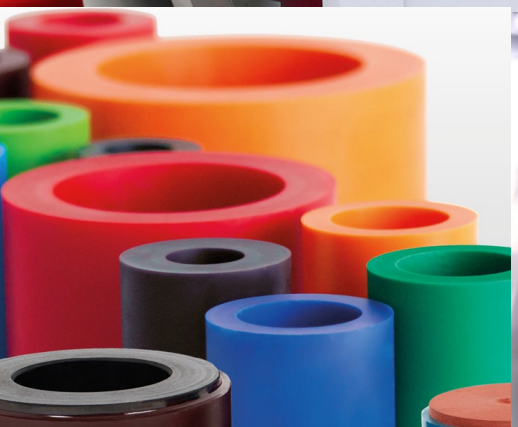
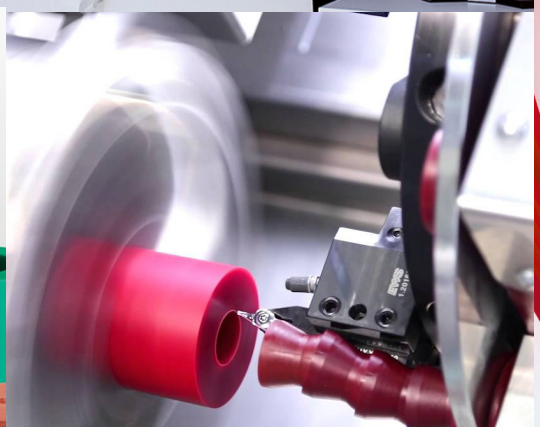
KLINGER Salinas

MACHINED SEALING

Catalogue





www.productos-salinas.com

SEMI-FINISHED PRODUCTS

POLYURETHANES

SPECIFICATION

The development, production and sale of high-quality semi-finished raw materials is one of KLINGER Besma's core business areas. Our state-of-the-art production systems enable us to cover the entire spectrum of materials required in sealing technology.

Our quality control systems ensure that each individual dolla is checked several times before it leaves our production, an important factor in guaranteeing our customers quality and competitive prices. In addition to a wide range of standard dimensions, we also offer non-standard sizes at very short delivery times, in all materials and also in FDA qualities.

Polyurethane in general has become a substantial and indispensable product in modern sealing technology. Today, it is a dominant material in the piston rod and piston rod sectors. KLINGER Salinas polyurethanes are particularly characterised by the high quality of their raw materials, and seals made from KLINGER Salinas materials exceed the service life of many other seals and manufacturers on the market.

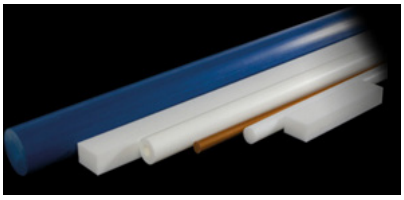
The reason for this lies in two reasons, firstly the careful selection of raw materials and secondly the 'direct' production technology. In contrast to materials manufactured in the thermoplastic process, KLINGER Salinas polyurethanes are manufactured in the casting process, which allows the material during polymerisation to develop its physical properties to a maximum.

This method excludes the negative influence of high temperatures and the associated moulding. In addition to standard materials, KLINGER Salinas logically manufactures special materials such as friction-optimised materials for applications in the food industry.

A further special feature of KLINGER Salinas polyurethanes is that all polyurethanes up to a hardness of 94 Shore are manufactured with a clamping ring. This fact facilitates machining with CNC lathes and makes them independent of a particular clamping system.

With the KLINGER Salinas Polyurethanes series you have a diversified product range, which is also available in various optimised versions, and in addition in the standard version SALPUR. Whether it is a high temperature application up to 135 °C, low temperature down to -50 °C, with reduced friction, higher hardness, lower hardness, high chemical resistance or use in contact with foodstuffs, U5XX covers all areas.

The polyurethanes offered by KLINGER Salinas are hydrolysis resistant (H-PU). More information can be found in our material data sheets.



ELASTÓMERS

Elastomers or rubber materials represent a significant supplement to the production of seals. Although they have been superseded by modern polyurethanes in many areas of application, elastomers with their extremely high thermal and chemical resistance spectra cannot be excluded from sealing technology. KLINGER Salinas manufactures without exception compounds from the most renowned international suppliers.

This fact and the most modern manufacturing technologies guarantee the customer high quality raw materials with an excellent price-performance ratio. All KLINGER Salinas elastomers are coated with synthetic material for the protection of the raw material and easy and excellent machining on CNC lathes.

NBR | EPDM | FPM | TFE/P | SILICONE

PLASTICS

Duroplastics and fluorinated thermoplastics are used for guide and support rings as well as for special seals and preloads. These materials complete KLINGER's range of semi-finished products. Salinas applies the most stringent quality controls to its suppliers in order to guarantee the high quality required by its customers. Excellent supplier relations, a wide range of products and excellent warehouse management guarantee customers short delivery times. The variety of dimensions, compounds and a large stock cover all requirements for customer satisfaction in all sealing applications.

POM | PA | PTFE | PEEK | DIVERSE COMPOUNDS

SPECIAL MATERIALS

These materials are high quality products, produced exclusively with the extrusion process for plastomers. Wide range of thermoplastic materials: sheets, rods and tubes available in all standard dimensions. Different grades available in all sizes, intermediate sizes and in defined tolerances.

CHEMICAL RESISTANCE

	TYPICAL PRODUCTS	SALPUR 92	PU - D60	NBR N107	HNBR HN112
Material group	Air up to 100° C	R	R	R	R
	Water up to 90°	R	R	R	R
	Sea Water	R	R	R	R
	Steam up to 140°C	U	U	U	S
	Mineral oil and greases	R	R	R	R
	ASTM 1 aliphatic motor- and gear oils	R	R	R	R
	ASTM 3 aromatic mineral oils	S	R	R	R
	Aliphatic hydro-carbons (Propane, Butane, natural gas, etc.)	R	R	R	R
	Aromatic hydro-carbons (Benzol, Toluol, xylol, etc.)	U	U	U	U
	Chlorinated hydro-carbons (Chloroform, Trichlorethylen, etc.)	U	U	U	U
	Fuel (Benzine, Diesel, Kerosine)	S	R	R	R
	Hydraulic oils with mineral oil basis	R	R	R	R
	Hydraulik fluids of group HFA	R	R	R	R
	Hydraulik fluids of group HFC (Glycol-water)	U	U	R	R
	Hydraulik fluids of group HFD (Ester of phosphoric acid)	U	U	U	U
	Breaking fluids based on Glycol	U	U	U	U
	Silicone oils and greases	R	R	R	R
	Animal and vegetarian oils and greases	R	R	R	R
	Alcohol	U	U	S	S
	Polar solvents (Acetone, MEK, Ethyl-Acetate, Di-Ethyl-Ether,etc.)	U	U	U	U
	Diluted acids and leaches	R	R	S	S
	Concentrated acids and leaches	U	U	U	U
	Saline solution	R	R	R	R

The chemical resistance table given here is a general description of the media, fluids and materials as well as their suitability for each application. It should be noted that the operating conditions described, such as temperature, may affect the suitability of the individual materials in the media.

