

**CIRCLIPS TO DIN 471/472**

For shafts and bores are the most universally applicable retaining systems. These series offer a favourable solution with regard to thickness and radial width. They transfer large axial forces from the located component onto the groove wall. The external rings can also be used for very high speeds.

**Applications:**

Mechanical, automotive and electrical engineering. Gear systems, precision mechanics and apparatus engineering.

**Material:**

Spring Steel

**Hardness:**

d1: 3 - 48 = 47-54 HRC  
d1: 50 - 200 = 44-51 HRC  
d1: 202 - 300 = 40-47 HRC  
d1: 305 - 1000 = 38-43 HRC

**Surface Protection:**

Phosphated and oiled

Special options - please enquire:

Self-finished and oiled  
Zinc plated  
Bronze CuSn8  
Corrosion resistant steels

\*\*Rings in excess of 650mm nominal diameter are manufactured as concentric circlips.

**KEY TO DIMENSIONS**

L = Lug dimension  
h = Hole dimension  
b = Beam dimension  
D1 = Internal diameter (DIN 471)  
D2 = Outside diameter (DIN 472)  
t = thickness  
S = Shaft diameter  
B = Bore diameter  
n = Shoulder dimension  
W = Groove width  
G = Groove diameter  
Fr = Load bearing capacity of Circlip  
Fn = Load bearing capacity of groove

**CIRCLIPS SELON LA DIN 471/472**

Pour des axes et des alésages sont les systèmes de conservation le plus universellement applicables. Ces séries offrent une solution favorable en ce qui concerne l'épaisseur et la largeur radiale. Elles transfèrent les forces axiales importantes à partir du composant localisé sur le mur de cannelure. Les anneaux externes peuvent également être employés pour très des vitesses.

**Applications:**

Électrotechnique mécanique, des véhicules à moteur et. Embrayez les systèmes, la mécanique de précision et la technologie d'appareil.

**Matériel:**

Acier de ressort

**Dureté:**

d1: 3 - 48 = 47-54 HRC  
d1: 50 - 200 = 44-51 HRC  
d1: 202 - 300 = 40-47 HRC  
d1: 305 - 1000 = 38-43 HRC

**Protection extérieure:**

Phosphaté et huilé

Options spéciales - enquérez-vous svp :

Individu-de finition et huilé  
Zinguee  
Bronze CuSn8  
Aciers résistants à la corrosion

\*\* Les anneaux dont le diamètre extérieur nominal excède 650mm sont fabriqués comme des anneaux d'arrêt concentriques.

**ABBREVIATIONS UTILISEES**

L = Taille de l'oreille  
h = Taille du trou  
b = Hauteur radiale  
D1 = Diamètre Intérieur (DIN 471)  
D2 = Diamètre Extérieur (DIN 471)  
t = Epaisseur  
S = Diamètre d'arbre  
B = Diamètre d'alésage  
n = Longueur cisailée à fond de gorge  
W = Largeur de gorge  
G = Diamètre de gorge  
Fr = Capacité de charge du segment  
Fn = Capacité de charge de la gorge

**ANILLOS DE RETENCIÓN DIN 471/472**

Para los ejes y los alesajes son los sistemas de retención lo más universal posible aplicables. Estas series ofrecen una solución favorable con respecto a grueso y a anchura radial. Transfieren fuerzas axiales grandes del componente localizado sobre la pared del surco. Los anillos externos se pueden también utilizar para mismo las velocidades.

**Usos:**

Ingeniería mecánica, automotora y eléctrica. Engrane los sistemas, los mecánicos de la precisión y la ingeniería del aparato.

**Material:**

Acero del resorte

**Dureza**

d1: 3 - 48 = 47-54 HRC  
d1: 50 - 200 = 44-51 HRC  
d1: 202 - 300 = 40-47 HRC  
d1: 305 - 1000 = 38-43 HRC

