PTFE Products

PTFE (Polytetrafluoroethylene) has emerged as the most common thermoplastic gasket material. PTFE's outstanding properties include resistance to temperature extremes from cryogenic to 500°F (260°C). PTFE is highly resistant to chemicals, solvents, caustics and acids except free fluorine and alkali metals. It has a very low surface energy and does not adhere to the flanges. PTFE gaskets can be supplied in a variety of forms; either as virgin or reprocessed material, and also with a variety of filler material. The principal advantage in adding fillers to PTFE is to inhibit cold flow or creep relaxation.

Matrix is a premium range of PTFE material that covers the full spectrum of customer requirements. This product line covers, biaxally orientated filled materials (L100, L104, L110) for low creep, higher loaded applications. High compression (L120) for applications where high load values are not achievable but low creep is still required.

Matrix L100, L104 and L110 products are manufactured to the HS10 method which was developed by DuPont in 1960. The result is a material that has exceptional strength and stability under load. The resultant biaxial orientation of the PTFE particles creates a unique strength where both the longitudinal and transverse directions are equally as strong. This superior matrix orientation and addition of premium fillers allows the material to resist creep and cold flow when subject to load.

Matrix L120 is our range of high quality Expanded PTFE materials, it is offered in both sheet, cut gaskets and joint sealant form.

Expanded PTFE (ePTFE) is manufactured by heating solid Polytetrafluoroethylene, the material is then stretched up to 800% of its original size and this forms a microporous structure which consists of around 70% air. This gives the material good compression characteristics, which allows the ePTFE to seal under low loads.

The Matrix range can be used in its pure form or can be used as facings or fillers for our range of semi-metallic gaskets.

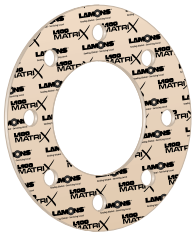
All of our Matrix materials conform to FDA requirements.

Matrix™ BY LAMONS

L100

Matrix™ BY LAMONS

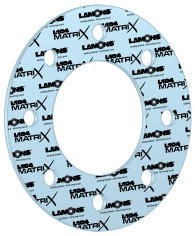
A biaxially orientated high quality silica-filled PTFE sheet for use in sealing most chemicals except molten alkali metals, fluorine gas, and hydrogen fluoride. This material is approved for potable water service, complies with requirements of FDA regulations and can be used at all concentrations of sulfuric acid.



L104

Matrix™ BY LAMONS

A superior performance, biaxially orientated sheet material containing PTFE and hollow glass microspheres for use in sealing most chemicals except molten alkali metals, fluorine gas and hydrogen fluoride. This material is approved for potable water service, complies with requirements of FDA regulations and has exceptional compression characteristics making it good for use in glass lined flanges or where loading problems exist.



L110

Matrix™ BY LAMONS

A pigment-free biaxially orientated with superior performance, barium sulfate-filled PTFE sheet for use in sealing food, pharmaceuticals, and other general chemical media. This material complies with requirements of FDA regulations and is acceptable for use in aqueous hydrofluoric acid below 49%, but is not suitable for sealing molten alkali metals or fluorine gas.

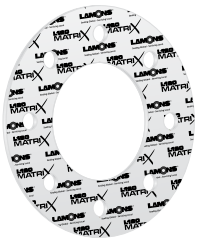
Typical Physical Properties

Style	Matrix L100	Matrix L104	Matrix L110
Color	Tan	Blue	Off White
Density	137 lbs/ft^3 (2.2 g/cc)	87 lbs/ft^3 (1.4 g/cc)	180 lbs/ft^3 (2.9 g/cc)
Temperature Limits	-450ºF (-268ºC) to 500ºF (260ºC)	-450ºF (-268ºC) to 500ºF (260ºC)	-450ºF (-268ºC) to 500ºF (260ºC)
MAX Pressure	1235 psi (8.5 MPa)	1235 psi (8.5 MPa)	1235 psi (8.5 MPa)
F36 Compression	7%	35%	6%
F36 Recovery	45%	45%	40%
F152 Tensile Strength	2320 psi (16 MPa)	1885 psi (13 MPa)	2030 psi (14 MPa)
F37 Liquid Leakage	<0.3 mL/hr	<0.25 mL/hr	<0.2 mL/hr
F38 Creep Relaxation	35%	31%	13%
F149 Dielectric Strength	20 kV/mm	15 kV/mm	21 kV/mm
Residual Stress BS7531 @ 175ºC	4496 psi (31 MPa)	4351 psi (30 MPa)	4351 psi (30 MPa)
Gas Leakage - DIN 3535	<0.01 mg/(s-m)	<0.02 mg/(s-m)	<0.01 mg/(s-m)
Gas Leakage - BS7531	<0.005 mL/min	<0.01 mL/min	<0.004 mL/min
ROTT Constant Gb	172	100	146
ROTT Constant a	0.401	0.401	0.375
ROTT Constant Gs	2.76 x 10^{-6}	2.87 x 10^{-5}	1.2
Tpmax	24260	33240	60460
m	4	2	2
y	2175 psi (15 MPa)	1595 psi (11 MPa)	1740 psi (12 MPa)

Expanded PTFE Sheet

L120

Matrix BY LAMONS



Matrix L120 effectively fills flange imperfections for a tight, leak-free seal. It is easily compressed under lower loads, beneficial for applications such as FRP or glass-lined flanges. Unlike conventional PTFE, which is prone to creep and cold flow, L120 has good creep resistance and bolt torque retention properties even under higher compressive force. With L120, it is much more possible to bolt up once and not have to re-torque later. Most commonly FDA/USDA suitable.