EPDM E131	FPM F109	TFE/P AF101	SILICONA S102	POM P101	PA A112	PTFE T101	PEEK PK100
R	R	R	R	R	R	R	R
R	R	R	R	R	S	R	R
R	R	R	R	R	S	R	R
R	U	R	S	U	U	R	R
U	R	R	S	R	R	R	R
U	R	R	R	R	R	R	R
U	R	R	U	R	R	R	R
U	R	R	U	R	R	R	R
U	R	R	U	R	R	R	R
U	R	R	U	U	U	R	R
U	R	R	U	R	R	R	R
U	R	R	S	R	R	R	R
U	R	R	S	R	S	R	R
R	R	R	S	R	S	R	R
S	R	R	S	R	R	R	R
R	R	R	R	U	U	R	R
R	R	R	U	R	R	R	R
U	R	R	R	R	R	R	R
R	S	R	R	R	R	R	R
R	U	U	U	R	R	R	R
R	R	R	S	S	S	R	R
R	R	R	U	U	U	R	R
R	R	R	R	R	S	R	R

R = Resistant (Resistente) | S = Suitable (Aplicable) | U = Unsuitable (No resistente)

PHYSICAL PROPERTIES

	Sealing materials Semi-finished products	Color	Density	Hardness	Hardness	100% modulus	300% modulus	Tear strength
POLYURETHANES	Standard		DIN ISO 1183-1	DIN ISO 7619-1	DIN ISO 7619-1	DIN 53504	DIN 53504	DIN 53504 / ASTM D4894
	Unidad		g/cm3	Shore A	Shore D	N/mm2	N/mm2	N/mm2
	SALPUR 92		1,10 ±0,03	92 ±3	-	9,8	18,2	43
	PU-D60		1,16 ±0,03	-	60 ±3	17,9	43,1	48
	PU U500-R95		1,16 ±0,03	95 ±2	-	≥ 10	≥ 30	≥ 50
	PU U505-P79		1,15 ±0,03	79 ±3	-	≥ 5,5	≥ 25	≥ 30
	PU U510-G88		1,17 ±0,03	90 ±2	-	≥ 8	≥ 30	≥ 45
	PU U520-OR95-HT		1,16 ±0,03	96 ±2	-	≥ 10	≥ 25	≥ 45
	PU U530-B95-LT		1,11 ±0,03	95 ±2	-	≥ 7	≥ 15	≥ 40
	PU U535-B95		1,17 ±0,03	95 ±2	-	≥ 10	≥ 30	≥ 50
	PU U540-VI95-CR		1,16 ±0,03	95 ±2	-	≥ 10	≥ 30	≥ 45
	PU U550-GM95		1,16 ±0,03	95 ±2	-	≥ 10	≥ 30	≥ 45
	PU U570-D57		1,17 ±0,03	-	57 ±3	≥ 12	≥ 25	≥ 40
	PU U580-D57 G		1,17 ±0,03	-	57 ±3	≥ 13	≥ 25	≥ 45
	PU U203-G95		1,10 ±0,03	95 ±2	-	≥ 10	≥ 15	≥ 40
ELASTOMERS	NBR N107-B85		3,31 ±0,03	85 ±5	-	12,7 *	-	15,6 *
	NBR 95 N109-B95		3,31 ±0,03	95 ±3	-	-	-	21,2 *
	NBR-FDA N111-W85		1,38 ±0,03	85 ±5	-	5,8 *	-	10,6 *
	H-NBR HN112-B85		1,23 ±0,03	83 ±5	-	9,5 *	-	19,3 *
	HNBR HN900-B85-RGD		1,30 ±0,03	86 ±5	-	7,5 *	-	19,9 *
	HNBR HN901-B85-RGD-LT		1,39 ±0,03	83 ±5	-	3,4 *	-	7,8 *
	EPDM E131-B85		1,21 ±0,03	85 ±5	-	9,3 *	-	12,7 *
	EDPM FDA E132-W85		1,39 ±0,03	85 ±5	-	3,0 *	-	5,8 *
	EDPM KTW W270 E134-B85		1,27 ±0,03	85 ±5	-	-	-	16,1 *
	TFE/P AF101-B85		1,76 ±0,03	86 ±5	-	10,6 *	-	12,1 *
	FPM F109-BR85		2,41 ±0,03	84 ±5	-	6,7 *	-	9,4 *
	FPM F110-BR85		2,45 ±0,03	85 ±5	-	6,3 *	-	8,5 *
	FPM F111-B85		1,86 ±0,03	85 ±5	-	7,5 *	-	11,6 *
	FPM RGD F800-B85-RGD		2,0 ±0,03	86 ±3	-	8,5 *	-	12,5 *
	Silicone FDA S102-R85		1,525 ±0,03	85 ±5	-	6,8 *	-	7,7 *
	Silicone FDA S103-B85		1,54 ±0,03	85 ±5	-	6,1 *	-	7,5 *

