

RULON® PTFE-FILLED FLUOROPOLYMER MATERIALS







Saint-Gobain

Saint-Gobain is a worldwide group whose history spans more than three centuries. Created in 1665 in France, Saint-Gobain launched its first industrial department with the production of mirrors, which adorn the famous Hall of Mirrors at Versailles.

Expansion beyond French borders began in the middle of the 19th century. An international pioneer, Saint-Gobain established a glass factory in Germany in 1857, another in Italy in 1889 and one in Belgium in 1904. The group moved toward the New World in 1937 with the opening of a plant in Brazil.

Strongly established in flat glass production, Saint-Gobain began looking toward other activities at the beginning of the 20th century. The company entered the papermaking business in 1925, and the insulation business in 1936.

The 1970 addition of the company Pont-á-Mousson, the world leader in cast iron pipes, reinforced Saint-Gobain's position in the construction market. Throughout the 1970s and 80s the Saint-Gobain Group continued to pursue both internal and external growth, which culminated with the 1990 acquisition of Norton Company, one of the world's leading abrasives and ceramics manufacturers.

Norton Performance Plastics in turn acquired Furon Company and created Saint-Gobain Performance Plastics, with Saint-Gobain Seals being one of their business units. In 2021, Saint-Gobain Seals was rebranded to Omniseal Solutions[™], combining decades of experience and leadership in not only polymer seals, bearings and components but also metal seals and composites.

The Rulon® trademark **was** acquired by Furon in the purchase of Dixon Industries Corporation, founded in 1876 by Ezra Dixon, specializing in selflubricating bearings for the then emerging textile industry in the northeastern United States.

Glossary of Materials

• Rulon [®] AR	Maroon material for seals and applications requiring higher physical properties than Rulon LR
• Rulon [®] LR	Maroon material with low deformation characteristics
• Rulon [®] J	Dull gold polymer-filled material for lower abrasion and softer mating surfaces
• Rulon [®] 641	White FDA/USDA/USP Class VI compliant material for most mating surfaces
• Rulon® W2	Excellent for fresh water applications
• Rulon [®] 123	FDA/USDA compliant, low and consistent friction material for most mating surfaces
∙ Rulon [®] 488	Inorganic filled material ideal for dry applications, compatible with most surfaces
• Rulon [®] 957	Green speckled material, excellent bearing grade with noise dampening capability
• Rulon® XL	Tan, low friction material, suitable for aluminum surfaces, with excellent outgassing capability for use in vacuum
• Rulon [®] 142	Aqua colored low deformation material suitable for linear bearings and slides
• Rulon [®] 945	Black very low deformation material suitable for high heat / impact applications
• Rulon [®] 1045	Dull gold colored high elongation and moderate deformation material suitable for bearings, rings and seals
• Rulon [®] 1337	Tan FDA/USDA compliant material with low frictional characteristics and excellent chemical resistance for most mating surfaces
• Rulon [®] 1410	Gold colored material for use in applications requiring high elongation
• Rulon [®] 1439	White FDA/USDA compliant material most suitable for submerged applications with low wear

Processes

Automatic Molding	 Custom bearings Components, near-net
Extrusion	· Rods & Tubes
	 Specialty Profiles
Hand Molding	 Rod, Sheet, and Tube
Machining	Custom Machined Parts
Skiving	 Tapes and Thin Sheet
Stamping / Forming	• Seals
	• Washers
	• Bearings & Glides

Products

Bearings:

Sleeve, flanged, and thrust bearings are available in the standard materials, Rulon[®] LR, J, and 641, through our distribution channels. Please contact Saint-Gobain Seals' customer service for the preferred distributor in your area or for other material options.

Rings:

Solid and split piston rings, featuring a full complement of joint configurations, can be manufactured to your custom specifications, or our applications engineers can work with you to design the optimal ring for your needs. Please contact the main number and you will be connected with the district sales manager for your area.

Tapes:

Most materials can be skived (shaved) into sheets using state of the art equipment. These can be etched for bonding to other materials, or used as is in a wide assortment of applications where friction reduction is desired. FDA-compliant materials can be used as nonstick coating surfaces for food preparation.

Formed Parts:

A wide assortment of cup seals is available, either hot-formed to hold a specific shape, or cold-formed to retain the natural memory of the materials. These produce a consistent hysteresis in dust sealing applications, as well as precision electronic applications. Please contact the main number and you will be connected with the district sales manager for your area.

Basic Shapes:

Molded and extruded rods and tubes and molded sheets are available in most of the materials. Please contact Saint-Gobain Seals' customer service for the preferred distributor in your area.

Wear Components:

Wear components can take a variety of shapes and sizes, other than those described above. These can encompass things such as wear bands, pump bodies, and pistons for chemically and thermally demanding environments. These are usually manufactured to your specifications or Saint-Gobain Seals can assist you in the design. Please send email to sealsmarketing@saint-gobain.com. Please contact the main number and you will be connected with the district sales manager for your area.

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Available Shapes

Extruded – Up to 10 ft. long (3.05m) 3" (76.2mm) Max O.D.

Molded - Up to 12" long (304.8mm) 47" (1,193.8mm) Max O.D.

