



YOUR CHOICE FOR  
**FLUOROBASED** PRODUCTS

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### IPM Industrial Plastics & Machine



Industrial Plastics & Machine Inc. was established in 1979. Based upon a commitment to quality, integrity and outstanding customer service, the company has grown to be a national supplier of stock and custom molded PTFE rod, tube, plate, sheets, gaskets and machined parts. These products are sold through a national network of distributors.

**In march 2004, IPM was sold to the Italian PTFE manufacturing group GUARNIFLON S.p.A.**

This investment made Guarniflon S.p.A. one of the largest worldwide manufacturers of PTFE semi-finished and machined components with more than 9 million pounds of PTFE materials processed every year and 55 countries served worldwide.

Our company is organized to insure that we meet these commitments.

Our PTFE FASTSHIP program assures that you get your PTFE products when you need them.

We are committed to having an ample inventory of raw materials and stocked products to meet your needs.

We are committed to making it easy for you to do business with us. Using our toll free number 1-800-833-1382 makes it simple and economical to order from us.

Our FAX number (225) 925-8279 greatly facilitates communications with our network of distributors.

### About Guarniflon®

Guarniflon was established in 1982, enthusiasm, dedication and perseverance being the key factors which have allowed us to evolve to our present status of worldwide leader in our business field.

A clear and successful model, in conjunction with the evolution of the Italian entrepreneur spirit, means, we are able to share the business inspiration and the renowned resources of the Italian SME together with the globalized perspective of today's modern organization.

Step by step, Guarniflon have been evolving and during recent years we have lead an International Group of companies which are continually integrating with the foreign markets, utilising the most updated marketing, technological tools and management flair.





# THE PTFE GLOBAL NETWORK







# ***PTFE***

***Available materials***



# PTFE PROPERTIES

- The base characteristics of PTFE are the ones offering a unique combination of:
- low coefficient of friction
  - excellent chemical inertness
  - non-adhesive surface
  - wide temperature range withstanding (–200° C to +260° C)
  - excellent dielectric properties

## MECHANICAL PROPERTIES

The compressive strength at a certain predetermined compression value is one of the most significant mechanical characteristics of PTFE, in a wide range of service temperatures. Flexibility strength, plastic memory and hardness, are additional characteristics of PTFE products.

## ELECTRICAL PROPERTIES

PTFE products have excellent dielectric performances in a wide range of frequencies and temperatures. The dielectric strength changes according to the thickness and decreases when the frequency increases, with no substantial alterations up to 300°C.

## CHEMICAL INERTNESS

PTFE is practically inert to all chemical products, except for some alkaline metals, for example, clorotrifluoruro and for basic fluorine at high temperatures and pressures.

## THERMAL PROPERTIES

PTFE is considered one of the most stable materials from the thermal point of view. Up to a service temperature of 260° C PTFE does not change its own physical and molecular properties.



# PTFE G200

- Available products:
- extruded tubes and rods
  - skived tapes
  - skived sheets
  - finished products

Property	Unit	Method	Value	
			Extruded	Molded
Density	g/cm³	ASTM D792	2,13 - 2,20	
Tensile strength	N/mm²	ASTM D1708	≥ 13	≥ 13
Elongation at break	%≥	ASTM D1708	100	≥ 150
Compressive strength at 1% deformation	N/mm²	ASTM D695	2 - 4	
Coefficient of friction (dynamic)	/	ASTM D1894	0,06	
Service temperature (min - max)	°C	/	– 200 / +260	

# PTFE G300

- Available products:
- extruded tubes and rods
  - finished products

Property	Unit	Method	Value	
			Extruded	
Density	g/cm³	ASTM D792	2,13 - 2,20	
Tensile strength	N/mm²	ASTM D1708	≥ 18	
Elongation at break	%≥	ASTM D1708	180	
Compressive strength at 1% deformation	N/mm²	ASTM D695	4 - 6	
Coefficient of friction (dynamic)	/	ASTM D1894	0,06	
Service temperature (min - max)	°C	/	– 200 / +260	
Dielectric strength in air	kV/mm	ASTM D149	≥ 20	

# PTFE G400

- Available products:
- extruded tubes and rods
  - skived tapes
  - Molded tubes, rods and sheets
  - finished products
  - skived sheets

Property	Unit	Method	Value	
			Extruded	Molded
Density	g/cm³	ASTM D792	2,14 - 2,18	
Tensile strength	N/mm²	ASTM D4894	≥ 20	≥ 24
Elongation at break	%≥	ASTM D4894	200	≥ 250
Compressive strength at 1% deformation	N/mm²	ASTM D695	4 - 5	
Coefficient of friction (dynamic )	/	ASTM D1894	0,06	
Service temperature (min - max)	°C	/	– 200 / +260	
Dielectric strength in air	kV/mm	ASTM D149	≥ 20	≥ 40

# PTFE G500

Available products:

- extruded tubes and rods
- skived sheets
- skived tapes
- finished products

## MAIN PROPERTIES

Property	Unit	Method	Value	
			Extruded	Molded
Density	g/cm³	ASTM D792	2,14 - 2,19	
Tensile strength	N/mm²	ASTM D4894	≥ 24	≥ 30
Elongation at break	%≥	ASTM D4894	300	≥ 400
Compressive strength at 1% deformation	N/mm²	ASTM D695	4 - 5	
Coefficient of friction (dynamic )	/	ASTM D1894	0,06	
Service temperature (min - max)	°C	/	– 200 / +260	
Dielectric strength in air	kV/mm	ASTM D149	≥ 25≥	45

# PTFE G800

Available products:

- extruded tubes and rods
- Molded tubes, rods and sheets
- skived sheets
- skived tapes
- finished products

## MAIN PROPERTIES

Property	Unit	Method	Value	
			Extruded	Molded
Density	g/cm³	ASTM D792	2,14 - 2,18	
Tensile strength	N/mm²	ASTM D4894	≥ 24	≥ 30
Elongation at break	%	ASTM D4894	≥ 300	≥ 400
Compressive strength at 1% deformation	N/mm²	ASTM D695	5 - 6	
Coefficient of friction (dynamic )	/	ASTM D1894	0,06	
Service temperature (min - max)	°C	/	– 200 / +260	
Dielectric strength in air	kV/mm	ASTM D149	≥ 40	≥ 60

# PTFE COMPOUNDS

## more than 80 different compounds available

Where the most critical operating conditions are present, even the excellent performances of virgin PTFE can not always fulfil the customers’ expectations.

The solution is provided by using special fillers together with PTFE, thus enhancing the following characteristics:

- wear strength
- dimensional stability
- thermal conductivity
- deformation under load
- flexibility and strength under work
- coefficient of friction
- dielectric strength

Fillers can be blended with PTFE in different combinations and percentages.

**Today IPM has available more than 80 different compounds providing solutions to the most tribological applications.**

**Standard fillers: glass fibre, bronze, graphite, carbon.**

**Special fillers:** standard fillers together with **carbographite, alumina, calcium fluoride, PPS, PEEK, quartz, spherical glass, polyamide, carbon fibre, molybdenum dysulphide and different types of pigments, etc.**

## DESCRIPTION OF THE MAIN PTFE COMPOUNDS THEIR CHARACTERISTICS AND POSSIBLE APPLICATIONS

IPM CODE	COMPOUND	GENERAL CHARACTERISTICS	MAIN APPLICATIONS
G401-G402-G403-G404-G405-G406-G513	<b>GLASS FIBER</b> Different types and percentages	Enhanced wear resistance. Enhanced chemical resistance (except for alkali and hydrofluoric acid).	Valve seats, seals, bearings, required to resist sliding and chemicals. Suitable for bearings working at low PV values.
G412-G414-G483	<b>GRAPHITE</b> Different types and percentages	Extremely low coefficient of friction. Fairly good compressive strength. Enhanced chemical resistance. Good wear resistance. Good thermal dissipation.	Bearings for high speed on fairly hard surface.
G410-G415-G430-G450-G451-G452-G456-G463-G453-G472	<b>CARBON</b> Different types and percentages	Good thermal and electrical conductivity. Good resistance to deformation. Excellent resistance to load with low coefficient of friction and high wear strength. Enhanced chemical resistance.	Bearings for high speed and when fast dissipation of electric charges is needed. Elastic bands for unlubricated compressors. Valve seats.
G411-G436	<b>MOLYBDENUM DISULPHITE</b> Different types and percentages	Enhanced non-stick properties. Low static coefficient of friction. Fairly good resistance to deformation.	Guide bands. Details needing good resistivity.
G416-G417-G425-G427-G428-G429-G458-G459-G464-G473-G476-G488-G506-G548	<b>BRONZE</b> Different types and percentages	Enhanced compressive strength. Good wear resistance and high thermal conductivity.	Unlubricated bearings for high speed excluding hard surfaces.





PTFE STANDARD COMPOUNDS

The more common compounded PTFE grades are filled with **glass fibre, bronze, graphite, carbon**.  
The values from the associated chart are obtained by the analysis of both the molding and extrusion process.  
The first column on the left sums-up the basic data of virgin PTFE G400, in order to compare with the values of the different compounds.

