

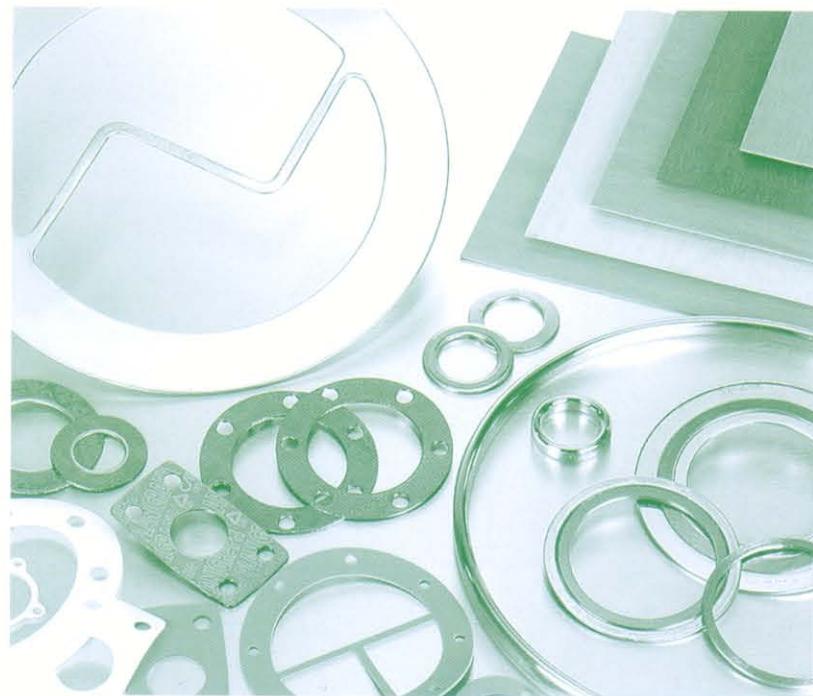
# SettingFlange



Gaskets for Flanges

**CARRAMI**  
PACKINGS AND GASKETS

# Gaskets for Flange



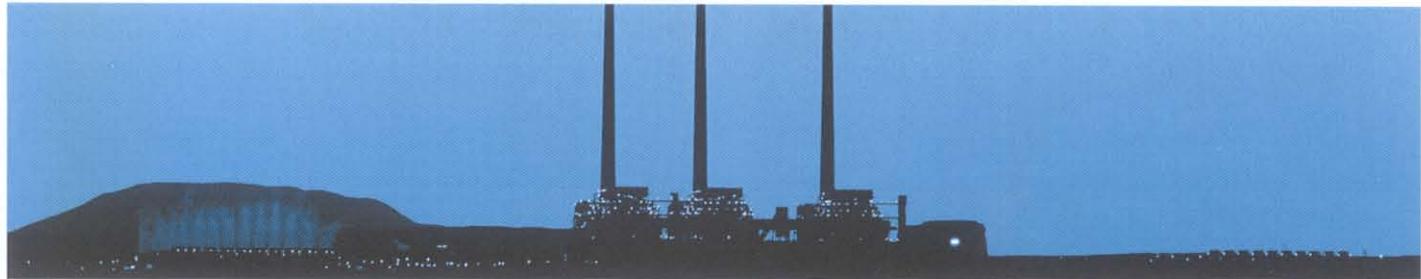
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# SettingFlange

The Carrara S.p.a. Product Range that is oriented to the O.E.M, to the maintenance companies and to the End Users appears more complete and rich of novelties. Innovative products and high quality technical offices are used to offer the best-supplemented seal selection. Carrara S.p.a.: gaskets and competence at your service.

## Carrara, gaskets with value



Carrara S.p.a. believes in the modern SUPPLIER meaning: active subject that actively takes part in the value chain! A value that emerges from: competence and flexibility, innovation and availability, always being oriented to the customer's necessities and the continuous interaction with them. Carrara S.p.a. proposes, thanks to the experiences made in the field of the seals systems for flange, a Product Range of flat and metal gaskets, very complete and heterogeneous. For the most general applications as for the most severe one, enriched by the technical competence acquired through the constant relationships that Carrara S.p.a. holds with the main Partners, such as the plant builders, the shopkeepers and the Maintainers, for the information

exchange, to verify the effectiveness of the choices and the efficiency of our gaskets. The Carrara S.p.a Product Range constitutes a true combination of "supplemented seal solutions" truly satisfying the most heterogeneous seals demands. With the very large PLANIFLEX™ lines of asbestos free and PLANIFLON™ products in PTFE, you will find in the PLANIGRAPH™ line all possible options of graphite products, together with PLANIGRAPH™ METALBOND and PLANIGRAPH™ CROSS OVER. At last the PLANISTEEL line offers you all usually used metal gaskets in the industrial plants, Spiral wounds, Ring Joints and Jacketed gaskets in all kinds of steel.

Always ask the best. Carrara gives you more.

# Carrara, a partner for the future



When a market becomes mature combined with the products that represent it, what orientation can assume a Player of this market?

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Carrara S.p.a. is one of the most important worldwide packing producer and of operating seals systems for valves operating in the western world. With quality as always, Carrara also produces flat and metal gaskets.

While many other Big Players of the sector move their production activities in other areas, Carrara S.p.a. invests in Italy, in the European Community, because considers that the customers of this mature market want and will want to buy, integrated with the product, also attributes such as: Certainty, guarantee, efficiency, flexibility and support, that are and will be essential prerogatives of this market.

Our Competitive Strategy is to compete in the mature market assigning value to the product through a better organizational performance in order

Carrara is here!

## Certainty

In a market strongly Price Oriented, the risk of a progressive reduction of the qualitative standards is always present. The **certainty** to have bought the corresponding product to the requested qualifications is a customer's right and a duty of the Supplier.

## Guarantee

**Guarantee** means keeping control on the productive process and those where the product is involved to guarantee the conformity to certify their performance.

## Efficiency

**Efficiency** means to manage the production process and those correlated to the product optimizing the resources in order to create value perceivable from the customer.

## Flexibility

**Flexibility** is to be able to answer the customer necessity and able to provide what is required quickly at sustainable prices, it is a priority Asset!

## Support

Systematically the Carrara S.p.a.'s technical staff takes part at symposiums of the sector and is integrated with the technical offices of End Users and planning of the OEM to consolidate and to update the technical competence necessary in order to provide **support** before and after sale to the customers.

Carrara still has a lot to say!

If offering good products is taken for granted, we are pleased to be repetitive. In our Product Range you will find definite security and quality.

## PLANIGRAPH™

### **Sheets and gaskets in graphite**

- Planigraph™ LG - LGR - LGRF
- Planigraph™ Metalbond
- Planigraph™ Cross Over

## PLANIFLEX™

### **Sheets and asbestos free gaskets**

- Planiflex™ PF 13
- Planiflex™ PF 41 - PF 41G
- Planiflex™ PF 63 - PF 63R - PF 64 - PF 65
- Planiflex™ PF 81 - PF 81R

## PLANIFLON™

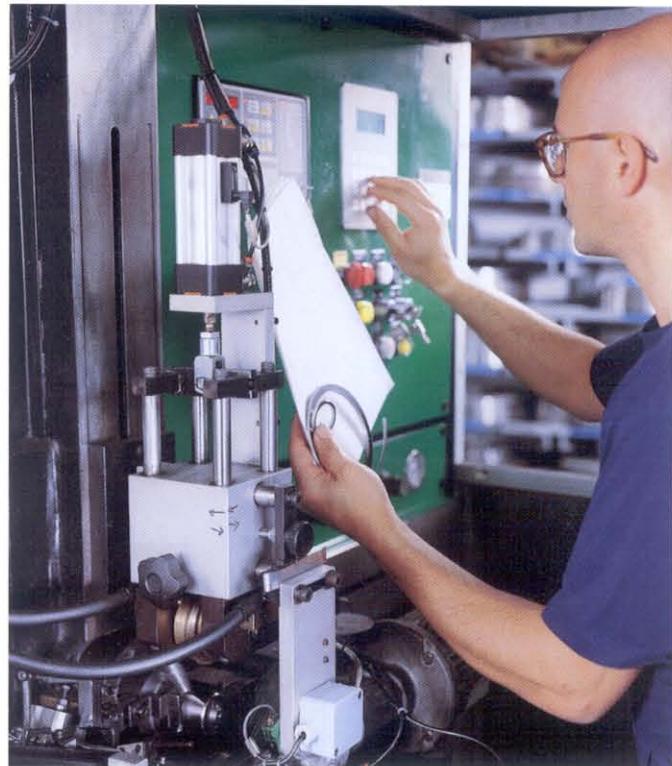
### **Sheets and gaskets in PTFE**

- Planiflon™ B10
- Planiflon™ B11
- Planiflon™ E12
- Planiflon™ Seal Tape

## PLANISTEEL

### **Metal gaskets**

- Planisteel SW
- Planisteel MJ
- Planisteel MJS
- Planisteel GG
- Planisteel RJ



The numeric control machines are guarantee of homogeneity in the production.

