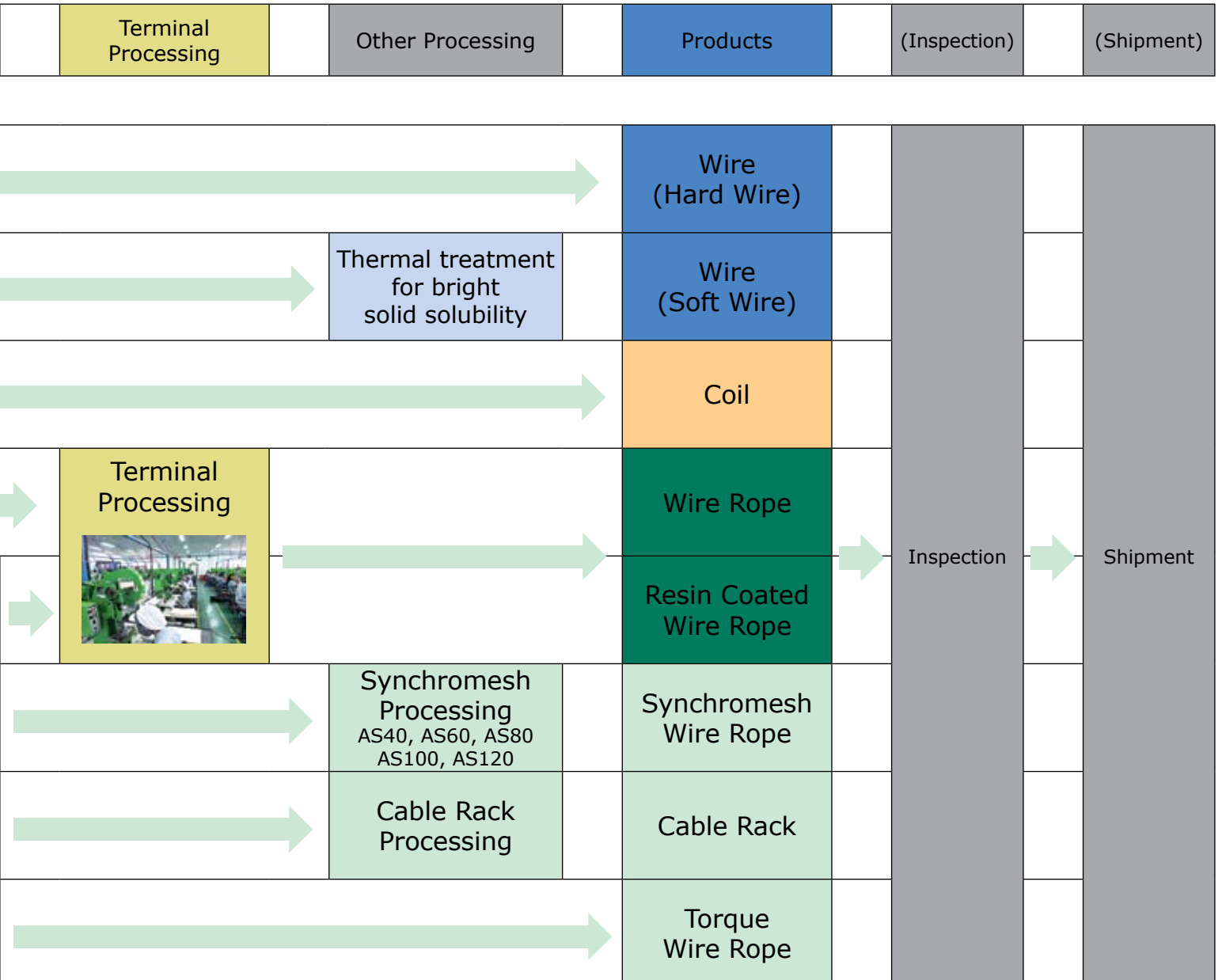
Tensile Strength Tester



Micro-Vickers Hardness Tester



Pin Gauges



**Torque technology**

Full utilization of our technology and processing machinery for wires and wire ropes. We are able to provide our products with superior torque properties that are normally difficult to accomplish with conventional processing methods. This allows us to offer products with superior manoeuvrability.

**Coating technology**

To further improve the properties of our wire ropes and coils, we coat them with nylon or polyethylene. Two primary coating technologies are used: extrusion molding with thermoplastic resin and ultra thin film coating with polytetrafluoroethylene.

# Precision Wire

## Wire

Wire drawing tech.



Stainless steel wires  $\varnothing 0.013$  mm

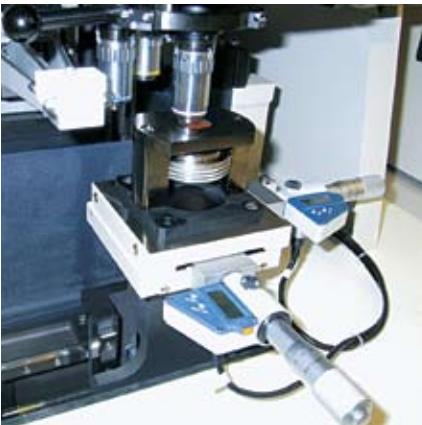


Diamond dies for wire drawing

We make full use of the proprietary wire processing technologies, such as bright solution thermal treatment, ultra-fine wire drawing, and die forming to manufacture fine stainless steel wires with diameters from  $\varnothing 0.013$  to  $\varnothing 0.50$  mm.

## Features

- Continuous drawing and bright solution thermal treatment performed in-house to enable production of stainless steel wires with an ultra-fine diameter of 0.013mm.
- Diamond dies used in wire drawing are formed and polished in-house to enable production of wires with intermediate sizes (manufacturing of wires with diameters at 2- $\mu$ m intervals is possible).
- Our high precision rolling press machine manufactures ultra-fine pressed wires ( $t=0.015$ mm).
- All of the production facilities required for wire drawing are owned in-house, allowing special wires with stiffness that is not specified by JIS standards to be manufactured.



Micro-Vickers hardness tester

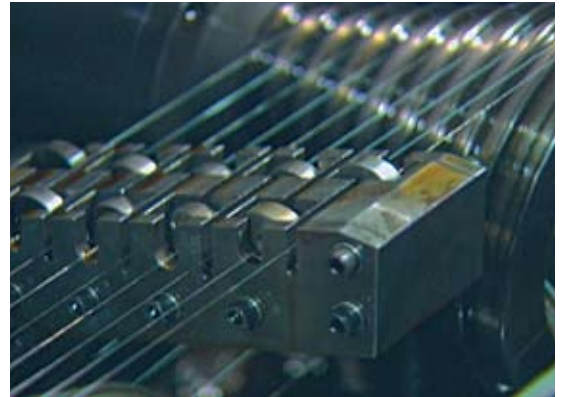


Material tester



Die shape meter

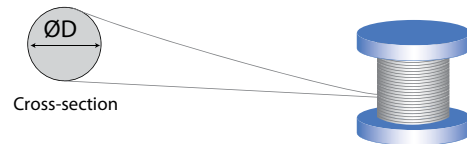
- W1      Stainless-steel soft wire conforming to JIS G4309, manufactured with the bright solution thermal treatment process.
- WPB    Stainless-steel hard wire (for spring) conforming to JIS G 4315, manufactured with the continuous wire drawing process.
- WHT    High-strength stainless steel hard wire manufactured with the special continuous wire drawing process.
- Flat Wire   High-accuracy stainless steel pressed wire manufactured using a high-precision rolling press machine.  
Note: The level of refining can be selected from soft, hard and intermediate.