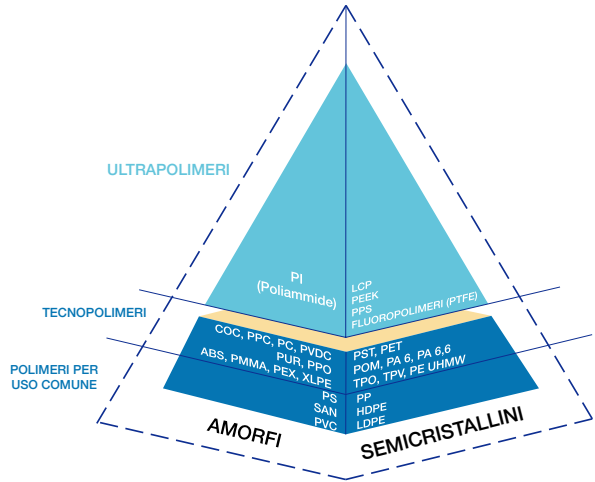
Property	Test method	Unit	Virgin	G Standard Compounds					
			G400 VIRGIN PTFE	G403 15% GLASS FIBER	G405 25% GLASS FIBER	G412 15% GRAPHITE	G415 25% SOFT CARBON	G453 25% CARBOGRAPHITE	G458 60% BRONZE 2% CARBON
MOULDED									
Specific gravity	ASTM D792	g/cm³	2.14 - 2.18	2.19 - 2.22	2.23 - 2.25	2.10 - 2.15	2.05 - 2.11	2.05 - 2.11	3.80 - 3.90
Coefficient of linear thermal expansion	ASTM D696	1/°C • 10 <sup>-5</sup>	12 - 13	11 - 13	7.5 - 11	12 - 13	12 - 13	10 - 12	8 - 9
Hardness Shore D	ASTM D2240	Punti/ Points	≥ 58	60 - 65	62 - 67	55 - 60	60 - 65	62 - 67	65 - 70
Tensile strength	ASTM D4894 ASTM D4745	N/mm²	≥ 24	17 - 24	14 - 21	15 - 20	15 - 20	14 - 18	17 - 23
Elongation at break	ASTM D4894 ASTM D4745	%	≥ 250	250 - 300	230 - 270	170 - 250	150 - 200	70 - 120	100 - 160
Compressive strength at 1% deformation	ASTM D695	N/mm²	4 - 5	6 - 7	8 - 9	6.5 - 7.5	7 - 9	7 - 9	10 - 11
Deformation under load (24 h 13.7 N/mm² 23°C)	ASTM D621	%	14 - 17	10 - 14	7 - 10	8 - 10.5	4.5 - 6.5	5 - 6	5 - 6
Permanent deformation (as above, after 24-h relaxation)	ASTM D621	%	7 - 9	6 - 7	4 - 6.5	4 - 6	2.5 - 4	2.5 - 4	1.5 - 2.5
Kinetic coefficient of friction	ASTM D1894	/	0.06	0.12	0.13	0.07	0.13	0.11	0.13
Wear factor at PV 100	ASTM D3702	$\frac{\text{cm}^3 \cdot \text{min} \cdot 10^{-8}}{\text{Kg} \cdot \text{m} \cdot \text{h}}$	2900	10 - 20	10 - 15	60	20 - 30	16 - 20	10
EXTRUDED									
Specific gravity	ASTM D792	g/cm³	2.14 - 2.18	2.18 - 2.21	2.22 - 2.24	2.09 - 2.14	2.04 - 2.10	2.04 - 2.10	3.80 - 3.88
Hardness Shore D	ASTM D2240	Punti/ Points	51 - 60	60 - 65	62 - 67	55 - 60	60 - 65	62 - 67	65 - 70
Tensile strength	ASTM D4894	N/mm²	≥ 20	≥ 15	≥ 13	≥ 14	≥ 14	≥ 12	≥ 13
Elongation at break	ASTM D4745	%	≥ 200	≥ 200	≥ 180	≥ 70	≥ 100	≥ 50	≥ 80

All IPM compounded PTFE products can be processed as skived sheets and tapes, Molded sheets, extruded or Molded tubes and rods, finished products, etc.  
All IPM semi finished and finished products in compounded PTFE grades can be supplied fully or partially etched.

PTFE SPECIAL COMPOUNDS

Special “G” compounds compliment the series of standard “G” compounds.  
Although these products are not widespread in the market, they provide solutions that standard compounds will not permit.  
Special compounds, designed to meet the specific requirements of the application, are gained using the expertise of IPM R&D team.  
The associated table illustrates the properties of some special “G” compounds by IPM. They represent only a small number of the compounds available among the range of solutions IPM is able to suggest.  
**Some of IPM compounds include fillers like PEEK, PPS, polyimide, LCP, molybdenum disulphide, etc.**

Property	Test method	Unit	G Special Compounds						
			G416 40% BRONZE 2% CARBON	G418 15% GLASS FIBER 5% MOS2	G420 50% STEEL	G427 40% BRONZE 5% MOS2	G436 3% MOS2	G455 35% CARBOGRAPHITE	G456 25% HARD CARBON
MOULDED									
Specific gravity	ASTM D792	g/cm³	3.05 - 3.12	2.20 - 2.30	3.25 - 3.35	3.15 - 3.25	2.19 - 2.24	1.90 - 2.00	2.05 - 2.11
Coefficient of linear thermal expansion	ASTM D696	1°C • 10 <sup>-5</sup>	10 - 11.5	9 - 12	10 - 12	9 - 12	11 - 12	6.5 - 10	8 - 11
Hardness Shore D	ASTM D2240	Punti Points	62 - 67	55 - 60	65 - 70	60 - 67	50 - 55	65 - 70	65 - 70
Tensile strength	ASTM D4745	N/mm²	23 - 28	15 - 20	17 - 23	23 - 28	23 - 28	8 - 13	12 - 16
Elongation at break	ASTM D4745	%	200 - 250	220 - 270	180 - 230	200 - 250	230 - 280	40 - 70	70 - 110
Compressive strength at 1% deformation	ASTM D695	N/mm²	7 - 9	8.5 - 9	10 - 10.5	6.5 - 8	5.5 - 6.5	12 - 13.5	7 - 11
Deformation under load (24 h 13.7 N/mm² 23°C)	ASTM D621	%	8 - 11	7 - 8	5.5 - 6.5	6.5 - 7.5	13 - 14	4 - 6	4 - 5.5
Permanent deformation (as above, after 24-h relaxation)	ASTM D621	%	3 - 5	3 - 4	2 - 3	3 - 3,5	5 - 6	1.2 - 1.4	1.4 - 1.9
Kinetic coefficient of friction	ASTM D1894	/	0.13	0.08	0.13	0.13	0.08	0.12	0.12
Wear factor at PV 100	ASTM D3702	$\frac{\text{cm}^3 \cdot \text{min} \cdot 10^{-8}}{\text{Kg} \cdot \text{m} \cdot \text{h}}$	9 - 13	10 - 20	20 - 30	10 - 15	3.000	20 - 30	12 - 18



All IPM compounded PTFE products can be processed as skived sheets and tapes, Molded sheets, extruded or Molded tubes and rods, finished products, etc.  
All IPM semi finished and finished products in compounded PTFE grades can be supplied fully or partially etched.

FEP

Fluorinated thermoplastic material with excellent thermal, electrical and chemical inertness properties. Widely used for different industrial applications for its excellent chemical resistance up to 200° C. The most common format being, skived film, it can be used as non-stick material in the compression molding processes, or melting material between fluorinated resins.

MAIN PROPERTIES

Properties	Unit	Method	Value
Physical - Mechanical			
Density	g/cm³	ASTM D792	2.14 - 2.17
Hardness Shore D	points	ASTM D2240	57 - 62
Tensile strength	Mpa	ASTM D638	≥ 25
Elongation at break	%	ASTM D638	≥ 350
Thermal			
Melting point	°C	/	260 - 270
Thermal expansion coeficient (linear) 25 - 100°C	10 <sup>-5</sup> /°C	ASTM D696	8 - 10
Service Temperature	°C	/	-200 / +205
Thermal conductivity	W/mK	ASTM D177	0.24
Electrical			
Dielectric strength	KV/mm	ASTM D149	20 - 30

PFA

Fluorinated thermoplastic material, offers the advantages of being thermo-processed whilst at the same time having the properties of PTFE, with excellent chemical and mechanical resistance for applications up to 260°C. Thanks to its fluidity during the processing, the final products in PFA – especially the skived film - are absolutely porous-free, hence very suitable for electrical applications.

MAIN PROPERTIES

Properties	Unit	Method	Value
Physical - Mechanical			
Density	g/cm³	ASTM D792	2.12 - 2.17
Hardness Shore D	points	ASTM D2240	55 - 60
Tensile strength	Mpa	ASTM D638	≥ 30
Elongation at break	%	ASTM D638	≥ 380
Flexural Modulus	Mpa	ASTM D790	600
Thermal			
Melting point	°C	/	300 - 310
Thermal expansion coeficient (linear) 25 - 100°C	10 <sup>-5</sup> /°C	ASTM D696	12 - 20
Service Temperature	°C	/	-200 / +260
Thermal conductivity	W/mK	ASTM D177	0.24
Electrical			
Dielectric strength	KV/mm	ASTM D149	30 - 40

MFA

It's a semi-crystalline fully-fluorinated melt processable fluoropolymer which offer the highest temperature rating and broadest chemical resistance of all melt processable fluoropolymers. It is an ideal choice for extreme thermal and chemical environments. MFA exhibits the outstanding thermal behaviour and chemical resistance found in PTFE, PFA and FEP. In addition, parts made with MFA have been shown to have smooth finished surfaces. This makes MFA a good candidate for the semiconductor, electronics and biologic applications.