Precision grinding or machining available for some sizes

Tape - 38" (965.2mm) width* Skived Up to 0.25" (6.35mm) thick

1abr Ŷ Molded - Up to 24"x3" (609.6mm x 76.2mm) thick Max thickness 3" (76.2mm)

Precision grinding or machining available on thickness *Other sizes available upon request **Contact District Sales Manager**

Custom

Full machining capabilities available

	Materials S	election Gui	de					
Rulon [®] Grades	Grade	AR	LR	J	641	W2	123	488
RULON®	Color	Maroon	Maroon	Gold	White	Black	Black	Turquoise
Ü	Max Load "P" (psi) MPa	1,000 6.9	1,000 6.9	750 5.2	1,000 6.9	1,000 6.9	1,000 6.9	1,000 6.9
Performance	Max Speed "V" (fpm) m/s	400 2.0	400 2.0	400 2.0	400 2.0	400 2.0	400 2.0	400 2.0
PE	Max "PV" (psi-fpm) (MPa • m/s)	10,000 0.35	10,000 0.35	7,500 0.26	10,000 0.35	10,000 0.35	10,000 0.35	10,000 0.35
	Rb 25 & higher			x	x	x	x	x
SURFACE NLESS STEEI	Rc 35 & higher	х	х					
MATING SURFACE Steel & Stainless Steel	Painted metal and porcelain							
Ċ	Aluminum							
	FDA/USDA compliant						x	
ц	Steam	x	x			x	x	x
ENVIRONMENT	Wet	x	x		x	x	x	x
Ц	Dry	x	x	x	x	x	x	x
	Vacuum	x	x	x	x			x
DN	Coefficient of friction	4	4	1	1	2	2	3
Relative Rating 1 = Low, 5 = High	Creep resistance	3	4	3	4	4	4	4
Rel 1=	Insulative properties (Elec & Temp)	Yes	Yes	Yes	No	No	Yes	Yes
COMMENTS		Standard Rulon® seal material with higher physical properties.	Standard Rulon® bearing grade. High creep & abrasion resistance.	Lowest coefficent of friction of Rulon® series. Excellent insulator.	Widely used in the food process industry.	Very good operation; in wet environments.	Good thermal and electrostatic dissipation.	Temperature (dry) oven bearings. Excellent abrasion.

The list above is only a partial list of available formulations of Rulon.®

P or V data may be exceeded based on specific application requirements. Ask to speak to an Application Engineer. RATINGS above are relative within Rulon® family ONLY.

For Rulon[®] materials, coefficient of friction decreases with increasing load, and wear decreases with increasing surface hardness. For PTFE based materials, wear in steam and wet environments is higher than in dry environments.

Omniseal Solutions[™] offers enhanced Rulon[®] grades, which minimize this effect.

Most Rulon® products have excellent chemical compatability. Data available upon request.

	Materials S	election Gu	ide						
Rulon® Grades	Grade	957	XL	142	945	1045	1337	1410	1439
Rulon®	Color	Green	Tan	Turquoise	Black	Gold	Tan	Gold	White
ų	Max Load "P" (psi) MPa	1,000 6.9	1,200 8.3	1,000 6.9	1,000 8.3	1,000 6.9	1,000 6.9	750 5.2	1,000 6.9
Performance	Max Speed "V" (fpm) m/s	400 2.0	400 2.0	400 2.0	400 2.0	400 2.0	400 2.0	400 2.0	400 2.0
Ре	Max "PV" (psi-fpm) (MPa ∙ m/s)	10,000 0.35	10,000 0.35	10,000 0.35	10,000 0.35	10,000 0.35	10,000 0.35	7,500 0.26	10,000 0.35
<u>e</u>	Rb 25 & higher	x	x			x	x	x	x
Surface nless Ste	Rc 35 & higher			x	x				
Mating Surface Steel & Stainless Steel	Painted metal and porcelain	x							
Ste	Aluminum		x						
	FDA/USDA compliant						x		x
t	Steam	x	x	x	x		x	x	x
Environment	Wet	x	x	x	x	x	x	x	x
Eu	Dry	x	x	x	x	x	x	x	x
	Vacuum	x	x	x		x	x	x	x
ing ligh	Coefficient of friction	2	1	2	4	1	1	1	3
Relative Rating 1 = Low, 5 = High	Creep resistance	4	4	5	5	2	2	2	4
Rels 1 = L	Insulative properties (Elec & Temp)	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Comments		Low friction/ wear against coated metal or porcelain surfaces.	The best Rulon® against aluminum surfaces.	Extensively used in machine tool guide ways.	Extremely low deformation under load, and high impact resistance.	A standard material for compressor piston flip seals.	FDA compliant; excellent chemical resistance.	A standard material for compressor piston flip seals.	ldeal for submerged applications.

The list above is only a partial list of available formulations of Rulon®

P or V data may be exceeded based on specific application requirements. Ask to speak to a Saint-Gobain Application Engineer. RATINGS above are relative within Rulon® family ONLY.

For Rulon® materials, coefficient of friction decreases with increasing load, and wear decreases with increasing surface hardness. For PTFE based materials, wear in steam and wet environments is higher than in dry environments.

Saint-Gobain offers enhanced Rulon® grades, which minimize this effect.

Most Rulon® products have excellent chemical compatability. Data available upon request.

RULON® AR

Rulon® AR is a light maroon colored material best known as the current version of the first Rulon® introduced, namely Rulon® A.

It is somewhat more flexible than Rulon[®] LR, hence suitable for seals and bonded coating of slide surfaces. It has many decades of use in automotive shaft seals and fuel metering pump cups.

Rulon[®] AR has a practically universal chemical inertness like that of Rulon[®] LR and provides long life and reliability in continuous nonlubricated service.

It is capable of operating at PV values up to approximately 10,000. Higher PV values are possible for intermittent use applications.