Inside the wire drawing machine

## Specifications

### Round wire

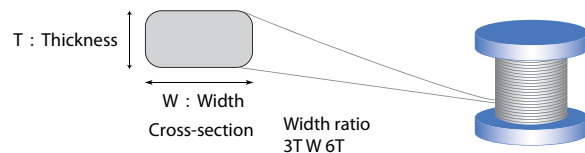


Type	ØD : Outer Diameter (mm)		Tensile Strength (N/mm <sup>2</sup> )
	Min.	Max.	
W1	0.030	—	680~1,030
H	0.016	0.660	1,650~2,750
WHT	0.013	0.130	2,900~3,500

- Notes : • Materials — SUS304, SUS316.  
• PTFE coating is available.

### Flat wire

T : Thickness (mm)	
Min.	Max.
0.015	0.090



- Notes : • Materials — SUS304, SUS316.  
• W1 and H can be manufactured as flat wires.

## Chemical components of wire materials (JIS G4308)

The type of stainless steel used in our wires is SUS304. The type used for non-magnetic applications is SUS316.

Type	Characteristics	C %	Cr %	Ni %	Si %	Mn %	Mo %
SUS304	Most commonly used. Possesses corrosion resistance, heat resistance and low-temperature tolerance.	0.08>	18.00 - 20.00	8.00 - 10.50	1.00>	2.00.>	
SUS316	With the addition of Mo, this is superior to SUS304 in terms of corrosion resistance to dilute sulphuric acids and sulphurous acids.	0.08>	16.00 - 18.00	10.00 - 14.00	1.00>	2.00>	2.00

## Physical properties of wire materials

AISI No.	Modulus of elasticity (103N/mm)	Density (g/cm <sup>2</sup> )	Resistivity (10-8Ω·m)	Specific heat (J/kg·°C)	Coefficient of thermal conductivity (W/m·°C)		Coefficient of thermal expansion (10-6/°C)				Melting point (°C)
					100°C	500°C	25~100°C	25~300°C	25~500°C	25~700°C	
					304	167~193	7.93	72~74	460~502	16.3~25.1	
316	193	7.98	74	16.1	16.1	21.4	16.0	17.5	18.0	18.5	1370~1397

## Wire Rope

Wire drawing tech.

Wire forming tech.

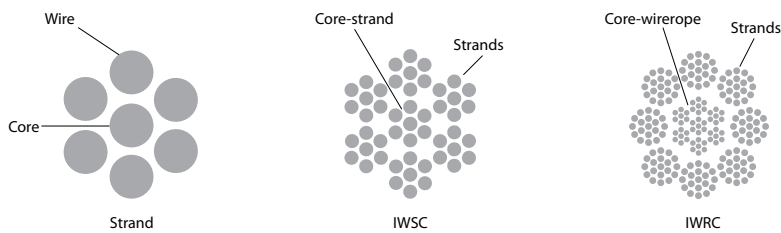
We can manufacture stainless steel wire ropes for various purposes by combining many types of precision wires and strand/rope structures. We can also manufacture wire ropes with specific properties such as low ductility, high durability and high strength.

Wire rope	Includes standard products such as wire ropes composed of strand(s) of $\phi 0.03$ mm wires as well as special wire ropes composed of strand(s) of $\phi 0.013$ mm ultra-fine wires.
Coated wire rope	Wire ropes coated with a film of thermoplastic resin (such as nylon and polyethylene) as thin as 0.02mm manufactured by continuous extrusion molding.
Randics wire rope	Composite wire ropes manufactured by combining dissimilar materials such as stainless steel wires, tungsten wires and high-tensile fibers.
Repulse wire rope	Wire ropes designed to have significantly low initial elongation by unique twisted wires.
R2 wire rope	High-durability wire ropes with improved fatigue characteristics manufactured by applying coating on the core wire rope.
Spiral wire rope	Manufactured by processing a stainless steel wire rope into a coil spring shape using special forming process.
Endless wire rope	Endless-shape wire rope manufactured by using a special process.

### Structure of stainless steel wire rope

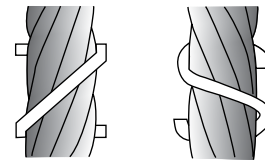
The stainless steel wire ropes have either a strand core or a wire rope core.

- IWSC (Independent Wire Strand Core) :The core consists of a strand made of the same material as the outside strands of the wire rope. These strands are combined in configurations such as 3 $\times$ 7, 7 $\times$ 7 and 7 $\times$ 19. This structure can be used universally as a mechanical element and features excellent rigidity and flexibility. These are used in a wide range of applications, including office equipment, automobiles, audio equipment, interior equipment, and leisure equipment.
- IWRC (Independent Wire Rope Core) :The core consists of a wire rope, around which the outside strands are twisted. The core wire rope and strands are combined in configurations such as  $\{ (7 \times 7) + (1 \times 19) \times 8 \}$ , etc. This structure is used for mechanical elements that require high flexibility. As durability in the original form is low due to easy deformation under contact stress, it is usually coated with a synthetic resin such as nylon.



### Wire rope strand directions

The wire rope is twisted in either Z-lay or S-lay. The Z-lay is commonly used.



Z-lay

S-lay

### Wire rope specifications


#### Type-E (1 $\times$ 7)

Structure Cross-section	Type No.	Wire rope outer dia. (mm)	Wire rope outer dia. (mm)	Breaking load (N)	Breaking load (Kgf)	Weight (kg/1,000m)
	E-9	0.09	0.03	9.0	0.9	0.04
	E-15	0.15	0.05	25.0	2.6	0.11
	E-27	0.27	0.09	88.2	9.0	0.36
	E-36	0.36	0.12	156.8	16.0	0.64
	E-51	0.51	0.17	308.7	31.5	1.25
	E-75	0.75	0.25	646.8	66.0	2.80
	E-105	1.05	0.35	1,127.0	115.0	5.40
	E-150	1.50	0.50	2,548.0	260.0	10.90