MAIN PROPERTIES

Properties	Unit	Method	Value
Physical - Mechanical			
Density	g/cm³	ASTM D792	2.12 - 2.17
Hardness Shore D	points	ASTM D2240	55 - 60
Tensile strength	Mpa	ASTM D638	≥ 25
Elongation at break	%	ASTM D638	≥ 300
Flexural Modulus	Mpa	ASTM D790	600
Thermal			
Melting point	°C	/	280 - 290
Thermal expansion coeficient (linear) 25 - 100°C	10 <sup>-5</sup> /°C	ASTM D696	12 - 20
Service Temperature	°C	/	-200 / +250
Thermal conductivity	W/mK	ASTM D177	0.24
Electrical			
Dielectric strength	KV/mm	ASTM D149	30 - 40





ETCHING TECHNOLOGY

The etching process consists in a chemical surface treatment on virgin or filled PTFE. It allows PTFE to be glued on to surfaces of various materials, such as rubber, metal, plastics, etc. Some of the most common applications are for the tank lining where chemical agents must be stored, machine tool sliding surfaces, coupling with other materials for finished parts, etc.

IPM owns the most updated technologies devoted to the etching process on semifinished (sheets, tapes, tubes, bars) and finished PTFE products, virgin or compounded. The etching process of IPM is capable of providing uniformly reactive surfaces.

**Sheets and skived tapes, etched on one or two sides, are available in the following standard sizes:**

**Sheets**  
Thickness: min. mm. 1,5 - max. mm. 100  
Sizes (mm.): 600 x 600  
1000 x 1000  
1200 x 1200  
1500 x 1500

**Skived tapes**  
Thickness: min. mm. 0,020 - max. mm. 4  
Width: min. mm. 300 - max. mm. 1500

**Finished products**  
Rings, bushes, parts and other designed products can be etched – according to the end use – partially or on the total surface.



QUALITY OF ETCHING

GUARNIFLON can guarantee the quality of etching by the control of process parameters and by evaluating the extent of etching itself through a wettability test (Contact Angle Method), and an adhesion test (ref. ASTM D903).

CONTACT ANGLE METHOD

It is based on the measure of the angle between the tangent to a distilled water drop and the PTFE surface (ie, the contact angle).

In Figure 1 two examples of contact angle are illustrated - on unetched surface (poor wetting) and on etched surface (good wetting), respectively.

The relationship in terms of performance between contact angle and etching is shown in Figure 2.

Contact angle and surface energy of etched PTFE are related by the following formula:

$$Es = 72 + \frac{\cos \varphi - 1}{0,025}$$

where:  
Es = surface energy (dynes/cm)  
 $\varphi$  = contact angle (degrees)

The graph in Figure 3 shows contact angle vs. surface energy.

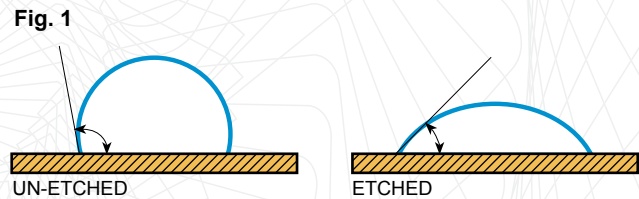
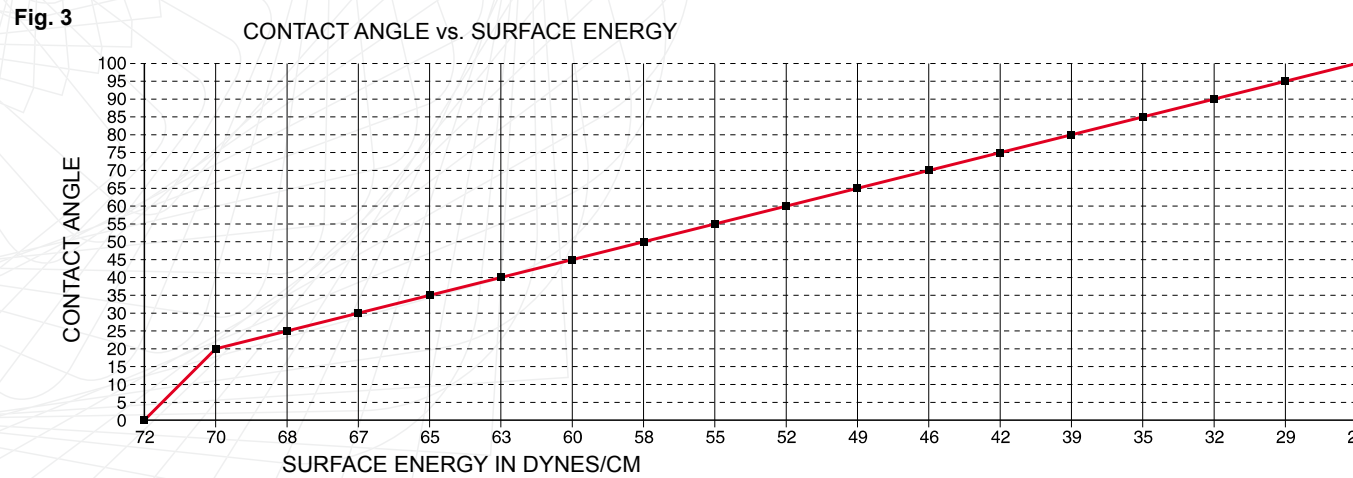


Fig. 2

Contact Angle	Degree of Etching
20° - 45°	excellent
46° - 60°	fair
>60°	poor





# PRODUCTS

- **TUBES AND RODS**
- **SHEETS**
- **SKIVED FILMS**
- **BEARING TAPES - WEAR STRIPS**
- **DIMPLED SHEETS - DISCS**
- **FINISHED PRODUCTS**
- **BACK-UP RINGS**
- **O-RINGS**
- **CALFILM SERIES**
- **SC SERIES**



## **TUBES AND RODS**

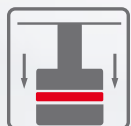
An extensive range of sizes are available to satisfy customers' requirements for both molded and extruded products. In addition to virgin PTFE tubes and rods, standard or special compound products are also available.

According to customers' needs, IPM can suggest the most suitable solutions concerning available technologies, materials and dimensions.

In order to grant a fast and efficient service to its customers, IPM stocks a wide range of molded and extruded tubes and rods, in virgin PTFE as well as compounded.



**EXTRUDED**



**Molded**



EXTRUDED RODS

Diameter - Inc. "	Tolerance - Inc."	Lenght - Ft
0.125 (1/8")	+ 0.002	6' - 12'
0.156 (5/32")		
0.187 (3/16")		
0.218 (7/32")		
0.250 (1/4")		
0.260	+ 0.003	
0.281 (9/32")	+ 0.002	
0.312 (5/16")		
0.343 (11/32")		
0.375 (3/8")		
0.437 (7/16")		
0.500 (1/2")	+ 0.004	
0.562 (9/16")		
0.625 (5/8")		
0.687 (11/16")		
0.750 (3/4")		
0.812 (13/16")	+ 0.010	
0.875 (7/8")		
0.937 (15/16")		
1		
1.125 (1-1/8")		
1.187 (1-13/16")	+ 0.102	
1.250 (1-1/4")		
1.375 (1-3/8")		
1.500 (1-1/2")		
1.625 (1-5/8")	+ 0.110	
1.750 (1-3/4")		
1.875 (1-7/8")		
2		
2.125 (2-1/8")		
2.250 (2-1/4")	+ 0.126	
2.375 (2-3/8")		
2.500 (2-1/2")		
2.625 (2-5/8")		
2.750 (2-3/4")		
2.875 (2-7/8")	+ 0.142	
3		
3.125 (3-1/8")		
3.250 (3-1/4")		
3.500 (3-1/2")	+ 0.157	
3.750 (3-3/4")		
4		
4.250 (4-1/4")		
4.500 (4-1/2")		
4.750 (4-3/4")	+ 0.157	
5		
5.500 (5-1/2")		
6		
7		