Design Criteria Rulon® AR

Temperature - Typical Range °F (°C) Maximum PV (continuous)(MPa·m/s) Maximum P - psi (static)(MPa) Maximum V - SFM (no load)(m/s)	-400/+550 (-240/+288)* 10,000 (0.35)* 1000 (6.9)* 400 (2)* Rc35
Shaft Hardness - Minimum Shaft finish recommended Ra µin(µm) Shaft Material	8 - 16 (0.2-0.4)* Steel
Engineering Information	
Friction - static & dynamic Water Absorption ASTM D570 Flammability ASTM D635 Chemical Resistance Thermal Conductivity BTU/hr/sq. ft./° F/in. (W/m·K) Linear Coefficient of 78° - 300° F Thermal Expansion (26° to 149 °C) x 10 -5 in/in °F (x 10 -5 m/m °C)	0.15 - 0.25 0% Non-Flammable Inert 2.3 (0.33)* Diameter 4.8 (8.6)* Length 6.2 (11.1)*
Physical Data	
Elongation ASTM D4894 Tensile Strength ASTM D4894 (MPa) Deformation ASTM D621 Specific Gravity ASTM D792	175% 2000 psi (13.8)* 5% (1500 psi - 24 hr. RT) 2.22

A more complete data sheet is available upon request. *Metric data in parentheses

Products	Applications
 Automatically molded bearings & components 	• Pumps
Skived sheet	• Mixers
• Piston/Piston rings	 Compressors Appliances
 Stamped/Machined formed seals 	 Automotive
• Extruded shapes	 Insulators
 Machined parts 	 Linear slides
 Molded shapes 	• Pipe support
	• Wear bands

RULON® LR



Rulon[®] LR is a maroon colored bearing material best known for its versatile design properties.

It is compatible with most hardened steel substrates. Mild steel is acceptable; harder running surfaces are better.

Rulon[®] LR has a practically universal chemical inertness. Of the chemicals encountered in commercial practice, only molten sodium and fluorine, at elevated temperatures and pressures, show any signs of attack.

For continuous non-lubricated service, Rulon® LR sleeve bearings are capable of operating up to 10,000 PV. Higher values are possible for intermittent service.

Design Criteria Rulon[®] LR

Temperature, Typical Dange °E (°C)	-400/+550 (-240/+288)*
Temperature - Typical Range °F (°C) Maximum PV (continuous)(MPa•m/s)	,(,
Maximum P - psi (static)(MPa)	1,000 (6.9)*
Maximum V -SFM (no load)(m/s)	, , ,
Shaft Hardness - Minimum	Rc35
Shaft finish recommended Ra μ in(μ m)	
Shaft Material	Steel
Engineering Information	
Friction - static & dynamic	0.15 - 0.25
Water Absorption ASTM D570	0%
Flammability ASTM D635	Non-Flammable
Chemical Resistance	Inert
Thermal Conductivity	
BTU/hr/sq. ft./° F/in. (W/m•K)	2.3 (0.33)*
Linear Coefficient of 78° to 300° F	Diameter 5.1 (9.2)*
Thermal Expansion (26° to 149°C)	Length 5.9 (10.6)*
x 10 -5 in/in °F (x 10 -5 m/m °C)	
Physical Data	
Elongation ASTM D4894	150%
Tensile Strength ASTM D4894 (MPa)	
Deformation ASTM D621	3% (1500 psi - 24 hr. RT)
Specific Gravity ASTM D792	

A more complete data sheet is available upon request. *Metric data in parentheses

Products	Applications
 Automatically molded bearings & components Sleeve, flanged and thrust bearings Piston rings Stamped and formed seals Extruded shapes Machined parts Molded shapes 	 Pumps Mixers Compressors Appliances Automotive Insulators Linear slides Pipe supports Wear bands Textile Industry

RULON® J

Rulon[®] J is an all-polymeric reinforced, dull gold colored PTFE compound that operates exceptionally well against soft mating surfaces such as 316 stainless steel, aluminum, mild steel, brass and other plastics. The unique "shaft friendly" material is also low in friction and wear and self-lubricating.

Rulon[®] J has one of the lowest coefficients of friction of most reinforced PTFE materials. This makes it ideally suited for start/stop applications where stick-slip must be eliminated. The tribological properties of this material also make it suitable for both bearing and wear component applications.



Design Criteria Rulon® J

Temperature - Typical Range °F (°C) Maximum PV (continuous)(MPa·m/s) Maximum P - psi (static)(MPa) Maximum V -SFM (no load)(m/s) Shaft Hardness - Minimum Shaft finish recommended Ra µin(µm) Shaft Material	-400/+550 (-240/+288)* 7,500 (0.26)* 750 (5.2)* 400 (2)* Rb25 8 - 16 (0.2-0.4)* 316 Stainless Steel and Non-Ferrous
Engineering Information	
Friction - static & dynamic Water Absorption ASTM D570 Flammability ASTM D635 Chemical Resistance Thermal Conductivity BTU/hr/sq. ft./° F/in. (W/m·K) Linear Coefficient of 78° to 300° F Thermal Expansior(26° to 149° C) x 10 -5 in/in °F (x 10 -5 m/m °C) Physical Data	0.12 - 0.20 0% Non-Flammable Data Available 1.7 (0.24)* Diameter 5.2 (9.3)* Length 6.8 (12.2)*
Elongation ASTM D4894 Tensile Strength ASTM D4894 (MPa) Deformation ASTM D621 Specific Gravity ASTM D792	180% 2000 psi (13.8)* 3% (1500 psi - 24 hr. RT) 1.95

A more complete data sheet is available upon request. *Metric data in parentheses

 Automatically molded bearings & components Sleeve, flanged and thrust bearings Piston rings Stamped and formed Automotive 	Products	Applications
 Statinged and formed seals Extruded shapes Machined parts Molded shapes Solenoid valves Refrigeration valves Textile Industry 	 bearings & components Sleeve, flanged and thrust bearings Piston rings Stamped and formed seals Extruded shapes Machined parts 	 Printers Copiers Air Compressors Appliances Automotive Insulators Linear slides Anemometers Wear bands Solenoid valves Refrigeration valves

RULON[®] 641



Rulon[®] 641 is manufactured from FDA and USDA compliant materials possessing excellent load and wear characteristics while meeting the requirements for USP Class VI.

