Lisprings

PRODUCT GUIDE

WAVE SPRINGS

SPIRAL RETAINING RINGS

WE ONLY MAKE WAVE SPRINGS AND SPIRAL RETAINING RINGS, BECAUSE OF SPECIFICITY SO PROFESSIONAL.

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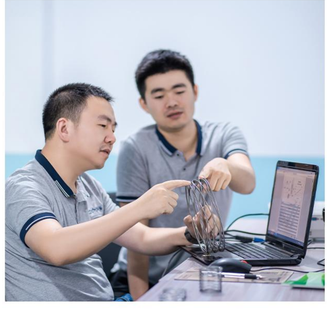
CONTENTS

Lispring Company was founded in 2009, is a private enterprise specializing in the design and production of wave springs and spiral retaining rings. At present, it has become the largest production base of wave spring and spiral retaining ring in China. Our company is the supplier of parts for the first Mars probe Tianwen 1 in China.

Lispring company covers an area of 7000 square meters, building area of 24000 square meters.It has about 100 employees, 90 processing equipments, 60 testing equipments. At present, our company keeps thousands of kinds of conventional size products in stock. Whether you need carbon steel, stainless steel, special high temperature and corrosion resistant materials, copper alloys, titanium alloys, we can help you solve the problem.



Due to the introduction of wave spring and retaining ring machine from Japan and wave spring and retaining ring design software FERD of German , we can quickly produce the non-standard products you need without making redundant molds.

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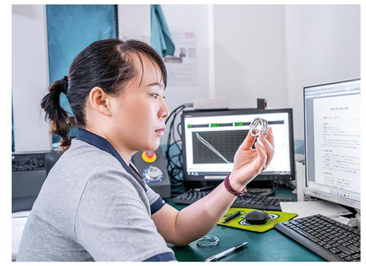
FACTORY ENVIRONMENT

Meeting Room

Laboratory



Quality Test Room

Flattening Machine

Field Work

Production Workshop

Japanese Machine

Sample Chamber

Raw Material Warehouse

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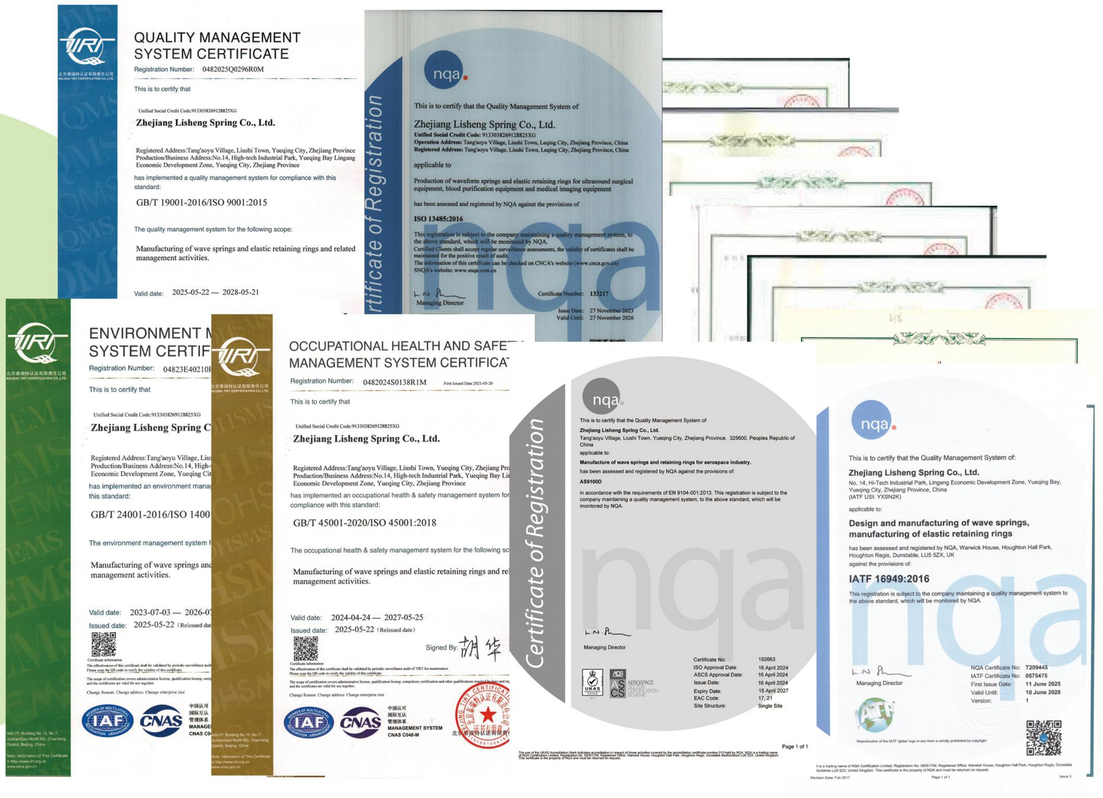
HONORARY QUALIFICATIONS

