

# 716SPN

ROD SEAL  
Single-Acting

## TECHNICAL DETAILS

The Hallite 716SPN is a single-acting, o-ring energized rod seal proven to be ideal for a variety of applications. This seal is typically made out of our high-quality Hythane® materials combined with an elastomer energizer design optimized for superior performance.

The Hallite 716SPN can be used as a single rod seal or incorporated into a rod sealing system as the secondary seal. The 716SPN is paired with an R16 made from an Armorlene® PTFE material which becomes the primary seal in the system (see drawing above) with the 716SPN as the secondary seal in the system. This tandem arrangement is ideal for long-stroke and high-speed applications, providing optimum sealing performance.

This design fits standard ISO 7425-2 grooves and is offered in a wide range of metric and inch options.



## FEATURES

- Low break-away force
- Design minimizes occurrence of stick-slip
- Design offers excellent dynamic and static sealing properties
- Long wear and high extrusion resistance
- Excellent performance as a single or tandem seal system

## Part Number Structure

716MR00500N111\_

<b>716</b>	<b>M</b>	<b>R</b>	<b>00500</b>	<b>N</b>	<b>111</b>	_
<b>PROFILE DESIGNATION</b>	<b>UNIT OF MEASUREMENT</b> M = Metric E = Inch	<b>APPLICATION</b> Refer to <b>Installation Recommendations</b> and use designator for desired application	<b>ROD DIAMETER</b> Metric = mm X 10 Inch = inches X 1000	<b>ENERGIZER MATERIAL</b> Refer to <b>Energizer Table</b> for desired energizer material	<b>MATERIAL</b> Refer to <b>Material Table</b> for desired (face) material	<b>SPECIAL FEATURE</b> Blank = Std profile

## OPERATING CONDITIONS

	metric	inch
<b>Maximum Speed</b>	Up to 1.0m/sec	Up to 3.3ft/sec
<b>Temperature Range*</b>	-40 to 100°C	-40 to 212°F
<b>Maximum Dynamic Pressure**</b>	250 bar	3600 psi
<b>When used in Tandem with R16***</b>	400 bar	5800 psi

\*Dependent upon energizer used (NBR, FKM, etc.). \*\*For pressures above 250 bar (3600 psi), contact Hallite Engineering. \*\*\*For pressures above 400 bar (5800 psi), contact Hallite Engineering.

### NOTE

Data given are maximum values and can apply depending on specific application. Maximum ratings of temperature, pressure, or operating speeds are dependent on fluid medium, surface, gap value, and other variables such as dynamic or static service. Maximum values are not intended for use together at the same time, e.g. max temperature and max pressure. Please contact your Hallite technical representative for application support.

## SURFACE FINISH RECOMMENDATIONS

SURFACE ROUGHNESS	metric			inch			RMR*
	μMRA	μMRZ	μMRT	μINRA	μINRZ	μINRT	
<b>Dynamic Sealing Face Ød<sub>1</sub></b>	0.1 - 0.4	1.3 max	2.5 max	4 - 16	52 max	98 max	45% - 70%
<b>Static Sealing Face ØD<sub>1</sub></b>	1.6 max	7 max	10 max	63 max	276 max	394 max	
<b>Static Housing Faces L<sub>1</sub></b>	3.2 max	10 max	16 max	125 max	394 max	630 max	

\*RMR is measured at a depth of 25% of the Rz value based upon a reference level (zero line) at 5% material/bearing area. For sealing systems where a PTFE rod seal is used, please refer to the PTFE rod seal surface finish requirements.

## ENERGIZER TABLE

ENERGIZER MATERIAL (SHORE A)	ENERGIZER TYPE	ENERGIZER DESIGNATION	ENERGIZER OPERATING TEMPERATURE°C	ENERGIZER OPERATING TEMPERATURE°F
<b>NBR - 70A</b>	O-Ring	N	-30 to 100°C	-22 to 212°F
<b>NBR - 70A Low temp.</b>	O-Ring	L	-45 to 80°C	-49 to 176°F
<b>FKM - 75A</b>	O-Ring	F	-10 to 200°C	14 to 392°F
<b>EPDM - 70A</b>	O-Ring	E	-45 to 145°C	-49 to 293°F
<b>HNBR - 70A</b>	O-Ring	H	-25 to 150°C	-13 to 302°F
<b>NBR - 90A</b>	O-Ring	Q	-30 to 100°C	-22 to 212°F
<b>HNBR - 90A</b>	O-Ring	U	-25 to 150°C	-13 to 302°F
<b>No Energizer*</b>	None	X	-	-