It offers excellent, continuous non-lubricated service up to 10,000 PV – higher for intermittent

service. While the load capacity of Rulon® 641 is generally limited to 1,000 psi (6.9 MPa) at room temperature, deformation is a function of wall thickness, temperature and load.

Its compatibility with a wide array of mating surfaces, including mild steel, 303 and 316 stainless steels, as well as harder materials, make it a good choice for most food and pharmaceutical bearing applications.

Design Criteria Rulon® 641

Temperature - Typical Range °F (°C)	-400/+550 (-240/+288)*
Maximum PV (continuous)(MPa·m/s)	10,000 (0.35)*
Maximum P - psi (static)(MPa)	1,000 (6.9)*
Maximum V -SFM (no load)(m/s)	400 (2)*
Shaft Hardness - Minimum	Rb25
Shaft finish recommended Ra	8 - 16 (0.2-0.4)*
µin(µm)	Mild, 303 & 316
Shaft Material	Stainless Steel
Engineering Information	
Engineering mormation	
Friction - static & dynamic	0.10 - 0.30
Water Absorption ASTM D570	0%
Flammability ASTM D635	Non-Flammable
Chemical Resistance	Inert
Thermal Conductivity	
BTU/hr/sq. ft./° F/in. (W/m·K)	2.6 (0.37)*
Linear Coefficient of 78° to 300° F	Diameter 4.2 (7.5)*
Thermal Expansion (26° to 149°C)	Length 5.7 (10.2)*
x 10 -5 in/in °F (x 10 -5 m/m °C)	
Dhusiaal Data	
Physical Data	
Elongation ASTM D4894	175%
Tensile Strength ASTM D4894 (MPa)	2000 psi (13.8)*
Deformation ASTM D621	4% (1500 psi - 24 hr. RT)
Specific Gravity ASTM D792	2.25

A more complete data sheet is available upon request. *Metric data in parentheses

Products	Applications
 Automatically molded bearings & components Sleeve, flanged and thrust bearings Piston rings 	Pumps Mixers Compressors Appliances
 Stamped and formed seals Extruded shapes Machined parts Molded shapes 	 Chute Liners Insulators Linear slides Shaft bearings Wear bands Seals

RULON® W2

Rulon® W2 is a black PTFE-based material developed for use in fresh-water applications. It exhibits low friction and excellent wear characteristics (one of the lowest wear rates in fresh water) as well as good thermal dissipation, preventing shaft distress. Its properties are enhanced when wet.

It is compatible with most metal substrates and soft mating surfaces. Rulon® W2 is a good alternative to Rulon® J when superior chemical resistance is needed. However, it should not be used on very soft mating surfaces or where electrical insulation is desired.



Design Criteria Rulon® W2

Temperature - Typical Range °F (°C) Maximum PV (continuous)(MPa·m/s) Maximum P - psi (static)(MPa) Maximum V -SFM (no load)(m/s) Shaft Hardness - Minimum Shaft finish recommended Ra µin(µm) Shaft Material	-400/+550 (-240/+288)* 10,000 (0.35)* 1,000 (6.9)* 400 (2)* Rb25 8 - 16 (0.2-0.4)* Hard, mild and stainless steels
Engineering Information	
Friction - static & dynamic Water Absorption ASTM D570 Flammability ASTM D635 Chemical Resistance Thermal Conductivity BTU/hr/sq. ft./° F/in. (W/m•K)	0.15 - 0.30 0% Non-Flammable Inert 4.5 (0.65)*
Linear Coefficient of 78° to 500° F Thermal Expansion (26° to 260° C) x 10 -5 in/in °F (x 10 -5 m/m °C)	Diameter 6.2 (11.1)* Length 8.6 (15.4)*
Physical Data	
Elongation ASTM D4894 Tensile Strength ASTM D4894 (MPa) Deformation ASTM D621 Specific Gravity ASTM D792	70% 1800 psi (12.4)* 3% (1500 psi - 24 hr. RT) 2.10

A more complete data sheet is available upon request. *Metric data in parentheses

Products	Applications
 Automatically molded bearings & components 	• Pumps
 Sleeve, flanged and 	• Mixers
thrust bearings	 Compressors
• Piston rings	 Appliances
 Stamped and formed 	 Automotive
seals	• Fresh water
 Extruded shapes 	submerged
 Machined parts 	 Thrust bearings
 Molded shapes 	 Plating tanks
	• Wear bands
	• Ovens



Rulon® 123 is a glossy black non-abrasive compound for softer mating surfaces, such as stainless steel. This material has excellent chemical resistance and is FDA and USDA compliant. It is less expensive than Rulon® J, but is slightly less flexible and higher in wear.

It has a high resistance to deformation, low coefficient of friction and good thermal and electrostatic dissipation. This material has a maximum operating temperature of 550°F (288°C).

Rulon[®] 123 releases black wear debris over time and should not be used in ultra-dry, vacuum applications, or where electrical insulation is desired.