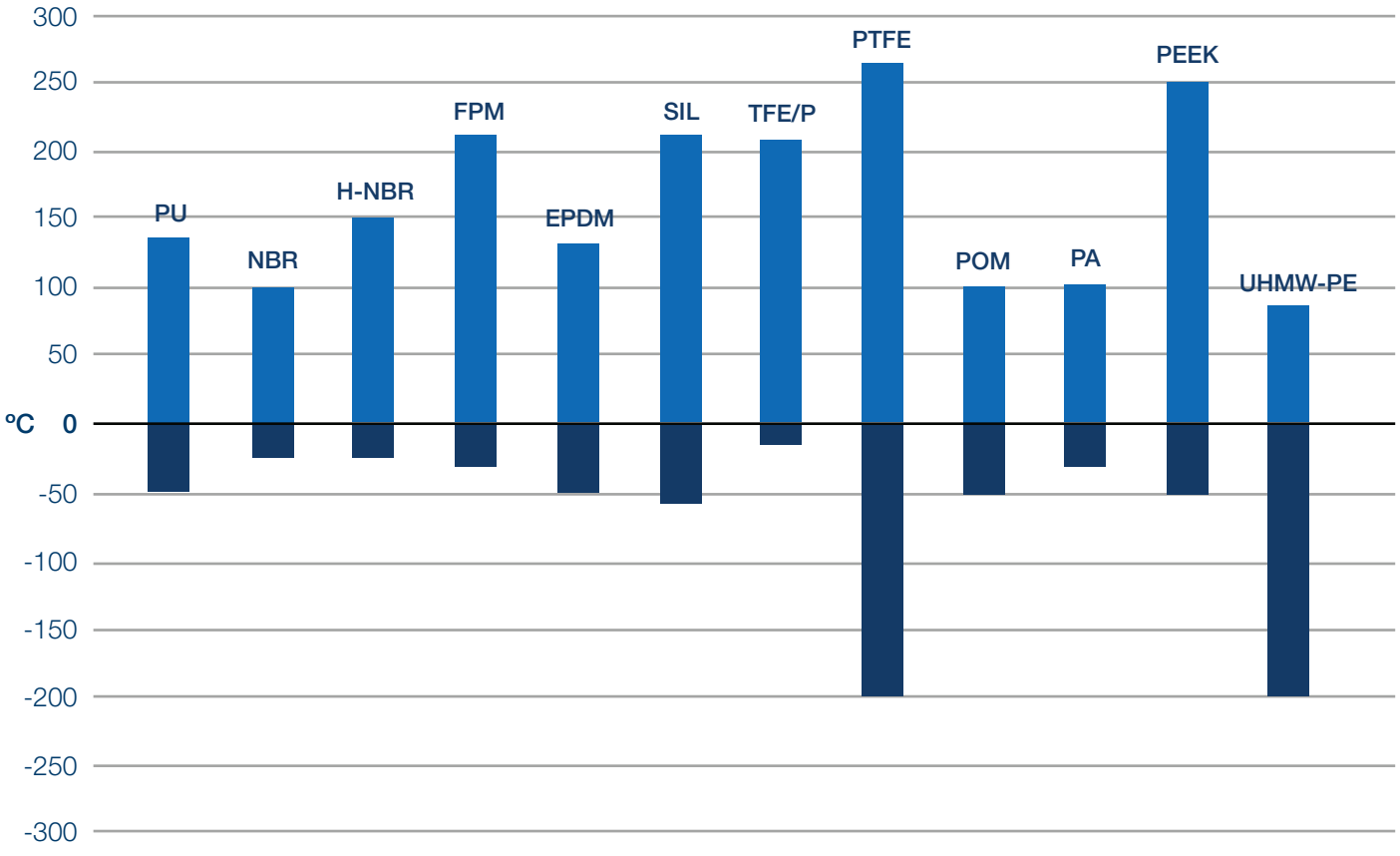
Elongation at break	Tear growth resistance	Compression set 22h/70°C	Compression set 22h/100°C	Compression set 22h/150°C	Compression set 22h/175°C	friction (dyn.)	Humidity absorption	Minimum service temperature	Maximum service temperature
DIN 53504 / ASTM D4894	DIN ISO 34-1	DIN ISO 815-1	DIN ISO 815-1	DIN ISO 815-1	DIN ISO 815-1	ASTM D1894	23°C/50% rel. M		
%	kN/m	%	%	%	%	µ	%	°C	°C
≥ 350	≥ 100	≤ 25	≤ 35	-	-	-	-	-30	125
≥ 310	-	≥ 30	≤ 35	-	-	-	-	-25	100
≥ 300	≥ 90	≤ 25	≤ 45	-	-	-	-	-30	115
≥ 350	≥ 110	≤ 25	≤ 30	-	-	-	-	-30	135
≥ 450	≥ 100	≤ 20	≤ 30	-	-	-	-	-50	105
≥ 350	≥ 100	≤ 25	≤ 35	-	-	-	-	-30	125
≥ 300	≥ 120	≤ 25	≤ 40	-	-	-	-	-30	115
≥ 320	≥ 110	≤ 25	≤ 35	-	-	-	-	-30	125
≥ 330	≥ 130	≤ 25	≤ 35	-	-	-	-	-30	125
≥ 310	≥ 120	≤ 25	≤ 30	-	-	-	-	-30	125
≥ 400	≥ 100	≤ 20	≤ 30	-	-	-	-	-30	105
169,0 *	19,9 *	6,2 *	12,5 *	-	-	-	-	-25	100
56,8 *	16,2 *	13,5 *	14,2 *	-	-	-	-	-25	100
285,1 *	7,2 *	11,0 *	14,3 *	-	-	-	-	-22	100
241,5 *	19,6 *	15 *	13,5 *	-	-	-	-	-25	150
236,7 *	16,6 *	13,7 *	11,5 *	≤ 27	-	-	-	-20	150
273,2 *	10,4 *	10,6 *	11,9 *	≤ 24	-	-	-	-40	150
120,3 *	34,4 *	10,8 *	9,2 *	-	-	-	-	-50	130
454,5 *	28,8 *	19,8 *	31,1 *	-	-	-	-	-50	100
145,0 *	6,9 *	7,0 *	12,0 *	-	-	-	-	-45	100
140,0 *	19,4 *	21,7 *	21,0 *	-	36,8 *	-	-	-15	210
168,0 *	16,8 *	7,3 *	7,1 *	-	12,6 *	-	-	-20	210
208,1 *	16,0 *	7,6 *	7,3 *	-	12,3 *	-	-	-25	210
211,6 *	20,4 *	4,0 *	10,5 *	-	16,5 *	-	-	-25	210
240,0 *	28,2 *	≤ 12	≤ 12	-	19,9 *	-	-	-30	210
130,0 *	24,2 *	4,0 *	4,1 *	-	9,8 *	-	-	-55	210
177,3 *	24,8 *	3,6 *	4,8 *	-	10,8 *	-	-	-55	180

