






# Torque coil



The torque coil is a highly flexible coil consisting of multiple layers with very fine wires, which makes the coil ideal for high-speed rotation in very tortuous routings or anatomies. Typical applications are for IVUS, OCT catheter or atherectomy device.

## Specifications

| Type                                                                                         | Rotation direction                                                                  | High speed rotation | Flexibility | Elongation resistance | OD                                                                                           | ID                                  | Filar | Length       |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------|-------------|-----------------------|----------------------------------------------------------------------------------------------|-------------------------------------|-------|--------------|
| 2 layer*  |  | 5                   | 5           | 3                     | 0.44-1.68 mm<br>(Trial : 0.30-5.17)                                                          | 0.18-1.10 mm<br>(Trial : 0.15-3.20) | 4-18  | up to 3000mm |
| 3 layer*  |  | 5                   | 5           | 3                     | 0.36-2.76 mm<br>(Trial : 0.36-6.00)                                                          | 0.18-1.71 mm<br>(Trial : 0.18-3.20) | 4-18  | up to 3000mm |
| Auger     |                                                                                     | -                   | -           | -                     | Above torque coil with spiral wire, used as Archimedes screw (Japan Patent number : 5408809) |                                     |       |              |













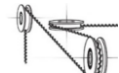

\*Round and flat type is available for its fine wires. Round is suitable for application that require High speed rotation, flat is for Elongation resistance.