#### Type-G (1 $\times$ 19)

Structure Cross-section	Type No.	Wire rope outer dia. (mm)	Wire rope outer dia. (mm)	Breaking load (N)	Breaking load (Kgf)	Weight (kg/1,000m)
	G-15	0.15	0.03	24.5	2.5	0.11
	G-25	0.25	0.05	68.6	7.0	0.30
	G-30	0.30	0.06	98.0	10.0	0.44
	G-50	0.50	0.10	274.4	28.0	1.20
	G-100	1.00	0.20	1,078.0	110.0	4.90
	G-150	1.50	0.30	2,548.0	260.0	11.00
	G-180	1.80	0.36	3,528.0	360.0	15.00
	G-200	2.00	0.40	3,670.3	374.5	17.00


## Type-B (7×7)

Structure Cross-section	Type No.	Wire rope outer dia. (mm)	Wire rope outer dia. (mm)	Breaking load (N)	Breaking load (Kgf)	Weight (kg/1,000m)
	B-27	0.27	0.03	58.8	6.0	0.29
	B-36	0.36	0.04	102.9	10.5	0.52
	B-45	0.45	0.05	161.7	16.5	0.80
	B-54	0.54	0.06	235.2	24.0	1.20
	B-63	0.63	0.07	323.4	33.0	1.60
	B-72	0.72	0.08	421.4	43.0	2.10
	B-81	0.81	0.09	529.2	54.0	2.60
	B-90	0.90	0.10	646.8	66.0	3.20
	B-100	1.00	0.11	784.0	80.0	3.90
	B-108	1.08	0.12	940.8	96.0	4.30
	B-120	1.20	0.13	1,127.0	115.0	5.00
	B-135	1.35	0.15	1,450.4	148.0	7.20
	B-150	1.50	0.17	1,862.0	190.0	9.20
	B-180	1.80	0.20	2,548.0	260.0	13.20
	B-200	2.00	0.22	3,234.0	330.0	16.50
B-250	2.50	0.27	4,704.0	480.0	24.50	
B-300	3.00	0.33	7,154.0	730.0	35.00	


## Type-C (7×19)

Structure Cross-section	Type No.	Wire rope outer dia. (mm)	Wire rope outer dia. (mm)	Breaking load (N)	Breaking load (Kgf)	Weight (kg/1,000m)
	C-45	0.45	0.03	152.9	15.6	0.81
	C-60	0.60	0.04	269.5	27.5	1.44
	C-75	0.75	0.05	416.5	42.5	2.24
	C-90	0.90	0.06	612.5	62.5	3.50
	C-105	1.05	0.07	833.0	85.0	4.40
	C-120	1.20	0.08	1,078.0	110.0	5.60
	C-135	1.35	0.09	1,372.0	140.0	7.10
	C-150	1.50	0.10	1,666.0	170.0	9.00
	C-180	1.80	0.12	2,632.5	268.6	13.20
	C-200	2.00	0.13	2,842.0	290.0	17.00
	C-250	2.50	0.15	4,214.0	430.0	18.70
	C-300	3.00	0.19	6,762.0	690.0	30.00


## Type-F (1×12)

Structure Cross-section	Type No.	Wire rope outer dia. (mm)	Wire rope outer dia. (mm)	Breaking load (N)	Breaking load (Kgf)	Weight (kg/1,000m)
	F-20	0.20	0.05	43.1	4.4	0.18
	F-52	0.52	0.13	291.1	29.7	1.21
	F-120	1.20	0.30	1,568.0	160.0	6.50


## Type-D (1×3)

Structure Cross-section	Type No.	Wire rope outer dia. (mm)	Wire rope outer dia. (mm)	Breaking load (N)	Breaking load (Kgf)	Weight (kg/1,000m)
	D-6	0.06	0.03	4.0	0.4	0.018
	D-9	0.09	0.04	7.0	0.7	0.032
	D-11	0.11	0.05	12.0	1.2	0.050


## Type-S {(1×19)+(1×7)×8}

Structure Cross-section	Type No.	Wire rope outer dia. (mm)	Wire rope outer dia. (mm)	Breaking load (N)	Breaking load (Kgf)	Weight (kg/1,000m)
	S-33	0.33	0.03	96.0	9.8	0.43
	S-66	0.66	0.06	387.1	39.5	1.70
	S-77	0.77	0.07	494.9	50.5	2.30
	S-99	0.99	0.09	823.2	84.0	3.90
	S-154	1.54	0.14	1,960.0	200.0	9.20

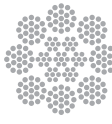
## Type-I (1×37)

Structure Cross-section	Type No.	Wire rope outer dia. (mm)	Wire rope outer dia. (mm)	Breaking load (N)	Breaking load (Kgf)	Weight (kg/1,000m)
	I-35	0.35	0.05	132.3	13.5	0.57
	I-70	0.70	0.10	421.4	43.0	2.30
	I-110	1.10	0.16	1,281.8	130.8	4.70

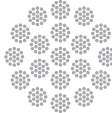
## Type-P (7×7×7)

Structure Cross-section	Type No.	Wire rope outer dia. (mm)	Wire rope outer dia. (mm)	Breaking load (N)	Breaking load (Kgf)	Weight (kg/1,000m)
	P-81	0.81	0.03	412.0	42.0	2.40
	P-108	1.08	0.04	715.0	73.0	4.30
	P-135	1.35	0.05	1,127.0	115.0	6.70
	P-162	1.62	0.06	1,646.4	168.0	8.40
	P-216	2.16	0.08	2,940.0	300.0	14.70

## Type-R {(7×7)+(1×19)×8}

Structure Cross-section	Type No.	Wire rope outer dia. (mm)	Wire rope outer dia. (mm)	Breaking load (N)	Breaking load (Kgf)	Weight (kg/1,000m)
	R-57	0.57	0.03	245.0	25.0	1.17
	R-76	0.76	0.04	421.4	43.0	2.12
	R-95	0.95	0.05	686.0	70.0	3.20
	R-152	1.52	0.08	1,764.0	180.0	8.34
	R-171	1.71	0.09	2,156.0	220.0	10.36

## Type-T (19×19)

Structure Cross-section	Type No.	Wire rope outer dia. (mm)	Wire rope outer dia. (mm)	Breaking load (N)	Breaking load (Kgf)	Weight (kg/1,000m)
	T-75	0.75	0.03	431.2	44.0	2.10
	T-100	1.00	0.04	833.0	85.0	3.80
	T-125	1.25	0.05	1,274.0	130.0	5.70
	T-150	1.50	0.06	1,862.0	190.0	8.40

# Wirerope

(Variations)