EXTRUDED TUBES

ø Outside - Inc. "	Tol. - Inc. "	ø Inside - Inc. "	Tol. - Inc. "	Lenght - Ft		
0.393	+0.03937 -0	0.157 - 0.196	+0 -3.937	6' – 12'		
0.472		0.157 - 0.196 - 0.236 - 0.275 - 0.314				
0.551		0.157 - 0.196 - 0.236 - 0.275 - 0.314 - 0.354				
0.590		0.157 - 0.196 - 0.236 - 0.275 - 0.314 - 0.354 - 0.393				
0.629		0.196 - 0.236 - 0.275 - 0.314 - 0.354 - 0.393				
0.669		0.196 - 0.236 - 0.275 - 0.314 - 0.354 - 0.393 - 0.433				
0.708		0.196 - 0.236 - 0.275 - 0.314 - 0.354 - 0.393 - 0.433 - 0.472				
0.748		0.236 - 0.275 - 0.314 - 0.354 - 0.393 - 0.433 - 0.472 - 0.511				
0.787		0.236 - 0.275 - 0.314 - 0.354 - 0.393 - 0.433 - 0.472 - 0.511 - 0.551 - 0.590				
0.826		0.236 - 0.275 - 0.314 - 0.354 - 0.393 - 0.433 - 0.472 - 0.511 - 0.551 - 0.590				
0.866		0.236 - 0.275 - 0.314 - 0.354 - 0.393 - 0.433 - 0.472 - 0.511 - 0.551 - 0.590				
0.905		0.314 - 0.354 - 0.393 - 0.433 - 0.472 - 0.511 - 0.551 - 0.590 - 0.629				
0.944		0.314 - 0.354 - 0.393 - 0.433 - 0.472 - 0.511 - 0.551 - 0.590 - 0.629 - 0.669				
0.984		0.354 - 0.393 - 0.433 - 0.472 - 0.551 - 0.590 - 0.629 - 0.669 - 0.708				
1.023		0.393 - 0.433 - 0.511 - 0.511 - 0.590 - 0.629 - 0.669 - 0.708 - 0.748				
1.102	0.472 - 0.511 - 0.590 - 0.629 - 0.669 - 0.708 - 0.748 - 0.787 - 0.866					
1.181	+0.05905 -0	0.354 - 0.393 - 0.511 - 0.748 - 0.787 - 0.826 - 0.866 - 0.944	+0 -5.905			
1.220		0.511 - 0.590 - 0.708 - 0.787 - 0.866 - 0.944				
1.259		0.590 - 0.708 - 0.748 - 0.787 - 0.866 - 0.944 - 0.984				
1.338		0.590 - 0.669 - 0.748 - 0.787 - 0.866 - 0.944 - 0.984				
1.377		0.393 - 0.590 - 0.708 - 0.748 - 0.787 - 0.866 - 0.944 - 0.984 - 1.023				
1.456	+0.07874 -0	0.590 - 0.669 - 0.708 - 0.787 - 0.866 - 0.944 - 0.984 - 1.023 - 1.102 - 1.181	+0 -7.874			
1.496		0.590 - 0.787 - 0.826 - 0.866 - 0.984 - 1.062 - 1.102 - 1.181 - 1.220				
1.614		0.590 - 0.787 - 0.984 - 1.023 - 1.102 - 1.181 - 1.259 - 1.299				
1.653		0.393 - 0.590 - 0.629 - 0.787 - 0.984 - 1.023 - 1.181 - 1.259 - 1.299 - 1.377				
1.771		0.590 - 0.787 - 0.984 - 1.023 - 1.102 - 1.181 - 1.259 - 1.299 - 1.377 - 1.496				
1.850		0.787 - 0.984 - 1.181 - 1.259 - 1.299 - 1.338 - 1.377 - 1.496				
1.968		0.787 - 0.984 - 1.181 - 1.259 - 1.377 - 1.417 - 1.535 - 1.574				
2.047		1.181 - 1.377 - 1.496 - 1.574 - 1.614 - 1.653				
2.165		0.787 - 0.984 - 1.102 - 1.181 - 1.259 - 1.377 - 1.496 - 1.535 - 1.614 - 1.653 - 1.771				
2.283		0.984 - 1.220 - 1.496 - 1.771 - 1.850 - 1.889 - 1.929 - 1.968				
2.362		1.377 - 1.574 - 1.771 - 1.811 - 1.850 - 1.929 - 1.968 - 2.007 - 2.125				
2.440		1.377 - 1.496 - 1.614 - 1.732 - 1.968 - 2.047 - 2.165				
2.480		1.574 - 1.732 - 1.771 - 2.007 - 2.047 - 2.165				
2.559		1.181 - 1.574 - 1.771 - 1.889 - 2.007 - 2.165				
2.677		2.047 - 2.165 - 2.283 - 2.362				
2.755	1.574 - 1.771 - 1.968 - 2.165 - 2.362 - 2.559					
2.834	+0.00118 -0	1.968 - 2.165 - 2.283 - 2.362 - 2.440	+0 -0.118			
2.952		1.968 - 2.362 - 2.440 - 2.559 - 2.637 - 2.755				
3.070		2.283 - 2.440 - 2.519 - 2.598 - 2.637 - 2.834				
3.149		1.968 - 2.362 - 2.440 - 2.559 - 2.755 - 2.952				
3.346		2.362 - 2.559 - 2.755 - 2.952 - 3.149				
3.543		2.755 - 2.952 - 3.149				
3.661		2.952 - 3.149 - 3.346				
3.740		2.952 - 3.149 - 3.346				
3.937		2.952 - 3.149 - 3.346 - 3.543				
4.133		+0.00157 -0			3.149 - 3.543 - 3.740 - 3.937	+0 -0.157
4.330					3.543 - 3.740 - 3.937	
4.527					3.543 - 3.74 - 3.937 - 4.330	
4.724					3.740 - 3.937 - 4.33	
4.921					3.543 - 3.937 - 4.33 - 4.527 - 4.724	
5.1183					.937 - 4.527 - 4.724 - 4.921 - 5.118	
5.314	4.724 - 4.921					
5.108	4.921 - 5.314 - 5.511					
5.905	4.921 - 5.511 - 5.708					
6.496	5.708 - 5.905					



A close-up photograph of several white PVC pipes of different diameters. A small red pipe is also visible, partially obscured by the larger white pipes. The pipes are arranged in a way that shows their hollow interiors and smooth, slightly textured exteriors. The background is a plain, light-colored surface.



Molded RODS

Mold OD	Mold ID	Length
9,25	2 - 2.25 - 2.375 - 2.5 - 2.625 - 2.75 - 3 - 3.125 - 3.25 - 3.625 - 3.75 - 3.875 - 4 - 4.25 - 4.375 - 4.5 - 4.625 - 5 - 5.25 - 5.5	6.25 - 6.5 - 6.75 - 7 - 7.5
9,5	2 - 2.25 - 2.375 - 2.5 - 2.625 - 2.75 - 3 - 3.125 - 3.25 - 3.625 - 3.75 - 3.875 - 4 - 4.25 - 4.375 - 4.5 - 4.625 - 5 - 5.25 - 5.5	6.25 - 6.5 - 6.75 - 7 - 7.5
9,75	3.25 - 3.625 - 3.75 - 3.875 - 4 - 4.25 - 4.375 - 4.5 - 4.625 - 5 - 5.25 - 5.5 - 6.25 - 6.5 - 6.75 - 7 - 7.5 - 8.5	
10	5 - 5.25 - 5.5 - 6.25 - 6.5 - 6.75 - 7 - 7.5 - 8.5	
10,5	3 - 3.125 - 3.25 - 3.625 - 3.75 - 3.875 - 4 - 4.25 - 4.375 - 4.5 - 4.625 - 5 - 5.25 - 5.5 - 6.25 - 6.5 - 6.75 - 7 - 7.5 - 8.5	
10,75	4 - 4.25 - 4.375 - 4.5 - 4.625 - 5 - 5.25 - 5.5 - 6.25 - 6.5 - 6.75 - 7 - 7.5 - 8.5	
11	2.5 - 2.625 - 2.75 - 3 - 3.125 - 3.25 - 3.625 - 3.75 - 3.875 - 4 - 4.25 - 4.375 - 4.5 - 4.625 - 5 - 5.25 - 5.5 - 6.25 - 6.5 - 6.75	7 - 7.5 - 8.5 - 9.5
11,25	4 - 4.25 - 4.375 - 4.5 - 4.625 - 5 - 5.25 - 5.5 - 6.25 - 6.5 - 6.75 - 7 - 7.5 - 8.5 - 9.5 - 10	
11,5	4 - 4.25 - 4.375 - 4.5 - 4.625 - 5 - 5.25 - 5.5 - 6.25 - 6.5 - 6.75 - 7 - 7.5 - 8.5 - 9.5 - 10	
11,75	4 - 4.25 - 4.375 - 4.5 - 4.625 - 5 - 5.25 - 5.5 - 6.25 - 6.5 - 6.75 - 7 - 7.5 - 8.5 - 9.5 - 10 - 10.5	
12,375	4.25 - 4.375 - 4.5 - 4.625 - 5 - 5.25 - 5.5 - 6.25 - 6.5 - 6.75 - 7 - 7.5 - 8.5 - 9.5 - 10 - 10.5	
12,625	3 - 3.125 - 3.35 - 3.625 - 3.75 - 3.875 - 4 - 4.25 - 4.375 - 4.5 - 4.625 - 5 - 5.25 - 5.5 - 6.25 - 6.5 - 6.75 - 7 - 7.5 - 8.5 - 9.5	10 - 10.5
13,25	4 - 4.25 - 4.375 - 4.5 - 4.625 - 5 - 5.25 - 5.5 - 6.25 - 6.5 - 6.75 - 7 - 7.5 - 8.5 - 9.5 - 10 - 10.5	
13,75	6.5 - 6.75 - 7 - 7.5 - 8.5 - 9.5 - 10 - 10.5	
14	4 - 4.25 - 4.375 - 4.5 - 4.625 - 5 - 5.25 - 5.5 - 6.25 - 6.5 - 6.75 - 7 - 7.5 - 8.5 - 9.5 - 10 - 10.5	
15	5.25 - 5.5 - 6.25 - 6.5 - 6.75 - 7 - 7.5 - 8.5 - 9.5 - 10 - 10.5	
18	6.5 - 6.75 - 7 - 7.5 - 8.5 - 9.5 - 10 - 10.5 - 13	
19		
20		
21	18	
27	18	
29,5	18	
33		
35,375		
43		







# Molded AND SKIVED SHEETS

Technologies available at IPM provide options among a wide range of molded or skived sheets, in virgin PTFE as well as compounded PTFE.

According to customers' needs, IPM can suggest the most suitable solutions concerning available technologies, materials and dimensions.

In order to grant a fast and efficient service to its customers, IPM stocks a wide range of molded and extruded sheets, in different thickness and dimensions.

Etching process available on 1 or 2 sides.