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The technology is at the service to our quality and to your satisfaction.

Feel free to contact us, and you will receive all information about our products!

**[www.carrara.it](http://www.carrara.it)**

# Planigraph™

## Competitive quality

Whoever manages daily graphite products, a quick glance is enough to notice the difference between two gaskets from different production, apparently equal.

The Carrara S.p.a. products are always identifiable and certified. Just by touching it you notice the intimate adhesion between graphite and steel of the reinforced product and the extreme compactness of the product in pure graphite.

## Carrara offers performance, not only product.

Carrara S.p.a. products are recognisable by colour: green identifies LG, rose identifies LGR and blue identifies LGRF. Carrara S.p.a. always thinks of performance safety and to make the maintenance work easy.

Planigraph™ line includes three kinds of sheets:

- **LG** pure graphite
- **LGR** pure graphite with 316L plain reinforcement
- **LGRF** pure graphite with 316L punctured reinforcement

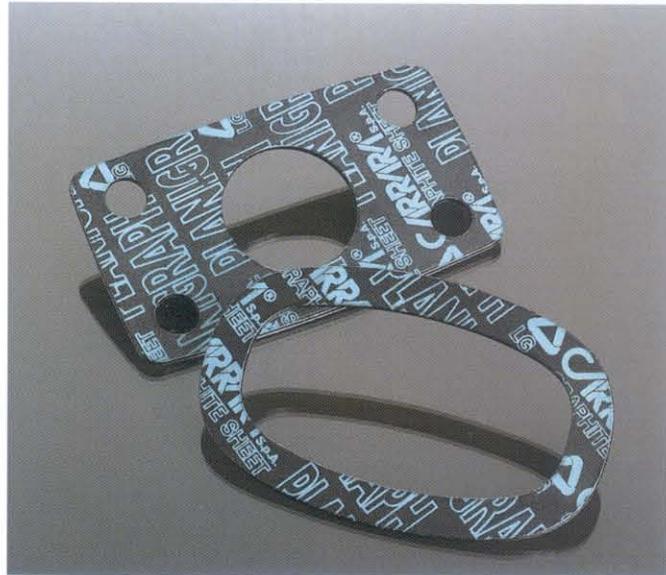
All kinds are available in the format:

- 1.000 mm x 1.000 mm (40" x 40")
- 1.500 mm x 1.500 mm (60" x 60")

Thickness from 0.4 up to 5.0 mm (1/64" to 3/16")

All Planigraph™ sheets are treated  
with corrosion inhibitor.

# Planigraph™ LG



The gaskets in pure **LG** graphite are perfect for applications on flanged couplings at low pressure or used as a seal element with a metal support. The pure graphite has poor resistance to traction; therefore it is always advisable the use reduced thickness (by 0.4 to 1.0 mm) to obtain a perfect seal.

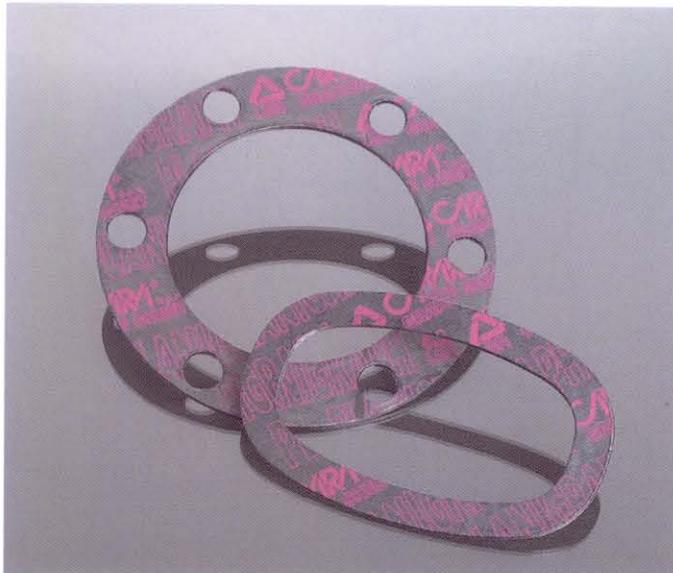
### THE PURE GRAPHITE WITHOUT INSERT

PLANIGRAPH™ LG		
<b>Graphite density</b>	gr/cm³	1.0
<b>Carbon Content</b>	%	≥ 98
<b>Ash Content</b>	%	≤ 2
<b>Material of insert</b>	AISI	
<b>Thickness of insert</b>	mm	
<b>Compressibility</b>	%	35 - 40
<b>Recovery</b>	%	3 - 5
<b>Gas Permeability DIN 3535</b>	Cm³/min	≤ 1.2
<b>Relaxation stress DIN 52913</b>	N/mm²	≥ 47
<b>Temperature</b>	°C	550
<b>"m" factor</b>		2.0
<b>"y" factor</b>	psi	900

Not usable with oxidizing stream. With oxygen and air, the maximum temperature is 400°C.

Size	1.000 x 1.000	40" x 40"
	1.500 x 1.500	60" x 60"
Thickness	0.4 ÷ 5.0	1/64" ÷ 3/16"

# Planigraph™ LGR



The gaskets in pure **LGR** graphite offer excellent performances in the applications on the Bonnet of the valves and for flanged couplings of heat exchangers. A better resistance to the permeability can be obtained with the internal edge of the gasket. To obtain a perfect seal with this kind of gasket, the thickness use of 1.5 mm is recommended.

## THE PURE GRAPHITE WITH FLAT INSERT

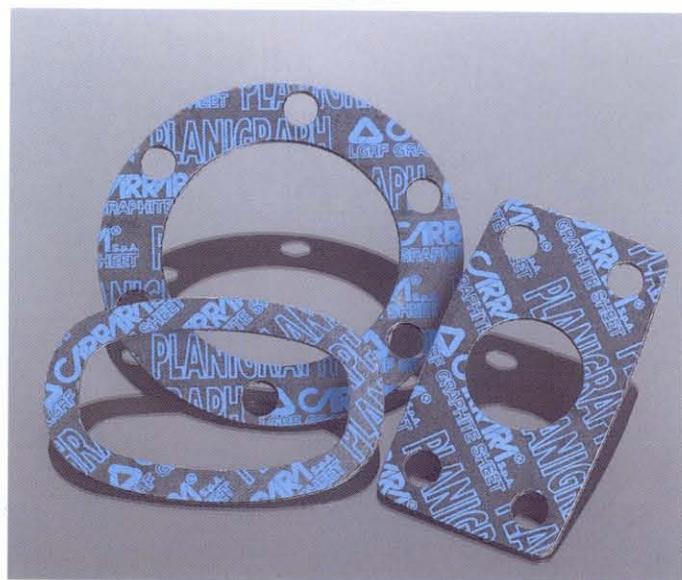
### PLANIGRAPH™ LGR

<b>Graphite density</b>	gr/cm³	1.0
<b>Carbon Content</b>	%	≥ 98
<b>Ash Content</b>	%	≤ 2
<b>Material of insert</b>	AISI	316L
<b>Thickness of insert</b>	mm	0.05
<b>Compressibility</b>	%	40 - 50
<b>Recovery</b>	%	10 - 15
<b>Gas Permeability DIN 3535</b>	Cm³/min	≤ 0.6
<b>Relaxation stress DIN 52913</b>	N/mm²	≥ 45
<b>Temperature</b>	°C	550
<b>" m " factor</b>		2.0
<b>" y " factor</b>	psi	900

Not usable with oxidizing stream. With oxygen and air, the maximum temperature is 400°C.

Size	1.000 x 1.000 1.500 x 1.500	40" x 40" 60" x 60"
Thickness	0.4 ÷ 5.0	1/64" ÷ 3/16"

# Planigraph™ LGRF



The gaskets in pure **LGRF** graphite are the most versatile and of universal application on the flanges and flanged couplings of heat exchangers. A better resistance to the permeability can be obtained with the internal edge of the gasket. To obtain a perfect seal with this kind of gasket, the thickness use of 2 mm is recommended.