*The stated values are subject to a tolerance of ±25%

PHYSICAL PROPERTIES

	Sealing materials Semi-finished products	Color	Density	Hardness	Hardness	100% modulus	300% modulus	Tear strength
PLASTICS	Standard		DIN ISO 1183-1	DIN ISO 7619-1	DIN ISO 7619-1	DIN 53504	DIN 53504	DIN 53504 / ASTM D4894
	Units		g/cm3	Shore A	Shore D	N/mm2	N/mm2	N/mm2
	POM FDA P101-WE		1,41	-	-	-	-	68-70
	PA FDA A112-WC		1,15	-	-	-	-	80-85
	PTFE FDA T101-W		2,13 – 2,19	-	≥ 51	-	-	≥ 20
	PTFE-F T105-G		2,20 – 2,30	-	≥ 55	-	-	≥ 17
	PTFE-BR40 T110-BR40		3,00 - 3,15	-	≥ 60	-	-	≥ 15
	PTFE-C25 T125-C25		2,05 - 2,12	-	≥ 62	-	-	≥ 13
	PEEK PK100-CN		1,31	-	-	-	-	115
	UHMW-PE PE1000-HD		0,93	-	60 - 65	-	-	40

TEMPERATURE RANGE



Elongation at break	Tear growth resistance	Compression set 22h/70°C	Compression set 22h/100°C	Compression set 22h/150°C	Compression set 22h/175°C	Coefficient of friction (dyn.)	Humidity absorption	Minimum service temperature	Maximum service temperature
DIN 53504 / ASTM D4894	DIN ISO 34-1	DIN ISO 815-1	DIN ISO 815-1	DIN ISO 815-1	DIN ISO 815-1	ASTM D1894	23°C/50% rel. M		
%	kN/m	%	%	%	%	µ	%	°C	°C
35	-	-	-	-	-	<0,4	0,2	-50	100
25	-	-	-	-	-	<0,4	2,2	-30	100
≥ 200	-	-	-	-	-	0,06 - 0,08	-	-200	260
≥ 200	-	-	-	-	-	0,08 - 0,18	-	-200	260
≥ 180	-	-	-	-	-	0,14 - 0,25	-	-200	260
≥ 60	-	-	-	-	-	0,12 - 0,25	-	-200	260
17	-	-	-	-	-	≤ 0,5	0,2	-50	250
17	-	-	-	-	-	≤ 0,025	0,01	-200	80

When applying sealing materials in practice, apart from the mechanical and chemical properties the temperature resistance is of highest importance. Constant exposure of a material to varying temperatures may cause deviations of dimensions and / or of mechanical and chemical properties. The material might be damaged or the minimum and maximum application temperatures might be significantly changed and service life reduced. Thus, the indicated values should be regarded as reference values.

TABLE OF MATERIALS

	Description	Color	Application. temp	Hardn. at 20°C	Main application
POLYURETHANES * all Polyurethane grades resistant to hydrolysis	SALPUR92		-30 to +110°C	Shore A 92	Outstanding chemical stability and physical properties. Resistance to torsion, low compression set and high elongation. Manufacture of collars, wipers, gaskets and a multitude of designs to solve any hydraulic and pneumatic problem.
	PU-D60		-30 to +125°C	Shore D 60	Support rings and guide rings, preload elements. Mineral oils, fluids HFA and HFB, water, sea water. High resistance against pressure and extrusion. Excellent friction properties and wear resistance.
	PU U500-R95 red		-30 to +125°C	Shore A 95 +/-2	Lip seals, wiper rings, vee packings and other seal elements | Mineral oils, HFA, HFB fluids, water, sea water, dilute acids and alkaline solutions improved chemical and thermal resistance excellent wear and friction properties.
	PU U505-P79 petrol		-25 to +100°C	Shore A 79 +/-3	U-cup seals and wipers in pneumatic applications, as a preload element replacing NBR espe cially in large diameter range | Hydraulic fluids, oil in water emulsions, water power applications and other applications that require high abrasion resistance and elasticity at the same time.
	PU U510-G88 light green		-30 to +115°C	Shore A 90 +/-2	Lip seals, wiper rings, vee packings and other seal elements | Mineral oils, HFA, HFB fluids, water, sea water, dilute acids and alkaline solutions | Application for pneumatic and low pressure
	PU U520-OR95-HT orange		-30 to +135°C	Shore A 96 +/-2	Lip seals, wiper rings, vee packings and other seal elements | Mineral oils, HFA, HFB fluids, water, sea water, dilute acids and alkaline solutions | Applications at high temperature
	PU U530-B95-LT light blue		-50 to +105°C	Shore A 95 +/-2	Lip seals, wiper rings, vee packings and other seal elements | Mineral oils, HFA, HFB fluids, water, sea water | Applications at low temperature
	PU U535-B95 blue		30 to +125°C	Shore A 95 +/-2	Static and dynamic applications, primarily used for U-cut seals, wipers and chevron packings | particularly suitable for food contact applications | hydraulic liquids, oil-in-water emulsions, water power and mining applications, as well as presses
	PU U540-VI95-CR violet		-30 to +115°C	Shore A 95 +/-2	Lip seals, wiper rings, vee packings and other seal elements | Mineral oils, HFA, HFB fluids, water, sea water | Improved chemical resistance, suitable for CIP processes | Applicable for contact with foodstuff
	PU U550-GM95 dark red		-30 to +125°C	Shore A 95 +/-2	Lip seals, wiper rings, vee packings and other seal elements | Mineral oils, HFA, HFB fluids, water, sea water | Improved wear and friction properties for waterhydraulics and heavy duty applications with low lubrication.
	PU U570-D57 blue		-30 to +125°C	Shore D 57 +/-3	Lip seals, wiper rings, vee packings and other seal elements | Mineral oils, HFA, HFB fluids, water, sea water | High pressure and extrusion resistance
	PU U580-D57G grey		-30 to +125°C	Shore D 57 +/-3	Back-up rings or composite seals with preload element | Mineral oils, HFA, HFB fluids, water, sea water | High pressure and extrusion resistance | Improved wear and friction properties
	PU U203-G95 green		-30 to +105°C	Shore A 95 +/-2	Lip seals, wiper rings, vee packings and other seal elements Mineral oils, HFA, HFB fluids, water, sea water
NBR	NBR N107-B85 black		-25 to +100°C	Shore A 85 +/-5	Lip seals, wiper rings, vee packings and other seal elements Mineral oils, HFA, HFB, HFC fluids, cold water
	NBR 95 N109-B95 black		-25 to +100°C	Shore A 95 +/-3	Lip seals, wiper rings, vee packings and other seal elements Mineral oils, HFA, HFB, HFC fluids, cold water
	NBR FDA N111-W85 white		-22 to +100°C	Shore A 85 +/-5	Lip seals, wiper rings, vee packings and other seal elements | Mineral oils, HFA, HFB, HFC fluids, cold water | Applicable for contact with foodstuf
H-NBR	H-NBR HN112-B85 black		-25 to +150°C	Shore A 83 +/-5	Lip seals, wiper rings, vee packings and other seal elements | Mineral oils, HFA, HFB, HFC fluids at high temperature | Aliphatic hydrocarbons, dilute acids and bases
	H-NBR RGD HN900-B85-RGD black		-20 to +150°C	Shore A 86 +/-5	Lip seals, wiper rings, vee packings and other seal elements | Mineral oils, HFA, HFB, HFC fluids at high temperature | Aliphatic hydrocarbons, dilute acids and bases | RGD (ED) optimized for use in Oil & Gas Industry
	H-NBR RGD LT HN901-B85-RGD black		-40 to +150°C	Shore A 83 +/-5	Lip seals, wiper rings, vee packings and other seal elements | Mineral oils, HFA, HFB, HFC fluids at high temperature | Aliphatic hydrocarbons, dilute acids and bases | RGD (ED) optimized for low temperature use in Oil & Gas Industry | Meets the NORSOK M-710 requirements
FPM	FPM F109-BR85 brown		-20 to +210°C	Shore A 84 +/-5	Lip seals, wiper rings, vee packings, oil seals at high speed and other seal elements | Mineral oils, HFD fluids at high temperature | Very good chemical resistance such as phosphates and chlorinated hydrocarbons, crude and sour gas