## Coating

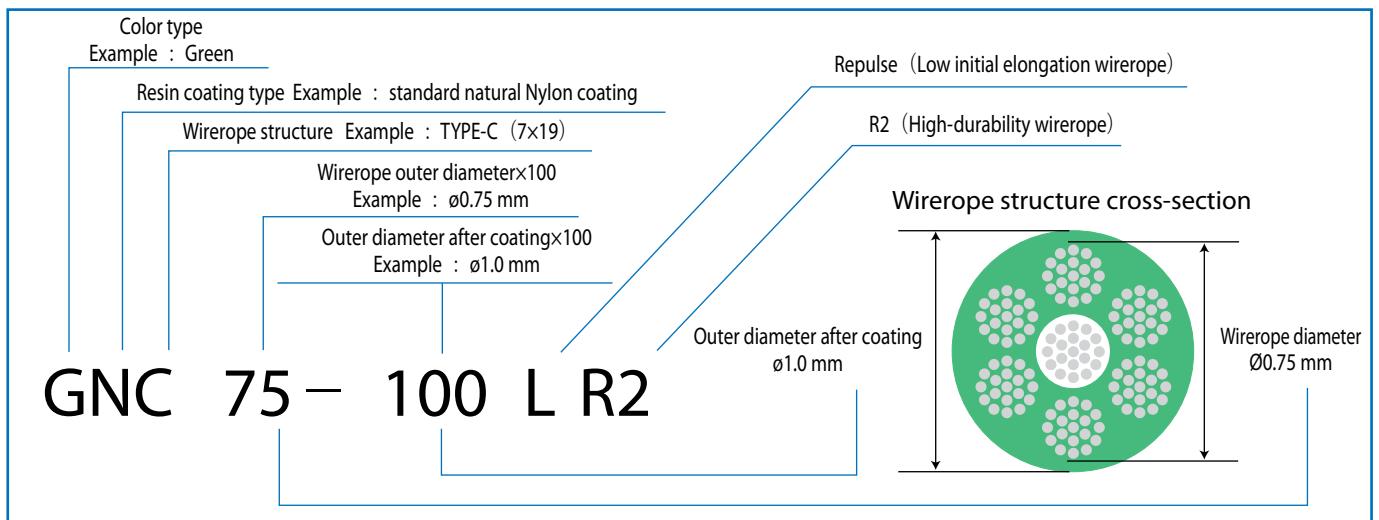
Wire drawing tech.

Wire forming tech.

Coating tech.

The coating of wire/wire rope is manufactured by means of a coating process technology that coats the wire/wire rope with an ultra-thin (2 to 7 $\mu$ m) film of PTFE resin and a forming technology that extrudes thermoplastic resin such as nylon into a minimum film thickness of 20 $\mu$ m. The coating wires/wire ropes manufactured with this technology exhibit a new property that combines the properties of the metallic material and the resin material.

### Code number composition



### Resin coating types

Type	Features
N	Standard Nylon 12
W	Standard Nylon 12 on wire rope soaked with oil
L	Nylon 12 with improved sliding property (Silicon type)
E	L-type Nylon 12 on wire rope soaked with oil
S	Nylon 12 with improved weather resistance (Carbon type)
U	S-type Nylon 12 on wire rope soaked with oil

### Color types

Type	Colors
B	Black
R	Red
G	Green
K	Golden
W	White
C	Brown

### NB

No.	Wire rope outer diameter(mm)	Outer diameter after nylon coating (mm)
NB27 - 36	0.27	0.36
NB36 - 51	0.36	0.51
NB45 - 61	0.45	0.61
NB54 - 70	0.54	0.70
NB63 - 80	0.63	0.80
NB72 - 90	0.72	0.90
NB81 - 100	0.81	1.00
NB90 - 110	0.90	1.10
NB100 - 120	1.00	1.20
NB108 - 130	1.08	1.30
NB120 - 150	1.20	1.50
NB150 - 180	1.50	1.80
NB180 - 210	1.80	2.10
NB200 - 240	2.00	2.40

### NC

No.	Wire rope outer diameter(mm)	Outer diameter after nylon coating (mm)
NC45 - 61	0.45	0.61
NC60 - 80	0.60	0.80
NC75 - 100	0.75	1.00
NC90 - 110	0.90	1.10
NC105 - 122	1.05	1.22
NC120 - 150	1.20	1.50
NC150 - 180	1.50	1.80
NC200 - 240	2.00	2.40

### NS

No.	Wire rope outer diameter(mm)	Outer diameter after nylon coating (mm)
NS44 - 61	0.44	0.61
NS55 - 70	0.55	0.70
NS66 - 80	0.66	0.80
NS77 - 100	0.77	1.00
NS88 - 110	0.88	1.10
NS99 - 120	0.99	1.20
NS110 - 130	1.10	1.30
NS121 - 150	1.21	1.50

### NR

No.	Wire rope outer diameter(mm)	Outer diameter after nylon coating (mm)
NR57 - 80	0.57	0.80
NR76 - 95	0.76	0.95
NR95 - 120	0.95	1.20
NR152 - 180	1.52	1.80
NR171 - 200	1.71	2.00

Note: Ropes can also be manufactured to custom specifications.

## Synchromesh Wire Rope

Wire drawing tech.

Wire forming tech.

Coating tech.



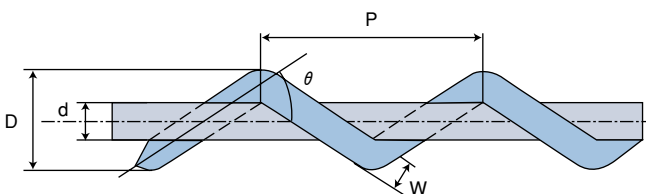
Patent Number: 3263387 (Japan), 3643105 (Japan)  
111769 (Korea), I 234622(Taiwan)

The synchromesh wire rope is manufactured by combining coating technology and wire-twisting technology. This provides the advantage of wire ropes (possible 3D distribution) and the convenience of timing belts (easy mounting). This wire rope employs the same gear-mesh type transmission as the timing belt.

### Features

- The synchromesh wire rope is manufactured through continuous forming. As it is not an endless type like the timing belt, any length can be selected.
  - With its round external design, this wire rope can be distributed in a 3D space in the same way as an ordinary wire rope. Unlike ordinary wire ropes, however, it does not need to be wound around a drum.
  - The mesh transmission allows it to be driven with a lower tension than an ordinary wire rope.
  - The helical construction reduces meshing noise, providing excellent low-noise properties.
- Note: Exclusive drive gears are required.

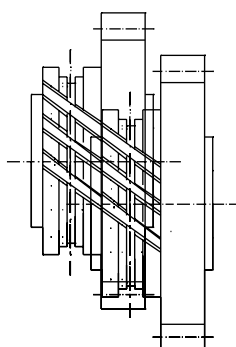
### Construction



- Wirerope : PA coating
- Outside lining : PU coating

### Exclusive drive gear

Since the synchromesh wire rope is driven by the same mesh transmission system as the timing belt, it requires exclusive gears for use in the drive. The gear is manufactured by injection molding of a resin such as POM and PBT. Drive gears manufactured by cutting are available for prototyping and test purposes.



### Application examples

Office automation equipment, home electric appliances, automobiles, FA, etc.