## THE PURE GRAPHITE WITH TANGED INSERT

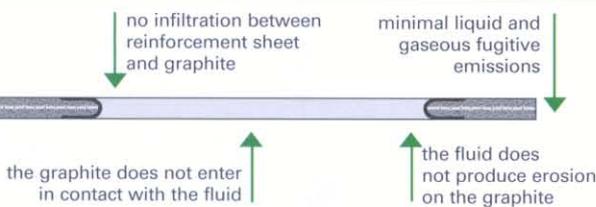
### PLANIGRAPH™ LGRF

<b>Graphite density</b>	gr/cm³	1.0
<b>Carbon Content</b>	%	≥ 98
<b>Ash Content</b>	%	≤ 2
<b>Material of insert</b>	AISI	316L
<b>Thickness of insert</b>	mm	0.10
<b>Compressibility</b>	%	35 - 45
<b>Recovery</b>	%	10 - 15
<b>Gas Permeability DIN 3535</b>	Cm³/min	≤ 0.6
<b>Relaxation stress DIN 52913</b>	N/mm²	≥ 48
<b>Temperature</b>	°C	550
<b>" m " factor</b>		2.0
<b>" y " factor</b>	psi	1800

Not usable with oxidizing stream. With oxygen and air, the maximum temperature is 400°C.

Size	1.000 x 1.000 1.500 x 1.500	40" x 40" 60" x 60"
Thickness	0.4 ÷ 5.0	1/64" ÷ 3/16"

# Planigraph™ Metalbond



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## COMPATIBLE FLUID PROCESS

ACIDS
boric acid
bromic acid
hydrochloric acid
chromium sulphate acid up to 20%*
hydrochloric acid
hydrofluoric acid
nitric acid 20-65%
nitric acid up to 20%
phosphoric acid up to 20%
sulphuric acid up to 70%*
sulphuric acid from 70 to 100%, up to 100 °C
sulphurous acid
ORGANIC ACIDS
acetic acid
acrylic acid
hexachlorophenylacetic acid
formic acid
maleic acid
monochloroacetic acid
phthalic acid
phenylacetic acid
stearic acid
sulphonic acid
tartaric acid
trichloroacetic acid
ALKALIS
ammonium solutions
caustic potash
caustic soda
potassium hydroxide up to 400 °C
sodium hydroxide up to 400 °C
ALCOHOLS
ethyl alcohol
glycolic alcohol
isopropyl alcohol

ALDEHYDES
acetaldehyde
benzaldehyde
formaldehyde
OTHER ORGANIC SUBSTANCES
acrylonitrile
carbon disulphide
dimethylsulphoxide
epichlorohydrin
phenol
mercaptan
nitrobenzene
silicon
siloxane
thionyl chloride
OTHER INORGANIC SUBSTANCES
bleach
hydrazine
hydrogen peroxide, 85%
sulphur
AMMINES
aniline
diethylamine
triethylamine ethanol
KETONES
acetone
methyl ethyl ketone
isobutyl methyl ketone
ESTERS
amyl ester of acetic acid
ethylbutyl ester
ethyl ester of acrylic acid
ETHERS
dioxin
diethyl ether

diphenyl ether
methyl ethynyl ether
GAS/VAPOUR
air up to around 550 °C
ammonia
bromidric acid
carbon dioxide up to around 600 °C
carbon monoxide
chlorine
sulphur hexafluoride
hydrochloric acid
hydrofluoric acid
nitrogen
nitrogen dioxide
nitrogen monoxide
oxygen up to around 350 °C
sulphidric acid
sulphur dioxide
steam up to 600 °C
HYDROCARBONS
benzene
ethylene
iso-octane
propane
propylene
styrene
xylene
HALOGENATED HYDROCARBONS
chlorobenzene
chloroform
carbon tetrachloride
MELTED METALS
aluminium
copper
gold
lead

magnesium
mercury
potassium up to 350 °C
silver
sodium up to 350 °C
tin
zinc
TECHNICAL MIXES
diathermic oils
engine oils
hydraulic fluid
paint thinners
petrol
petroleum
transformer oils
MELTED SALTS
borate, soda, potash
calcium chloride
potassium hydrogen sulphate
WATER-BASED SALINE SOLUTIONS
borates
bromide
carbonate
chloride
chromate, 20% conc.
fluoride
iodide
nitrate
nitrite
phosphate
sulphate

Carrara S.p.a. declines every responsibility for damages to things or persons, caused by an improper use, from wrong use or from use in not optimal configuration of the products.

## The protection ring

**PLANIGRAPH™ METALBOND** is a Planigraph™ gasket, with an inside reinforcement ring that increases the effectiveness of the seal, a solution that allows minimal spread of the fluid through the most stressed part of the gasket.

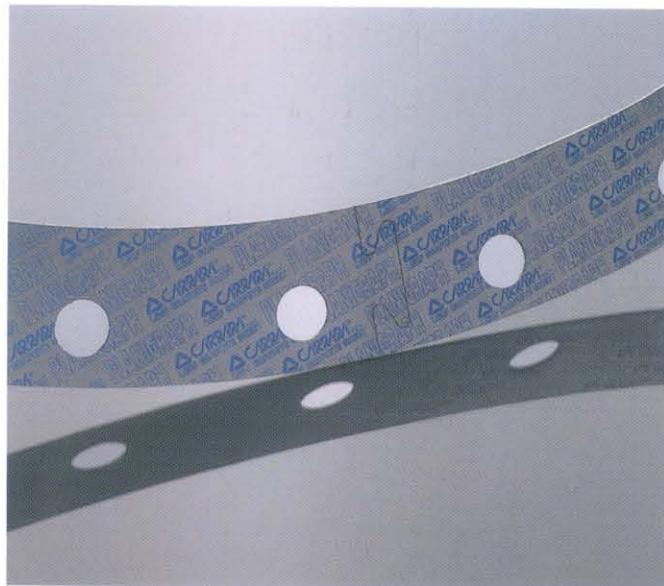
## Economy and long duration

The steel ring prevents the erosion of the inner edge of the seal and at the same time precludes the infiltrations between the graphite and the reinforcement sheet.

Since the graphite does not enter directly in contact with the fluid, the mechanical property of the seal remains unchanged within the time. A longer operating life, above drastic reduction of the liquid and gaseous fugitive emissions, guarantees greater security and economical performance.

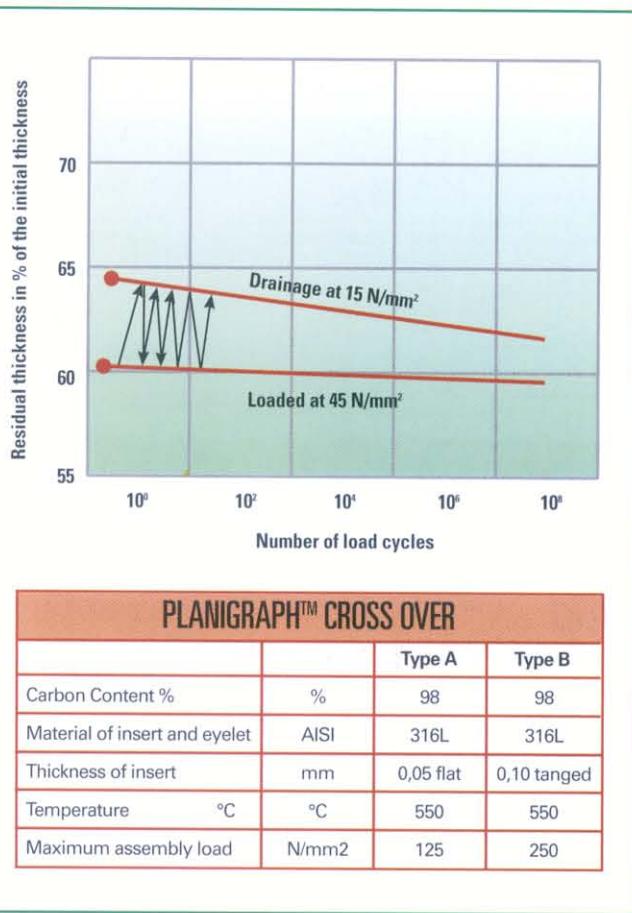
• Low Emission  
• fire Safe

# Planigraph™ Cross Over



The special joint technique easily allows the installation of the gasket without the extraction of the bundle tube.

Behaviour of Planigraph™ in presence of an oscillating load



## Planigraph™ Cross Over: versatile and effective

The exceptional performance of the PLANIGRAPH™ gasket and the inherent security of seal that they guarantee, combined with the versatility of this material that is compatible with the majority of fluid and the industrial gas, have allowed to the spread of PLANIGRAPH™ CROSS OVER also in applications previously prerogative of the jacketed gaskets or spiral wounds.

For the condensers, like for the heat exchangers, this gasket is in a position to guarantee the maximum security and reliability, also in presence of oscillating loads guaranteeing an important and long-lasting elastic return.

In order to allow the installation without extracting the bundle tube, or anywhere present, an impediment to the insertion of the gasket, Carrara S.p.a. has developed a cutting technique that allows an easy assembly directly on the machine. Thanks to the special splice technique Carrara S.p.a. is in a position to supply gaskets of whichever dimension beyond 1,500 mm. For applications on the high-pressure condensers of the electrical power plants PLANIGRAPH™ CROSS OVER is supplied directly with the double enveloping to preserve the quality of the gaskets for thousands of work hours.