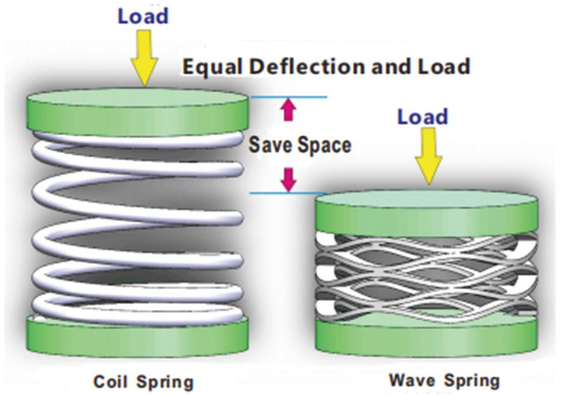
- ISO9001
- ISO13485
- ISO14001
- ISO45001
- AS9100
- IATF16949

IT HAS OBTAINED MORE THAN 30 PATENT CERTIFICATES



PRODUCT SPECIAL FEATURES

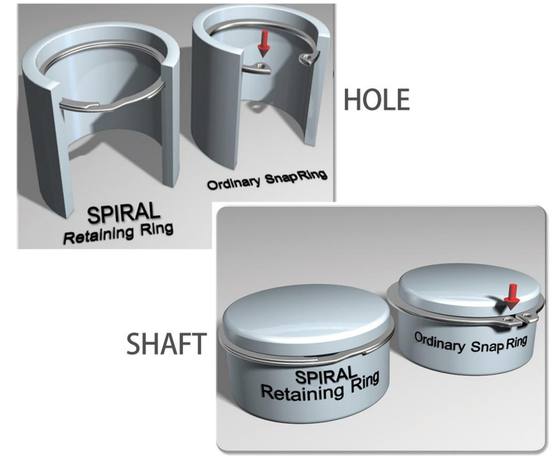
Wave Spring Advantage



Wave spring is a precision flat wire compression spring suitable for installation in parts where other springs cannot meet and space is limited. 50% less space than normal round wire springs.

Spiral Retaining Ring Advantage

Spiral retaining ring is an earless elastic stop ring formed by flat wire winding, no lug, no burr, will not interfere with the parts, and different from the traditional stamping process, will not produce waste caused by waste.



MATERIAL

CARBON STEEL

[65Mn OIL-QUENCHED & TEMPERED]

65Mn high-carbon oil-quenched and tempered spring steel is a standard material for spiral retaining rings and wave springs. Its oil-tempered martensitic structure maximizes tensile and yield strength.

- Operating temperature range: -20°C to 120°C
- Highly magnetic; available in blue, black and gray finishes.

[65MN COLD DRAWN]

65Mn high-carbon cold drawn (hard drawn) spring steel is a standard material for spiral retaining rings and wave springs. Its strength is derived from the wire drawing process.

- Operating temperature range: -20°C to 120°C
- Highly magnetic; typically gray in finish.

Carbon steel is suited for protected operating environments and susceptible to corrosion without lubrication or sealing. Additional corrosion protection is available via specialized surface finishes. Products are supplied with an oil-dipped finish for protection during transportation and shelf storage.

STAINLESS STEEL

[304H]

304H high-carbon spring stainless steel is a standard material for retaining rings and wave springs. Cold working delivers high strength and elasticity, with good oxidation and corrosion resistance. Finished parts receive low-temperature stress relief.

- Operating temperature: < 220℃
- Slightly magnetic after cold working; available in silver white, silver gray and golden yellow finishes depending on heat treatment.

[316]

316 nickel-chromium stainless steel offers mechanical properties nearly identical to 304H. With higher nickel and molybdenum content, it delivers superior corrosion resistance. Finished parts receive low-temperature stress relief.