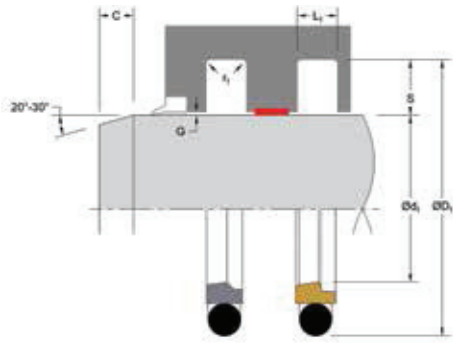
\*Seal ratings are based upon capabilities of its matched material components. Hallite cannot rate seal performance when the seal is mixed with other manufacturers' energizers/components.

# MATERIALS

MATERIAL FEATURES AND APPLICATIONS	FILLER	MATERIAL DESIGNATOR	COLOR	TEMPERATURE RANGE °C	TEMPERATURE RANGE °F	MAXIMUM DYNAMIC PRESSURE - BAR	MAXIMUM DYNAMIC PRESSURE - PSI
<b>HYTHANE® 9270111 - POLYESTER, 55D</b> <ul style="list-style-type: none"> <li>• Positive position load holding</li> <li>• Hydrolysis stabilized</li> <li>• Strong chemical resistance</li> <li>• Excellent extrusion resistance</li> <li>• Excellent wear properties</li> <li>• Available up to 1400mm (55 inches) diameter</li> </ul>	Hydrolysis Stabilized	111	Gray	-40 to 120°C	-40 to 250°F	250 bar	3600 psi
<b>HYTHANE® 9270261 - POLYESTER, 55D</b> <ul style="list-style-type: none"> <li>• Positive position load holding</li> <li>• Internal lubrication provides extended wear in high-speed applications</li> <li>• Excellent extrusion resistance</li> <li>• Excellent wear resistance</li> <li>• Available up to 500mm (19.5 inches) diameter</li> </ul>	Internally Lubricated	261	Off-White	-40 to 120°C	-40 to 250°F	250 bar	3600 psi
<b>HU5 - POLYURETHANE, 55D</b> <ul style="list-style-type: none"> <li>• Positive position load holding</li> <li>• Excellent extrusion resistance</li> <li>• Excellent wear resistance</li> <li>• Available up to 2540mm (100 inches) diameter</li> </ul>	Standard	HU5	Yellow	-20 to 115°C	-20 to 240°F	250 bar	3600 psi
<b>HU9 - POLYURETHANE, 95A</b> <ul style="list-style-type: none"> <li>• Positive position load holding</li> <li>• Excellent extrusion resistance</li> <li>• Excellent wear resistance</li> <li>• Available up to 2540mm (100 inches) diameter</li> </ul>	Standard	HU9	Red	-20 to 115°C	-20 to 240°F	250 bar	3600 psi
<b>HE5 - POLYESTER, 55D</b> <ul style="list-style-type: none"> <li>• Positive position load holding</li> <li>• Excellent extrusion resistance</li> <li>• Excellent wear resistance</li> <li>• Available up to 2540mm (100 inches) diameter</li> </ul>	Standard	HE5	Gray/Black	-20 to 115°C	-20 to 240°F	250 bar	3600 psi
<b>HYTHANE® 9220371 - POLYURETHANE, 55D</b> <ul style="list-style-type: none"> <li>• Positive load holding</li> <li>• Excellent extrusion resistance</li> <li>• Excellent wear resistance</li> <li>• Available up to 500mm (19.5 inches) diameter</li> </ul>	Standard	371	Green	-40 to 100°C	-40 to 212°F	250 bar	3600 psi

For other material options consult the Master Materials Index at the front of the catalog. If you do not find the material that you require, please contact your local Hallite sales office.





Applications with maximum radial clearance that are using nylon, phenolic, or PTFE bearings must ensure proper clearance in accordance with the bearing recommendations to avoid metal-to-metal contact. Please refer to Hallite Type 87, Type 506, and Type 533 Specification Sheets for this information.