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**Planigraph™ Cross Over,  
the quality that you  
were looking for!**

# Planiflex™

## A new world of gaskets

The new range of non-asbestos sheet **PLANIFLEX™** is in a sure position to satisfy all the technical requirements that can be performed from this class of gaskets. Search between the different models and you will find what you need! Carrara S.p.a. guarantees you an optimal quality of the products combined with a top certification.

**PLANIFLEX™**, another step ahead to offer you more!

Part of the **PLANIFLEX™** line, are the models:

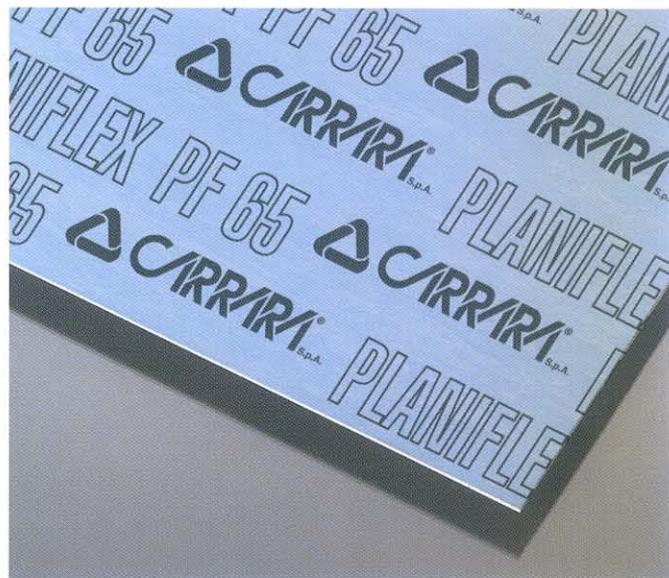
- **PF 41**, cellulose and rubber NBR, economic, reliable, ideal for the general applications, available also in graphitised version PF 41G and reinforced with net, PF 41RG.
- **PF 65**, inorganic fibres and rubber NBR, the TOP of the line, prestigious and certificate, ideal for the applications on steam and hydrocarbons, available also in the standard version PF 64, economy PF 63, and reinforced with net, PF 63R.
- **PF 81**, aramidic fibres, graphite and rubber NBR, available also in the version with net PF 81R.
- **PF 13**, special fibres and rubber CSM, used for applications with severe chemical substances.

You will find all the technical data sheets and other models of the **PLANIFLEX™** line at [www.carrara.it](http://www.carrara.it).

**Planiflex™**  
the friendly gasket!

# Planiflex™ PF 65

New



## The Excellence

**PF 65** is a material with an excellent parameter of relaxation stress, perfect for steam applications. Usable with oils, gas, fuels and inorganic acids.

Certified **Germanischer Llyod, BS 7531 Grade X**.

COMPOSITION		
• Inorganic Fibres • NBR		
Compressibility ASTM F 36/J	%	8
Recovery ASTM F 36/J	%	50
Tensile strength DIN 52910	N/mm² - Fb/inch	8
Stress resistance DIN 52913		
16 h, 300 °C, 50 N/mm²	N/mm² - Fb/inch	30
16 h, 175 °C, 50 N/mm²	N/mm² - Fb/inch	35
GAS permeability DIN 3535/6	ml/mm²	0.08
Thickness increase acc.to ASTM F 146		
ASTM oil no. 3, 5 h, 150 °C	%	8
ASTM Fuel B, 5 h, 23 °C	%	8
HNO <sub>3</sub> 50%, 1 h, 65 °C	%	
H <sub>2</sub> SO <sub>4</sub> 65%, 48 h, 23 °C	%	
Max. operating conditions		
Peak temperature	°C/F	440 / 824
* Continuous temperature	°C/F	350 / 662
- With steam	°C/F	250 / 482
* Pressure	bar/psi	100 / 1450
P x T	bar x T °C	10000

Typical values for a thickness of 2 mm.  
Sheet size: 1500x1500 mm. Thickness: 0.8 mm, 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm.  
Other on request. Tolerance: Thickness: < 1.0 mm ± 0.1 mm, ≥ 1.0 mm ± 10%, Length: ± 50.0 mm, Width: ± 50.0 mm. Surface treatment: standard sheets have anti-stick coating.

\* Temperature and pressure represent maximum values and they should not be used simultaneously. \*\* Ask P x T to CARRARA technical office.

# Planiflex™ PF 64



## The Versatility

**PF 64** is a material with an excellent certifications level. Usable with oils, gas, fuels and inorganic acids. Certified DWGW, KTW, WRc, BAM, HTB, SVGW, Germanischer Llyod, BS 7531 Grade Y.

### COMPOSITION

- Aramidic fibres
- NBR

Compressibility ASTM F 36/J	%	8
Recovery ASTM F 36/J	%	55
Tensile strength DIN 52910	N/mm² - Fb/inch	11
Stress resistance DIN 52913		
16 h, 300 °C, 50 N/mm²	N/mm² - Fb/inch	22
16 h, 175 °C, 50 N/mm²	N/mm² - Fb/inch	28
GAS permeability DIN 3535/6	ml/mm²	0.05
Thickness increase acc.to ASTM F 146		
ASTM oil no. 3, 5 h, 150 °C	%	5
ASTM Fuel B, 5 h, 23 °C	%	5
HNO <sub>3</sub> 50%, 1 h, 65 °C	%	
H <sub>2</sub> SO <sub>4</sub> 65%, 48 h, 23 °C	%	
Max. operating conditions		
Peak temperature	°C/F	400 / 732
* Continuous temperature	°C/F	250 / 482
- With steam	°C/F	200 / 392
* Pressure	bar/psi	100 / 1450
P x T	bar x T °C	10000

Typical values for a thickness of 2 mm.

Sheet size: 1500x1500 mm. Thickness: 0.8 mm, 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm. Other on request. Tolerance: Thickness: < 1.0 mm ± 0.1 mm, ≥ 1.0 mm ± 10%. Length: ± 50.0 mm, Width: ± 50.0 mm. Surface treatment: standard sheets have anti-stick coating.

\* Temperature and pressure represent maximum values and they should not be used simultaneously. \*\* Ask P x T to CARRARA technical office.

# Planiflex™ PF 81



## The Energy

**PF 81** is an excellent material with optimal thermal and chemical properties, resistant to steam, oils, gas, fuels, alkalis and weak acids. Certified BAM.

### COMPOSITION

- Aramidic and carbon fibres
- NBR

Compressibility ASTM F 36/J	%	7
Recovery ASTM F 36/J	%	55
Tensile strength DIN 52910	N/mm² - Fb/inch	9
Stress resistance DIN 52913		
16 h, 300 °C, 50 N/mm²	N/mm² - Fb/inch	25
16 h, 175 °C, 50 N/mm²	N/mm² - Fb/inch	30
GAS permeability DIN 3535/6	ml/mm²	0.08
Thickness increase acc.to ASTM F 146		
ASTM oil no. 3, 5 h, 150 °C	%	5
ASTM Fuel B, 5 h, 23 °C	%	8
HNO <sub>3</sub> 50%, 1 h, 65 °C	%	
H <sub>2</sub> SO <sub>4</sub> 65%, 48 h, 23 °C	%	
Max. operating conditions		
Peak temperature	°C/F	400 / 732
* Continuous temperature	°C/F	280 / 536
- With steam	°C/F	250 / 482
* Pressure	bar/psi	100 / 1450
P x T	bar x T °C	10000

Typical values for a thickness of 2 mm.

Sheet size: 1500x1500 mm. Thickness: 0.8 mm, 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm. Other on request. Tolerance: Thickness: < 1.0 mm ± 0.1 mm, ≥ 1.0 mm ± 10%. Length: ± 50.0 mm, Width: ± 50.0 mm. Surface treatment: standard sheets have anti-stick coating.

\* Temperature and pressure represent maximum values and they should not be used simultaneously. \*\* Ask P x T to CARRARA technical office.

# Planiflex™ PF 13



## The Aggressiveness

**PF 13** is a material with an excellent chemical resistance and usable with different substances, very aggressive alkalis and acids.

Certified BAM.

