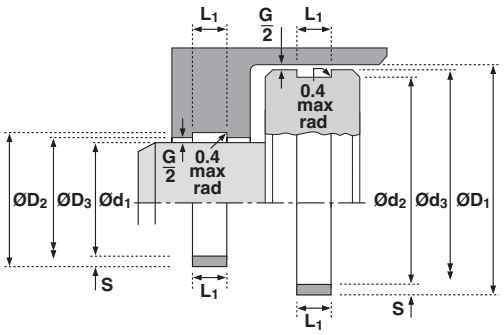
Design

Hallite 506 bearing strip is available in three forms: cut rings, spiral lengths and flat coils. Hallite 506 provides an extremely effective, hard wearing and easy to use bearing material.

Manufactured to very tight tolerances and providing bearing solutions for reciprocating, oscillating and slow rotary movement applications, Hallite 506 bearing strip is used in many of today's most arduous hydraulic applications around the world. Commonly fitted in reciprocating cylinders as rod and piston bearings, Hallite 506 is capable of withstanding extreme side-loads preventing metal to metal contact.

The material's design incorporates micro indentations on the bearing strip's surface to trap fluid and provide built-in lubrication to the bearing. The 506 bearing strip is manufactured by a patented process, using a woven fabric reinforced polyester resin material and is proven to be compatible with a wide range of fluids, including mineral oils, water based fluids and phosphate esters, to produce a rectangular section strip which is available in a wide range of inch and metric sizes including cross sections specified in ISO 10766.

* Please note that for reciprocating applications, the compressive stress at yield should be used for design calculations. For rotary shafts use the limiting P.V. values. It is suggested that a 2:1 factor of safety is applied.



Technical details

	Metric		Inch	
Operating conditions				
Temperature Range	-40°C +120°C		-40°F +250°F	
Limiting PV Values Lubricated*	Speed m/sec	Pressure MN/m2	Speed ft/sec	Pressure p.s.i.
	0.1	10.0	0.3	1500
	1.0	6.0	3.0	900
	5.0	0.8	16.0	120
Typical physical properties				
Specific Gravity		1.27		1.27
Compression Stress at Failure	(Temp 23°C)	450 MN/m2	(Temp 73°F)	65,000 p.s.i.
Compression Stress at Yield*	(Temp 23°C)	115 MN/m2	(Temp 73°F)	16,500 p.s.i.
Compression Stress at Yield*	(Temp 80°C)	58 MN/m2	(Temp 176°F)	8,500 p.s.i.
Coefficient of Thermal Conductivity		0.27 W/mK		0.16 Btu/hft °F
Coefficient of Thermal Expansion	Length	Thickness	Length	Thickness
	9 X 10 -5	13 X 10 -5	5 X 10 -5	7.3 X 10 -5
	per °C	per °C	per °F	per °F
Coefficient of Dynamic Friction on	Dry	Lubricated	Dry	Lubricated
steel surface (0.2 µm Ra) / (8 µin CLA)	0.50	0.06	0.50	0.06
Surface Roughness	**µm Ra**	**µm Rt**	**µin CLA**	**µin RMS**
Dynamic Sealing Face $Ød_1$,$ØD_1$	0.4	4 max	16	18
Static Sealing Face $Ød_2$,$ØD_2$, L_1	3.2 max	16 max	125 max	140 max
Bearing Strip Tolerances	**L_1**	**S**	**L_1**	**S**
	-0.1 to -0.6	-0.02 to -0.08	-0.005 to -0.025	-0.001 to -0.003
Width of Bearing Split – W	**$Ød_1$ / $ØD_1$**	**W**	**$Ød_1$ / $ØD_1$**	**W**
	Up to 50	3.00 - 1.50	Up to 2"	0.12 - 0.06
	Up to 120	5.00 - 3.50	Up to 5"	0.19 - 0.14
	Up to 250	9.00 - 7.25	Up to 10"	0.35 - 0.29
	Up to 550	17.00 - 15.00	Up to 22"	0.67 - 0.59
Housing Details & Tolerances				
Rod	**$Ød_1$**	**f9**	**$Ød_1$**	**f9**
	$ØD_2 = Ød_1+2S$	up to : Ø80 H10	$ØD_2 = Ød_1 + 2S$	up to : $Ø_3$in H10
		above : Ø80 H9		above : $Ø_3$in H9
	$ØD3 = Ød_1+G$	G min / max	$ØD3 = Ød_1 + G$	G min / max
	L_1	+ 0.2 -0 mm		+ 0.008 -0 in
Piston	**$ØD_1$**	**H11**	**$ØD_1$**	**H11**
	$Ød_2=ØD_1-2S$	f9	$Ød_2=ØD_1 -2S$	f9
	$Ød_3 = ØD_1- G$	G min / max	$Ød_3 = ØD_1 - G$	G min / max
	L_1	+ 0.2 -0 mm	L_1	+ 0.008 -0 in