- Operating temperature: < 220℃
- Slightly magnetic after cold working; available in silver white, silver gray and golden yellow finishes depending on heat treatment.

[631(17-7PH/C)]

631 is an aluminum-bearing precipitation-hardening stainless steel with corrosion resistance similar to 304H. It achieves high strength and elasticity through martensitic transformation, cold working and precipitation hardening.Ideal for wave spring fabrication, it performs well in fatigue and high-stress applications. Spring properties are obtained via dispersion hardening from Condition C to CH900, with no loss of elasticity at temperatures up to 343°C.

- Operating temperature: < 343℃
- Magnetic after cold working; blue/brown finish after open-air precipitation hardening, silver white/silver gray finish after protective atmosphere heat treatment.

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MATERIAL

EXOTIC ALLOYS

[INCONEL X-750]

INCONEL X-750 is a nickel-chromium alloy for high-temperature corrosive environments, with excellent sulfidation resistance. Two common elastic tempers are achieved via precipitation hardening:

- Spring Temper + Aged: operating temperature range -200°C to 370°C
- No. 1 Spring Temper + Aged: operating temperature range -200°C to 550°C, suitable for retaining rings and wave springs
- Non-magnetic; parts heat treated in open air exhibit a blue, brown or silver-gray finish.

[A286]

A286 alloy exhibits properties similar to INCONEL X-750 at temperatures up to 538°C. Spring tempers are achieved through precipitation hardening, with heat treatments equivalent to Spring Temper and No. 1 Spring Temper for INCONEL, delivering excellent mechanical properties.

- Operating temperature: < 538°C
- Non-magnetic; blue / silver-gray finish after heat treatment.

[INCONEL 718]

INCONEL 718 is a precipitation-hardening nickel-chromium-iron alloy. It delivers exceptional strength, corrosion resistance and mechanical properties at both high and cryogenic temperatures, ideal for demanding industrial applications requiring high creep and fatigue strength.

- Operating temperature range: -253°C to 550°C
- Non-magnetic; typically exhibits a dark appearance or metallic luster after heat treatment.

[BERYLLIUM COPPER]

Beryllium copper is typically specified in its hard-tempered condition. Combining low modulus of elasticity with high ultimate tensile strength, it provides excellent spring properties. Elasticity is achieved through precipitation hardening. It offers the highest strength among copper alloys, with minimal change in physical properties at elevated temperatures.

- Operating temperature range: -200°C to 200°C
- Non-magnetic; electrical conductivity is approximately 2 to 4 times that of phosphor bronze.

[ELGILOY 3J21]

ELGILOY (3J21 non-magnetic alloy) is renowned for its exceptional corrosion and wear resistance. It is widely used in oil industry applications to resist sulfide stress cracking with high reliability. At 343°C, it delivers 600% higher load retention than 17-7 PH stainless steel and 100% more fatigue cycles than carbon steel without failure.

- Operating temperature range: -50°C to 427°C
- Non-magnetic; blue-brown finish after heat treatment.

[HASTELLOY C-276]

HASTELLOY C-276 (NS3304) is a high-grade nickel-molybdenum-chromium-tungsten alloy, renowned for its outstanding corrosion resistance in highly aggressive environments including strong oxidizing and reducing media. It provides excellent resistance to pitting, crevice corrosion and stress corrosion cracking.

- Operating temperature: < 400°C
- Exceptional corrosion resistance; generally non-magnetic.