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### COMPOSITION

- Aramidic fibres • CSM

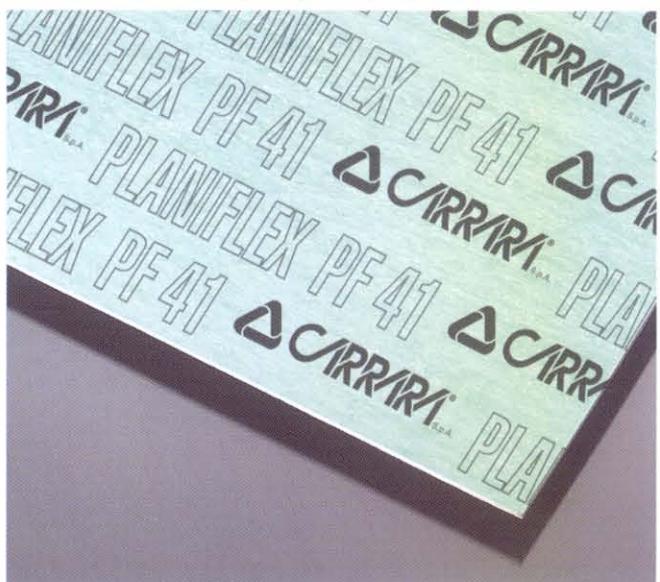
Compressibility ASTM F 36/J	%	8
Recovery ASTM F 36/J	%	45
Tensile strength DIN 52910	N/mm <sup>2</sup> - Fb/inch	10
Stress resistance DIN 52913		
16 h, 300 °C, 50 N/mm <sup>2</sup>	N/mm <sup>2</sup> - Fb/inch	
16 h, 175 °C, 50 N/mm <sup>2</sup>	N/mm <sup>2</sup> - Fb/inch	25
GAS permeability DIN 3535/6	ml/mm <sup>2</sup>	0.06
Thickness increase acc.to ASTM F 146		
ASTM oil no. 3, 5 h, 150 °C	%	
ASTM Fuel B, 5 h, 23 °C	%	
HNO <sub>3</sub> 50%, 1 h, 65 °C	%	5
H <sub>2</sub> SO <sub>4</sub> 65%, 48 h, 23 °C	%	8
Max. operating conditions		
Peak temperature	°C/F	200 / 392
* Continuous temperature	°C/F	150 / 300
- With steam	°C/F	
* Pressure	bar/psi	60 / 850
P x T	bar x T °C	5000

Typical values for a thickness of 2 mm.

Sheet size: 1500x1500 mm. Thickness: 0.8 mm, 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm. Other on request. Tolerance: Thickness: < 1.0 mm ± 0.1 mm, ≥ 1.0 mm ± 10%, Length: ± 50.0 mm, Width: ± 50.0 mm. Surface treatment: standard sheets have anti-stick coating.

\* Temperature and pressure represent maximum values and they should not be used simultaneously. \*\* Ask P x T to CARRARA technical office.

# Planiflex™ PF 41



## The Economy

**PF 41** is the common material for general applications. Economic, secure, tested.

Certified Germanischer Llyod.

### COMPOSITION

- Organic fibres • NBR

Compressibility ASTM F 36/J	%	7
Recovery ASTM F 36/J	%	55
Tensile strength DIN 52910	N/mm <sup>2</sup> - Fb/inch	9
Stress resistance DIN 52913		
16 h, 300 °C, 50 N/mm <sup>2</sup>	N/mm <sup>2</sup> - Fb/inch	25
16 h, 175 °C, 50 N/mm <sup>2</sup>	N/mm <sup>2</sup> - Fb/inch	30
GAS permeability DIN 3535/6	ml/mm <sup>2</sup>	0.08
Thickness increase acc.to ASTM F 146		
ASTM oil no. 3, 5 h, 150 °C	%	5
ASTM Fuel B, 5 h, 23 °C	%	8
HNO <sub>3</sub> 50%, 1 h, 65 °C	%	
H <sub>2</sub> SO <sub>4</sub> 65%, 48 h, 23 °C	%	
Max. operating conditions		
Peak temperature	°C/F	400 / 732
* Continuous temperature	°C/F	280 / 536
- With steam	°C/F	250 / 482
* Pressure	bar/psi	100 / 1450
P x T	bar x T °C	10000

Typical values for a thickness of 2 mm.

Sheet size: 1500x1500 mm. Thickness: 0.8 mm, 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm. Other on request. Tolerance: Thickness: < 1.0 mm ± 0.1 mm, ≥ 1.0 mm ± 10%, Length: ± 50.0 mm, Width: ± 50.0 mm. Surface treatment: standard sheets have anti-stick coating.

\* Temperature and pressure represent maximum values and they should not be used simultaneously. \*\* Ask P x T to CARRARA technical office.

## COMPATIBLE FLUID OF PROCESS

	PF 65	PF 64	PF 81	PF 13	PF 63 PF 63R	PF 41 PF 41G	PF 81R
Acetamide							
Acetic acid 10%							
Acetic acid 100%							
Acetic ester							
Acetone							
Acetylene							
Adipic acid							
Air							
Alum							
Aluminium acetate							
Aluminium chloride							
Aluminium chlorate							
Ammonia							
Ammonium bicarbonate							
Ammonium chloride							
Ammonium hydroxide							
Amyl acetate							
Aniline							
Asphalt							
Barium chloride							
Benzene							
Benoic acid							
Boric acid							
Borax							
Butane							
Butyl alcohol							
Butyric acid							
Calcium chloride							
Calcium hydroxide							
Carbon disulphide							
Carbon dioxide							
Chloroform							
Chloryne, dry							
Chloryne, wet							
Chromic acid							
Citric acid							
Copper acetate							
Creosote							
Cresol							
Cyclohexanol							
Cyclohexanone							
Decaline							
Dibenzyl ether							
Dimethyl formamide							
Dowtherm							
Ethane							
Ethyl acetate							
Ethyl alcohol							
Ethyl chloride							
Ethylene							
Ethylene glycol							
Formic acid 10%							
Formic acid 85%							
Formaldehyde							
Freon 12							
Freon 22							
Fuel oil							
Gasoline							
Glycerine							
Heptane							
Hydraulic oil (mineral)							
Hydraulic oil (Phosphate ester type)							
Hydraulic (Glycol based)							
Hydrazine							
Hydrochloric acid 20%							
Hydrochloric acid 36%							
Hydrofluoric acid 10%							
Hydrofluoric acid 40%							

	PF 65	PF 64	PF 81	PF 13	PF 63 PF 63R	PF 41 PF 41G	PF 81R
Hydrogen							
Isobutane							
Isooctane							
Isopropyl alcohol							
Kerosene							
Lead acetate							
Lead arsenate							
Magnesium sulphate							
Malic acid							
Methane							
Methanol							
Methyl chloride							
Methylene dichloride							
Methyl ethyl ketone							
Milk							
Mineral oil type ASTM no. 1							
Naphtha							
Nitric acid 20%							
Nitric acid 40%							
Nitric acid 96%							
Nitrobenzene							
Nitrogen							
Octane							
Oleic acid							
Oleum							
Oxalic acid							
Oxygen							
Palmitic acid							
Pentane							
Perchloroethylene							
Phenol							
Phosphoric acid							
Potassium acetate							
Potassium bicarbonate							
Potassium carbonate							
Potassium chloride							
Potassium dichromate							
Potassium hydroxide							
Potassium iodide							
Potassium nitrate							
Potassium permanganate							
Propane							
Pyridine							
Salicylic acid							
Silicon oil							
Soap							
Sodium aluminate							
Sodium bicarbonate							
Sodium bisulphite							
Sodium carbonate							
Sodium chloride							
Sodium cyanide							
Sodium hydroxide							
Sodium sulphate							
Sodium sulphide							
Starch							
Steam							
Stearic acid							
Sugar							
Sulphuric acid 20%							
Sulphuric acid 96%							
Tar							
Tartaric acid							
Toluene							
Transformer oil							
Trichlorethylene							
Water							
White Spirit							
Xylene							

Recommended

Recommendation depends on operating conditions

Not recommended

# Planiflon™

The PTFE PLANIFLON™ product line becomes rich of new models in order to better satisfy the technical requirements of the customers. Search between the different products and you will find your solution!

**PLANIFLON™** a step ahead in order not to remain behind!

Part of the **PLANIFLON™** line, are the models:

- **PLANIFLON™ SEAL TAPE**, the adhesive tape in expanded PTFE
- **PLANIFLON™ B10**, PTFE with special fillers
- **PLANIFLON™ B11**, modified PTFE
- **PLANIFLON™ E12**, expanded PTFE.

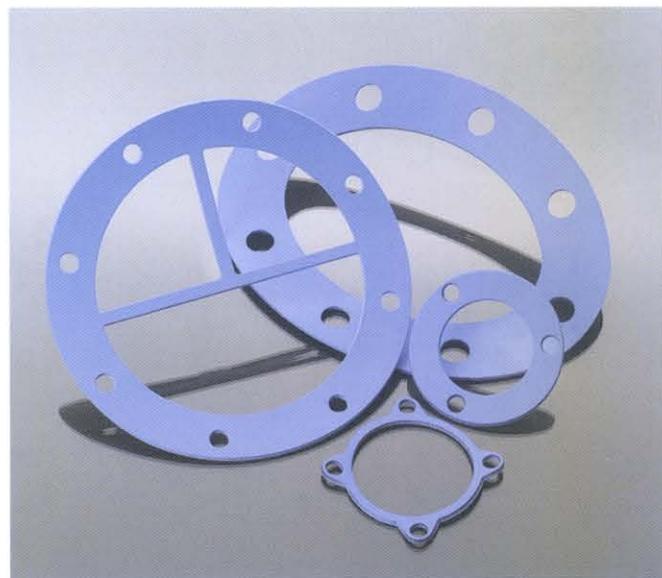
You will find all the technical data sheets and other models of the **PLANIFLON™** line at [www.carrara.it](http://www.carrara.it).