### Specifications

Type	AS-40	AS-60	AS-80	AS-100	AS-120
<b>Pitch</b> (P : mm)	2.03	2.82~3.05	3.53~3.81	4.23~5.08	6.35
<b>Outer diameter</b> (D : mm)	1.04	1.50	2.06	2.60	3.40
<b>Core diameter</b> (d : mm)	0.45	0.60	0.80	1.00	1.20
<b>Side span</b> (W : mm)	0.52	0.72	0.92	1.15	1.38
<b>Twisting angle</b> (θ°)	49	45~50	51~53	50~55	51
<b>Breaking Load</b> (N)	103.0	161.8	323.6	647.2	784.5

Note : The wirerope can also be manufactured to custom specifications.

# Wirerope

(Variations)

## Cable Rack

Wire drawing tech.

Wire forming tech.

Coating tech.

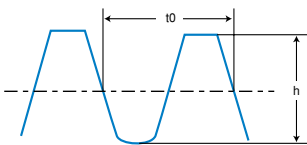


The cable rack is a resin coating wire rope with a stainless steel wire rope as the core, on which involute teeth are reformed with a special technique. In general, it can be used in the same way as a rack & pinion drive.

### Features

- Usable in both push and pull operations.
- The teeth are made of Nylon 12 material with excellent low-noise properties.
- Stainless-steel wire rope is used as the reinforcing core material.
- Excellent tensile strength.
- Withstands bending up to R30.
- Various shapes can be designed in dimensions up to 3.0×3.6mm
- Stable physical properties under any temperature.
- No production of toxic gas even under exposure to fire.

### Tooth shape



### Application examples

Office automation equipment, home electric appliances, automobiles, FA, etc.

### Specifications

		CL0.8S	CL0.8H
Tooth dimensions	m	0.8	←
	t0	2.5±0.1	←
	h	1.6	←
Minimum bending radius		R30	R60
Buckling strength		High	Extremely high
Materials	Core	SUS304	←
	Teeth	Nylon12	←
Weather resistance		-30~80°C	←
Chemical resistance		Good	←

## Torque Wire Rope

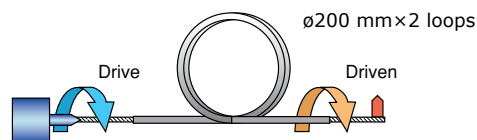
Wire drawing tech.

Wire forming tech.

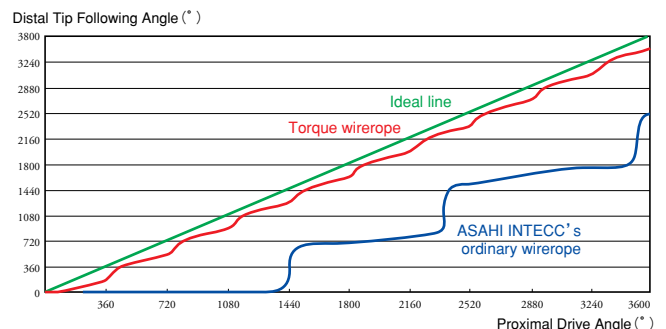
Torque tech.



While an ordinary wire rope transmits force through pulleys and drums or push/pull operations using an outer tube, the torque wire rope is a wire rope processed specially for rotation-tracking performance. The torque rope makes it possible to perform a push/pull operation and a rotation transmission simultaneously. (Patent Pending in Japan)



### Comparison of rotation tracking performance



### Specifications

Structure cross-section	Type	Outer diameter (mm)		Overall length (m)
		Min.	Max.	
	Type-D (Torque) 1×3	0.30	0.65	2.00
	Type-E (Torque) 1×7	0.30	1.00	2.00
	Type-G (Torque) 1×19	0.50	1.00	2.00

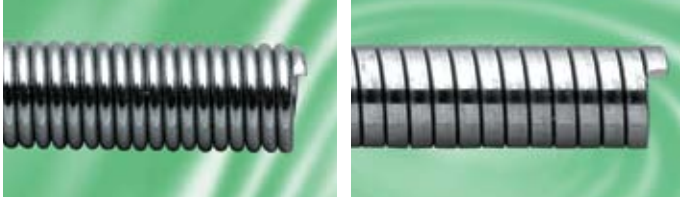
### Application examples

Office automation equipment, home electric appliances, automobiles, FA, etc.

## Round-Wire Coil, Flat-Wire Coil

Wire drawing tech.

Wire forming tech.



These fine coils are made of SUS304 or SUS316 materials. The coil shapes include round, flat and inner lumen flat wire coils. These coils are applied in endoscopic devices, guidewires for medical use, outer coils, etc.

### Specifications

Cross-section		Coil outer diameter (mm)	
		Min.	Max.
Round wire coil 	$\phi d$ : Wire outer diameter $3.5 \leq D/d \leq 9$ $\phi D$ : Coil outer diameter	0.10	3.50
Flat wire coil 	T: Wire thickness $5 \leq D/T \leq 8$ $\phi D$ : Coil outer diameter	0.14	2.00
Inner lumen flat wire coil 	W: Flatness width $\phi d$ : Wire outer diameter $\phi D$ : Coil outer diameter $3.8 \leq D/d \leq 5$ $W < d/3$	2.00	2.50

Note : PTFE coating is available.

Special product Platinum and stainless steel coil



Platinum      Stainless Steel

ASAHI INTECC's original jointless coil, manufactured by welding of dissimilar wires.

## Torque Coil

Wire drawing tech.

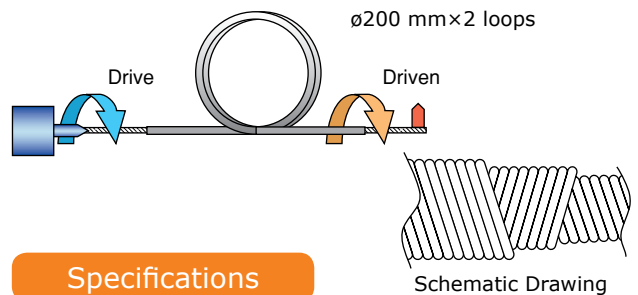
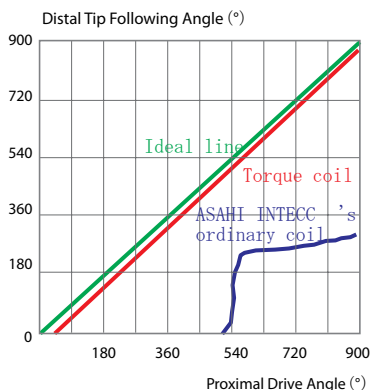
Wire forming tech.

Torque tech.



The torque coil is a fine coil with multiple threads and multiple layers, made of SUS304 or SUS316. It transmits the rotation of the proximal end accurately to the distal tip. The flexibility allows the torque coil to maintain performance even in bent sections.