## INSTALLATION RECOMMENDATIONS

### metric

ROD DIAMETER $\text{Ø}d_1$ f8/h9			GROOVE DIAMETER	GROOVE WIDTH	RADIUS	CHAMFER	GROOVE SECTION	RADIAL CLEARANCE G MAX*			O-RING CROSS SECTION
DIAMETER RANGE			$\text{Ø}d_1$ H9	$L_1 + 0.2$	$R_1$	C	S	Up to 100 bar	Up to 200 bar	Up to 400 bar	O-Ring
Standard Duty Application - R	Light Duty Application - L	Heavy Duty Application - H									
5.0 - 7.9	8.0 - 18.9	-	$d_1 + 4.9$	2.2	0.4	2.0	2.45	0.30	0.20	0.15	1.78
8.0 - 18.9	19.0 - 37.9	-	$d_1 + 7.5$	3.2	0.6	3.0	3.75	0.40	0.25	0.15	2.62
19.0 - 37.9	38.0 - 199.9	8.0 - 18.9	$d_1 + 11.0$	4.2	1.0	4.0	5.50	0.50	0.30	0.20	3.53
38.0 - 199.9	200.0 - 255.9	19.0 - 37.9	$d_1 + 15.5$	6.3	1.3	6.0	7.75	0.70	0.40	0.25	5.33
200.0 - 255.9	256.0 - 649.9	38.0 - 199.9	$d_1 + 21.0$	8.1	1.8	8.0	10.50	0.80	0.60	0.35	6.99
256.0 - 649.9	650.0 - 1000.0	200.0 - 255.9	$d_1 + 24.5$	8.1	2.5	9.0	12.25	1.00	0.80	0.50	6.99
650.0 - 1000.0	-	256.0 - 650.0	$d_1 + 28.0$	9.5	3.0	10.0	14.00	1.20	0.90	0.60	8.40
> 1000.0	-	-	$d_1 + 38.0$	13.8	3.0	10.0	19.00	1.20	0.90	0.60	12.00

At pressure >250 bar use diameter tolerance f8/H8.

\*Radial Clearance G max. = maximum permissible gap all on one side using min. rod diameter and max. clearance diameter.

### inch

ROD DIAMETER $\text{Ø}d_1$ f8/h9			GROOVE DIAMETER	GROOVE WIDTH	RADIUS	CHAMFER	GROOVE SECTION	RADIAL CLEARANCE G MAX*			O-RING CROSS SECTION
DIAMETER RANGE			$\text{Ø}d_1$ H9	$L_1 + .008$	$R_1$	C	S	Up to 1500 PSI	Up to 2900 PSI	Up to 5800 PSI	O-Ring
Standard Duty Application - R	Light Duty Application - L	Heavy Duty Application - H									
0.125 - 0.311	0.312 - 0.749	-	$d_1 + 0.193$	0.087	0.016	0.079	0.097	0.012	0.008	0.006	0.070
0.312 - 0.749	0.750 - 1.499	-	$d_1 + 0.287$	0.126	0.024	0.118	0.144	0.016	0.010	0.006	0.103
0.750 - 1.499	1.500 - 7.874	0.312 - 0.749	$d_1 + 0.421$	0.165	0.039	0.157	0.211	0.020	0.012	0.008	0.139
1.500 - 7.874	7.875 - 9.999	0.750 - 1.499	$d_1 + 0.594$	0.248	0.051	0.236	0.297	0.028	0.016	0.010	0.210
7.875 - 9.999	10.000 - 25.499	1.500 - 7.874	$d_1 + 0.807$	0.319	0.071	0.315	0.404	0.031	0.024	0.014	0.275
10.000 - 25.499	25.500 - 39.999	7.875 - 9.999	$d_1 + 0.945$	0.319	0.071	0.315	0.473	0.035	0.028	0.016	0.275
25.500 - 39.999	> 40.000	10.000 - 25.499	$d_1 + 1.075$	0.374	0.098	0.354	0.538	0.039	0.031	0.020	0.331

At pressure >3600 psi use diameter tolerance f8/H8.

\*Radial Clearance G max. = maximum permissible gap all on one side using min. rod diameter and max. clearance diameter.