Hallite

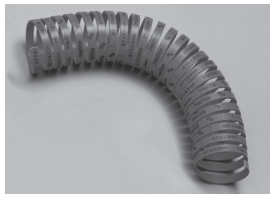
Hallite 506 bearing strip is available in three forms:

Cut Rings

Ready made bearings, cut to size and to customer specifications, and ready for installation, Hallite 506 bearings have become an industry standard favoured by designers and specifiers alike. Generally produced for the medium to high volume user.

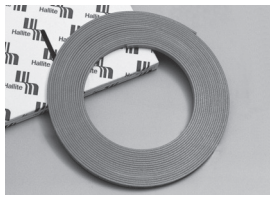
Spiral Lengths

Available in a wide range of preformed diameters, spirals are supplied in continuous lengths to suit a range of inside and outside diameters. Ideal for lower volume users requiring various diameters.



Flat Coils

Packaged in a dispenser for ease of storage and handling, flat coils are supplied in 10 metre lengths suitable for a wide range of diameters and are ideal for those using or supplying one off bearings for small volume requirements.



The ranges shown on the following pages are Hallite's most popular sizes. The section ranges identify section and groove width; from these nearly any diameter of cut ring or spiral length can be manufactured. If you cannot find the size you are looking for, please contact your local Hallite sales office for additional size information.

All standard bearing strip is printed with a size reference and includes distance marking every 100mm on metric size sections and every six inches on inch size sections for guidance only.

When ordering please clearly state whether cut rings, spiral lengths or flat coils are required. For cut rings and spiral lengths please state whether rod or piston application and provide inside (Ød) or outside (ØD) diameters, groove width (L_1) and section (S) dimensions and where spiral lengths are ordered also specify length required. For flat coils please specify groove width (L_1) and section (S) dimensions.

Features

- Ultra low friction
- Compact housing
- Inch sizes available on request
- Seal ring component machined by Hallite, so any size can be catered for

Cutting bearing strip to size

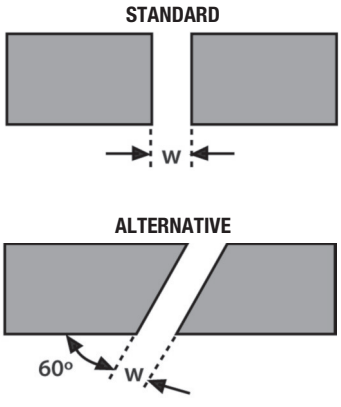
1. Select the groove width (L_1) and section (S) required.

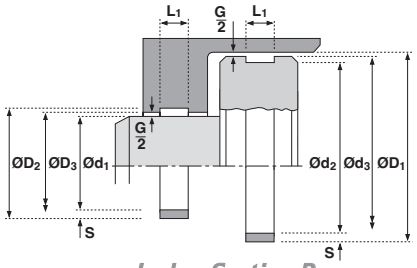
2. In the case of a rod bearing, position the bearing strip around the rod or in the case of a piston bearing, place it in the piston groove and mark the point of overlap. Determine the correct width of bearing split (W) for the Ød or ØD being used, as indicated in the technical details, and make a second mark.

3. Remove the strip and cut at the second marked position to the desired angle using secateurs or other similar cutting tool.

It is recommended that the standard cutting angle is used for the majority of applications.

Bearing split cutting angle





Metric – Section Range

S	L_1	
1.50	5.6	
2.00	9.7	
2.00	10.0	
2.00	15.0	
2.00	20.0	
2.00	22.0	
2.00	25.0	
2.50	5.6	‡
2.50	6.3	
2.50	7.0	
2.50	8.0	
2.50	9.7	‡
2.50	12.0	
2.50	13.0	

S	L_1	
2.50	15.0	‡
2.50	16.0	
2.52	19.5	
2.50	20.0	
2.50	25.0	‡
2.52	30.0	
2.50	40.0	
2.50	50.0	
3.00	9.7	
3.00	12.0	
3.00	12.8	
3.02	15.0	
3.00	16.0	
3.00	20.0	