	Description	Color	Application. temp.	Hardn. at 20° C	Main application
FPM	FPM FDA F110-BR85 brown		-25 to +210°C	Shore A 85 +/-5	Mineral oils, HFD fluids at high temperature | Very good chemical resistance such as phosphates and chlorinated hydrocarbons, crude and sour gas | Applicable for contact with foodstuff
	FPM F111-B85 black		-25 to +210°C	Shore A 85 +/-5	Lip seals, wiper rings, vee packings, oil seals at high speed and other seal elements | Mineral oils, HFD fluids at high temperature | Very good chemical resistance such as phosphates and chlorinated hydrocarbons, crude and sour gas
	FPM-RGD F800-B85 RGD black		-30 to +210°C	Shore A 86 +/-3	Lip seals, wiper rings, vee packings and other seal elements | Mineral oils, HFD fluids at high temperature | Very good chemical resistance such as phosphates and chlorinated hydrocarbons, crude and sour gas | RGD (ED) optimized for use in Oil & Gas Industry | Meets the NORSOK M-710 requirements
EPDM	EPDM E131-B85 black		-50 to +130°C	Shore A 85 +/-5	Lip seals, vee packings and other seal elements | Hot water and steam, ozone, dilute acids and alkaline solutions | EPDM is NOT resistant against mineral oils.
	EPDM FDA E132-W85 white		-50 to +100°C	Shore A 85 +/-5	Lip seals, vee packings and other seal elements | Hot water and steam, ozone, dilute acids and alkaline solutions | EPDM is NOT resistant against mineral oil | Applicable for contact with foodstuff
	EPDM KTW W270 E134-B85 black		-45 to +120°C	Shore A 85 +/-5	Lip seals, vee packings and other seal elements | Hot water and steam, dilute acids and alkaline solutions | EPDM is NOT resistant against mineral oil | Applicable for use in drinking water
SILICONES	Silicone FDA S102-R85		-55 to +210°C	Shore A 85 +/-5	Flange seals, gaskets and other static seals | Mineral oils, HFA, HFB, HFC, HFD fluids, ozone Not recommended for dynamic applications | Applicable for contact with foodstuff
	Silicone FDA S103-BL85 blue		-55 to +180°C	Shore A 85 +/-5	Flange seals, gaskets and other static seals | Mineral oils, HFA, HFB, HFC, HFD fluids, ozone Not recommended for dynamic applications | Applicable for contact with foodstuff
TFE/P	TFE/P AF101-B85 black		-15 to +210°C	Shore A 86 +/-5	Lip seals, vee packings and other seal elements | Mineral oils, HFA, HFB, HFC, HFD fluids Hot water and steam, ozone, dilute acids and alkaline solutions, Sour oil and gas, amines
PTFE	PTFE-P FDA T101-W white		-200 to +260°C	Shore D ≥ 51	Composite seals with elastomer preload elements, spring loaded seals, Back-up and guide rings Resistance to almost all common chemicals and fluids except molten alkaline metals | Applicable for contact with foodstuff
	PTFE-F T105-G grey		-200 to +260°C	Shore D ≥ 55	Composite seals with elastomer preaload elements | Spring loaded seals, back-up and guide rings | Resistance to almost all common chemicals and fluids except molten alkaline metals Glass fibre / MoS2 reinforced for improved wear and extrusion resistance
	PTFE-40% T110-BR40 bronze brown		-200 to +260°C	Shore D ≥ 60	Composite seals with elastomer preaload elements | Resistance to almost all common chemicals except molten alkaline metals | Filled with 40% bronze for improved wear, pressure and extrusion resistance
	PTFE-25% T125-C25 carbon grey		-200 to +260°C	Shore D ≥ 62	Composite seals with elastomer preaload elements | Spring loaded seals, back-up and guide rings, rotary seals | Resistance to almost all common chemicals except molten alkaline metals 25% carbon powder friction properties and increased extrusion resistance
PLÁSTICS	POM FDA P101-WE white		-50 to +100°C	-	Back-up and guide rings, machined parts with tight tolerances | Mineral oils, HFA, HFB, HFC fluids | Minor absorption of water, applicable for contact with foodstuff
	PA FDA A112-WC natural		-30 to +100°C	-	Back-up and guide rings, machined parts | Mineral oils, acids and dilute alkaline solutions Applicable for contact with foodstuff
	PEEK natural PK100-CN beige		-50 to +250°C	-	Composite seals with elastomer preload elements, Back-up and guide rings high prescision parts | Excellent wear, friction and extrusion properties | Resistance to almost all common chemicals | Applicable for contact with foodstuff
	UHMW - PE PE1000-HD white		-200 to +80°C	Shore D 60 - 65	Back-up and guide rings, spring loaded seals | Mineral oils, HFC, HFD fluids, acids and dilute alkaline solutions, Sour oil and gas | Very low water absorption, excellent friction and wear properties | Applicable for contact with foodstuff