MATERIAL

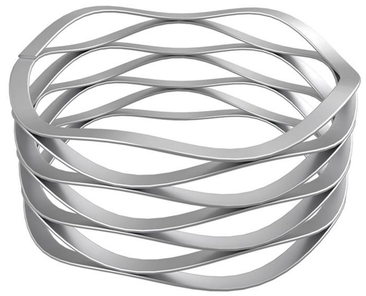
MATERIALS TABLE

MATERIAL	Material Thickness (mm)	Minimum Tensile Strength (N/mm²)	Shear Strength(N/mm²)	Maximum Recommended Operating Temp (℃)	Minimum Recommended Operating Temp(℃)	Modulus of Elasticity (N/mm²)	Number-DIN	Number-UNS
CARBON STEEL								
65MN OIL-QUENCHED & TEMPERED	0.17-0.359	1855	1055	120	-20	207000	1.1231-1.1248[1]	/
	0.36-0.539	1758	1000					
	0.54-1.09	1524	869					
	⩾1.1	1455	827					
65MN COLD DRAWN	0.17-0.359	1750	896					/
	0.36-0.539	1650	896					
	0.54-1.09	1450	710					
	⩾1.1	1350	614					
STAINLESS STEEL								
304H	⩽0.199	2050	820	200	-196	193000	1.4948	S30409
	0.2-0.559	1448	786					
	0.56-1.194	1379	786					
	1.195-1.575	1276	724					
	1.576-1.88	1207	689					
	1.881-2.261	1138	648					
	⩾2.262	1069	607					
316	0.001-0.584	1344	765				1.4401	S31600
	0.585-1.219	1310	745					
	1.220-1.549	1207	683					
	⩾1.550	1172	669					
631	All	1655[2]	945[2]	343	-40	203000	1.4568	/
EXOTIC ALLOYS								
A-286	All	1276[2]	724[2]	538	/	214000	1.4980	S66286
INCONEL X-750	All	1517[2]	862[2]	370	/		2.4669	N07750
INCONEL 718	All	1241[2]	703[2]	550	-253	204000	2.4668	N07718
QBe1.9-0.2	All	1276[2]	883[2]	200	-200	128000	2.1247	C17200
3J21[3] (ELGILOY)	＜0.109	2241[2]	1179[2]	427	-50	207000	/	R30003
	0.109-0.476	2172[2]	1138[2]					
	0.476-0.64	2068[2]	1096[2]					
	＞0.64	1896[2]	1062[2]					
NS3304 (Hastelloy C-276)	0.406 and below	1586	903	400	/	205000	2.4819	N10276
	0.406-0.813	1448	820					
	0.813-1.372	1379	786					
	＞1.372	1310	745					

Note: Additional available materials include MONEL 400, 420 Stainless Steel, Waspaloy, duplex stainless steel and others.For further details, please contact the Lisheng Sales & Engineering Department.

[1]For chemical composition reference only.
[2]Values obtained after precipitation hardening.
[3]Complies with NACE Standard MR0175.
[4]Temperatures exceeding these limits will result in increased relaxation. For high-temperature applications, consult the Lisheng Sales & Engineering Department.

WAVE SPRING



WAVE SPRING WITH PLAIN ENDS

WAVE SPRING WITH SHIM ENDS

PRODUCT INTRODUCTION

Wave springs are precise flat wire compression springs that fit into assemblieswhere space is at a premium. Since the overall lengths and operating heights ofwave springs are lower than those of conventional round wire springs, they willoften reduce the size of the spring cavity by as much as 50%. Of course, this will alsoreduce the weight and raw material cost of the assembly.

FEATURES AND BENEFITS

- Save 50% assembly space under the same load
- Reduce material usage and save costs
- Suitable for axial space restricted
- Standard size 6mm-60mm
- Customed size 5mm-3000mm
- More than 5,000 kinds in stock

Multi turn wave spring with plain ends from stock in carbon and 17-7PH stainless steel:

SERIES	TYPE	DIAMETER	MATERIAL
L	*PLAIN ENDS*	4.78-50.8mm	SUS631/65Mn
LM	*PLAIN ENDS*	5-60mm	SUS631/65Mn

Multi turn wave spring with shim ends from stock in carbon and 17-7PH stainless steel:

SERIES	TYPE	DIAMTER	MATERIAL
LS	*SHIM ENDS*	7.92-50.8mm	SUS631/65Mn
LMS	*SHIM ENDS*	8-60mm	SUS631/65Mn

WAVE SPRING

PRODUCT INTRODUCTION

Single turn wave spring washer can be used in a variety of applications, mainly for short travel and low load applications. Can provide reliable and accurate linear load output. During compression, the free end of the spring expands flexibly. If the spring is limited in the hole, it will not cause the phenomenon of stamping closed wave washer stuck, this design greatly improves the fatigue performance and service life, so as to effectively reduce the cost. The ends of the lap wave washer partially overlap on the circumference of the wave.