Legend 5 = Highest applicability  
1 = Lowest applicability

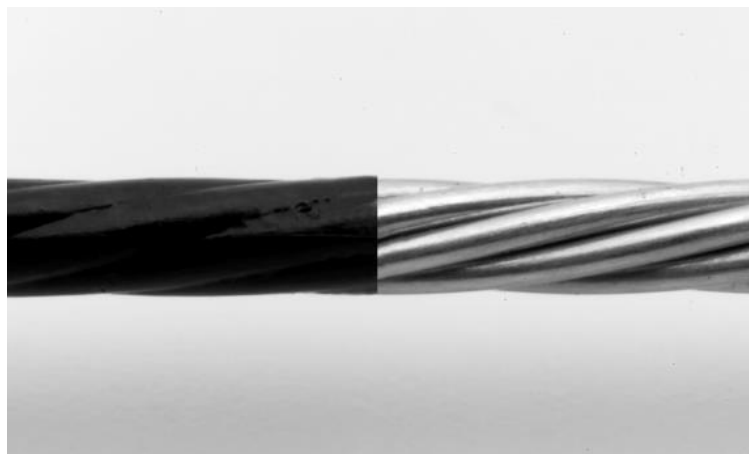
# Product lineup

## Specifications and Comparison of properties

Legend : 5=Highest, 1=Lowest applicability

| Category           | Item                  | Type                                                                                                                         | Specification(Trial)                                                                      |                                                                                           | 1to1 Torque response                                                                                  | High-speed rotation | Push/Pull | Compression | Flexibility | Feature                                                                                               |
|--------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------|-----------|-------------|-------------|-------------------------------------------------------------------------------------------------------|
|                    |                       |                                                                                                                              | OD(mm)                                                                                    | ID(mm)                                                                                    |                                                                                                       |                     |           |             |             |                                                                                                       |
| Hollow cable       | Torque coil           |  3layer<br>2layer<br>flat<br>auger*         | 0.36-6.00<br>0.30-5.17<br>-<br>-                                                          | 0.18-3.20<br>0.15-3.20<br>-<br>-                                                          | 5                                                                                                     | 5                   | 3         | 2           | 4           | bi-directional (3 layers) or unidirectional (2 layers) rotation<br>*Archimedes screw with spiral wire |
|                    | Torque Hypotube       |                                             | 0.20-1.10                                                                                 | 0.10-0.70                                                                                 | 5                                                                                                     | 2                   | 5         | 5           | 1           | high breaking strength and elongation resistance                                                      |
|                    | ACT ONE               |  standard<br>flat<br>ultra thin<br>auger*   | 0.21-4.52<br>0.21-4.52<br>0.42-3.75<br>-                                                  | 0.13-3.20<br>0.16-3.20<br>0.34-3.20<br>-                                                  | 4                                                                                                     | 3                   | 4         | 3           | 3           | well balanced properties<br>*Archimedes screw with spiral wire                                        |
|                    | Wire coil             |  round<br>flat                              | 0.10-3.50<br>0.10-5.90                                                                    | ~1.80<br>0.07-5.30                                                                        | 1                                                                                                     | 1                   | 2         | 4           | 5           | high flexibility and compression resistance                                                           |
| Cable              | Drive Cable           |  2-6layer                                 | 0.41-6.00                                                                                 | -                                                                                         | 5                                                                                                     | 5                   | 5         | 4           | 2           | Optimized for high speed rotation and power transmission                                              |
|                    | Torque rope           |  1x3,1x7,<br>1x12,1x19                    | 0.30-3.00                                                                                 | -                                                                                         | 4                                                                                                     | 3                   | 5         | 4           | 3           | 1:1 torque transmission at hand-speed rotation                                                        |
|                    | Wire rope             |  1x7,1x19<br>7x7,7x19<br>7x7x7, etc.      | 0.09-3.00                                                                                 | -                                                                                         | 1                                                                                                     | 1                   | 5         | 4           | 3           | High breaking strength and elongation resistance                                                      |
| Coating            | Outer coating         |  Extrusion<br>Dip coat<br>Spray           | Floropolymer<br>Nylon, etc.                                                               | To add lubricity, ablation resistance or biocompatible sealing to cable                   |                                                                                                       |                     |           |             |             |                                                                                                       |
|                    | Inner tube            |                                           | Floropolymer                                                                              | Inner coating applied to a hollow cable                                                   |                                                                                                       |                     |           |             |             |                                                                                                       |
|                    | Precoating            |                                           | PTFE                                                                                      | Coating for both inner and outer of hollow cable without losing the property of the cable |                                                                                                       |                     |           |             |             |                                                                                                       |
| Assembly           | Machining & Assembly  |  Laser welding, Grinding<br>Tube assembly | Variety of welding and machining available for assembly or additional mechanical property |                                                                                           |                                                                                                       |                     |           |             |             |                                                                                                       |
|                    | End termination       |  Ball, Eye, Loop, etc.                    | For the end of a cable or used for intermediate attaching.                                |                                                                                           |                                                                                                       |                     |           |             |             |                                                                                                       |
| Power transmission | Synchromesh wire rope |  AWS40<br>-AWS120                         | 1.10-3.40                                                                                 | -                                                                                         | Synchronous round belt, ideal for linear-motion system drawn in 3-dimensional.                        |                     |           |             |             |                                                                                                       |
|                    | Cable rack            |  CL0.8S / H                               | W3.0 x H3.6                                                                               | -                                                                                         | With stainless cable core, ideal when the Rack needs to be flexible and high-force movement required. |                     |           |             |             |                                                                                                       |

# Outer coating



A stainless steel cable assembly may be sprayed, dipped, or extruded with PTFE, Nylon, and other coatings for your particular abrasion-resistance, lubricity, low coefficient of friction, and long-term durability requirements. Asahi Intecc can precisely mask the ends of the coated stainless steel cable assemblies to attach various in-house iron (FE), stainless steel (SUS, SS), Aluminum (AL), Copper (Cu), and other metallic finishes.