FOOD CONTACT MATERIALS

CONFORM WITH FDA

	Materials	Technical properties					Standards					
		Color	Temp. min. [°C]	Temp. max [°C]	Hardness [°C]	Hardness [°C]	EU1935/2004 10/2011	REACh	FDA 21 CFR 177.1680	3A	GB4806.7	ADI
POLYURETHANES	U500-R95		-30	125	95 ±2	\	+	+	+	+	\	+
	U530-B95-LT		-50	105	95 ±2	\	+	+	+	+	\	+
	U535-B95		-30	125	95 ±2	\	+	+	+	+	+	+
	U540-VI95-CR		-30	115	95 ±2	\	+	+	+	+	\	+
	U570-D57		-30	125	\	57 ±3	+	+	+	+	\	+
ELASTOMERS	N111-W85		-22	100	85 ±5	\	+	+	+	+	\	+
	E132-W85		-50	100	85 ±5	\	+	+	+	+	\	+
	E134-B85		-45	110	88 ±5	\	+	+	+	+	\	+
	F110-BR85		-25	210	85 ±5	\	+	+	+	+	\	+
	S102-R85		-55	210	85 ±5	\	+	+	+	+	\	+
	S103-BL85		-55	180	85 ±5	\	+	+	+	+	\	+
PLÁSTICS	POM P101-WE		-50	105	\	\	+*	+	+	+	\	+
	PA A112-WC		-30	100	\	\	+*	+	+	+	\	+
	PTFE T101-W		-200	260	\	>50	+*	+	+	+	\	+
	PEEK PK100-CN		-50	250	\	\	+*	+	+	+	\	+

+ resistant I *on request

WIPERS

Profile	Type	Standard material	Pressure (bar)	Temp (°C)	Surface speed (m/sec)
	WA1	PU NBR	-	-30 to 105 -25 to 100	4
	WA1A	PU NBR	-	-30 to 105 -25 to 100	4
	WA2	PU NBR	-	-30 to 105 -25 to 100	4
	WA2A	PU NBR	-	-30 to 105 -25 to 100	4
	WA2B	PU NBR	-	-30 to 105 -25 to 100	4
	WA2C	PU NBR	-	-30 to 105 -25 to 100	4
	WA2D	PU PU-D57	-	-30 to 105	4
	WA3	PU/POM * NBR/POM *	-	-30 hasta105 -25 hasta100	4
	WA7	PU NBR	-	-30 hasta105 -25 hasta100	4
	WA13	POM PA PU-D57	-	-50 to 80 -50 to 80 -30 to 105	1
	WA13Y	POM PA PU-D57	-	-50 to 80 -50 to 80 -30 to 105	1
	WA11	PU NBR	-	-30 to 105 -25 to 100	4
	WA12	PU NBR	-	-30 to 105 -25 to 100	4
	WAXD	PTFE/NBR	15	-25 to 100	10
	WAXD	PTFE/NBR	15	-25 to 100	10
	WAXS	PTFE/NBR	15	-25 to 100	10
	WAX15	PTFE/NBR	15	-25 to 100	10
	WAX16	PTFE/NBR	15	-25 to 100	10
	WA17	PU NBR	-	-30 to 105 -25 to 100	4
	WA18	PU NBR	-	-30 to 105 -25 to 100	4

* For technical reasons POM should be used up to a maximum temperature of 80° C only
For higher temperature we recommend Alinum/Steel.

ROD SEALS

Profile	Type	Standard material	Pressure (bar)	Temp (°C)	Surface speed (m/sec)
	RS01	PU NBR FPM	400 160 160	-30 to 105 -25 to 100 -20 to 210	0,5
	RS01A	PU NBR FPM	300 160 160	-30 to 105 -25 to 100 -20 to 210	0,5
	RS01B	PU NBR FPM	400 160 160	-30 to 105 -25 to 100 -20 to 210	0,5
	RS01C	NBR FPM	160 160	-25 to 100 -20 to 210	1
	RS02	PU/POM NBR/POM FPM/PTFE	700 250 250	-30 to 100 -25 to 100 -20 to 210	0,5
	RS02A	PU/POM NBR/POM FPM/PTFE	700 250 250	-30 to 100 -25 to 100 -20 to 210	0,5
	RS02B	PU/PTFE	700	-30 to 105	0,5
	RS02C	PU/POM	400	-25 to 100	5
	RS03	PU/NBR	400	-25 to 100	0,5
	RS04	PU/NBR/POM	700	-25 to 100	0,5
	RS04A	PU/NBR/POM	700	-25 to 100	0,5
	RS05	PU NBR	25	-30 to 105 -25 to 100	1
	RS05A	PU NBR	25	-30 to 105 -25 to 100	1
	RS08	PU NBR	400 160	-30 to 105 -25 to 100	0,3
	RS09	PU-D57/NBR PTFE/NBR	600 400	-25 to 100	5 10
	RS09A	PU-D57/NBR PTFE/NBR	600 400	-25 to 100	5 10
	RS09B	PU-D57/NBR PTFE/NBR	600 400	-25 to 100	5 10
	RS10-12B	PU/POM NBR/POM	500 250	-30 to 100 -25 to 100	0,7
	RS91	PU-D57/NBR PTFE/NBR	600 400	-25 to 100	5 10
	RS91B	PU-D57/NBR PTFE/NBR	600 400	-25 to 100	5 10

ROD SEALS

Profile	Type	Standard material	Pressure (bar)	Temp (°C)	Surface speed (m/sec)
	RS16	PU NBR	160	-30 to 105 -25 to 100	0,5
	RS17	PU NBR	400 160	-30 to 105 -25 to 100	0,5
	RS17A	PU/POM	700	-30 to 100	0,5
	GS17B	PU/NBR	400	-25 to 100	0,5
	RS17C	PU/NBR/POM	700	-25 to 100	0,5
	RS17D	PU NBR	400 160	-30 to 105 -25 to 100	0,3
	RS17E	PU/POM	700	-30 to 100	0,3
	RS19	PTFE-virgin / V-spring PTFE-filled / V-spring	200 400	-200 to 260	15
	RS19A	PTFE/V-spring	150	-200 to 260	2
	RS20	NBR/POM	700	-25 to 100	0,5
	RS31-33	PU/POM	500	-30 to 100	0,5
	RS35	PU	400	-30 to 105	0,4
	RS35A	PU	400	-30 to 105	0,4