## Molded SHEETS

Thickness Inc. "	Tolerance Inc. "	Size Inc"	Tolerance Inc"
0.187" (3/16")	+ 0.050"	48" x 48"	( +1,57",-0)
0.250" (1/4")	+ 0.050"		
0.375" (3/8")	+ 0.059"		
0.500" (1/2")	+ 0.075"		
0.625" (5/8")	+ 0.094"		
0.750" (3/4")	+ 0.112"		
0.875" (7/8")	+ 0.115"		
1.000"	+ 0.115"		
1.250" (1-1/4")	+ 0.118"		
1.500" (1-1/2")	+ 0.118"		
1.625" (1-5/8")	+ 0.118"		
1.750" (1-3/4")	+ 0.118"		
1.875" (1-7/8")	+ 0.118"		
2.000"	+ 0.118"		
2.250" (2-1/4")	+ 0.118"	48" x 48" - 36"x36"	
2.500" (2-1/2")	+ 0.118"		
2.750" (2-3/4")	+ 0.118"		
3.000"	+ 0.118"		
3.500" (3-1/2")	+ 0.197"	48" x 48"	
4.000" (3-1/2")	+ 0.197"		

## SKIVED SHEETS

Tickness Inc. "	Tolerance Inc. "	Size Inc"	Tolerance Inc"
0.031" (1/32")	+ 0.0012"	48"x48" 36"x36" 60"x60"	(+1,57",0")
0.062" (1/16")	+ 0.0039"		
0.093" (3/32")	+ 0.0079"		
0.125" (1/8")	+ 0.0120"		
0.187" (3/16")	+ 0.0160"		
0.250" (1/4")	+ 0.0200"		

SKIVED FILM

If you need to skive very thin thickness and/or special compound, only the most updated technologies, the most selected raw materials and a skilful know-how can grant excellent and stable quality.

IPM have all of the above capabilities and presently able to offer very high quality products starting from the thickness of 0,025 mm. Some of IPM tapes applications are for the aerospace or electronics, a technological reference for quality and reliability.

IPM tapes are available in virgin PTFE or filled by bronze, carbon, glass fiber and other special materials, able to cover a very wide range of different industrial applications.

Etching process available on 1 or 2 sides.

Skived Film G400

Thickness Inc. "	Tolerance Inc. "	Width Inc"
0.002"	+ 0.0004"	From 0.5" up to 60" wide
0.003"		
0.004"		
0.005"		
0.008"	+ 0.0007"	
0.010"	+ 0.0008"	
0.015"	+ 0.0012"	
0.020"	+ 0.0013"	
0.025"	+ 0.0014"	
0.031" (1/32")	+ 0.0015"	
0.062" (1/16")	+ 0.0039"	
0.093" (3/32")	+ 0.0079"	
0.125" (1/8")	+ 0.0120"	
0.187" (3/16")	+ 0.0160"	
0.250" (1/4")	+ 0.0200"	

Skived Film G200

Thickness Inc. "	Tolerance Inc. "	Width Inc"
0.025"	+ 0.0014"	From 0.5" up to 60" wide
0.031" (1/32")	+ 0.0015"	
0.062" (1/16")	+ 0.0039"	
0.093" (3/32")	+ 0.0079"	
0.125" (1/8")	+ 0.0120"	
0.187" (3/16")	+ 0.0160"	
0.250" (1/4")	+ 0.0200"	



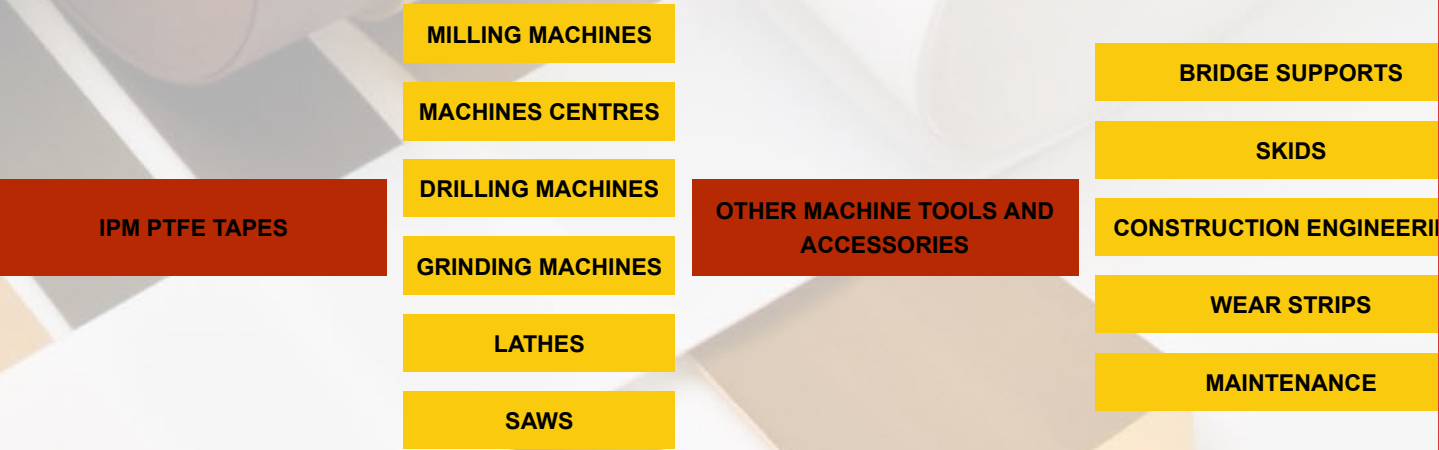
# COMPOUNDED PTFE SKIVED FILM ETCHED AND UNETCHED

Directly from IPM R&D Department, these materials are recognised worldwide for their quality and high performance. The very special fillers and the technologies used to process etched compounded tapes, enhance the following properties:

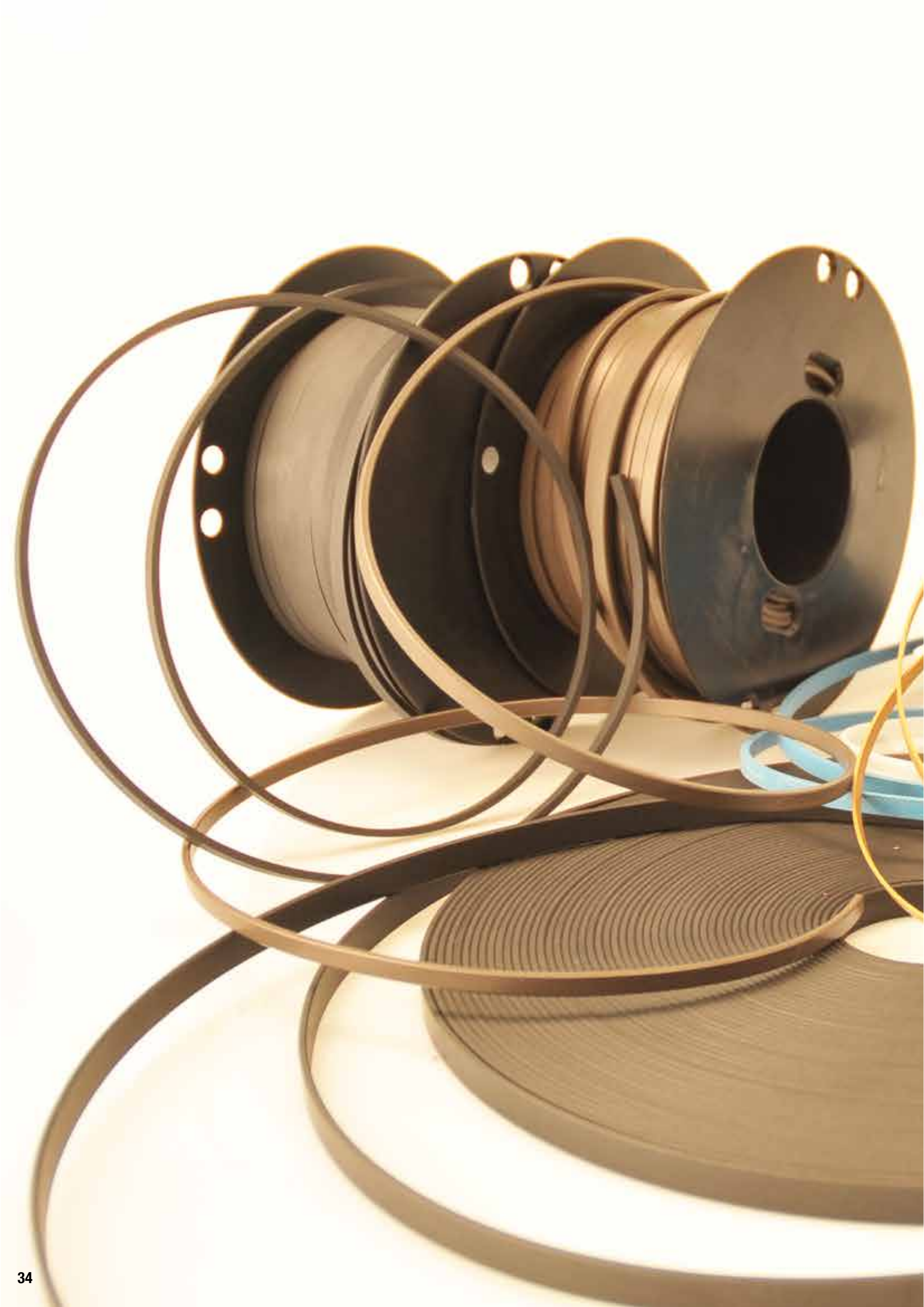
- low friction coefficient
- hardness and wear strength
- extremely high service temperature
- high resistance under pressure
- extreme longevity therefore resulting in low operating costs

Thanks to the etching treatment, IPM tapes can be adhered to plastic, metal, rubber surfaces, widening the range of potential applications.

A chart of the most common applications is displayed on the following page







## BEARING TAPES – WEAR STRIPS

For the heaviest applications in the hydraulic field, motion control and mechanical field, IPM developed a new family of products, made by special PTFE compounds and devoted technologies, in order to fulfil IPM customers requirements.

Compounded PTFE materials with bronze, carbon, graphite or other fillers are designed to enhance properties such as:

- wear resistance
- coefficient of friction
- compression strength

**Thickness from mm. 1,5 to mm. 4 Width from mm. 4 to mm. 300 Available:**

- with sharp edges
- with chamfers on 2 or 4 angles
- knurled on 1 or 2 sides
- etched on 1 or 2 sides

Width mm.