S	L_1	
3.00	25.0	
3.00	30.0	
3.00	35.0	
3.00	40.0	
3.20	9.7	
3.20	19.7	
3.50	25.0	
4.00	6.1	
4.00	9.7	
4.00	20.0	
4.00	25.0	‡
4.00	30.0	
4.00	35.0	
4.00	40.1	

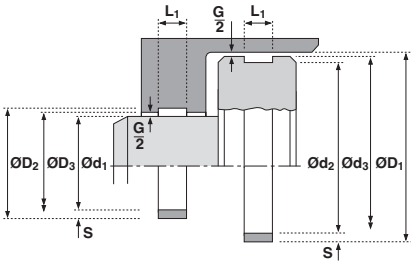
Inch – Section Range

S	L_1
0.063	0.375
0.125	0.375
0.125	0.500
0.125	0.625
0.125	0.750
0.125	1.000
0.125	1.500

Within the size range, items suffixed ‡ indicate cross sections to ISO 10766.

Metric – Spiral Lengths

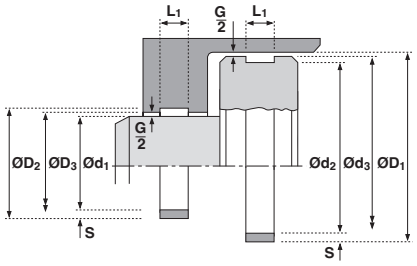
Ø RANGE $Ød_1$	$ØD_1$	S	L_1	G MAX	G MIN*	PART No.
25 - 41	45 - 90	2.0	10.0		0.7	8501310
35 - 70	74 - 160	2.0	10.0		0.7	8502610
70 - 155	159 - 310	2.0	10.0		0.7	8502252
35 - 50	54 - 110	2.0	15.0		0.7	8503357
50 -100	104 - 210	2.0	15.0		0.7	8503175
90 - 180	184 - 370	2.0	15.0		0.7	8503358
25 - 30	35 - 70	2.5	5.6		0.7	8502000‡
25 - 50	55 - 110	2.5	5.6		0.7	8502020‡
50 - 100	105 - 210	2.5	5.6		0.7	8502040‡
25 - 40	45 - 90	2.5	9.7	As required by	0.7	8502100‡
35 - 70	75 - 150	2.5	9.7	the seal extrusion	0.7	8502120‡
70 - 150	155 - 310	2.5	9.7	gap	0.7	8502140‡
40 - 50	55 - 110	2.5	13.0		0.7	8502200
50 - 100	105 - 210	2.5	13.0	For applications not	0.7	8502220
90 - 180	185 - 370	2.5	13.0	using a seal	0.8	8502230
40 - 50	55 - 110	2.5	15.0	G MAX can be 1.6mm	0.7	8502300‡
50 - 100	105 - 210	2.5	15.0		0.7	8502330‡
90 - 180	185 - 370	2.5	15.0		0.8	8502350‡
50 - 80	85 - 170	2.5	20.0		0.7	8502400
75 - 150	155 - 310	2.5	20.0		0.8	8502410
125 - 250	255 - 510	2.5	20.0		0.8	8502430
60 - 80	85 - 170	2.5	25.0		0.7	8502500‡
70 - 150	155 - 310	2.5	25.0		0.8	8502520‡
125 - 250	255 - 510	2.5	25.0		0.8	8502530‡
40 - 50	56 - 100	3.0	9.7		0.8	8503369



Metric – Spiral Lengths

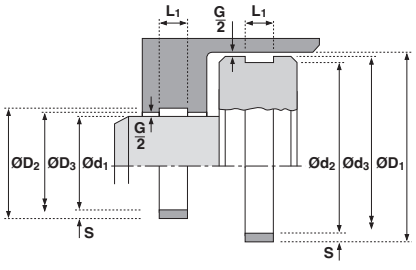
Ø RANGE Ød1	ØD1	S	L1	G MAX	G MIN*	PART No.
50 - 100	106 - 210	3.0	9.7	As required by the seal extrusion gap For applications not using a seal G MAX can be 1.6mm	0.8	8503370
100 - 150	156 - 310	3.0	9.7		0.8	8503371
50 - 60	66 - 120	3.0	12.8		0.7	8503037
60 - 104	110 - 220	3.0	12.8		0.8	8503038
90 - 149	155 - 300	3.0	12.8		0.8	8503039
55 - 80	86 - 170	3.0	20.0		0.8	8503124
80 - 150	156 - 310	3.0	20.0		0.8	8502635
140 - 250	256 - 510	3.0	20.0		0.8	8503189
50 - 75	81 - 160	3.02	15.0		0.7	8502734
60 - 80	68 - 170	4.0	6.1		0.8	8503359
80 - 150	158 - 310	4.0	6.1		0.8	8503360
150 - 250	258 - 510	4.0	6.1		0.8	8503361
60 - 80	88 - 170	4.0	9.7		0.8	8503362
80 - 150	158 - 310	4.0	9.7		0.8	8503363
150 - 250	258 - 510	4.0	9.7		0.8	8503364
60 - 80	88 - 170	4.0	20.0		0.8	8503365
80 - 150	158 - 310	4.0	20.0		0.8	8503366
150 - 250	258 - 510	4.0	20.0		0.8	8503191
120 -150	158 - 310	4.0	25.0		0.8	8503367‡
150 - 250	258 - 510	4.0	25.0		0.8	8503192‡
120 -150	158 - 310	4.0	30.0		0.8	8503368
150 - 250	258 - 510	4.0	30.0		0.8	8503193
170 - 200	208 - 410	4.0	40.1		0.8	8503179
200 - 300	308 - 610	4.0	40.1		0.8	8503180