PISTON SEALS

Profile	Type	Standard material	Pressure (bar)	Temp (°C)	Surface speed(m/sec)
	PK1	PU NBR FPM	400 160 160	-30 to 105 -25 to 100 -20 to 210	0,5
	PK1A	PU NBR FPM	300 160 160	-30 to 105 -25 to 100 -20 to 210	0,5
	PK1B	PU NBR FPM	400 160 160	-30 to 105 -25 to 100 -20 to 210	0,5
	PK1C	NBR FPM	160 160	-25 to 100 -20 to 210	1
	PK2	PU/POM NBR/POM FPM/PTFE	700 250 250	-30 to 100 -25 to 100 -20 to 210	0,5
	PK2SB	PU/POM NBR/POM FPM/PTFE	700 250 250	-30 to 100 -25 to 100 -20 to 210	0,5
	PK3	PU/NBR	400	-25 to 100	0,5
	PK4	PU/NBR/POM	700	-25 to 100	0,5
	PK4A	PU/NBR/POM	700	-25 to 100	0,5
	PK6	PU NBR	400 160	-30 to 105 -25 to 100	1
	PK6A	PU NBR	400 160	-30 to 105 -25 to 100	1
	PK8	PU-D57/NBR PTFE/NBR	600 400	-25 to 100	5 15
	PK8A	PU/NDR PU-D57/NBR PTFE/NBR	250 400 400	-25 to 100	1 5 15
	PK8B	PU-D57/NBR PTFE/NBR	600 400	-25 to 100	5 10
	PK8C	PTFE/NBR	400	-25 to 100	2
	PS08D	PTFE/NBR	400	-25 to 100	3
	PK8E	PU-D57/NBR PTFE/NBR	600 400	-25 to 100	5 10
	PK8F	PU-D57/NBR PTFE/NBR	400 250	-25 to 100	5 1
	PK8T	PU-D57/NBR PTFE/NBR	600 400	-25 to 100	5 10
	PK81B	PU-D57/NBR PTFE/NBR	600 400	-25 to 100	5 10

PISTON SEALS

Profile	Type	Standard material	Pressure (bar)	Temp (°C)	Surface speed (m/sec)
	PK81C	PU/NDR PU-D57/NBR PTFE/NBR	250 400 400	-25 to 100	1 5 15
	PK9	PU/NBR/POM	400	-25 to 100	0,5
	PK9A	PTFE/NBR/POM	400	-25 to 100	1
	PS10-12B	PU/POM NBR/POM	500 250	-30 to 100 -25 to 100	0,7
	PK16	PU NBR	160	-30 to 105 -25 to 100	0,5
	PS16A	PU NBR	160	-30 to 105 -25 to 100	0,5
	PK17	PU/POM NBR/POM	400 250	-25 to 100	0,5
	PK17A	PU/POM NBR/POM	400 250	-25 to 100	0,5
	PK17PB	PU/POM NBR/POM	400 250	-25 to 100	0,5
	PK19	PTFE-virgin / V-spring PTFE-filled / V-spring	200 400	-200 to 260	15
	PK19A	PTFE-virgin / V-spring PTFE-filled / V-spring	200 400	-200 to 260	2
	PK20	NBR/POM	700	-25 to 100	0,5
	PK23	PU/NBR/POM	400	-25 to 100	0,5
	PK35	PU	400	-30 to 105	0,4
	PK35A	PU	400	-30 to 105	0,4

SYMETRICAL SEALS

Profile	Type	Standard material	Pressure (bar)	Temp. (°C)	Surface speed (m/sec)
	GS06	PU NBR	400 160	-30 to 105 -25 to 100	0,5
	GS6A	PU NBR	300 160	-30 to 105 -25 to 100	0,5
	GS6P	PU NBR	400 160	-30 to 105 -25 to 100	0,5
	GS8B	PU NBR	400 160	-30 to 105 -25 to 100	0,3
	GS6D	PU NBR	400 160	-30 to 105 -25 to 100	0,5
	GS6E	PU NBR	400 160	-30 to 105 -25 to 100	0,5
	GS7	PU/NBR	400	-25 to 100	0,5
	GS10SP	PU FPM POM	-	-30 to 105 -20 to 210 -60 to 100	-
	GS10-12	PU/POM NBR/POM	500 250	-30 to 100 -25 to 100	0,5
	GS10-12A	PU/POM NBR/POM	500 250	-30 to 100 -25 to 100	0,7
	GS13-15	PU/POM NBR/POM	500 250	-30 to 100 -25 to 100	0,5
	GS18	PU/NBR	400	-25 to 100	0,5
	GS19	PTFE-virgin / V-spring PTFE-filled / V-spring	200 400	-200 to 260	15
	GS19B	PTFE-virgin / Helicoil Spring PTFE-filled / Helicoil Spring	200 400	-200 to 260	5
	GS19C	PTFE-virgin / Helicoil Spring PTFE-filled / Helicoil Spring	200 400	-200 to 260	5
	GS19D	PTFE-virgin / Helicoil Spring PTFE-filled / Helicoil Spring	200 400	-200 to 260	5
	PK22	PU/POM NBR/POM FPM/PTFE	400 160 160	-30 to 100 -25 to 100 -20 to 210	0,5
	PK25-27	PTFE-virgin PTFE-filled	100	-200 to 260	1,5
	PK99	PU NBR FPM	400 160 160	-30 to 105 -25 to 100 -20 to 210	0,5

BACK-UP RINGS

Profile	Type	Standard material	Pressure (bar)	Temp (°C)	Surface speed(m/sec)
	ST8	POM PTFE	-	-60 to 100 -200 to 260	-
	ST9	POM PTFE	-	-60 to 100 -200 to 260	-
	ST10	POM PTFE	-	-60 to 100 -200 to 260	-
	ST11	POM PTFE	-	-60 to 100 -200 to 260	-
	ST12	POM PTFE	-	-60 to 100 -200 to 260	-
	ST13	POM PTFE	-	-60 to 100 -200 to 260	-

GUIDE RINGS

Profile	Type	Standard material	Pressure (bar)	Temp (°C)	Surface speed(m/sec)
	GF1	POM PTFE Polyester-fabric*	-	-60 to 100 -200 to 260 -40 to 130	4
	GF1A	POM PTFE	-	-60 to 100 -200 to 260	4
	GF3	POM PTFE	-	-60 to 100 -200 to 260	4
	GF4	POM PTFE	-	-60 to 100 -200 to 260	4
	GF5	POM PTFE	-	-60 to 100 -200 to 260	4
	GF6	POM PTFE	-	-60 to 100 -200 to 260	4
	GF7	POM PTFE	-	-60 to 100 -200 to 260	4
	GF8	POM PTFE	-	-60 to 100 -200 to 260	4
	GF9	-	-	-	-