## Comparison of properties

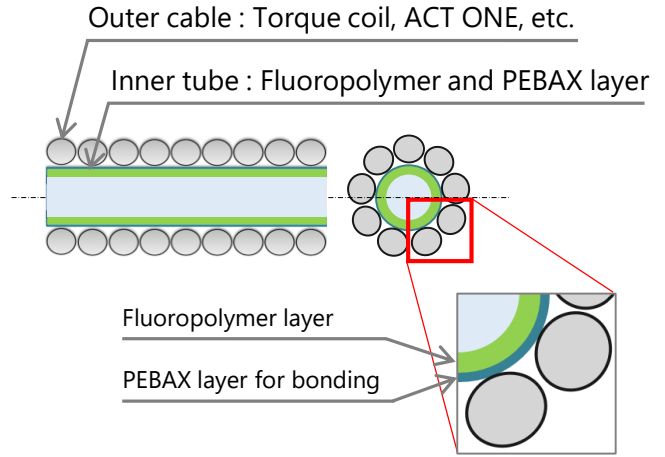
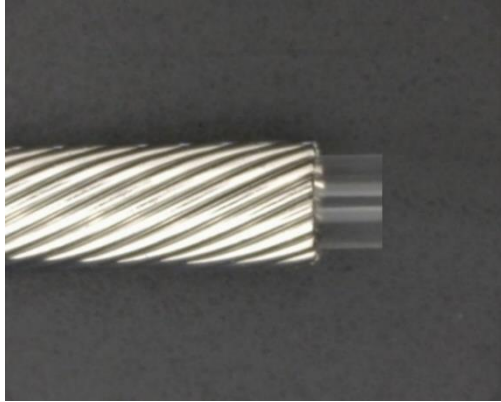
| Type         | Resin                          | Abbreviation | Cost (1=lowest) | Heat resistance | Flexibility | Chemical resistance | Lubricity | Minimum thickness |
|--------------|--------------------------------|--------------|-----------------|-----------------|-------------|---------------------|-----------|-------------------|
| Polyamide    | Nylon 12                       | PA           | 3               | 3               | 2           | 3                   | 2         | 20μ               |
|              | Nylon 6                        | PA           | 3               | 5               | 2           | 3                   | 2         | 20μ               |
| Polyurethane | Polyurethane                   | PU           | 4               | 2               | 5           | 3                   | 1         | 20μ               |
| Polyethylene | Polyethylene                   | PE           | 1               | 2               | 3           | 3                   | 2         | 20μ               |
| Fluororesin  | Fluorinated ethylene propylene | FEP          | 4               | 3               | 2           | 5                   | 5         | 20μ               |
|              | Perfluoroalkoxy alkanes        | PFA          | 4               | 5               | 2           | 5                   | 3         | 20μ               |
|              | Ethylene tetrafluoroethylene   | ETFE         | 3               | 3               | 2           | 3                   | 2         | 20μ               |
|              | Polytetrafluoroethylene        | PTFE         | 5               | 5               | 2           | 5                   | 5         | 7μ                |

### Legend

5 = Highest applicability

1 = Lowest applicability

# Inner tube



The Inner tube is designed for internal coating applied to hollow cable tubes like ACT ONE, Torque coil, or Wire coil for adding lubricity, chemical isolation, or surface preparation to the inside of the hollow cable. Ideal for applications requires lumen lubricity, sealing, or chemical resistance, for customers developing a delivery system.

## Specifications

Minimum wall thickness (including Fluoropolymer and PEBAX layer)

\*It depends on Inner tube ID as below, which is not include tolerance.

| Inner tube ID  | Min. wall thickness | Inner tube ID  | Min. wall thickness |
|----------------|---------------------|----------------|---------------------|
| 0.20 - 0.73 mm | 0.03 mm             | 1.58 - 1.85 mm | 0.07 mm             |
| 0.74 - 1.01 mm | 0.04 mm             | 1.86 - 2.13 mm | 0.08 mm             |
| 1.02 - 1.29 mm | 0.05 mm             | 2.14 - 2.33 mm | 0.09 mm             |
| 1.30 - 1.57 mm | 0.06 mm             | 2.34mm ~       | N/A                 |

Coating material (Fluoropolymer layer)

- PTFE      greatest lubricity and chemical resistance
- PFA      similar in chemical resistance to PTFE, but less lubricity
- FEP      similar to PFA, slightly less susceptible to water absorption than others
- ETFE     greatest strength and abrasion resistance

Length                                      up to 1800mm (Trial : up to 3000mm)

End treatment of inner tube      manually cut using utility knife

End treatment of outer cable      EDM cut, chamfering

# Machining & Assembly

## Processing on surface



### Swaging process

We can decrease O. D. without both I. D. change and decrease of stiffness by beating surface of rope. It improves the anti-elongation



### Flat-grinding process

We can perform Flat-grinding on surface of rope in whole length . It improves flexibility of rope without changing I. D..



### Auger

We can set additional filar on rope. This structure adds the transportation function to rope.



### Marking process

We can put marking to make clear the its position of the wire rope.

## End treatment



### Electric discharge method

This method makes individual filars avoid being crushed by cutting with nipper.



### End treatment by laser

We can unite individual filars into one end by laser welding.



### Plasma welding

We can make hemisphere shape at the end of rope. It improves both safety and sliding performance.



### L-grinding process

We can perform high precision grinding process to make L-shaped end of rope. This shape helps to connect rope to other materials.

## Assembly



### Laser welding

We can weld different kind of materials by laser welding.



### Solder welding

We can weld different kind of materials by soldering.