### Comparison of rotation tracking performance



### Specifications

	Min.	Max.
Outer diameter(mm)	0.51	2.03
Inner diameter(mm)	0.25	1.01
Number of layers	2	3
Number of threads	4	8

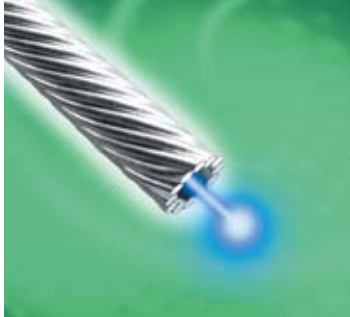
Note: PTFE coating is available.

## ACTONE\* (Cable Tube)

Wire drawing tech.

Wire forming tech.

Torque tech.



Structure cross-section

### Patent

- Patented in USA (U.S Patent No. 6.881.194 No.7.117.703)
- Patent pending in Japan and Europe etc.

### TradeMark

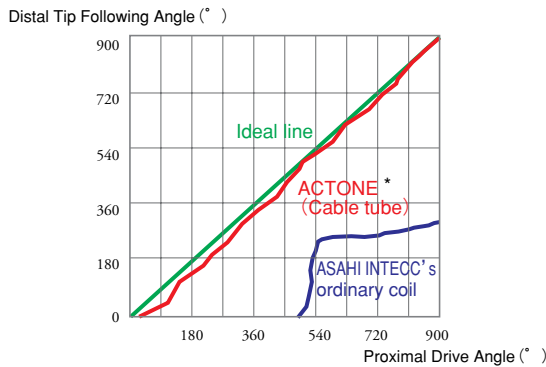
\* "ACTONE" is a registered trademark in USA and Japan.

The tube is a hollow wire rope manufactured with a special processing technology to provide high torque transmission, high kink resistance and low ductility. It is applied in multifunctional guide wires and catheters for medical use, etc.

### Features

- High torque transmission (compared to ASAHI INTECC coils)
- High pushability
- Low extension ratio

### Comparison of rotation tracking performance



### Specifications

	Min.	Max.
Outer diameter(mm)	0.30	1.30
Overall length(mm)	—	3,000
Number of threads	6	18

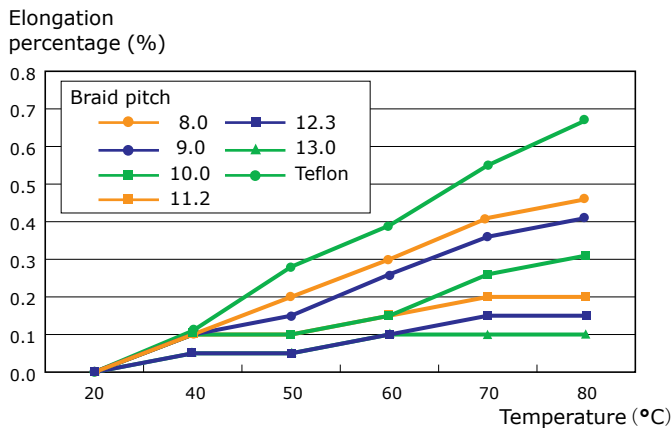
Notes: • Materials—SUS304, SUS316, NiTi.  
• PTFE coating is available.

## Braided Tube

Wire drawing tech.

Coating tech.

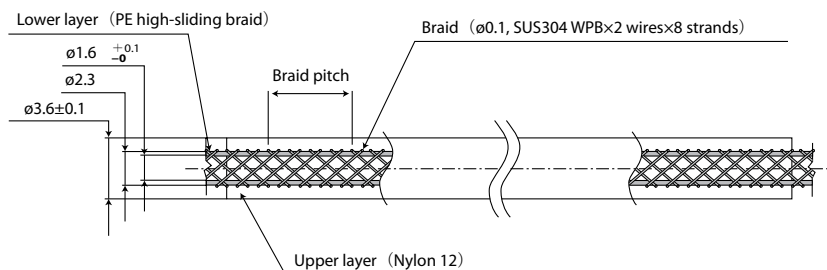
### Elongation test under high temperature



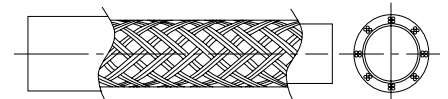
A braid is inserted between the upper and lower layers of a tube using ASAHI INTECC's proprietary technology. This design helps prevent the outer resin layer from stretching under high temperatures or excessive loads. Patent number: 3658309 (Japan) (For Control Cables)

### Materials

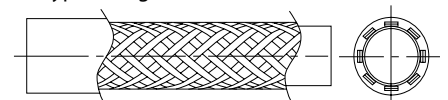
Upper layer	Lower layer
PA	PA
PAE	PAE
PU	PU
PE	PE
	PTFE
	PFA



Braid type : Two round wires



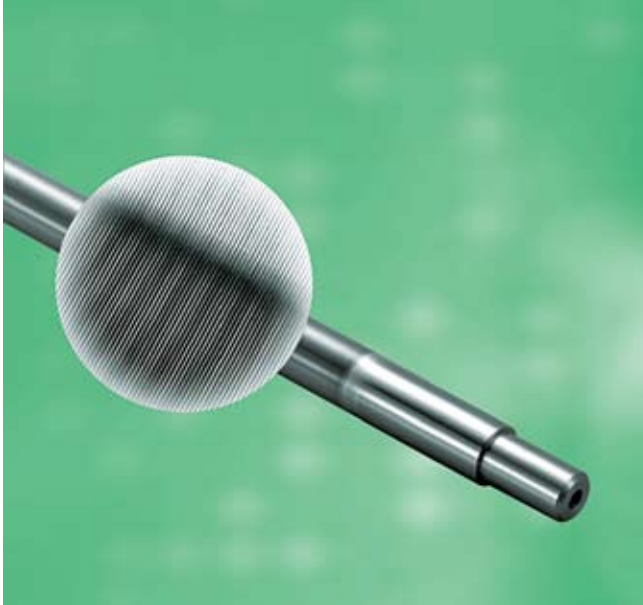
Braid type : Single flat wires



## Wire-Bar

Wire drawing tech.

Wire forming tech.

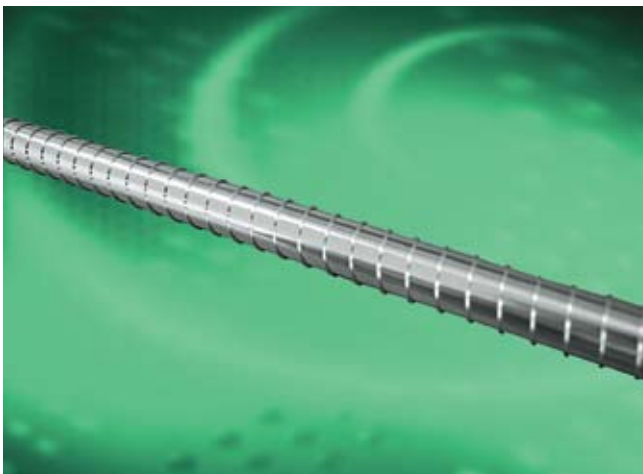


Precision wound

The wire bar is composed of a precision shaft with stainless steel wires wound precisely around it. Precision wound wire-bars are used in precision application of liquids such as liquid crystal films, etc, and pitch wound wire-bars are used to carry semiconductor parts. The wires used in the wire-bar are manufactured using an exclusive wire drawing machine to minimize scratches on their surface. The diameters of the wires wound around the shaft can be manufactured in 2 $\mu$ m steps according to the coated film thickness, thereby making it possible to manage the film thickness with high accuracy.