SINGLE TURN OVERLAP WAVE SPRING

SINGLE TURN GAP WAVE SPRING

FEATURES AND BENEFITS

- Used for short trips and medium and low load situations
- Provides reliable and accurate linear load output
- Notched type facilitates stacking and height reduction
- It is suitable for small diameter to avoid wrapping
- Standard parts available from 9mm to 580mm
- Custom parts available from 2mm to 1500mm

Gap wave spring washer from stock in carbon and 17-7PH stainless steel:

SERIES	TYPE	DIAMETER	MATERIAL
JBT	Gap	62-240mm	SUS631/65Mn
LB	Gap	100-580mm	SUS631/65Mn
LR	Gap	44.45-406.4mm	SUS631/65Mn
LR-N	Gap	82.55-196.85mm	SUS631/65Mn

Overlap wave spring washer from stock in carbon and 17-7PH stainless steel:

SERIES	TYPE	DIAMETER	MATERIAL
JBT	Overlap	16-52mm	SUS631/65Mn
LB	Overlap	9-95mm	SUS631/65Mn
LR	Overlap	12.7-41.28mm	SUS631/65Mn

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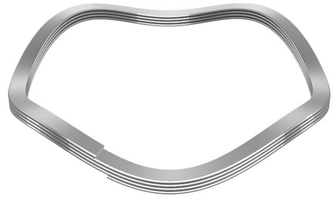
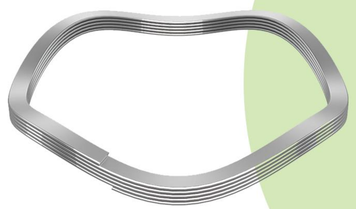
WAVE SPRING

NESTED WAVE SPRING





PRODUCT INTRODUCTION

The nested wave spring is made of a continuous flat wire stacked in parallel. Stacking individual springs for higher loads is no longer necessary. The spring stiffness of nested wave springs increases in proportion to the number of layers. They can generate tremendous force, but at the same time maintain the accuracy of the spring. Nested wave spring replace dish springs in many applications, especially where high and precise forces are required.

FEATURES AND BENEFITS

- Can replace the traditional disk spring
- Used for short trips and medium and low load situations
- Eliminate mismatches and load inconsistencies
- Reduce cost and assembly time
- Standard parts available from 12mm to102mm
- Custom parts available from 2mm to 500mm

Nested wave spring from stock in carbon and 17-7PH stainless steel:

SERIES	TYPE	DIAMETER	MATERIAL
NLR	\	12.7-101.6mm	SUS631/65Mn
NLB	\	16-100mm	SUS631/65Mn

WAVE SPRING

ROUND WIRE WAVE SPRING

LINEAR WAVE SPRING

PRODUCT INTRODUCTION

Round wire wave spring is produced from a circular section of steel wire, which can provide higher loads while maintaining precise spring loads. As an alternative to the dished spring, the circular coil provides a similar load, but with a more accurate, predictable spring stiffness.

FEATURES AND BENEFITS

- Suitable for very high forces and more compact radial Spaces
- Reduce or eliminate vibration during pretension
- Can replace the disc spring
- Standard parts available from 12.7mm to152.4mm
- Custom parts available from 4mm to 3000mm

Round wire wave spring from stock in carbon and 631 stainless steel:

SERIES	DIAMETER	MATERIAL
RW	12.7-152.4mm	SUS631/65Mn

PRODUCT INTRODUCTION

Linear wave spring is a continuous corrugated wire made of elastic tempered material. As a load-bearing device, they have approximately the same load and stroke characteristics as corrugated springs. The axial pressure is obtained by laying the spring flat on a straight line.

FEATURES AND BENEFITS

- Suitable for low to moderate loads and deflection
- Used in linear cavities where spring forces are required
- Standard parts length from 38.1mm to 304.8mm
- Custom parts length from 5mm to 2000mm

Linear wave spring from stock in carbon and 631 stainless steel:

SERIES	LENGTH	MATERIAL
LLS	38.1-304.8mm	SUS631/65Mn

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SPIRAL RETAINING RING

SINGLE TURN FOR BORE

SINGLE TURN FOR SHAFT

PRODUCT INTRODUCTION

Spiral retaining ring is formed by flat wire winding elastic ring, no lug, no burr, will not interfere with the parts, and different from the traditional stamping process , will not produce waste caused by waste.