Typical Product and Application Description

Products	Applications
 Automatically molded bearings & components Sleeve, flanged and thrust bearings Piston rings Stamped and formed seals Extruded shapes Machined parts Molded shapes 	 Pumps Mixers Compressors Appliances Automotive lip seals Liners Linear slides Pipe supports Wear bands Dust seals Solenoid valves TPS shaft seals EGR valves

Design Criteria Rulon® 123

Temperature - Typical Range °F (°C) Maximum PV (continuous)(MPa·m/s) Maximum P - psi (static)(MPa) Maximum V -SFM (no load)(m/s) Shaft Hardness - Minimum Shaft finish recommended Ra µin(µm) Shaft Material	-400/+550 (-240/+288)* 10,000 (0.35)* 1,000 (6.9)* 400 (2)* Rb25 8 - 16 (0.2-0.4) Steel
Engineering Information	
Friction - static & dynamic Water Absorption ASTM D570 Flammability ASTM D635 Chemical Resistance Thermal Conductivity BTU/hr/sq. ft./° F/in. (W/m·K) Linear Coefficient of 78° to 200° F Thermal Expansion (26° to 93° C) x 10 -5 in/in °F (x 10 -5 m/m °C)	0.10 - 0.30 0% Non-Flammable Inert 4.6 (0.66)* Diameter 4.4 (7.9)* Length 7.0 (12.6)*
Physical Data	
Elongation ASTM D4894 Tensile Strength ASTM D4894 (MPa) Deformation ASTM D621 Specific Gravity ASTM D792	150% 2500 psi (17.2)* 2.5% (1500 psi - 24 hr. RT) 2.12

A more complete data sheet is available upon request. *Metric data in parentheses

Rulon[®] 488 is a dull turquoise material originally developed for use with painted surfaces. It has been used in veneer dryer bearings in the plywood industry.

Its excellent wear resistance, especially in extremely dry environments, make it a material of choice in hydrogen and natural gas compressors. Its almost universal chemical resistance enables it to withstand corrosives and acids sometimes present in trace amounts in these environments.

It has a higher load capacity than Rulon[®] J and better abrasion resistance than both Rulon[®] J and Rulon[®] 123.



Design Criteria Rulon® 488

Temperature - Typical Range °F (°C) Maximum PV (continuous)(MPa·m/s) Maximum P - psi (static)(MPa) Maximum V -SFM (no load)(m/s) Shaft Hardness - Minimum Shaft finish recommended Ra µin(µm) Shaft Material	-400/+550 (-240/+288) 10,000 (0.35)* 1,000 (6.9)* 400 (2)* Rb25 8 - 16 (0.2-0.4)* Hard, mild and stainless steels
Engineering Information	
Friction - static & dynamic Water Absorption ASTM D570 Flammability ASTM D635 Chemical Resistance Thermal Conductivity BTU/hr/sq. ft./° F/in. (W/m·K) Linear Coefficient of 78° to 300° F Thermal Expansior(26° to 149° C) x 10 -5 in/in °F (x 10 -5 m/m °C)	0.10 - 0.30 0% Non-Flammable Inert 2.6 (0.37)* Diameter 4.2 (7.5)* Length 5.7 (10.2)*
Physical Data	
Elongation ASTM D4894	175%
Tensile Strength ASTM D4894 (MPa)	2000 psi (13.8)*
Deformation ASTM D621	4% (1500 psi - 24 hr. RT)
Specific Gravity ASTM D792	2.25

A more complete data sheet is available upon request. *Metric data in parentheses

Products	Applications
 Automatically molded bearings & components Sleeve, flanged and thrust bearings Piston rings Stamped and formed seals Extruded shapes Machined parts Molded shapes 	 Pumps Mixers Compressors Appliances Automotive Insulators Linear slides Pipe support Wear bands



Rulon® 957 is a speckled green material that was developed specifically for noise dampening and abrasion resistance, such as in commercial or residential clothes dryers.

It provides low friction operation on softer mating surfaces at higher loads than Rulon[®] J.

This material also offers excellent performance on coated metals, particularly porcelain. Among its many benefits are an overall reduction of the weight of the finished product, vibration absorption, and cost reduction due to rapid manufacturing methods.

Typical Product and Application Description

Products	Applications
 Automatically molded bearings & components 	Clothes Dryers
 Sleeve, flanged and thrust bearings 	 Mixers Compressors
• Piston rings	\cdot Ovens and Dryers
 Stamped glides 	 Automotive
• Extruded shapes	 Insulators
 Machined parts 	 Linear slides
 Molded shapes 	• Sanders
	• Wear bands

Design Criteria Rulon® 957

Temperature - Typical Range °F (°C) Maximum PV (continuous)(MPa·m/s) Maximum P - psi (static)(MPa) Maximum V -SFM (no load)(m/s) Shaft Hardness - Minimum	-400/+550 (-240/+288)* 10,000 (0.35)* 1,000 (6.9)* 400 (2)* Rb25	
Shaft finish recommended Ra µin(µm) Shaft Material	8 - 16 (0.2-0.4) Hard, Mild and Stainless Steel and Porcelain	
Engineering Information	coated	
Friction - static & dynamic (Dynamic, 20 psi, 360 sfm)	0.13	
Water Absorption ASTM D570	0%	
Flammability ASTM D635 Chemical Resistance	Non-Flammable Data Available	
Physical Data		
Elongation ASTM D4894	200%	
Tensile Strength ASTM D4894 (MPa)	2200 psi (15.2)*	
Specific Gravity ASTM D792	1.96	

A more complete data sheet is available upon request. *Metric data in parentheses

RULON® XL

Rulon[®] XL is a tan colored material that is best for use against aluminum (including anodized) substrates. Rulon[®] XL exhibits very low wear as compared with other Rulon[®] grades.

Other advantages offered by this unique material are that it combines low deformation under load with exceptionally good chemical resistance.