* Various dimensions available in reels

ROTARY SEALS

Profile	Type	Standard material	Pressure (bar)	Temp. (°C)	Surface speed (m/sec)
	BP2	PU/POM* NBR/POM* FPM/PTFE	0,5 0,5 0,5	-30 to 100 -25 to 100 -20 to 210	5 10 15
	BP2	PU/POM* NBR/POM* FPM/PTFE	0,5 0,5 0,5	-30 to 100 -25 to 100 -20 to 210	5 10 15
	BP3	PU NBR FPM	0,5 0,5 0,5	-30 to 100 -25 to 100 -20 to 210	5 10 15
	BF8	PU NBR	-	-30 to 105 -25 to 100	5 10
	BF8A	PU NBR	-	-30 to 105 -25 to 100	5 10
	HR3	PU/POM NBR/POM	400 250	-30 to 105 -25 to 100	0,2 0,2
	HR4	PU NBR	160 100	-30 to 105 -25 to 100	0,2 0,2
	HR4A	PU NBR	160 100	-30 to 105 -25 to 100	0,2 0,2
	HR5	PU NBR	160 100	-30 to 105 -25 to 100	0,2 0,2
	HR5A	PU NBR	160 100	-30 to 105 -25 to 100	0,2 0,2
	BP6	NBR	-	-25 to 100	25
	BP7	NBR	-	-25 to 100	25
	HR8	PTFE/NBR	350	-25 to 100	0,4
	HR8D	PTFE/NBR	350	-25 to 100	0,4
	HR9	PTFE/NBR	350	-25 to 100	0,4
	HR9A	PTFE/NBR	350	-25 to 100	0,4
	R10	PTFE/NBR	350	-25 to 100	0,4
	HR10A	PTFE/NBR	350	-25 to 100	0,4
	HR11	PTFE/NBR	350	-25 to 100	0,4
	HR11D	PTFE/NBR	350	-25 to 100	0,4
	HR18	PTFE/ V-SPRING	150	-200 to 260	2
	HR19	PTFE/ V-SPRING	150	-200 to 260	2

* For technical reasons POM should be used up to a maximum temperature of 80° C only
For higher temperature we recommend Aluminum/Steel

STATIC SEALS AND O-RINGS

Profile	Type	Standard material	Pressure (bar)	Temp (°C)	Surface speed (m/sec)
	FL1A	PU FPM EPDM	400 250 250	-30 to 105 -25 to 100 -20 to 210	-
	FL2B	PU FPM EPDM	400 250 250	-30 to 105 -25 to 100 -20 to 210	-
	FL3	PU NBR FPM	600 250 250	-30 to 105 -25 to 100 -20 to 210	-
	FL4	PU NBR	400 160	-30 to 105 -25 to 100	0,3
	FL5	PU NBR	400 160	-30 to 105 -25 to 100	0,3
	HR6	PTFE-virgin / Helicoil Spring PTFE-filled / Helicoil Spring	200 400	-60 to 200	0,1
	HR7	PTFE-virgin / Helicoil Spring PTFE-filled / Helicoil Spring	200 400	-60 to 200	0,1
	HR8	PTFE-virgin / Helicoil Spring PTFE-filled / Helicoil Spring	200 400	-60 to 200	0,1
	HOR	PU NBR FPM	600 160 160	-30 to 105 -25 to 100 -20 to 210	-
	HRH	PU NBR FPM	600 160 160	-30 to 105 -25 to 100 -20 to 210	-
	HRV	PU NBR FPM	600 160 160	-30 to 105 -25 to 100 -20 to 210	-
	HRX	PU NBR FPM	600 160 160	-30 to 105 -25 to 100 -20 to 210	-
	HRX2	PU NBR FPM	600 160 160	-30 to 105 -25 to 100 -20 to 210	-
	HRS1	PU NBR FPM	600 250 250	-30 to 105 -25 to 100 -20 to 210	-

CUSTOMIZED SEALS AND MACHINED PARTS

SPECIAL JOINTS & MACHINED PARTS

Profile					
					
					

MINING SEALS

Profile	Type	Standard material	Pressure (bar)	Temp (°C)	Surface speed(m/sec)
	PK50	PU/POM	400 dyn. 1500 stat.**	-30 to 100	0,5 0,2
	PK50A	PU/POM	400 dyn. 1500 stat.**	-30 to 100	0,5 0,2
	PK23	PU/NBR/POM	400 dyn. 1500 stat.**	-25 to 100	0,5 0,2
	PK23C	PU/NBR/POM	400 dyn. 1500 stat.**	-25 to 100	0,5 0,2
	PK51G	PU/NBR/POM	400 dyn. 1500 stat.**	-25 to 100	0,5 0,2
	PK52	PU/POM	700 dyn. 1500 stat.**	-30 to 100	0,5 0,2
	PK53	PU/NBR/POM	700 dyn. 1500 stat.**	-25 to 100	0,5 0,2
	PK9	PU/NBR/POM	400 dyn. 1500 stat.**	-25 to 100	0,5 0,2
	PK9C	PU/NBR/POM	400 dyn. 1500 stat.**	-25 to 100	0,5 0,2
	PK55	PU/POM NBR/POM	700 dyn./1500 stat.** 400 dyn./1500 stat.**	-25 to 100	0,5/0,2 0,5/0,2
	GS33	PU/NBR/POM	700	-25 to 100	0,5
	GS33A	PU/NBR/POM	700	-25 to 100	0,5
	GS51	PU/NBR	400	-25 to 100	0,5
	GS52	PU/POM	700	-30 to 100	0,5
	GS53	PU	400	-30 to 105	0,5
	WA2	PU	-	-30 to 105	2
	WA2F	PU	-	-30 to 105	2
	WA3	PU/POM*	-	-30 to 80	2
	WA1	PU	-	-30 to 105	2
	GF1	POM PTFE	-	-60 to 100 -200 to 260	4
	GF1A	POM PTFE	-	-60 to 100 -200 to 260	4
	GS8	PU	400	-30 to 105	0,3

* For technical reasons POM should be used up to a maximum temperature of 80° C only.
For higher temperature we recommend Aluminum / Steel.

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