## 14 The PTFE that renews!



Seal Tape is available in all standard measurements.

# Planiflon™ B10



## The Elasticity

**PLANIFLON™ B10** is a PTFE with special fillers whose elasticity will astonish you. A unique product in its kind, secure and easy to cut, LONG LIFE, that guarantees great elasticity also in presence of thermal gradients and oscillating loads.

Certified **FDA - BAM**.

## COMPOSITION

- Pure virgin PTFE • Loaded with complex inorganic fillers

	Testing Method	Gauge	Value
Specific weight	ASTM D1457	Gr / cm³	2.2 - 2.3
Hardness	ASTM D2240	Shore D	90 - 98
Temperature work		°C	-200 / +260
Permanent set 160°C - 24h	ASTM D621	%	7
Creep relaxation 160° - 24h	ASTM D621	%	22
size		1500 x 1500 // 60" x 60"	
thickness		1.00 - 1.50 - 3.00 // 5/128" - 1/16" - 1/8"	

# Planiflon™ B11

*New*



## The Security

**PLANIFLON™ B11** is a modified PTFE with special fillers. A High Tech product unique in its kind that guarantees great resistance to the deformation in the long period and the elasticity also in presence of thermal gradient and oscillating loads.

Certified FDA - BAM.

# Planiflon™ E12



## The Softness

**PLANIFLON™ E12** is an expanded PTFE. An excellent product, very soft and elastic ideal for applications on fibreglass flange for the low torque load required.

Certified FDA - BAM.

15

### COMPOSITION

- Pure modified PTFE • Loaded with complex inorganic fillers

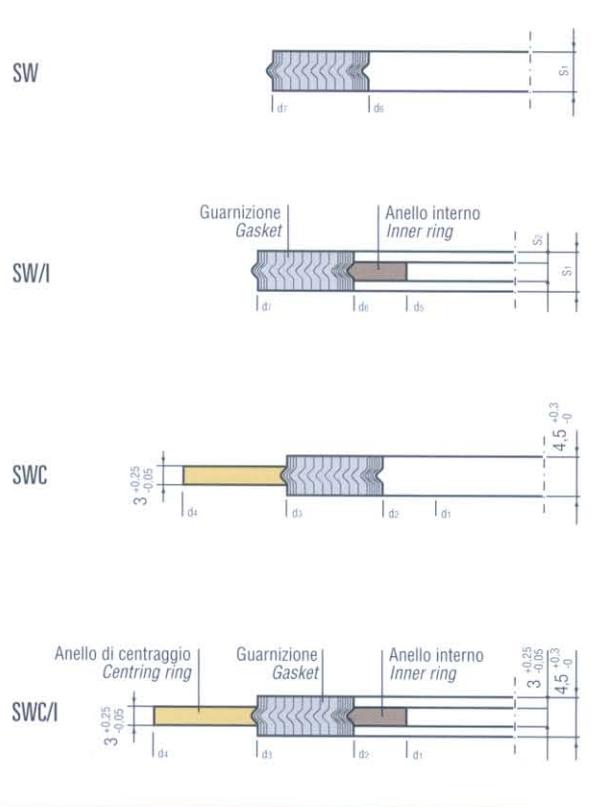
	Testing Method	Gauge	Value
Specific weight	ASTM D1457	Gr / cm³	2.2 - 2.3
Hardness	ASTM D2240	Shore D	100 - 110
Temperature work		°C	-200 / +260
Permanent set 160°C - 24h	DIN 28090-2	%	11
Creep relaxation 160° - 24h	DIN 28090-2	%	3
size	1200 x 1200 // 48" x 48"		
thickness	1.50 - 2.00 - 3.00 // 1/16" - 5/64" - 1/8"		

### COMPOSITION

- Pure expanded PTFE

	Testing Method	Gauge	Value
Specific weight	ASTM D1457	Gr / cm³	0.8
Hardness	ASTM D2240	Shore D	50 - 60
Temperature work		°C	-200 / +260
Permanent set 160°C - 24h	ASTM D621	%	0
Creep relaxation 160° - 24h	ASTM D621	%	31
size	1500 x 1500 // 60" x 60"		
thickness	1.50 - 3.00 - 6.00 // 1/16" - 1/8"		

# Planisteel SW



## Elasticity and the security: Planisteel SW!

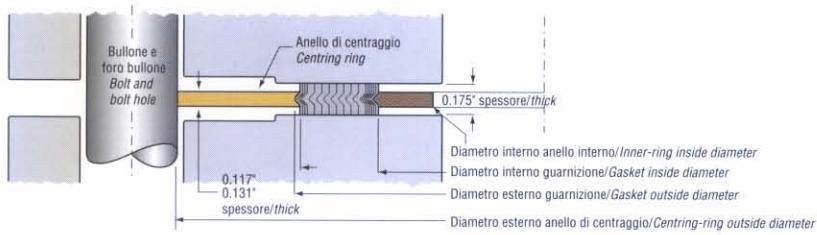
The spiral wounds product range **PLANISTEEL SW** includes all types of gaskets for seal on the flanged coupling of any kind. The gaskets are realized in the dimensions and steels previewed from the regulations or in those request from the industrial applications, from the most common to the special ones. The spiral wound is a gasket that must answer to the requirement of compressibility and elasticity in order to guarantee the seal. Therefore, Carrara S.p.a. produces spiral wounds on modern machinery with controlled winding tension, in order to always offer an answering product to the technical detailed lists of the regulations.

Thanks to the versatile of its own plants, we are able to assure fast deliveries and also for series of limited quantities. Above that we offer consulting and technical support that only a constant effort of a strongly motivated teamwork can express.

Try the difference,  
try **PLANISTEEL SW!**

### MATERIAL FOR METALLIC STRIP

ASTM	DIN Material No.
AISI 304	1.4301
AISI 316	1.4401
AISI 321	1.4541
AISI 316 Ti	1.4571
Monel (NiCu30Fe)	2.4360



ASME B 16.20 (API 601) FOR ANSI B16.5 FLANGES

DN	d <sub>1</sub>					d <sub>2</sub>					d <sub>3</sub>					d <sub>4</sub>				
	150-300	400-600	900	1500	2500	150-300	400-600	900	1500	2500	150-600	900-2500	150	300	400	600	900	1500	2500	
1/2	14,2	14,2	14,2	14,2	14,2	19,1	19,1	19,1	19,1	19,1	31,8	31,8	47,8	54,1	54,1	54,1	63,5	63,5	69,9	76,2
3/4	20,6	20,6	20,6	20,6	20,6	25,4	25,4	25,4	25,4	25,4	39,6	39,6	57,2	66,8	66,8	66,8	69,9	69,9	69,9	76,2
1	26,9	26,9	26,9	26,9	26,9	31,8	31,8	31,8	31,8	31,8	47,8	47,8	66,8	73,2	73,2	73,2	79,5	79,5	79,5	85,9
1 1/4	38,1	38,1	38,1	33,3	33,3	47,8	47,8	39,6	39,6	39,6	60,5	60,5	76,2	82,6	82,6	82,6	88,9	88,9	88,9	104,9
1 1/2	44,5	44,5	44,5	41,4	41,4	54,1	54,1	47,8	47,8	47,8	69,9	69,9	85,9	95,3	95,3	95,3	98,6	98,6	98,6	117,6
2	55,6	55,6	55,6	52,3	52,3	69,9	69,9	58,7	58,7	58,7	85,9	85,9	104,9	111,3	111,3	111,3	143	143	143	146,1
2 1/2	66,5	66,5	66,5	63,5	63,5	82,6	82,6	69,9	69,9	69,9	98,6	98,6	124	130,3	130,3	130,3	165,1	165,1	165,1	168,4
3	81	81	81	81	81	101,6	101,6	95,3	92,2	92,2	120,7	120,7	136,7	149,4	149,4	149,4	168,4	168,4	168,4	196,9
4	106,4	106,4	106,4	106,4	106,4	127	120,7	120,7	117,6	117,6	149,4	149,4	174,8	181,1	177,8	193,8	206,5	209,6	235	
5	131,8	131,8	131,8	131,8	131,8	155,7	147,6	147,6	143	143	177,8	177,8	196,9	215,9	212,9	241,3	247,7	254	279,4	
6	157,2	157,2	157,2	157,2	157,2	182,6	174,8	174,8	171,5	171,5	209,6	209,6	222,3	251	247,7	266,7	289,1	282,7	317,5	
8	215,9	209,6	209,6	206,2	200,2	233,4	225,6	222,3	215,9	215,9	263,7	257,3	279,4	308,1	304,8	320,8	358,9	352,6	387,4	
10	268,2	260,4	260,4	257,8	247,7	287,3	274,6	276,4	266,7	270	317,5	311,2	339,9	362	358,9	400,1	435,1	435,1	476,3	
12	317,5	317,5	314,5	314,5	292,1	339,9	327,2	323,9	323,9	317,5	374,7	368,3	409,7	422,4	419,1	457,2	498,6	520,7	549,4	
14	349,3	349,3	342,9	339,9	339,9	371,6	362	356,6	362	362	406,4	400,1	450,9	485,9	482,6	492,3	520,7	577,9		
16	400,1	400,1	393,7	387,4	387,4	422,4	412,8	412,8	406,7	406,7	463,6	457,2	514,4	539,8	536,7	565,2	574,8	641,4		
18	449,3	449,3	444,5	438,2	438,2	474,7	469,9	463,6	463,6	463,6	527,1	520,7	549,4	596,9	593,9	612,9	638,3	704,9		
20	500,1	500,1	495,3	489	489	525,5	520,7	520,7	514,4	514,4	577,9	571,5	606,6	654,1	647,7	682,8	698,5	755,7		
24	603,3	603,3	603,3	577,9	577,9	628,7	628,7	628,7	616	616	685,8	679,5	717,6	774,7	768,4	790,7	838,2	901,7		