It is compatible with a wide range of mating surfaces, but is not recommended for use with alkalis. Its non-abrasive character enhances the frictional performance to prevent galling of softer mating surfaces.

It is the best material for vacuum service.

Design Criteria Rulon® XL

Temperature - Typical Range °F (°C) Maximum PV (continuous)(MPa·m/s) Maximum P - psi (static)(MPa) Maximum V -SFM (no load)(m/s) Shaft Hardness - Minimum Shaft finish recommended Ra µin(µm) Shaft Material	-400/+550 (-240/+288) 10,000 (0.35)* 1,200 (8.3)* 400 (2)* Rb25 8 - 16 (0.2-0.4)* All Steels and aluminum
Engineering Information	
Friction - static & dynamic	0.10 - 0.25
Water Absorption ASTM D570	0%
Flammability ASTM D635	Non-Flammable
Chemical Resistance	Inert
Thermal Conductivity	
BTU/hr/sq. ft./° F/in. (W/m•K)	1.7 (0.24)*
Linear Coefficient of 78° to 400° F	Diameter 6.4 (11.5)*
Thermal Expansion (26° to 204°C)	Length 6.8 (12.2)*
x 10 -5 in/in °F (x 10 -5 m/m °C)	
Physical Data	
Elongation ASTM D4894	160%
Tensile Strength ASTM D4894 (MPa)	1700 psi (11.7)*
Deformation ASTM D621	1.4% (1500 psi - 24 hr. RT)
Specific Gravity ASTM D792	1.97

A more complete data sheet is available upon request. *Metric data in parentheses



Products	Applications
 Automatically molded bearings & components Sleeve, flanged and thrust bearings Piston rings Stamped and formed seals Extruded shapes Machined parts Molded shapes 	 Vacuum Pumps Mixers Compressors Appliances Automotive Insulators Linear slides Shaft support Wear bands

Rulon[®] 142 is a specially formulated dull bluegreen linear bearing material that exhibits low wear, high thermal dissipation, and good dimensional stability characteristics.

Among its many benefits are the virtual elimination of stick-slip, vibration dampening, self-lubrication, uniform friction, long life, ease of application and design diversity.

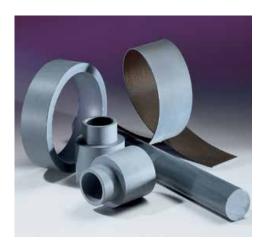
Rulon® 142 has excellent mechanical properties and is the ideal material for machine tool applications. Its low deformation characteristics limit the amount of misalignment that can occur with other bearing materials.

Strong acids and bases should be avoided, as they may attack the fillers.

Design Criteria Rulon® 142

Temperature - Typical Range °F (°C) Maximum PV (continuous)(MPa·m/s) Maximum (continuous bonded) Maximum P - psi (static)(MPa) Maximum V -SFM (no load)(m/s) Shaft Hardness - Minimum Shaft finish recommended Ra µin(µm) Shaft Material Engineering Information	-400/+550 (-240/+288) 10,000 (0.35)* 25,000 (0.88)* 1000 (6.9)* 400 (2) Rc35 8 - 16 (0.2-0.4)* Mild/Hardened Steel
Friction - static & dynamic Flammability ASTM D635 Chemical Resistance Thermal Conductivity BTU/hr/sq. ft./°F/in. (W/m·K) Linear Coefficient of 78° to 200°F Thermal Expansion (26° to 93°C) x 10 -5 in/in °F (x 10 -5 m/m °C)	0.025 with oil Non-Flammable Data Available 4.8 (0.69)* Length 4.9 (8.8)*
Physical Data Elongation ASTM D4894 Tensile Strength ASTM D4894 (MPa) Deformation ASTM D621 Specific Gravity ASTM D792	200% mold direction 3100 psi (21.4)* 3% (1500 psi - 24 hr. RT) 3.11

A more complete data sheet is available upon request. *Metric data in parentheses



Products	Applications
• Packings	• Lathes
 Sleeve, flanged and 	\cdot Gibs, guideways
thrust bearings	 Compressors
• Piston rings	 Appliances
Stamped parts	 Rotary tables
• Extruded parts	• Motor mounts
 Machined parts 	• Linear slides
 Molded shapes 	 Pipe supports
• Wear bands	
• Seal rings	 Hydraulic presses



Rulon® 945 is a black PTFE-based material that has very low wear and deformation under load, making it ideally suited for demanding thermal applications. In fact, its deformation is the lowest of all Rulon® grades. It also possesses excellent chemical resistance and good dimensional stability.

Rulon[®] 945 is best suited for use against hard mating surfaces, like hardened steel substrates since it does have moderate abrasive qualities. It is not suitable in applications where electrically insulating properties are required.

Typical Product and Application Description

Products	Applications
 Automatically molded bearings & components Sleeve, flanged and thrust bearings Piston rings Stamped and formed seals Extruded shapes Machined parts Molded shapes 	 Pumps Mixers Compressors Appliances Automotive Insulators Linear slides Pipe supports Wear bands

Design Criteria Rulon® 945

Temperature - Typical Range °F (°C) Maximum PV (continuous)(MPa·m/s) Maximum P - psi (static)(MPa) Maximum V -SFM (no load)(m/s) Shaft Hardness - Minimum Shaft finish recommended Ra µin(µm) Shaft Material Engineering Information	-400/+550 (-240/+288) 10,000 (0.35)* 1,200 (8.3)* 400 (2)* Rc35 8 - 16 (0.2-0.4)* Steel
Friction - static & dynamic Flammability ASTM D635 Chemical Resistance Linear Coefficient of 78° to 400° F Thermal Expansion (26° to 204° C) x 10 -5 in/in °F (x 10 -5 m/m °C)	0.20 - 0.35 Non-Flammable Data Available Diameter 2.8 (5.0)* Length 7.1 (12.7)*
Physical Data Elongation ASTM D4894 Tensile Strength ASTM D4894 (MPa) Deformation Astm D621 Specific Gravity ASTM D792	20% 3000 psi (20.7)* 0.7% (1500 psi - 24 hr. RT) 1.4% (2000 psi - 24 hr .RT) 1.90

A more complete data sheet is available upon request. *Metric data in parentheses

Rulon® 1045 is a dull gold material that has an excellent ability to elongate in a flip seal application. Coupled with excellent frictional characteristics, it offers the added benefit of energy savings, as well as increased sealing efficiency.