**Protección superficial:**

Fosfatado y engrasado

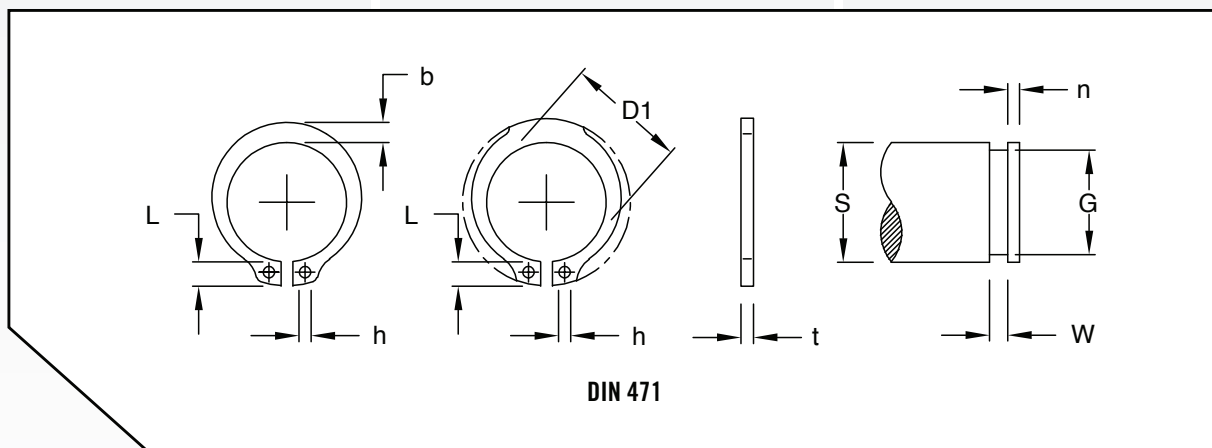
Opciones especiales - investigue por favor:

Uno mismo-acabado y engrasado  
Cinc plateado  
Bronce CuSn8  
Aceros resistentes a la corrosión

\*\*Los anillos con un diámetro nominal mayor a 650 mm se fabrican como anillos de retención al estruendo concéntricos

**CLAVES DE DIMENSIONES**

L = Dimensión de la oreja  
h = Dimensión del agujero  
b = Altura radial  
D1 = Diámetro interior (DIN 471)  
D2 = Diámetro exterior (DIN 471)  
t = Espesor  
S = Diámetro del eje  
B = Diámetro del rodamiento  
n = Dimensión de la espalda  
W = Anchura de la ranura  
G = Diámetro de la ranura  
Fr = Capacidad de carga del segmento  
Fn = Capacidad de carga de la ranura

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**SEEGERRINGE ZUM LÄRM 471/472**

Für Wellen und Ausbohrungen sind die allgemein anwendbaren Haltesysteme. Diese Reihen bieten eine vorteilhafte Lösung hinsichtlich der Stärke und der Radialbreite an. Sie bringen große axiale Kräfte vom lokalisierten Bestandteil auf die Nutwand. Die externen Ringe können für große Geschwindigkeiten auch sehr benutzt werden.

**Anwendung:**

Mechanische, Automobil- und Elektrotechnik. Übersetzen Sie Systeme, Präzisionsmechaniker und Apparatechnik.

**Werkstoff:**

Federstahl

**Härte:**

d1: 3 - 48 = 47-54 HRC  
d1: 50 - 200 = 44-51 HRC  
d1: 202 - 300 = 40-47 HRC  
d1: 305 - 1000 = 38-43 HRC

**Oberflächenschutz:**

Phosphatiert und geölt

Spezielle Wahlen - erkundigen Sie bitte sich:

Selbst-fertig und geölt  
Verzinkt  
Bronze CuSn8  
Korrosionsbeständige Stähle

\*\*Ringe mit einem Nenndurchmesser von über 650mm werden als konzentrische Sicherungsringe hergestellt.

**KENNZEICHEN DER ABMESSUNGEN**

L = Ansatz  
h = Öffnung  
b = Balken  
D1 = Innendurchmesser (DIN 471)  
D2 = Außendurchmesser (DIN 472)  
t = Dicke  
S = Wellendurchmesser  
B = Bohrungsdurchmesser  
n = Schulter  
W = Nutbreite  
G = Nutdurchmesser  
Fr = Belastbarkeit von Circlip  
Fn = Belastbarkeit von Nut

**ANELLO DIN 471/472**

Per i pozzi e fori sono i sistemi di conservazione il più universalmente applicabili. Queste serie offrono una soluzione favorevole riguardo a spessore ed alla larghezza radiale. Trasferiscono le grandi forze assiali dalla componente individuata sulla parete della scanalatura. Gli anelli esterni possono anche essere usati per molto le alte velocità.

**Applicazioni:**

Ingegneria elettrica meccanica, automobilistica e. Innessi i sistemi, i meccanici di precisione e l'ingegneria dell'apparecchio.