4
5
5,4
5,5
6
6,1
7
7,9
8
9
9,5
9,8
11
11,5
12
12,5
13
14
14,5
15
16
16,5
18
19,5
20
21,5
22
24
24,5
25
27
27,5
28
29,5
30
30,5
31,5
32
34
34,5
35
38
40
45
50

Thickness mm.

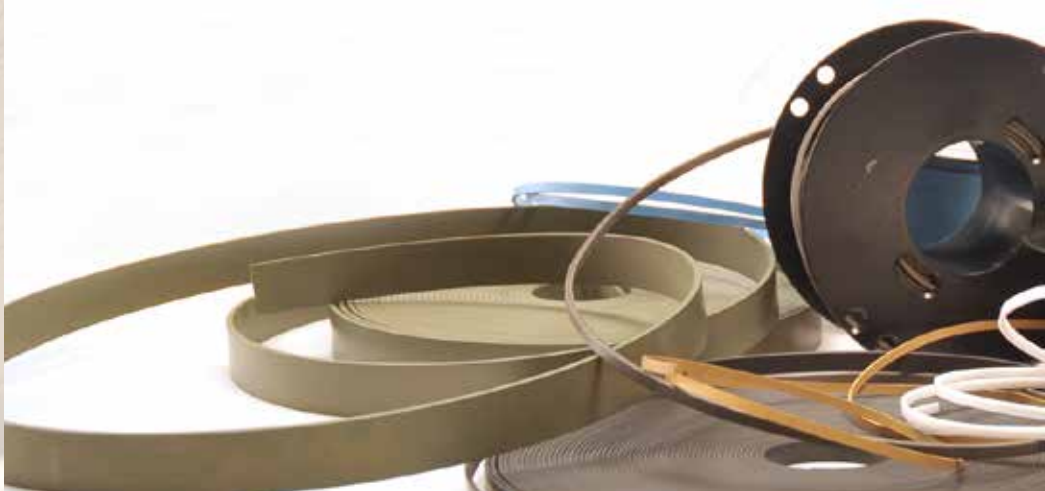
1,50 - 1,55
2,00 - 2,50
3,00 - 3,50
4,00

Rolls lenght

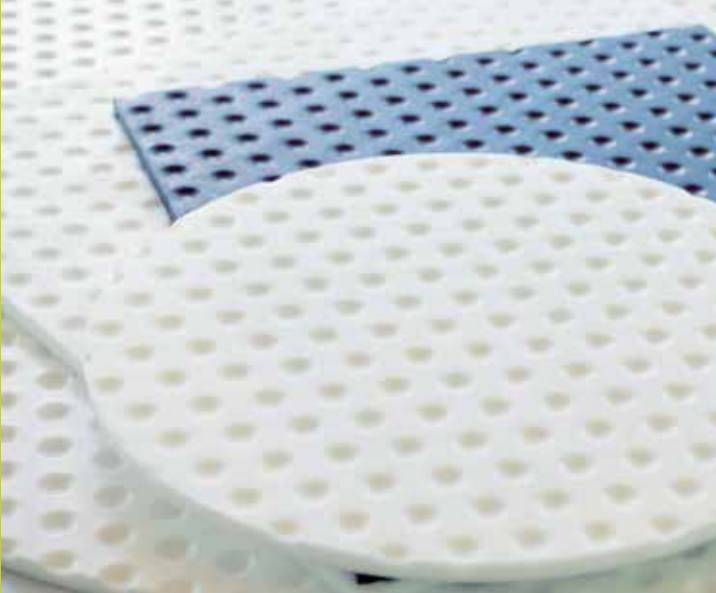
Thickness mm.	Length (ft)
1,5	115
1,55	115
2	82
2,5	66
3	53
3,5	92
4	79

Tolerance standard

from 3,00 to 40,00 mm.	± 0,10 mm.
from 40,01 to 50,00 mm.	± 0,20 mm.
Thickness	
from 1,00 to 4,00 mm.	+ 0/-0,05 mm
from 4,01 to 5,00 mm.	± 0,05 mm.







## DIMPLED SHEETS AND DISCS

Virgin PTFE or compounded PTFE dimpled sheets. Thanks to the special surface, the above dimpled sheets are generally used in the engineering and construction field.

Dimpled sheets are the perfect solution to thermal expansion and load problems usually connected with structural elements.

One of the most common applications for dimpled sheets is the insertion between 2 movable elements (i.e. bridges), working as a self lubricating system exempt from any need of maintenance.

Due to their special and heavy applications, not only **the process technology is certified by IPM, but also the type of raw materials used**. IPM dimpled sheets are processed in accordance with the **international standard EN 1337-2**.

**Etching process available.**  
**Available sizes on stock**  
mm. 1000 x 1000 thickness mm. 4,5  
mm. 1000 x 1000 thickness mm. 5,0  
mm. 1000 x 1000 thickness mm. 5,5  
mm. 1200 x 1200 thickness mm. 5,0  
mm. 1200 x 1200 thickness mm. 5,5  
mm. 1200 x 1200 thickness mm. 6,0

Customized dimensions and shapes on request.

## FINISHED PRODUCTS

A wide range of finished products are processed on CNC machines / automatic lathes. To ensure high and stable quality standards, IPM is running the electronic system S.P.C. (Statistical Process Control).

More than 40 million pieces machined every month, delivered all over the world and for a range of applications.

Virgin PTFE or compounded PTFE materials can be machined and fully or partially etched.

- globe valves seats
- piston rings
- hydraulic seals
- snap rings
- to customer drawing
- O-Rings/Back-up Rings









The PTFE Back-Up Ring Technology

If you need to prevent extrusion in Rubber O-Ring sealing systems, a PTFE Back-Up ring is the right solution.

Rubber O-Rings are generally used in dynamic and static hydraulic and pneumatic applications but tend to wear when subject to increasing temperatures and pressures.

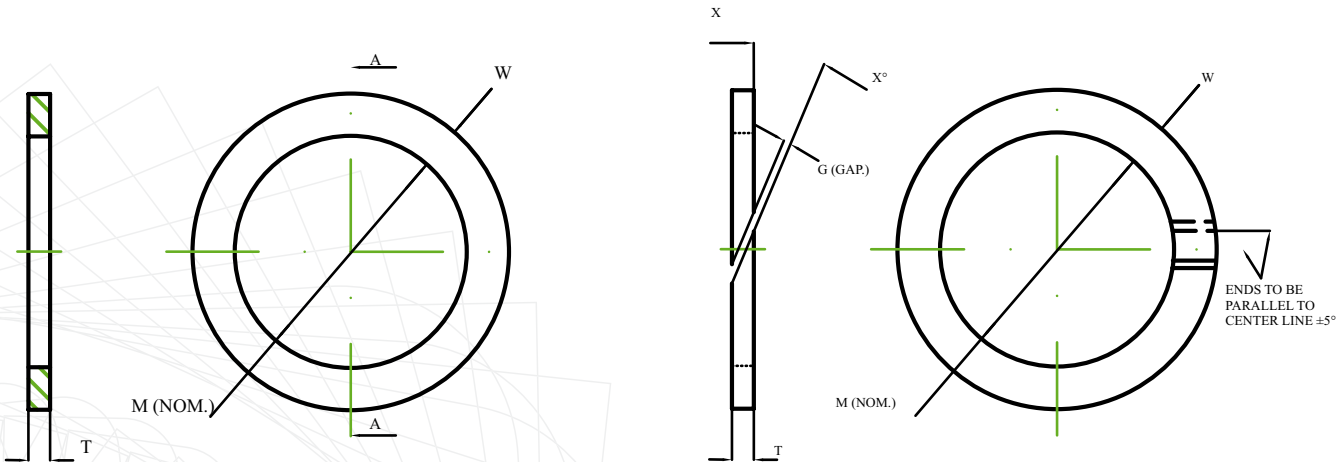
The current fluid system technology combines moreand more high pressures with high temperatures. A combination, which is a strong burden to Rubber O-Rings' physical and mechanical properties. This explains why a PTFE Back-Up Ring is so important in preventing the O-Ring extrusion.

The PTFE Back-Up Ring improving solution

To put more emphasis on the role of PTFE Back-Up Rings, IPM offers a wide range of Virgin PTFE grade Back-Up Standard list (material according to standard AS8791A).