This material is also resistant to many harsh chemicals found in the application environments where it is typically used. It is also compatible with most commercially available lubricants for additional reduction in friction.

Its low deformation properties allow it to be effective as a bearing or sliding surface.



Design Criteria Rulon® 1045

A more complete data sheet is available upon request. *Metric data in parentheses

Products	Applications
 Automatically molded bearings & components Sleeve, flanged and thrust bearings Piston rings & flip seals Stamped and formed seals Extruded shapes Machined parts 	 AC compressors Transmissions Air compressors Appliances Automotive Linear slides Fluid transfer systems
• Molded shapes	• Vacuum Pumps • Valves



Rulon® 1337 is a tan material made entirely from FDA and USDA compliant components. It has excellent physical properties and is chemically compatible with most chemicals, except concentrated sulfuric acid. This offers much flexibility in wash-down environments of food and pharmaceutical processing environments.

It has a slightly lower coefficient of friction than Rulon[®] J, offering extended life and less abrasion with softer mating surfaces.

It is compatible with most commercially available natural lubricants for additional reduction in friction.

Typical Product and Application Description

Products	Applications
 Automatically molded bearings & components Sleeve, flanged and thrust bearings Piston rings Stamped and formed seals Extruded shapes Machined parts Molded shapes 	 Pumps Mixers Compressors Appliances Chute liners Insulators Linear slides Shaft bearings Wear bands Seals

Design Criteria Rulon® 1337

Temperature - Typical Range °F (°C)	-400/+550 (-240/+288)
Maximum PV (continuous)(MPa·m/s)	10,000 (0.35)*
Maximum P - psi (static)(MPa)	1,000 (6.9)*
Maximum V -SFM (no load)(m/s)	400 (2)*
Shaft Hardness - Minimum	Rb25
Shaft finish recommended Ra	8 - 16 (0.2 - 0.4)*
µin(µm) Shaft Material	Stainless to Hardened
	Steel
Engineering Information	
Friction - static & dynamic	0.10 - 0.20
Flammability ASTM D635	Non-Flammable
Chemical Resistance	Data Available
Linear Coefficient of 78° to 400° F	Diameter 6.1 (10.9)*
Thermal Expansion (26° to 204°C)	Length 7.4 (13.3)*
x 10 -5 in/in °F (x 10 -5 m/m °C)	
Physical Data	
	175%
Elongation ASTM D4894	
Tensile Strength ASTM D4894 (MPa)	2500 psi (172)*
Deformation ASTM D621	3.38% (1500 psi - 24 hr. RT) 1.95
Specific Gravity ASTM D792	

A more complete data sheet is available upon request. *Metric data in parentheses.

Rulon® 1410 is a gold material with excellent elongation and tensile strength suitable for flip seal and other flexible sealing applications. Coupled with low frictional characteristics, it offers the added benefit of energy savings and/or increased sealing efficiency.

This material is also resistant to most harsh chemicals. It is also compatible with many commercially available lubricants for additional reduction in torque.

It can also be used as a liner material for substrates requiring any of the above characteristics.



Design Criteria Rulon® 1410

-400/+550 (-240/+288)
7,500 (0.26)*
750 (5.2)*
400 (2)*
Rb25
8 - 16 (0.2-0.4)*
Stainless to Hardened
Steel & cast iron
0.10 - 0.20
Non-Flammable
Data Available
Length 8.6 (15.4)*
210%
2150 psi (14.8)*

A more complete data sheet is available upon request. *Metric data in parentheses

Products	Applications
 Automatically molded bearings & components Sleeve, flanged and 	 AC compressors Transmissions
thrust bearings Piston rings & flip seals 	 Air compressors Appliances
 Stamped and formed 	• Automotive
seals • Extruded shapes	 Linear slides Fluid transfer systems
Machined parts	• Vacuum pumps
 Molded shapes 	• Valves



Rulon® 1439 is a white FDA and USDA compliant material that is suitable for immersed service with better wear characteristics than most other PTFE compounds. Its color makes it aesthetically pleasing for food and pharmaceutical applications.

This material is also resistant to many harsh chemicals found in the application environments where it is typically used. It is compatible with most commercially available lubricants for additional reduction in friction.

Its properties allow it to be effectively utilized as a bearing or sliding surface.