ASME B 16.47 SERIES B FOR API 605 FLANGES

DN	d <sub>1</sub>					d <sub>2</sub>					d <sub>3</sub>					d <sub>4</sub>					
	150	300	400	600	900	150	300	400	600	900	150	300	400	600	900	150	300	400	600	900	
26	654,1	654,1	654,1	644,7	673,1	673,1	673,1	666,8	663,7	692,2	698,5	711,2	698,5	714,5	749,3	725,4	771,7	746,3	765,3	838,2	
28	704,9	704,9	701,8	692,2	723,9	723,9	723,9	723,9	714,5	704,9	743	749,3	762	749,3	755,7	800,1	776,2	825,5	800,1	819,2	901,7
30	755,7	755,7	752,6	752,6	787,4	774,7	774,7	774,7	765,3	778	806,5	800,1	812,8	806,5	828,8	857,3	827	886	857,3	879,6	958,3
32	806,5	806,5	800,1	793,8	838,2	825,5	825,5	812,8	831,9	863,6	850,9	863,6	858,5	882,7	914,4	881,1	939,8	911,4	933,5	1016	
34	857,3	857,3	850,9	850,9	895,4	876,3	876,3	866,9	889	920,8	908,1	914,4	911,4	939,8	971,6	935	993,9	962,2	997	1073,2	
36	908,1	908,1	889,7	901,7	927,1	927,1	927,1	917,7	939,8	946,2	958,9	962,5	990,6	997	987,6	1047,8	1022,4	1047,8	1124		
38	958,9	971,6	952,5	952,5	1009,7	974,6	974,6	974,6	974,6	974,6	1035,1	1009,7	1047,8	1022,4	1041,4	1085,9	1044,7	1098,6	1073,2	1200,2	
40	1009,7	1003,3	1000,3	1009,7	1060,5	1022,4	1022,4	1022,4	1022,4	1022,4	1025,7	1047,8	1098,6	1063,8	1098,6	1149,4	1095,5	1149,4	1127,3	1155,7	
42	1060,5	1054,1	1051,1	1066,8	1111,3	1079,5	1079,5	1079,5	1079,5	1079,5	1104,9	1149,4	1149,4	1149,4	1149,4	1149,4	1149,4	1149,4	1149,4	1251	
44	1111,3	1124	1104,9	1111,3	1155,7	1124	1124	1124	1124	1124	1162,1	1130,3	1162,1	1206,5	1165,4	1200,2	1146,3	1200,2	1178,1	1219,2	
46	1162,1	1178,1	1168,4	1162,1	1219,2	1181,1	1181,1	1181,1	1181,1	1181,1	1193,8	1212,9	1270	1224	1244,6	1263,7	1320,8	1257,5	1317,8	1289,1	
48	1212,9	1231,9	1206,5	1219,2	1270	1231,9	1231,9	1231,9	1231,9	1231,9	1244,6	1270	1320,8	1270	1311,4	1295,4	1320,8	1371,6	1368,6	1346,2	
50	1263,7	1263,7	1257,3	1270		1282,7	1282,7	1282,7	1282,7	1282,7	1317,8	1295,4	1320,8		1325,6	1355,9	1346,2	1371,6	1357,4	1419,4	
52	1314,5	1317,8	1308,1	1320,8		1335,5	1335,5	1335,5	1335,5	1335,5	1368,6	1346,2	1371,6		1376,4	1406,7	1397	1422,4	1408,2	1470,2	
54	1365,3	1365,3	1352,6	1352,6	1378	1384,3	1384,3	1384,3	1384,3	1384,3	1403,4	1403,4	1428,8		1422,4	1454,2	1454,2	1479,6	1463,8	1530,4	
56	1422,4	1428,8	1403,4	1403,4	1428,8	1444,8	1444,8	1444,8	1444,8	1444,8	1479,6	1454,2	1479,6		1477,8	1524	1505	1530,4	1514,6	1593,8	
58	1478	1478	1454,2	1473,2		1485,9	1485,9	1485,9	1485,9	1485,9	1511,3	1505	1536,7		1528,8	1573,3	1555,8	1587,5	1579,6	1655,8	
60	1511,3	1524	1517,7	1530,4		1535,7	1535,7	1562,1	1562,1	1562,1	1568,5	1593,9	1587,5	1612,9	1619,3	1644,7	1714,5	1644,7	1682,8	1733,6	

ASME B 16.47 SERIES A FOR MSS SP 44 FLANGES

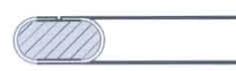
DN	d <sub>1</sub>					d <sub>2</sub>					d <sub>3</sub>					d <sub>4</sub>				
	150	300	400	600	900	150	300	400	600	900	150	300	400	600	900	150	300	400	600	900
26	654,1	654,1	660,4	647,7	666,8	673,1	685,8	685,8	685,8	685,8	704,9	736,6	736,6	736,6	736,6	774,7	835,2	831,9	866,9	882,7
28	704,9	704,9	711,2	698,5	711,2	723,9	736,6	736,6	736,6	736,6	755,7	787,4	787,4	787,4	787,4	831,9	888,7	892,3	914,4	946,2
30	755,7	755,7	755,7	755,7	774,7	774,7	793,8	793,8	793,8	793,8	806,5	844,6	844,6	844,6	844,6	882,7	952,5	946,2	971,6	1009,7
32	806,5	806,5	812,8	812,8	812,8	825,5	825,5	825,5	825,5	825,5	850,9	850,9	850,9	850,9						

# Planisteel MJ - MJS - GG



PLANISTEEL MJ

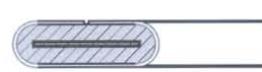
18  
MJ 00



MJ 10



MJ 12



MJ 14



MJ 16



MJ 18



MJ 19



MJ 22



## Planisteel MJ - MJS - GG

Carrara S.p.a. realizes jacketed gaskets PLANISTEEL in all materials and inserts for piping and heat exchangers applications, in the following versions:

- **PLANISTEEL MJ**

Jacketed Gaskets, in profiles

MJ 00 - MJ 10 - MJ 12 - MJ 14

MJ 16 - MJ 18 - MJ 19 - MJ 22

- **PLANISTEEL MJS**

Spiral Wound Gaskets with ribs in MJ in profiles

MJS 10 - MJS 20 - MJS 30

- **PLANISTEEL GG**

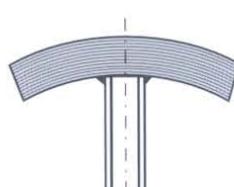
Grooved Gaskets in profiles

GG 10 - GG 20 - GG 30

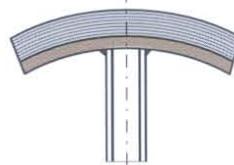
**Easy & Better!**  
**Carrara helps your work.**