FEATURES AND BENEFITS

- No gap - 360°retaining surface
- The coiling process produces no scrap
- No-Charge on custom design
- No protruding ears interfere with mating components
- Easy installation and removal
- Standard parts available from 6mm to 400mm
- Custom parts available from2mm to-3000mm

Single turn for bore from stock in carbon and 304 stainless steel:

SERIES	TYPE	DIAMETER	MATERIAL
VK	Light Duty	6.35-254mm	SUS304/65Mn
VKM	Light Duty	6.00-300mm	SUS304/65Mn

Single turn for shaft from stock in carbon and 304 stainless steel:

SERIES	TYPE	DIAMETER	MATERIAL
VZ	Light Duty	6.35-254mm	SUS304/65Mn
VZM	Light Duty	6.00-300mm	SUS304/65Mn

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SPIRAL RETAINING RING

2- TURN FOR BORE

2- TURN FOR SHAFT

PRODUCT INTRODUCTION

Spiral retaining ring is formed by flat wire winding elastic ring, no lug, no burr, will not interfere with the parts, and different from the traditional stamping process, will not produce waste caused by waste.

FEATURES AND BENEFITS

- No gap - 360°retaining surface
- The coiling process produces no scrap
- No-Charge on custom design
- No protruding ears interfere with mating components
- Easy installation and removal
- Standard parts available from 6mm to 400mm
- Custom parts available from 2mm to 3000mm

2-turn for bore from stock in carbon and 304 stainless steel:

SERIES	TYPE	DIAMETER	MATERIAL
WK	Medium Duty	12.7-279.4mm	SUS304/65Mn
EK	Medium Duty	6.00-280mm	SUS304/65Mn
DNK	Heavy Duty	13.0-400mm	SUS304/65Mn
WKM	Heavy Duty	6.35-381mm	SUS304/65Mn
WKT	Heavy Duty	12.7-279.4mm	SUS304/65Mn

2-turn for shaft from stock in carbon and 304 stainless steel:

SERIES	TYPE	DIAMETER	MATERIAL
WZ	Medium Duty	12.7-279.4mm	SUS304/65Mn
EZ	Medium Duty	6.00-280mm	SUS304/65Mn
DNZ	Heavy Duty	13.0-400mm	SUS304/65Mn
WZM	Heavy Duty	6.35-381mm	SUS304/65Mn
WZT	Heavy Duty	11.9-254mm	SUS304/65Mn

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SPIRAL RETAINING RING

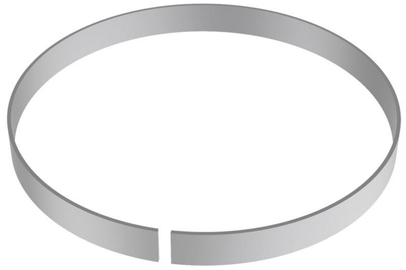
PRODUCT INTRODUCTION

Wave spiral retaining ring is a spiral retaining ring in the form of axial wave.It is like a standard retaining ring with additional compression characteristics. Stack components that compensate for overall length tolerances while keeping the retaining ring functional. Once assembled, the wave spiral retaining ring will reduce the loosening and vibration of the components.

WAVE SPIRAL RETAINING RING

Wave spiral retaining ring from stock in carbon and 631 stainless steel:

SERIES	TYPE	DIAMETER	MATERIAL
WKW	Internal	19.1-127mm	SUS631/65Mn
WZW	External	19.1-127mm	SUS631/65Mn



HOOP RETAINING RING

PRODUCT INTRODUCTION

Hoop retaining ring is a single, square-rimmed ring that functions in a very shallow radial groove.

Hoop retaining ring from stock in carbon and 304 stainless steel:

SERIES	TYPE	DIAMETER	MATERIAL
HK	Internal	9.5-76.2mm	SUS304/65Mn
HKM	Internal	10-76mm	SUS304/65Mn
HZ	External	9.5-76.2mm	SUS304/65Mn
HZM	External	10-76mm	SUS304/65Mn

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CONSTANT SECTION RETAINING RINGS

CONSTANT SECTION RETAINING RINGS

PRODUCT INTRODUCTION

Constant section retaining ring, also known as concentric ring or Eaton ring, has the characteristics of uniform and fixed section. This means that the material used to make the ring is the same width at any point on the circumference of the ring. Especially suitable for high speed and high load applications.