**Materiale:**

Acciaio della molla

**Durezza**

d1: 3 - 48 = 47-54 HRC  
d1: 50 - 200 = 44-51 HRC  
d1: 202 - 300 = 40-47 HRC  
d1: 305 - 1000 = 38-43 HRC

**Protezione di superficie:**

Fosfatizzato e lubrificato

Scelte particolari - domandi prego:

Auto-rifinito e lubrificato  
Zinco placcato  
Bronzo CuSn8  
Acciai resistenti alla corrosione

\*\*Gli anelli con un diametro esterno nominale superiore a 650mm sono costruiti come anelli concentrici.

**LEGENDA**

L = Dimensioni aletta  
h = Dimensioni del foro  
b = Vedi disegno  
D1 = Diametro interno (DIN 471)  
D2 = Diametro esterno (DIN 472)  
t = Spessore  
S = Diametro del perno  
B = Diametro della sede  
n = Dimensioni spalla  
W = Larghezza scanalatura  
G = Diametro scanalatura  
Fr = Capacità di carico dell'anello  
Fn = Capacità di carico della sede

**OS GRAMPOS DE RETENÇÃO AO RUÍDO 471/472**

Para eixos e furos são os sistemas de retenção o mais universal aplicáveis. Estas séries oferecem uma solução favorável no que diz respeito à espessura e à largura radial. Transferem grandes forças axiais do componente encontrado na parede do sulco. Os anéis externos podem igualmente ser usados para muito altas velocidades.

**Aplicações:**

Engenharia mecânica, automotriz e elétrica. Engre sistemas, mecânicos da precisão e engenharia do instrumento.

**Material:**

Aço da mola

**Dureza**

d1: 3 - 48 = 47-54 HRC  
d1: 50 - 200 = 44-51 HRC  
d1: 202 - 300 = 40-47 HRC  
d1: 305 - 1000 = 38-43 HRC

**Proteção de superfície:**

Fosfatado e oleado

Opções especiais - inquirir por favor:

Auto-terminado e oleado  
Zinco chapeado  
Bronze CuSn8  
Aços resistentes à corrosão

\*\*Anéis com mais de 650mm de diametro nominal são manufaturados com anéis concentricos.

**LEGENDA**

L = Lobulo  
h = Furo  
b = Trava  
D1 = Diametro Interno ( Din 471)  
D2 = Diametro Externo ( Din 472)  
t = Espessura  
S = Diametro do eixo  
B = Diametro do furo  
n = Suporte  
W = Largura do encaixe  
G = Diametro do encaixe  
Fr = Capacidade de carga  
Fn = Encaixe

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**CIRCLIPS DIN472 - J PARTS**