PLANISTEEL MJS

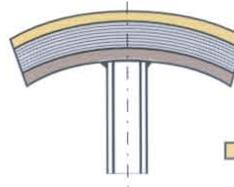
MJS 10



MJS 20



MJS 30



# Planisteel MJ - MJS - GG

## M&J GASKETS FACTORS

Gaskets Type	Material	ASME	
		m	y (psi)
PLANISTEEL MJ	stainless steel	2,75	9.000
	4%-6%& chrome	2,75	9.000
	soft iron	2,75	7.600
	Copper or Brass	2,50	6.500
	Monel	2,50	8.000
	Aluminium	2,25	5.500
PLANISTEEL MJS	all	3,00	10.000
PLANISTEEL GG	stainless steel	3,75	11.000
	4%-6%& chrome	3,75	9.000
	soft iron	3,75	7.600
	Copper or Brass	3,50	6.500
	Monel	3,75	7.600
	Aluminium	3,25	5.500

## PLANISTEEL GG

GG 10



GG 20



GG 30



## MATERIALS

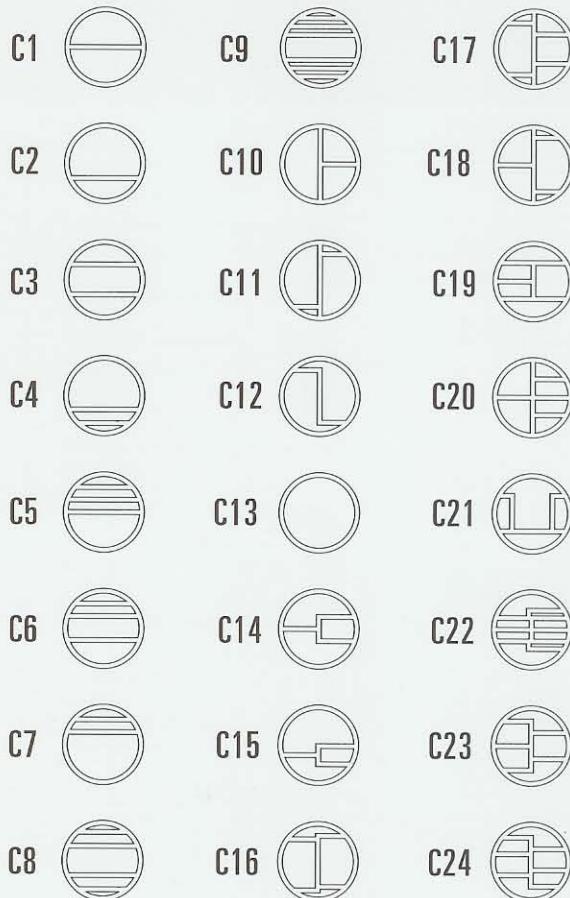
Material	ASTM	DIN Material No.
Low Carbon Steel	Soft iron	1.1003
Stainless steel	AISI 304	1.4301
Stainless steel	AISI 316	1.4401
Stainless steel	AISI 321	1.4541
Stainless steel	AISI 316 Ti	1.4571
Monel (NiCu30Fe)	B172, alloy 400	2.4360
Copper	Copper	2.0090
Brass	Brass Ms 63	2.0321
Aluminium	Aluminium 99.5	3.0255

Carrara S.p.a. realize PLANISTEEL gaskets in all materials and with all types of inserts.

To select the **PLANISTEEL** that you needs is very simple. It will be sufficient to select the family, the type and the shape, as in the examples:

- Cam profile with central rib **PLANISTEEL GG 10 C1**
- Spiral with inner ring and central rib **PLANISTEEL MJS 20 C1**
- Double jacketed with central rib **PLANISTEEL MJ 10 C1**

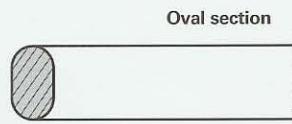
## Coding of the gaskets shape PLANISTEEL



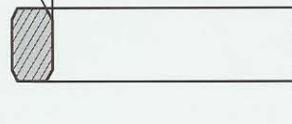
# Planisteel RJ



**20**  
STYLE R



STYLE RX



STYLE BX



## STANDARD MATERIALS

Standard Materials recommend by ANSI B16.20

ASTM	DIN No	Max HB	Max HV	Material Code
Soft Iron	1.1003	90	56	D
Low CS	1.0038	120	78	F
4-6 Cr 1/2 Mo	1.7362	130	72	F5
AISI 410	1.4000	170	86	S 410
AISI 304	1.4301	160	83	S 304
AISI 316	1.4401	160	83	S 316
AISI 347	1.4550	160	83	S 347

## Planisteel RJ

Ring Joints **PLANISTEEL RJ**, are produced in compliance to the standards BEES 6A and B16.20 ASTHMA for applications at elevated temperature and pressure.

The surfaces of contact between the gasket and the flange must be shaped with particular attention in order to guarantee the maximum performance of the gasket. Thanks to our modern equipments and the particular cure dedicated in the production, we succeed to guarantee superficial hardness and tolerances truly perfect.

The Ring Joints **PLANISTEEL RJ** gaskets are available in all inox stainless steels and in all alloy steels.

### Ring Joints, style R – RX – BX

## DIMENSIONS

### Ring Joints standard used for flanges

Type RJ	Dimensional standard	Flange standard
R	ASME B16.20 - API 6A	ASME B16.5 - ANSI B16.47 series A
RX	ASME B16.20 - API 6A	API 6B
BX	API 6A	API 6BX

ASME B 16.20						ASME B 16.47A		API 6B			WEIGHT Kg		
150	300	600	900	1500	2500	3/600	900	2000	3000	5000	R	OVAL	OCTAGONAL
1/2	1/2										R11	0,05	0,05
			1/2								R12	0,10	0,10
3/4	3/4			1/2							R13	0,10	0,10
				3/4							R14	0,11	0,11
1	1	1		1	3/4			1	1	1	R15	0,12	0,12
1,1/4											R16	0,12	0,11
	1,1/4	1,1/4		1,1/4	1			1 1/4	1 1/4	1 1/4	R17	0,14	0,13
1,1/2		1,1/2		1,1/2				1 1/2	1 1/2	1 1/2	R18	0,15	0,14
					1,1/4						R19	0,16	0,15
2	2	2			1,1/2			2			R20	0,17	0,15
2,1/2		2,1/2			2				2	2	R21	0,30	0,29
				2,1/2				2 1/2			R22	0,20	0,19
3					2,1/2				2 1/2	2 1/2	R23	0,34	0,33
3	3	3			3			3	3		R24	0,39	0,38
3 1/2		3 1/2			3						R25	0,25	0,23
											R26	0,42	0,41
4	4	4			4						R27	0,45	0,43
					4						R28	0,57	0,55
5	5	5			5						R29	0,28	0,26
6					5						R30	0,48	0,47
6	6	6			6			6	6		R31	0,51	0,50
					6						R32	0,65	0,63
8	8	8			8			8	8		R33	0,32	0,30
					8						R34	0,54	0,52
10	10	10			10			10	10		R35	0,56	0,55
					10						R36	0,37	0,34
12	12	12			12			12	12		R37	0,62	0,60
14					12						R38	1,16	1,14
											R39	0,67	0,65
14	14				14			14	14		R40	0,42	0,39
					14						R41	0,75	0,73
16	16				16			16			R42	1,91	1,88
					16						R43	0,48	0,44
18	18				18			18			R44	0,80	0,78
					18						R45	0,87	0,85
20	20				20			20			R46	1,08	1,05
					20						R47	2,29	2,26
24	24				24			24			R48	0,61	0,56
					24						R49	1,11	1,09
					22			22			R50	1,99	1,95
											R51	3,65	3,69
											R52	0,75	0,69
											R53	1,34	1,30
											R54	2,39	2,35
											R55	7,35	7,68
											R56	0,93	0,87
											R57	1,57	1,53
											R58	4,98	5,03
											R59	0,98	0,90
											R60	10,47	11,09
											R61	1,73	1,69
											R62	3,09	3,04
											R63	7,33	7,54
											R64	1,12	1,03
											R65	1,94	1,89
											R66	3,47	3,40
											R67	10,07	10,53
											R68	1,28	1,18
											R69	2,20	2,15
											R70	5,35	5,27
											R71	11,43	11,95
											R72	1,38	1,27
											R73	2,99	2,92
											R74	5,85	5,77
											R75	15,05	15,94
											R76	1,66	1,53
											R77	5,11	5,01
											R78	12,10	12,46
											R79	22,58	22,06
											R80	1,40	
											R81	3,86	
											R82	0,23	
											R84	0,25	
											R85	0,40	
											R86	0,65	
											R87	0,72	
											R88	1,22	
											R89	1,13	
											R90	2,05	
											R91	7,10	
											R92	0,94	0,92
											R93	7,40	
											R94	7,90	
											R95	8,47	
											R96	12,08	
											R97	12,75	
											R98	13,51	
											R99	0,95	
											R100	16,79	
											R101	21,83	
											R102	23,39	
											R103	24,95	
											R104	31,49	
											R105	33,35	