PTFE Back-Up Ring Configurations

- There are basic types of Back-Up Rings in use:
- Cut - MS28774
  - Solid - MS27595



PTFE Back-Up Rings standard sizes

BACK-UP RING		OD mm (Outside Dia.)	ID mm (Inside Dia.)	T mm (Wall Thick.)	W mm (Wall Thick.)
SOLID	CUT	6,00	3,80 *	1,00	1,10
		8,00	5,80 *	1,00	1,10
		10,00	7,80 *	1,00	1,10
		22,00	19,00 *	1,40	1,50
		22,00	19,40 *	1,40	1,30
		25,00	22,00 *	1,40	1,50
		25,00	22,40 *	1,40	1,30
		40,00	35,40 *	1,40	2,30
		40,00	36,00 *	1,40	2,00
		42,00	37,40 *	1,40	2,30
		42,00	38,00 *	1,40	2,00
		45,00	40,40 *	1,40	2,30
		45,00	41,00 *	1,40	2,00
SOLID	CUT	6,20 **	4,00	1,40	1,10
		6,60 **	4,00	1,40	1,30
		7,20 **	5,00	1,40	1,10
		7,60 **	5,00	1,40	1,30
		8,20 **	6,00	1,40	1,10
		8,60 **	6,00	1,40	1,30
		10,60 **	8,00	1,40	1,30
		11,00 **	8,00	1,40	1,50
		12,60 **	10,00	1,40	1,30
		13,00 **	10,00	1,40	1,50
		14,60 **	12,00	1,40	1,30
		15,00 **	12,00	1,40	1,50
		16,60 **	14,00	1,40	1,30
		17,00 **	14,00	1,40	1,50
		17,60 **	15,00	1,40	1,30
		18,00 **	15,00	1,40	1,50
		18,60 **	16,00	1,40	1,30
		19,00 **	16,00	1,40	1,50
		20,60 **	18,00	1,40	1,30

\* STATIC, INTERNAL SEALING    \*\* STATIC, EXTERNAL SEALING

PTFE Back-Up Rings standard sizes

BACK-UP RING		OD mm (Outside Dia.)	ID mm (Inside Dia.)	T mm (Wall Thick.)	W mm (Wall Thick.)
SOLID	CUT	21,00 **	18,00	1,40	1,50
		22,60 **	20,00	1,40	1,30
		23,00 **	20,00	1,40	1,50
		26,00 **	22,00	1,40	2,00
		26,60 **	22,00	1,40	2,30
		29,00 **	25,00	1,40	2,00
		29,60 **	25,00	1,40	2,30
		32,00 **	28,00	1,40	2,00
		32,60 **	28,00	1,40	2,30
		34,00 **	30,00	1,40	2,00
		34,60 **	30,00	1,40	2,30
		36,00 **	32,00	1,40	2,00
		36,60 **	32,00	1,40	2,30
		39,00 **	35,00	1,40	2,00
		39,60 **	35,00	1,40	2,30
		40,00 **	36,00	1,40	2,00
		40,60 **	36,00	1,40	2,30
		45,40 **	40,00	1,40	2,70
		46,20 **	40,00	1,70	3,10
		47,40 **	42,00	1,40	2,70
		48,20 **	42,00	1,70	3,10
		50,40 **	45,00	1,40	2,70
		51,20 **	45,00	1,70	3,10
		53,40 **	48,00	1,40	2,70
		54,20 **	48,00	1,70	3,10
		55,40 **	50,00	1,40	2,70
		56,20 **	50,00	1,70	3,10
		57,40 **	52,00	1,40	2,70
		58,20 **	52,00	1,70	3,10
		60,40 **	55,00	1,40	2,70
		61,20 **	55,00	1,70	3,10
		61,40 **	56,00	1,40	2,70
		62,20 **	56,00	1,70	3,10

\*any other size not included in these lists can be custom made on demand

## ***The PTFE O-Ring Technology***

Whenever the chemical and thermal resistance of standard rubber O-Rings in static applications like static seals or flange connections is no longer sufficient, PTFE O-Ring is the solution.

PTFE O-Rings are produced following the standard dash sizes as for rubber sizes. They are circular rings with an ID and a cord diameter, which gives various advantages on the rubber O-Rings. They guarantee all the chemical and mechanical characteristics of PTFE, but have a low elasticity and during installation they can be stretched or compressed to a limited extent.

### **The PTFE O-Ring improving solution**

IPM offers a wide range of Virgin PTFE grade O-Rings standard list.

### **PTFE O-Ring Configurations**

As for rubber, even the PTFE O-Rings refer to a standard dash size list.

### **O-Ring AS568A**

To choose the right O-Ring size to use, the nominal diameter of the application (rod or bore) must always be considered.



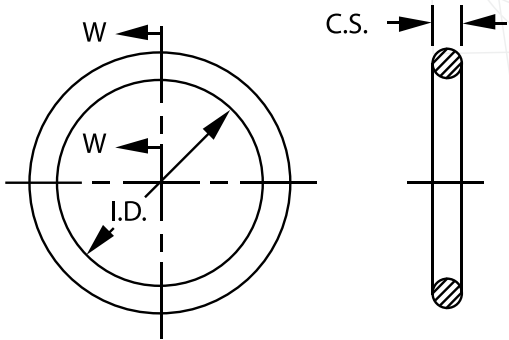
PTFE O-Rings standard sizes

DASH #	METRIC (mm)		US STANDARD	
	ID	C/S	ID	C/S
-004	1,78	1,78	.070	.070
-005	2,57		.101	
-006	2,9		.114	
-007	3,68		.145	
-008	4,47		.176	
-009	5,28		.176	
-010	6,07		.239	
-011	7,65		.301	
-012	9,25		.364	
-013	10,82		.426	
-014	12,42		.489	
-015	14		.551	
-016	15,6		.614	
-017	17,17		.676	
-018	18,77		.739	
-019	20,35		.801	
-020	21,95		.864	
-021	23,52		.926	
-022	25,12		.989	
-023	26,7		1.051	
-024	28,3		1.114	
-025	29,87		1.176	
-026	31,47		1.239	
-027	33,05		1.301	
-028	34,65		1.364	
-029	37,82		1.489	
-030	41		1.614	
-031	44,17		1.739	
-032	47,35		1.864	
-033	50,52		1.989	
-034	53,7		2.114	
-035	56,87		2.239	
-036	60,05		2.364	
-103	2,06	2,62	.081	.103
-104	2,84		.112	
-105	3,63		.143	
-106	4,42		.174	
-107	5,23		.206	
-108	6,02		.237	

DASH #	METRIC (mm)		US STANDARD	
	ID	C/S	ID	C/S
-109	7,59	2,62	.299	.103
-110	9,19		.362	
-111	10,77		.424	
-112	12,37		.487	
-113	13,94		.549	
-114	15,54		.612	
-115	17,12		.674	
-116	18,72		.737	
-117	20,3		.799	
-118	21,89		.862	
-119	23,47		.924	
-120	25,07		.97	
-121	26,64		1.049	
-122	28,24		1.112	
-123	29,82		1.174	
-124	31,42		1.237	
-125	32,99		1.299	
-126	34,59		1.362	
-127	36,17		1.424	
-128	37,77		1.487	
-129	39,34		1.549	
-130	40,94		1.612	
-131	42,52		1.674	
-132	44,12		1.737	
-133	45,69		1.799	
-134	47,3		1.862	
-135	48,9	3,53	1.925	.139
-136	50,47		1.987	
-137	52,07		2.050	
-138	53,64		2.112	
-139	55,25		2.175	
-140	56,82		2.237	
-141	58,42		2.03	
-201	4,34	3,53	.171	.139
-202	5,94		.234	
-203	7,52		.296	
-204	9,12		.359	
-205	10,69		.421	
-206	12,29		.484	

DASH #	METRIC (mm)		US STANDARD	
	ID	C/S	ID	C/S
-207	13,87	3,53	.546	.139
-208	15,47		.609	
-209	17,04		.671	
-210	18,64		.734	
-211	20,22		.796	
-212	21,82		.859	
-213	23,39		.921	
-214	25		.984	
-215	26,57		1.046	
-216	28,17		1.109	
-217	29,74		1.171	
-218	31,34		1.234	
-219	32,92		1.296	
-220	34,52		1.359	
-221	36,09		1.421	
-222	37,69		1.484	
-223	40,87		1.609	
-224	44,04		1.734	
-225	47,22		1.859	
-226	50,39		1.984	
-227	53,57		2.109	
-228	56,74		2.234	
-309	10,46	5,33	.412	.210
-310	12,07		.475	
-310	12,07		.475	
-311	13,64		.537	
-311	13,64		.537	
-312	15,24		.600	
-313	16,81		.662	
-314	18,42		.725	
-314	18,42		.725	
-315	19,99		.787	
-316	21,59		.850	
-317	23,16		.912	
-317	23,16		.912	

DASH #	METRIC (mm)		US STANDARD	
	ID	C/S	ID	C/S
-318	24,77	5,33	.975	.210
-319	26,34		1.037	
-320	27,94		1.1	
-320	27,94		1.1	
-321	29,51		1.162	
-321	29,51		1.162	
-322	31,12		1.225	
-323	32,69		1.287	
-324	34,29		1.35	
-325	37,47		1.475	
-325	37,47		1.475	
-326	40,64		1.6	
-327	43,82		1.725	
-328	46,99		1.85	
-329	50,17		1.975	
-330	53,34		2.01	
-901	4,7	1,42	.185	.056
-902	6,07	1,63	.239	.064
-903	7,65	1,63	.301	.064
-904	8,92	1,83	.351	.072
-905	10,52	2,95	.414	.116
-906	11,89		.468	
-907	13,46		.53	
-908	16,36		.644	
-909	17,93		.706	
-910	19,18		.755	
-911	21,92	2,95	.863	.116
-912	23,47		.924	
-913	25,04		.986	
-914	26,59		1.047	
-916	29,74	3	1.171	.118
-918	34,42		1.355	
-920	37,47		1.475	
-924	43,69		1.72	
-928	53,09		2.09	



\*dimensioni speciali su richiesta del cliente  
\*any other size not included in these lists can be custom made on demand



CALFILM SERIES

PTFE skived films calendered and/or ultra flat, available with adhesive coating or etched surfaces.  
CALFILM Series is grouping 4 different types of products:

- > GF – High modulus and pressure sensitive tape
- > GFI – Ultra flat film
- > GF COMPOUND – High Performance tape
- > PSA – Pressure sensitive adhesive tape

Some applications:

SEALING COATING AGAINST HIGH TEMPERATURES

Using on cylinders and to protect sensitive components against high temperatures up to 280°C

SLIDING SURFACE SHELL

The application of PTFE film on sliding surfaces shell allow to create antifriction surfaces, for a very smooth motion.

ANTICORROSIVE SHELL

Water and oil proof, IPM tapes can tolerate most chemical agents, except for organic solvents that can attack the tape adhesive coating.