No.	S (mm)	Product Dimensions								Groove Dimensions				
		t (mm)	Tol (mm)	D (mm)	Tol (mm)	L (mm)	b (mm)	hi (mm)	Fr (kN)	G (mm)	Tol (mm)	W (mm)	n (mm)	FN (kN)
A12	12			11		3.3	1.8		5				0.8	1.5
A14	14	1		12.9		3.5	2.1	1.7	6.4		13.4	1.1	0.9	2.1
A15	15			13.8	+0.10-0.36	3.6	2.2		6.9		14.3		1.1	2.6
A17	17			15.7		3.8	2.3		8		16.2	-0.11	1.2	3.4
A18	18			16.5		3.9	2.4		17		17			4.5
A19	19			17.5		3.9	2.5		17		18			4.8
A20	20			18.5		4	2.6		17.1		19		1.5	5
A21	21	1.2		19.5		4.1	2.7		16.8		20	-0.13	1.3	5.3
A22	22			20.5		4.2	2.8	2	16.9		21			5.6
A23	23			21.5	+0.13-0.42	4.3	2.9		16.6		22	-0.15		5.9
A24	24		-0.06	22.2		4.4	3		16.1		22.9		1.7	6.7
A25	25			23.2		4.4	3		16.2		23.9	-0.21		7
A28	28			25.9		4.7	3.2		32.1		26.6		2.1	10
A32	32	1.5		29.6		5.2	3.6		31.2		30.3		1.6	13.8
A34	34			31.5		5.4	3.8		31.3		32.3			14.7
A35	35			32.2	+0.25-0.50	5.6	3.9		30.8		33			17.8
A36	36			33.2		5.6	4		49.4		34		3	18.3
A38	38			35.2		5.8	4.2		49.5		36			19.3
A40	40			36.5		6	4.4		51		37.5	-0.25		25.3
A42	42	1.8		38.5		6.5	4.5		50		39.5		1.85	26.7
A44	44			40.5		6.6	4.6	2.5	48.5		41.5		3.8	28
A45	45			41.5	+0.39-0.90	6.7	4.7		49		42.5			28.6
A48	48			44.5		6.9	5		49.4		45.5			30.7
A50	50			45.8		6.9	5.1		73.3		47			38
A52	52			47.8		7	5.2		73.1		49			39.7
A55	55	2		50.8		7.2	5.4		71.4		52		2.15	42
A58	58			53.8		7.3	5.6		71.1		55		4.5	44.3
A60	60		-0.07	55.8		7.4	5.8		69.2		57			46
A65	65			60.8		7.8	6.3		135		62	-0.30		49.8
A70	70			65.5	+0.46-1.10	8.1	6.6		134		67			53.8
A72	72	2.5		67.5		8.2	6.8	3	131		69		2.65	55.3
A80	80			74.5		8.6	7.4		128		76.5			71.6
A82	82			76.5		8.7	7.6		128		78.5			73.5
A85	85			79.5		8.7	7.8		215		81.5		5.3	76.2
A90	90	3	-0.08	84.5		8.8	8.2		217		86.5	-0.35	3.15	80
A95	95			89.5		9.4	8.6		212		91.5			85
A100	100			94.5		9.6	9	3.5	206		96.5			90
A105	105			98	+0.54-1.30	9.9	9.3		471		101			107
A110	110			103		10.1	9.6		457		106	-0.54		113
A115	115			108		10.6	9.8		438		111			118
A120	120			113		11	10.2		424		116		6	123
A130	130			123		11.6	10.7		395		126			134
A135	135			128		11.8	11		389		131			139
A140	140	4	-0.10	133		12	11.2		376		136		4.15	144
A145	145			138		12.2	11.5		367		141			149
A150	150			142	+0.63-1.50	13	11.8		357		145	-0.63		193
A160	160			151		13.3	12.2		349		155			206
A165	165			155.5		13.5	12.5	4	345		160		7.5	212
A170	170			160.5		13.5	12.9		349		165			219
A180	180			170.5		14.2	13.5		345		175			232
A200	200			190.5		14.2			319		195			258
A210	210			198		14.2			598		204			325
A230	230			218	+0.72-1.70	14.2	14		548		224	-0.72	9	356
A240	240	5	-0.12	228		14.2			530		234		5.15	372
A250	250			238		14.2			504		244			388
A260	260			245		16.2	16	5	540		252		12	535
A280	280			265	+0.81-2.00	16.2			508		272	-0.81		576
A320	320			303					988		310			825
A340	340			323					932		330			876
A350	350			333					906		340			903
A360	360	6		343	+0.90-2.00		20		880		350	-0.89	6.2	928
A380	380			363					833		370			980
A390	390		-0.15	373				6	814		380			1008
A400	400			383					793		390			1033
A440	440			420					1500		428			1363
A460	460	7		440	+1.00-2.00				1443		448		7.2	1426
A500	500			480			26		1329		488	-1.00		1550
A560	560	8		535	+1.50-3.00				1777		546		8.2	2026
A600	600			575					1600		586			2170