FEATURES AND BENEFITS

- No lugs and save space
- No stamping burrs
- According to DIN 471/472
- Higher retaining ring shear
- Special ends for a variety of special uses
- Heavy duty components with high rotation capacity

Constant section retaining ring for hbore from stock in carbon and 304 stainless steel:

SERIES	TYPE	DIAMETER	MATERIAL
KLR	Single Sector Notch	12.7-279.4mm	SUS304/65Mn
DKL	Single Sector Notch	13-300mm	SUS304/65Mn
UHB	Bilateral Sector Notch	9.5-254mm	SUS304/65Mn
HN	Bilateral Sector Notch	28.6-203.2mm	SUS304/65Mn

Constant section retaining ring for shaft from stock in carbon and 304 stainless steel:

SERIES	TYPE	DIAMETER	MATERIAL
CLR	Single Sector Notch	12.7-279.4mm	SUS304/65Mn
DCL	Single Sector Notch	13-300mm	SUS304/65Mn
USC	Bilateral Bevel Incision	7.9-254mm	SUS304/65Mn
SNL	Bilateral Bevel Incision	12.7-203.2mm	SUS304/65Mn

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LAMINAR SEAL RINGS

PRODUCT INTRODUCTION

Laminar seal ring is a metal labyrinth seal consisting of multiple sealing rings in a groove. The arrangement and specific orientation of the rings are determined by the application and structure to determine the severity of the environment.

FEATURES AND BENEFITS

- One group is divided into two, three or five rings
- The configuration and the used materials depend on the severity of the environment
- Protects components from solids

INTERCHANGE LISTING

LISPRING	FEY
KS	AS(FK3)
KSK	ASK(FK3)
ZS	IS(FK3)
ZSK	ISK(FK3)
KSD	ASD(FK6)
KSKD	ASKD(FK6)
ZSD	ISD(FK6)
ZSKD	ISKD(FK6)

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CUSTOM CONFIGURATIONS

Marcel

Marcel expanders are circular wave springs that provide radial force or outward pressure in an assembly.

. Suitable for tolerance take-up or to self-center an assembly

. Suitable to energize seals when no other pressure is available

. Available as a custom wave spring

Balanced Rings

Balanced Retaining Rings are retaining rings with cut-out slots opposite the gap end to centralize the rings' center of gravity.

. Slots made in radial wall/missing material balances the ring

. Suitable for reducing eccentric loading in applications where balance is critical

. Balanced when rotating in an assembly, particularly for higher RPM's

Self-Locking Rings

Self-Locking Retaining Rings are multiple-turn rings that have a small tab on either the inside, outside, or center of the radial wall, along with an aligned slot on the next turn for it to "lock" into.

. Suitable for applications with high rotational requirements or speeds exceeding recommended rotational capacity

. Prevents interference with mating components

Pitched Coil Spring

The pitched coil spring has significant advantages over the round wire spring in terms of bending resistance, friction, compact design, and sensitivity to overload.

. Mainly used in the scene of micro stiffness and long stroke..

. Better bending resistance and reduced friction.

. More compact design: The design of the flat wire spring allows its spring length to be shortened by up to 50%.

. Since the effective working length of the flat wire spring is close to its compression length, the sensitivity to overload is improved.

Interlaced

Interlaced springs are flat wire, multi-turn wave springs wound together in series and parallel.

. Mainly used in the scene of heavy load and long stroke.

. Effectively provides increased loading capacity and greater fatigue resistance

. Alternative to peaks versus troughs when higher loads are needed

. Substitute to a Nested Spirawave when higher free height or deflection is needed

STANDARD AND SPECIAL MATERIAL

- Carbon Steel
- Stainless Steel 304
- Stainless Steel 316
- Stainless Steel 17-7PH
- Incoloy A-286
- Inconel X-750
- Inconel X718, Hastelloy C-276, Beryllium Copper, Monel400, Super Duplex

APPLICATION SCENARIO

Our wave springs and spiral retaining rings are mainly used in aerospace, new energy vehicles, medical ,oil and gas, wind energy, construction machinery, consumer electronics and other industrial products, such as mechanical seals, electrical connectors, motor bearing preload, pump valves, air blower, vacuum equipment, compressors and so on.

RETAINING RINGS

INTERCHANGE LISTING

Lispring retaining rings are interchangeable with both imperial and metric retaining ring grooves. Lispring offers free samples of all stock retaining rings to test in your application. Cross reference a standard stamped or snap ring to find the appropriate Lispring retaining ring to fit your application.