PROTECTION AGAINST THE JUNK DEPOSIT

IPM tapes help to avoid the deposit of textile debris, inks, glues, pasty elements, preserving the machines from possible damages.

ELECTRICAL/ELECTRONIC FIELDS

Assembling of PCB (Printed Circuit Board), solar panels, LCD/TFT monitors, electrical cables.

Main applications from food to mechanical industries, from electronic to aerospace industries, from textile to paper mill industries.

Available in tapes and rolls.



GFCOMPOUND

GF

HIGH MODULUS & PRESSURE SENSITIVE TAPE		
THICKNESS	2 mil	0,051 mm
WIDTH	Roll: 35 in max - Tape on request	Roll: 900 mm max - Tape on request
LENGTH	35 yd	33 m
ADHESIVE	Silicone - Acrylic	

HIGH PERFORMANCE TAPE		
THICKNESS	2 mil	0,051 mm
COLOR	Blue - Orange	Blue - Orange
RELEASE PAPER	Without release paper	Without release paper
WIDTH	Roll: 25 in max - Tape on request	Roll: 635 mm max - Tape on request
LENGTH	36 yd	33 m
ADHESIVE	Silicone - Acrylic	





## GFI

ULTRA FLAT FILM		
THICKNESS	from 1 mil to 20 mil	from 0,025 mm to 0,508 mm
WIDTH	Max 60 in	Max 1500 mm
Standard & Etched		



## PSA

PRESSURE SENSITIVE ADHESIVE TAPE WITH RELEASE PAPER						
THICKNESS	5 mil	10 mil	20 mil	0,127 mm	0,254 mm	0,508 mm
WIDTH	Max 40 in			Max 1000 mm		
LENGTH *	36 yd			33 m		
ADHESIVE	Silicone - Acrylic					

\* special length according to customers' needs

## SC SERIES

### The solutions to problems of sealing

Developed by IPM R&D team, SC series is a superior and unique material for gasket (flat Sealing) applications.

The overall benefits of IPM SC series over that of both conventional PTFE and competitive PTFE/filler blends are found in the areas of environmental improvement (they are asbestos free) and overall cost saving.

Main applications in the chemical, petrochemical, pharmaceutical, food, paper industries, etc.

4 different types of products are available from SC Series, in sheets and rolls:

- SC 1100
- SC 1200
- SC 1400
- SC 1600

### Available also in stock in sheets

**mm. 1500 x 1500 - thickness mm. 1,5 – 2,0 – 3,0.**

Sheets can be delivered with printed surface under customers' order.



# SC 1100

Features

- Superior chemical resistance

Excellent resistance to deformation

No ageing

Good compressibility
- High sealability

No water absorption

Non-flammable

Easy maintenance (assembling / disassembling)

Property	Unit	Method	Value
Pressure, max	bar	/	80
Temperature, min	°C	/	-200
Temperature, max	°C	/	+260
P x T, max	bar x °C	/	12.000
Density	g/cm3	ASTM D792	2,20
Compression Modulus Room Temperature - 20 MPa KSW	%	DIN 28090-2	11
Creep Relaxation Room Temperature - 1 MPa KRW	%	DIN 28090-2	3
Compression Modulus 150°C - 20 MPa - 16 hours WSW	%	DIN 28090-2	45
Creep Relaxation 150°C - 1 MPa - 16 hours WRW	%	DIN 28090-2	4
Recovery	mm	DIN 28090-2	0,08
Leakage Rate	mg/(s-m)	DIN 28090-2	<0,001
Leakage Rate (with Nitrogen)	cm3/min	DIN 3535	0,01
Compression Creep 150°C - 30 N/mm2	MPa	DIN 52913	14

Size	Dimension mm	1500 x 1500	Toll. +20 -0
Thickness mm		1,5 - 2,0 - 3,0	Toll. +0% -10%

# SC 1200

Features

- Superior chemical resistance

Excellent resistance to deformation

No ageing

High compressibility
- High sealability

No water absorption

Non-flammable

Easy maintenance (assembling / disassembling)

Complies with FDA specifications

Property	Unit	Method	Value
Pressure, max	bar	/	80
Temperature, min	°C	/	-200
Temperature, max	°C	/	+260
P x T, max	bar x °C	/	12.000
Density	g/cm3	ASTM D792	2,24
Compression Modulus Room Temperature - 20 MPa KSW	%	DIN 28090-2	7
Creep Relaxation Room Temperature - 1 MPa KRW	%	DIN 28090-2	3
Compression Modulus 150°C - 20 MPa - 16 hours WSW	%	DIN 28090-2	37
Creep Relaxation 150°C - 1 MPa - 16 hours WRW	%	DIN 28090-2	5
Recovery	mm	DIN 28090-2	0,09
Leakage Rate	mg/(s-m)	DIN 28090-2	<0,001
Leakage Rate (with Nitrogen)	cm3/min	DIN 3535	0,01
Compression Creep 150°C - 30 N/mm2	MPa	DIN 52913	16

Size	Dimension mm	1500 x 1500	Toll. +20 -0
Thickness mm		1,5 - 2,0 - 3,0	Toll. +0% -10%

# SC 1400

Features

- Superior chemical resistance

Strong acids, solvents, hydrocarbons, chlorine

Water and steam

Excellent resistance to deformation

No ageing

High compressibility

Superior sealability for a wide range of pressure and temperature
- No water absorption

Non-flammable

Easy maintenance (assembling / disassembling)

Complies with FDA specifications

Certified by BAM ( 200°C, 25 bar )

Property	Unit	Method	Value
Pressure, max	bar	/	85
Temperature, min	°C	/	-200
Temperature, max	°C	/	+260
P x T, max	bar x °C	/	12.000
Density	g/cm3	ASTM D792	2,20
Compression Modulus Room Temperature - 20 MPa KSW	%	DIN 28090-2	8
Creep Relaxation Room Temperature - 1 MPa KRW	%	DIN 28090-2	3
Creep Relaxation 150°C - 1 MPa KRW	%	DIN 28090-2	15
Recupero elastico 150°C - 1 MPa - 16 ore WRW	%	DIN 28090-2	4
Recovery	mm	DIN 28090-2	0,07
Leakage Rate	mg/(s-m)	DIN 28090-2	<0,01
Leakage Rate ( with Nitrogen )	cm3/min	DIN 3535	0,02
Compression Creep 150°C - 30 N/mm2	MPa	DIN 52913	17

Size	Dimension mm	1500 x 1500	Toll. +20 -0
Thickness mm		1,5 - 2,0 - 3,0	Toll. +0% -10%

# SC 1600

Features

- Superior chemical resistance

Acids, solvents, hydrocarbons, refrigerant, water

Low bolt load

No ageing

Excellent compressibility
- Superior sealability

No water absorption

Non-flammable

Easy maintenance ( assembling / disassembling )

Complies with FDA specifications

Property	Unit	Method	Value
Pressure, max	bar	/	60
Temperature, min	°C	/	-200
Temperature, max	°C	/	+260
P x T, max	bar x °C	/	11.000
Density	g/cm3	ASTM D792	1,60
Compression Modulus Room Temperature - 20 MPa KSW	%	DIN 28090-2	25
Creep Relaxation Room Temperature - 1 MPa KRW	%	DIN 28090-2	7
Compression Modulus 150°C - 1 MPa KRW	%	DIN 28090-2	32
Creep Relaxation 150°C - 1 MPa - 16 hours WRW	%	DIN 28090-2	5
Recovery	mm	DIN 28090-2	0,07
Leakage Rate	mg/(s-m)	DIN 28090-2	<0,01
Leakage Rate ( with Nitrogen )	cm3/min	DIN 3535	0,02
Compression Creep 150°C - 30 N/mm2	MPa	DIN 52913	14

Size	Dimension mm	1500 x 1500	Toll. +20 -0
Thickness mm		1,5 - 2,0 - 3,0	Toll. +0% -10%



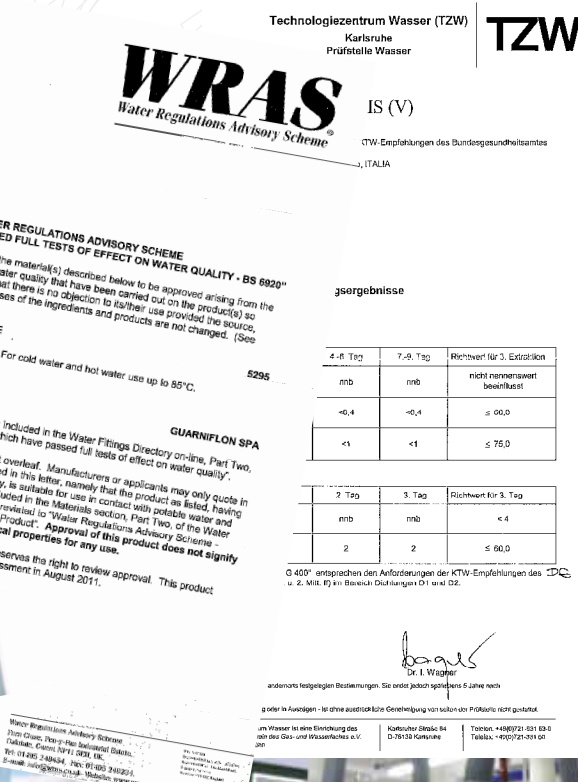
# QUALITY MANAGEMENT R&D TEAM



Guarniflon have been Quality Certified since 1993, certificate n. 015, one of the first in its own field.

Nowadays Guarniflon is UNI EN ISO 9001 certified by the certification body Cermet.

Guarniflon policy implies a high powered and experienced R & D Team continuously improving and developing day by day new solutions for new applications.



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REVISION 2011

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