**CIRCLIPS DIN472 - J PARTS**

No.	S (mm)	Product Dimensions								Groove Dimensions				
		t (mm)	Tol (mm)	D (mm)	Tol (mm)	L (mm)	b (mm)	hi (mm)	Fr (kN)	G (mm)	Tol (mm)	W (mm)	n (mm)	FN (kN)
J16	16			17.3	+0.36-0.10	3.8	2	1.7	5.5	16.8	0.11		1.2	3.4
J20	20	1		21.5	+0.42-0.13	4.1	2.3		7.2	21	0.13	1.1	1.5	5.4
J22	22			23.5		4.2	2.5		8	23			1.5	5.9
J24	24			25.9	+0.42-0.21	4.3	2.6	2	13.9	25.2			1.8	7.7
J26	26			27.9		4.7	2.8		13.8	27.2	0.21		1.8	8.4
J28	28	1.2		30.1		4.8	2.9		13.3	29.4		1.3	2.1	10.5
J30	30			32.1		4.8	3		13.7	31.4			2.1	11.3
J32	32		-0.06	34.4	+0.50-0.25	5.4	3.2		13.8	33.7			2.6	14.6
J35	35			37.8		5.4	3.4		26.9	37				18.8
J36	36	1.5		38.8		5.4	3.5		26.4	38		1.6	3	19.4
J38	38			40.8		5.5	3.7		28.2	40	0.25			22.5
J40	40			43.5		5.8	3.9		44.6	42.5				27
J42	42			45.5	+0.90-0.39	5.9	4.1		44.7	44.5				28.4
J45	45	1.75		48.5		6.2	4.3		43.1	47.5		1.85	3.8	30.2
J47	47			50.5		6.4	4.4	2.5	43.5	49.5				31.4
J48	48			51.5		6.4	4.5		43.2	50.5				32
J50	50			54.2		6.5	4.6		60.8	53				40.5
J52	52			56.2		6.7	4.7		60.2	55				42
J55	55			59.2		6.8	5		60.3	58				44.4
J58	58	2		62.2		6.9	5.2		60.8	61		2.15		46.7
J60	60			64.2	+1.10-0.46	7.3	5.4		61	63				48.3
J62	62			66.2		7.3	5.5		60.9	65	0.3			49.8
J64	64		-0.07	68.2		7.4	5.7		60.6	67			4.5	51.4
J65	65			69.2		7.6	5.8		121	68				51.8
J67	67			71.5		7.7	6		121	70				53.8
J68	68			72.5		7.8	6.1		119	71				56.2
J72	72	2.5		76.5		7.8	6.4	3	119	75		2.65		58
J75	75			79.5		7.8	6.6		118	78				60
J78	78			82.5		8.5	6.8		122	81				62.3
J80	80			85.5		8.5	7		120	83.5				74.6
J82	82			87.5		8.5	7		119	85.5				76.6
J85	85			90.5		8.6	7.2		201	88.5				79.5
J88	88			93.5		8.6	7.4		209	91.5	0.35		5.3	82
J90	90	3	-0.08	95.5	+1.30-0.54	8.6	7.6		199	93.5		3.15		84
J92	92			97.5		8.7	7.8		201	95.5				85
J95	95			100.5		8.8	8.1	3.5	195	98.5				88
J100	100			105.5		9.2	8.4		188	103.5				93
J105	105			112		9.5	8.7		436	109				112
J110	110			117		10.4	9		415	114	0.54			117
J115	115			122		10.5	9.3		409	119				122
J120	120			127		11	9.7		396	124				127
J125	125			132		11	10		385	129			6	132
J130	130			137		11	10.2		374	134				138
J135	135			142		11.2	10.5		358	139				143
J145	145			152	+1.50-0.63	11.4	10.9		336	149				153
J148	148			155		11.8	11.1		331	152	0.63	4.15		157
J150	150	4	-0.10	158		12	11.2		326	155				191
J155	155			164		12	11.4		324	160				206
J160	160			169		13	11.6		321	165				212
J165	165			174.5		13	11.8		319	170				219
J170	170			179.5		13.5	12.2		349	175			7.5	225
J175	175			184.5		13.5	12.7	4	351	180				232
J180	180			189.5			13.2		347	185				238
J190	190			199.5			13.8		340	195				251
J195	195			204.5			13.8		330	200				258
J200	200			209.5	+1.70-0.72		14		325	205				265
J205	205			217			14		616	211				326
J210	210			222		14.2	14		601	216	0.72			333
J215	215			227			14		586	221				341
J220	220			232			14		574	226			9	349
J230	230			242			14		549	236				365
J240	240			252			14		525	246		5.15		380
J250	250	5	-0.12	262			14		504	256				396
J255	255			270			16		549	263				541
J260	260			275	+2.00-0.81		16		538	268				553
J270	270			285		16.2	16	5	518	278	0.81		12	573
J280	280			295			16		499	288				593
J285	285			300			16		491	293				605
J290	290			305			16		482	298				615



**CIRCLIPS DIN472 - J PARTS**

No.	S (mm)	Product Dimensions								Groove Dimensions				
		t (mm)	Tol (mm)	D (mm)	Tol (mm)	L (mm)	b (mm)	hi (mm)	Fr (kN)	G (mm)	Tol (mm)	W (mm)	n (mm)	FN (kN)
J300	300	5	-0.12	315	+2.00-0.81	16.2	16	5	466	308	0.81	5.15	12	636
J310	310			327					947	320				823
J320	320			337					919	330				850
J330	330			347					894	340				876
J340	340			357	+2.00-0.90				869	350	0.89	6.2	15	903
J350	350	6		367			20		846	360				929
J360	360			377					823	370				955
J380	380			397					784	390				1008
J390	390			407					764	400				1033
J400	400		-0.15	417				6	746	410				1060
J420	420			440	+2.00-1.00				1480	432				1338
J440	440			460					1418	452				1401
J450	450	7		470					1388	462		7.2	18	1431
J470	470			490			26		1330	482	1			1495
J500	500			520					1256	512				1588
J520	520			545	+3.00-1.50				1802	534				1931
J540	540	8		565					1738	554		8.2	21	2004
J600	600			625					1571	614				2221