Within the size range, items suffixed ‡ indicate cross sections to ISO 10766.



Inch – Spiral Lengths

Ø RANGE $Ød_1$	Ø RANGE $ØD_1$	S	L_1	G MAX	G MIN*	PART No.
1.000 - 1.375	1.625 - 3.500	0.125	0.375	As required by the seal extrusion gap For applications not using a seal G MAX can be 0.080in	0.031	8502098
1.250 - 1.875	2.125 - 4.250	0.125	0.375		0.031	8502099
2.000 - 3.500	3.750 - 6.250	0.125	0.375		0.031	8502183
1.250 - 1.750	2.000 - 4.000	0.125	0.500		0.031	8502089
1.750 - 3.500	3.750 - 6.250	0.125	0.500		0.031	8502090
3.500 - 6.000	6.250 - 10.000	0.125	0.500		0.031	8502091
8.000 - 12.500	12.750 - 25.000	0.125	0.500		0.031	8502720
2.000 - 3.500	3.750 - 6.250	0.125	0.625		0.031	8502092
3.500 - 6.000	6.250 - 10.000	0.125	0.625		0.031	8502093
2.000 - 3.500	3.750 - 6.250	0.125	0.750		0.031	8502094
3.500 - 6.000	6.250 - 10.000	0.125	0.750		0.031	8502095
2.500 - 3.500	3.750 - 6.250	0.125	1.000		0.031	8502096
3.500 - 6.000	6.250 - 10.000	0.125	1.000		0.031	8502097
8.000 - 12.500	12.750 - 25.000	0.125	1.000		0.031	8502222



Metric – Flat Coils

Ø RANGE Ød1	ØD1	S	L1	G MAX	G MIN*	PART No.
140	190	1.5	5.6	As required by the seal extrusion gap For applications not using a seal G MAX can be 1.6mm	0.7	8581810
140	210	2.0	9.7		0.7	8581910
140	210	2.0	10.0		0.7	8584610
140	210	2.0	20.0		0.7	8582210
140	210	2.0	15.0		0.7	8581210
140	230	2.5	5.6		0.7	8580010‡
140	230	2.5	6.3		0.7	8581310
140	230	2.5	8.0		0.7	8581610
140	230	2.5	9.7		0.7	8580110‡
140	230	2.5	13.0		0.7	8581110
140	230	2.5	15.0		0.7	8580210‡
140	230	2.5	20.0		0.8	8580310
140	230	2.5	25.0		0.8	8580410‡
140	230	2.5	30.0		0.7	8582010
140	240	3.0	9.7		0.7	8581410
140	240	3.0	12.8		0.7	8581010
140	240	3.0	20.0		0.7	8581510
140	240	3.02	15.0		0.7	8581710

Inch – Flat Coils

5.500	9.750	0.125	0.375	As required by the seal extrusion gap For applications not using a seal G MAX can be 0.080in	0.031	8580510
5.500	9.750	0.125	0.500		0.031	8580610
5.500	9.750	0.125	0.625		0.031	8580710
5.500	9.750	0.125	0.750		0.031	8580810
5.500	9.750	0.125	1.000		0.031	8580910

Within the size range, items suffixed ‡ indicate cross sections to ISO 10766.
ID and OD are indicated as approximate values for guidance only.

* This value can be reduced if required by the seal's maximum extrusion gap- Refer to Housing Design section.

If necessary coil diameters can be re-sized by curing on a suitable mandrel in an oven for 1 hr at 120°C 250°F and allowing to cool on the mandrel.