Typical Product and Application Description

Products	Applications
 Automatically molded bearings & components Sleeve, flanged and thrust bearings Piston rings Stamped and formed seals Extruded shapes Machined parts Molded shapes 	 Transmissions Air Compressors Appliances Pillow Blocks Linear slides Fluid transfer systems Vacuum Pumps Valves Food Processing Equipment

Design Criteria Rulon® 1439

Temperature - Typical Range °F (°C) Maximum PV (continuous)(MPa•m/s) Maximum P - psi (static)(MPa) Maximum V -SFM (no load)(m/s) Shaft Hardness - Minimum Shaft finish recommended Ra µin(µm) Shaft Material	-400/+550 (-240/+288) 10,000 (0.35)* 1,000 (6.9)* 400 (2)* Rb25 8 - 16 (0.2-0.4)* Stainless to Hardened Steel
Engineering Information	
Friction - static & dynamic Flammability ASTM D635 Chemical Resistance Linear Coefficient of 78° to 400° F Thermal Expansion (26° to 204° C) x 10 -5 in/in °F (x 10 -5 m/m °C)	0.15 - 0.25 Non-Flammable Data Available Diameter 4.8 (8.6)* Length 5.7 (10.2)*
Physical Data	
Elongation ASTM D4894 Tensile Strength ASTM D4894 (MPa) Deformation ASTM 621 Specific Gravity ASTM D792	190% 1800 psi (12.4)* 2% (1500 psi - 24 hr. RT) 2.60

A more complete data sheet is available upon request. *Metric data in parentheses

RULON® SOLUTIONS



Typical Product and Application Description

Bearings	Applications
• Wide range of materials	• Mixers
 Various mating surfaces 	• Pumps
 Food and pharmaceutical 	· Compressors
Chemical resistance	• Ovens, Toasters
• Standard sizes available	

Piston Cups & Flip Seals	Applications
• Wide range of materials	• Fuel metering pumps
 Various mating surfaces 	• AC compressors
 Long life materials 	 Oxygen compressors
· Chemical resistance	 Automotive transmissions
• Economical alternative	 Pneumatic tools



RULON® PRODUCTS



Typical Product and Application Description

Formed Seals	Applications
• Low friction	• TPS shaft seals
 Various surface compatability Long life materials Chemical resistance Consistent hysteresis 	Emmissions controls
	• Dust Seals
	• Automotive
	 Medical pumps
	 Refrigeration valves

Piston/Seal Rings	Applications
 Molded or machined 	• Pumps
\cdot Solid or custom joints	 Transmissions
 Long life materials 	• Face seals
 Chemical resistance 	• Automotive
• Low friction	• Medical pumps
	 Solenoid valves
	• Air Compressors



RULON® PRODUCTS



Typical Product and Application Description

Wear Components	Applications
• Low friction	• Mixers
 Painted and plastic surfaces 	• Pumps
 Long life materials 	• Compressors
 Chemical resistance 	• Ovens, toasters
 High volume-manufacturing 	

Notes



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Omniseal Solutions[™] Application Inquiry Data Form

Customer Information						
Company	<i>y</i> :					
Street	t:					
City, St, Zip	D:					
Engineering Contact	t:			Fax Number:		
Telephone Number	r:					
Purchasing Contact	t:			Fax Number:		
Telephone Number	r:	-				
Action Required		Date Need	ed	Quotation Gener	ralities	
Material Recomm	mendation			Quote Production		
Provide Tech Data c	on Material			Quantities of:		
Part Design Recomm	mendation			Send Quote to:		
Produce	orototypes			Quote Due Date:		
Production Inform	mation (Attach D	rawing or Ske	etch if	Available)		
Design:	New	Existing	Beari	ing* Size (Units):	🗌 In.	mm.
			*For r	non bearing applicatio	on, attach drawing	
If Existing:						
Type/Brand:			ID	2:	OD:	
Material:			Length		Flange OD:	
Part/Drawing #:		Flange Thickness:				
Describe End Uses:		Other Dimensions:				
Desired Characterist	tics:					
Other Comments:						

Omniseal[™] Solutions

help@omniseal-solutions.com



Omniseal SolutionsTM Application Inquiry Data Form

Part Inst	allation			
Pres	ss Fit on OD:			
Shri	nk Fit on ID:			
Mecha	nical Means:			
	Slip Fit:			
	Bonding:			
	Other (list):			
Shaft Spe	ecifications		Housing Spec	ifications
Diameter ((& Tolerance):		Diameter (& Tole	erance):
N	Naterial Type:		Materia	al Type:
Su	urface Finish:		Length (& Tole	erance):
	Hardness:			
Temperat	ture		Load	
Typical:	°F 🗌	°C 🗌	Radial] Thrust 🗌
			Units: lb] psi 🗌 N/mm² 🗌 Other: 🗌
Maximum:	°F 🗌	°C 🗌	Cantilevered	Impact 🗌
Duration:	Min.	Hrs. 🗌	Typical:	
			Maximum:	
Minimum:	°F 🗌	°C 🗌	Duration:	
Duration:	Min.	Hrs.	Minimum:	
			Duration:	
Velocity				Environment
	Units:	rpm 🗌 ft	/min 🗌 m/sec 🗌	Dry Water Lubricated
Linear/Stro	oke Length:			Clean Dirt Vacuum
Number of S	Strokes/Min:			Chemicals: Specify
	Rotary:			
Degree of	Oscillation:			Gases: Specify
Number of	Cycles/Min:			
	Other:			Oil: (Type)
Runni	ing Surface:		OD 🗌 🛛 Face 🗌	
Service Life Production		on Validation	Product Testing	
Current:		Bench:		Test Start Date:
Desired:		Field:		Test Duration:
		Both:		

Omniseal[™] Solutions

help@omniseal-solutions.com omniseal-solutions.com



Other Omniseal Solutions[™] Lines



Omniseal® critical parts are engineered for sealing control. The springenergized polymer seals are designed for high static pressures and the metal-cased polymer lip seals are designed for high rotational speeds.



Meldin® critical parts are engineered for tolerance control. The thermoplastic components are injection molded and the polyimide materials have no melting point and can handle extreme temperatures.



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