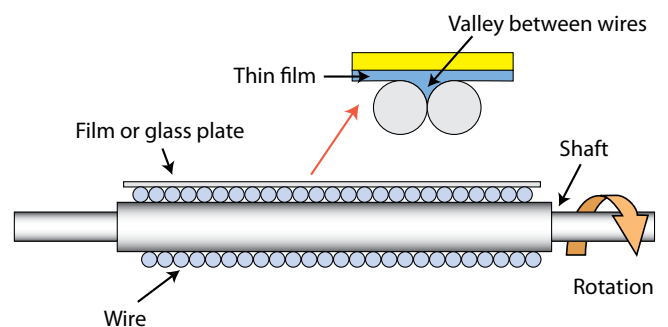
### Features

- Film thickness can be controlled by varying the wire diameter.
- Regular surface coating made possible by high shaft precision and improved wire winding precision.
- Applicable to a wide range of products.



Pitch wound

### Example of use



### Specifications

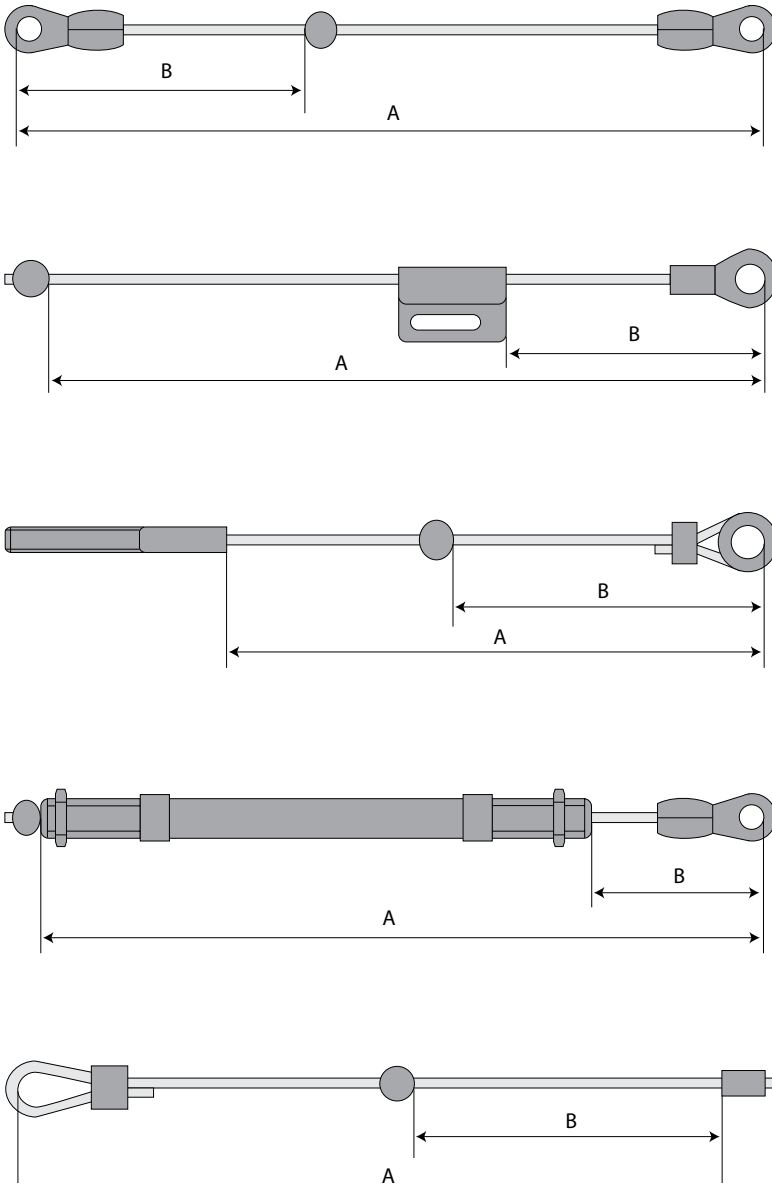
Wire material	SUS304, SUS316
Wire outer diameter	$\phi$ 55, 60, 65, 70, 75, 80, 85 and 90 $\mu$ m, etc. Wire sizes can be manufactured in 2 $\mu$ m increments according to orders.
Wire winding width	300 mm to 1,400 mm
Shaft outer diameter	Above $\phi$ 3mm
Shaft material	SUS304, etc.
Shaft shape	According to the customers' specifications.

## Example of Design Specifications

Wire drawing tech.

Wire forming tech.

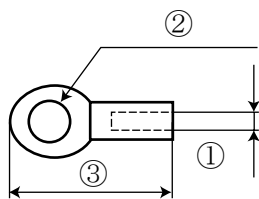
Coating tech.



### Terminal types

#### A-type terminal

Flat/round/square caulking

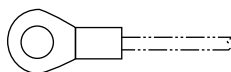


Reference - Outer diameter after caulking

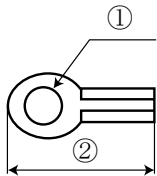
- Flat caulking:  $t$  1.7~2.7
- Round caulking:  $\phi$  3.0~4.4
- Square caulking:  $\square$  3.2~4.0

Code No.	Material	1	2	3	Optimum wire rope outer diameter
A61	Fe	1.8	4.2	20	$\phi$ 1.50~1.60
A71	Fe	1.7	5.2	21	$\phi$ 1.35~1.50
A72	Fe	1.8	5.8	18.5	$\phi$ 1.50~1.60
A73	Bs	1.9	4.4	22.5	$\phi$ 1.50~1.60
A74	Fe	1.8	6.2	18.5	$\phi$ 1.50~1.60

Note: Mainly used in connection to a pin or a screw.



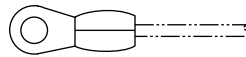
## OA-type terminal OA caulking



Reference Outer diameter after caulking

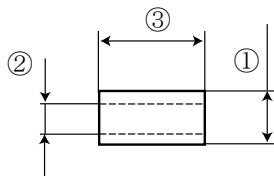
OA caulking:  $t$  2.7-3.4

Code No.	Material	1	2	Optimum wire rope outer diameter
A30	Fe	4.2	20	$\phi$ 0.81~1.10
A31	Fe	5.2	20	$\phi$ 0.81~1.10
A33	Fe	4.2	16.5	$\phi$ 0.72~1.00
A88	Fe	4.2	23	$\phi$ 1.10~1.50
A89	Fe	5.2	23	$\phi$ 1.10~1.50
A93	SUS	4.4	23	$\phi$ 1.10~1.50



Note: Mainly used with wire ropes with outer diameters of around 1.0 mm. Even with coated wire ropes, caulking is possible without removing the coating.