LISPRING	SMALLEY	SPIROLOX	MILITARY MIL-DTL-27426	AEROSPACE AS3219	AEROSPACE MA4035(METRIC)	EUROPEAN SPECIFICATION DIN	EATON	OTHER RINGS
VK	VH	UR	-	-	-	-	-	-
WK	WH	RR	/3	AS4299 AS3217	-	-	-	-
WKW	WHW	-	-	-	-	-	-	-
WKT	WHT	RRT	-	-	-	-	NAN	UHB
WKM	WHM	RRN	/4	AS4299 AS3215	-	-	IN	HO HOI
KLR	FHE	-	-	-	-	-	-	-
VKM	VHM	-	-	-	-	-	-	-
EK	EH	-	-	-	MA4017	-	-	-
DNK	DNH	-	-	-	-	DIN472	-	DHO
DKL	FH	-	-	-	-	DIN472	-	DHO
UHB	XAH	-	-	-	-	-	NAN	UHB
HN	XDH	-	-	-	-	-	ND	HN
VZ	VS	US	-	-	-	-	-	-
WZ	WS	RS	/1	AS4299 AS3218	-	-	-	-
WZW	WSW	-	-	-	-	-	-	-
WZT	WST	RST	-	-	-	-	XAN	USC
WZM	WSM	RSN	/2	AS4299 AS3216	-	-	EN	SH SHI
CLR	FSE	-	-	-	-	-	-	-
VZM	VSM	-	-	-	-	-	-	-
EZ	ES	-	-	-	MA4016	-	-	-
DNZ	DNS	-	-		-	DIN471	-	DSH
DCL	FS	-	-		-	DIN471	-	DSH
USC	XAS	-	-	-	-	-	XAN	USC
SNL	XDS	-	-	-	-	-	XD	SNL

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APPLICATION CHECKLIST

姓名(Name)_____ 职衔(Title) _____ 日期(Date) _____

公司 (Company) _____ 电子邮件(E-mail)_____

地址(Address) _____

电话(Phone) _____ 传真(Fax) _____

尺寸单位(Dimension unit)：

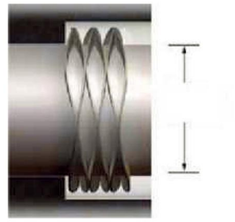
( )公制单位mm ( )英制单位inch

适用(Apply to)_____孔腔直径(Cavity diameter)

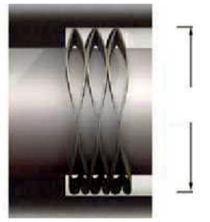
内径可通过(Inside Diameter can pass through)_____直径的轴(Shaft Diameter)

指定与弹簧最为贴近的直径(Radial Guide/Pilot)：

( )孔 Bore ( )轴 Shaft



轴引导(内径靠近轴)
Shaft Pilot



孔引导(外径靠近孔壁)
Bore Pilot

弹力与变形量（选择一项）
Spring Rate and Deformation (Choose one)

静载应用(Static loading application)

_____ _____

最小 最大弹力 @ 工作高度 ( )牛顿@毫米

(Min/Max Spring Rate) (Work Height) (N@MM)

自由高度(Free Height)___近似值(Approximate)

动载应用(Dynamic loading application)

_____ _____

最小 最大弹力 @ 工作高度 ( )牛顿@毫米

(Min/Max Spring Rate) (Work Height) (N@MM)

最小 最大负荷 @ 工作高度 ( )牛顿@毫米

(Min/Max Load) (Work Height) (N@MM)

自由高度(Free Height)__近似值(Approximate)

自由高度(Free Height)_____(最小)Min— _____(最大)Max

波形圈数(Waves)_____材料厚度(Material Thickness) _____

径向壁(宽度)Radial Wall_____

应用：(描述)
(Applications:)：

材料(Material)
请考虑实际使用环境：
(Please consider the actual use environment.)
温度(Temperature) _____
( )C ( )F
腐蚀性介质(Corrosive Media) _____
*碳素钢(Carbon Steel) ( )
*17-7 PH/CH900 不锈钢 ( )
304 不锈钢 ( )
316 不锈钢 ( )
Inconel X-750 ( )
其他(Other)_____( )

疲劳强度(Fatigue Strength)：
指定估计的循环寿命(Designated Estimated Cyclic Life)
( )静态应用(Static application) ( )100万次循环(1 million cycles)
( )10万次循环以下(Under 100 thousand cycles)
( )100万次循环以上(More than 1 million cycles)
( )10万次循环(100 thousand cycles)

数量(Quantity)：
样件(Sample)_____
量产(Volume production)_____

草图

Type

□ □ □