



HELICAL HOLLOW STRAND™

Fort Wayne Metals Helical Hollow Strand™ (HHS) furthers our excellence in stranding and cabling of medical grade wire.

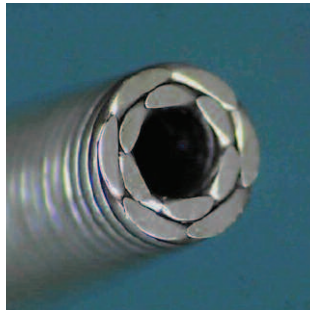
Features and Benefits

HHS is a Fort Wayne Metals stranded wire with an open center working channel.

HHS is manufactured using wire material drawn by Fort Wayne Metals. HHS has excellent whip free characteristics, and can be made highly kink resistant.

Designs can be tailored to customer requirements of tension, compression, torque and pitch direction.

HHS is manufactured according to customer requirements and specification. Single or Dual layer HHS for increased flexibility and control.



Applications

- Over the Wire Devices
- Manipulation Components
- Working Channels
- Endovascular Devices
- Minimally Invasive Tools
- Catheter Devices
- Delivery Devices
- Urological Tools
- Neurological Components

Specification

Helical Hollow Strands are designed using solid modeling according to mathematical formulas. Using parametric design, many design considerations can be evaluated in a short time. Materials are normally spring temper. Nitinol HHS is provided in the superelastic condition.

Flexibility can be influenced by design variables including ID, OD, Wire Size, Filar Count and other processing.

- Inside Diameter from 0.007" to 0.045"
- Outside Diameter from 0.014" to 0.087"
- Filars 6 to 12
- Layers up to 2
- Lengths up to 10' (longer possible depending on design)
- Pitch Left, Right, Unidirectional, Reverse

Secondary Operations

- Customer specified performance testing:
Droop, Compression, Yield (elongation at load) or Torque
- Square cut ends
- Chamfering
- Formed HHS
- Welding
- OD Step Grinding

Materials

- 302
- 304V
- 316L
- 35N LT®
- DFT®
- L-605
- CP Titanium
- Ti 6Al-4V ELI
- Nitinol
- Pt Alloys (Others may be available)

Characteristics	HHS™	Coil	
		Unifilar	Multifilar
Torque	Excellent	Poor	Good
Windup (Low)	Good	Poor	Poor
Whip	Excellent	Excellent	Excellent
Pushability	Excellent	Excellent	Good
Use Tension	Excellent	Poor	Good
Compression (%)	Good	Excellent	Poor
Hoop Strength	Good	Excellent (Tight Wound)	Good
Wall Thickness (thinwall)	Good	Excellent	Excellent

Manufacturing Illustration HHS™				
Dimensions in Inches (mm in parentheses)				
in/(mm)	Smallest	1.0mm ID	Largest	High ID/OD Ratio
IØ	.007 (0,18)	0.0394 (1,0)	0.045 (1,0)	.024 (0,61)
MØ (filar diameter)	0.002 (0,051)	0.0079 (0,2)	0.020 (0,5)	0.0035 (0,089)
OØ	0.011 (0,028)	0.055 (1,4)	0.080 (2,0)	0.031 (0,79)
M# (filar)	12	12	9	12
Pitch	.045 (1,14)	0.122 (3,1)	0.400 (10,2)	0.048 (1,22)

HHS Design Parameters