## B-type terminal Flat/round/square/edge-round caulking



Reference Outer diameter after caulking

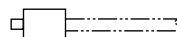
Flat caulking:  $t$  1.0~ 4.0

Round caulking:  $\phi$ 1.6~10.0

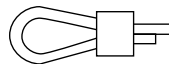
Square caulking:  $\square$ 2.0~ 6.7

Edge round caulking:  $\phi$ 4.4~10.0

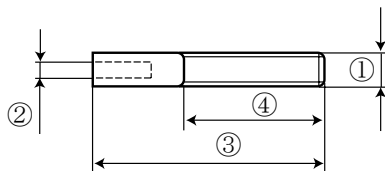
Code No.	Material	1	2	3	Optimum wire rope outer diameter
B16H	Bs	3	1.1	3.3	$\phi$ 0.72~0.90
B22H	Fe	5	1.75	4.8	$\phi$ 1.20~1.50
B23	AL	4	2.2	4	$\phi$ 1.80~2.00
B67H	Bs	4.6	1.1	3.4	$\phi$ 0.72~0.90
B51H	Cu	3.45	1.85	4	$\phi$ 1.30~1.50
B69H	Bs	4.6	1.4	3.4	$\phi$ 1.00~1.20



Notes: Available in a wide variety of sizes, materials and shapes.



## C-type terminal Flat/round/square caulking



Reference Outer diameter after caulking

Flat caulking:  $t$  2.5~2.7

Round caulking:  $\phi$ 2.7~4.2

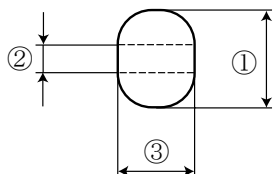
Square caulking:  $\square$ 4.0~4.5

Code No.	Material	1	2	3	4	Optimum wire rope outer diameter
C25	Bs	3	1.1	27	20	$\phi$ 0.80~0.90
C2	Bs	4	1.25	39	32	$\phi$ 0.90~1.05
C18	Bs	5	1.25	23	16	$\phi$ 0.90~1.05
C9	Bs	3	0.8	18	14	$\phi$ 0.51~0.63
C16	Bs	6	2.3	62	37	$\phi$ 1.85~2.00
C21	SUS	4	1.8	30	20	$\phi$ 1.50~1.60



Note: Attachable by fine adjusting the length.

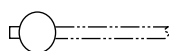
## D-type terminal Ball caulking



Reference Outer diameter after caulking

Ball caulking:  $\phi$ 3.0~6.0

Code No.	Material	1	2	3	Optimum wire rope outer diameter	Outer diameter after caulking
D7H	Bs	3.5	1.2	2	$\phi$ 1.00	$\phi$ 3.2
D13H	Bs	4.5	1.1	2.65	$\phi$ 0.90	$\phi$ 4.2
D10H	Bs	5.5	1.2	3.3	$\phi$ 1.00	$\phi$ 5
D55H	Bs	6.5	1.7	3.65	$\phi$ 1.50	$\phi$ 6
D9H	Bs	3.5	1.4	2	$\phi$ 1.20	$\phi$ 3.2
D14H	Bs	4.5	1.4	2.45	$\phi$ 1.20	$\phi$ 4



Note: Mainly used in connection to a slit or an opposite part. This terminal is also indispensable for intermediate attaching.

The above terminals are only the most general types.

For other types of terminals, please consult ASAHI INTECC. Other terminals can also be manufactured to custom specifications.

Note: With coated wire ropes, it may be recommended to remove the coating according to the load resistance specifications.

## Charge Wire

Wire forming tech.



The charge wire is composed of a tungsten wire with terminal manufactured for use as a corona discharge electrode in copiers, dust collectors, air cleaners, ion generators, etc. As the design of the corona discharge electrode varies widely depending on the operating environment, purpose and charging method, it is necessary to study the type, size and other factors for each application.

Patent Number: 3619166(Japan)  
Design Patent Number: 1138443(Japan)

### Specifications

Reference		Material: Tungsten wire
Type	Outer diameter (mm)	
Tungsten oxide wire	ø0.04~ø0.2	
Gold-plated tungsten wire	ø0.04~ø0.2	
Black wire (Carbon wire)	ø0.04~ø0.2	
White wire (Carbon-eliminated wire)	ø0.04~ø0.2	
Platinum-plated tungsten wire	ø0.04~ø0.2	

Note: 1) Spot welding assembly 2) Caulking assembly  
3) Winding assembly  
Various types of assembly are available according to applications.

## Control Cable

Wire drawing tech.

Wire forming tech.



The control cable is a remote control wire that transmits actions at the proximal end without using a pulley or gear. It is easy to install and can be remote controlled (action transmission) through linear sections, bent sections, and even narrow spaces. It is applied in a wide range of industrial and office equipment.

### Features

In automobiles, the control cables are used in accelerators and opening mechanisms. The simplified structure and low cost will make the control cables indispensable in a wider range of fields now and in the future.

Bespoke terminals for various applications



Resin molding items



Cutting items



Shafts



Aluminum extrusion and die-cast items



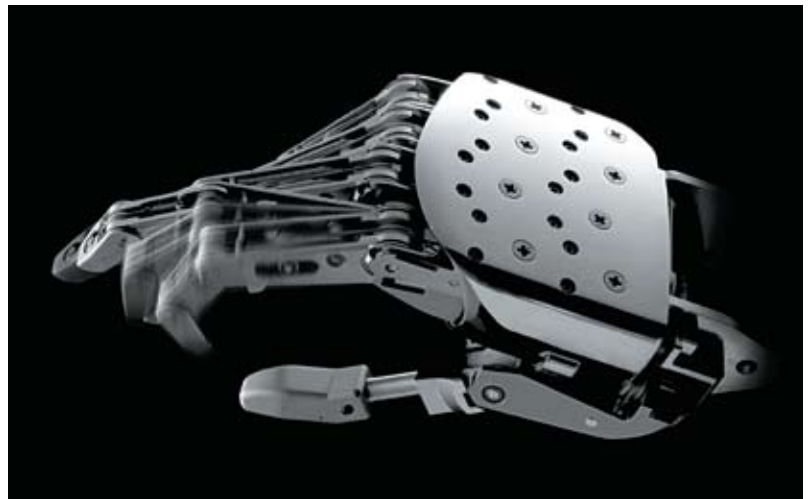
Pressed items



Sintered items



Unit assemblies



Note: ASAHI INTECC handles everything from trial production to mass-production.



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