Complies with the requirements of FDA21 CFR 177.1550
Minimum Temperature: -450°F (-268°C)
Maximum Temperature: 500°F (260°C)
Maximum Pressure: 735 psi (5.1 MPa)
Thickness Range: 0.020" (0.5 mm) to 1/4" (6.4 mm)

Typical Physical Properties

Property	ASTM Method	Typical Values
Compressibility	F36	55%
Recovery	F36	15%
Tensile Strength	F152	3190 psi (22MPa)
Liquid Leakage	F37	<0.1 mL/hr
Creep Relaxation	F38	17%
Density	-	59 lbs/ft^3 (0.95 g/cc)
Gas Leakage	BS7531	<0.03 mL/min

PTFE Joint Sealant

L120

Matrix BY LAMONS

100% pure, specially processed PTFE sealant provides soft, highly compressible gasketing on a roll for long-life, trouble-free sealing that cuts maintenance and storing costs. Under pressure, PTFE sealant provides a very thin and wide ribbon-like joint sealant so that the smallest possible gasket surface area is exposed to the harmful effects of corrosive media.

Width (in)	Length (ft)
1/8	100
1/4	50
3/8	25
3/8	250
1/2	15
1/2	30
1/2	150
5/8	15
5/8	30
5/8	150

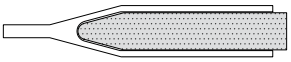
Width (in)	Length (ft)
3/4	15
3/4	30
3/4	50
3/4	100
1	15
1	30
1	75

PTFE Envelope Gaskets

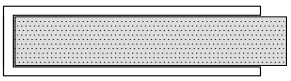
Envelope gaskets utilizing PTFE jackets have become popular for use in severely corrosive services because of their low minimum seating stresses, excellent creep resistance, high deformability and choice of a variety of filler materials to assure optimum performance on any specific application. Fillers such as corrugated metal and rubber sheets are available.

There are three basic designs of envelopes:

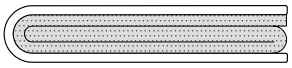
1. **Slit Type / V Type / Style 800:** sliced from cylinders and split from the outside diameter to within approximately 1/16" (1.5 mm) of the inside diameter. The bearing surface is determined by the filler dimensions. Clearance is required between the ID of the filler and the envelope ID. The gasket OD normally rests within the bolt hole circle and the ID is approximately equal to the nominal ID of pipe. Available in sizes to a maximum OD of 24.



2. **Milled Type / Square Cut / Style 820:** machined from cylinder stock. The jacket is machined from the OD to within approximately 1/32" (0.8 mm) it's ID. The jacket's ID fits flush with pipe bore and its OD nests within the bolts. Available in sizes up to a maximum OD of 24" (609 mm). Milled envelopes are more expensive than slit type since considerably more material is lost in machining.



3. **Formed Tape Type**: large diameter (over 12 NPS) and irregularly shaped envelopes are formed from tape and heat sealed to produce a continuous jacket construction.



Virgin / Glass-Filled / Reprocessed PTFE Sheet
Typical Physical Properties

Property	Units	ASTM Method	Typical Values (Virgin)	Typical Values (G-F)	Typical Values (Repro)
Specific Gravity	g/cc	D-792	2.14 - 2.20	2.15 - 2.24	2.13 - 2.20
Hardness	Shore D	D-2240	52 - 65	55 - 58	52 - 65
Tensile Strength	psi (MPa)	D-638 D-1708	2800 min (19.3 MPa)	1000 - 2000 (7-14 MPa)	1500 - 2400 (10 MPa - 17 MPa)
Elongation	%	D638 D-1708	270 min	50 - 150	75 - 200
Deformation Under Load (73ºF, 2000 psi, 24 hrs.)	%	D-621	15 - 16	3 - 9	N/A
Coefficient of Linear Thermal Expansion (78ºF - 400ºF)	in/in/ºF	D-696	4 - 9 x 10^{-5}	3 - 8 x 10^{-5}	N/A
Thermal Conductivity	BTU/hr/ ft^2/F-in	C-177	1.7	2.5 - 3.5	
Dielectric Strength	volts/mil	D-149a	300 min	N/A	500 - 1000
Temperature Range	ºF (°C)		Cryogenic to 450°F (232°C)	Cryogenic to 450°F (232°C)	Cryogenic to 450°F (232°C)