

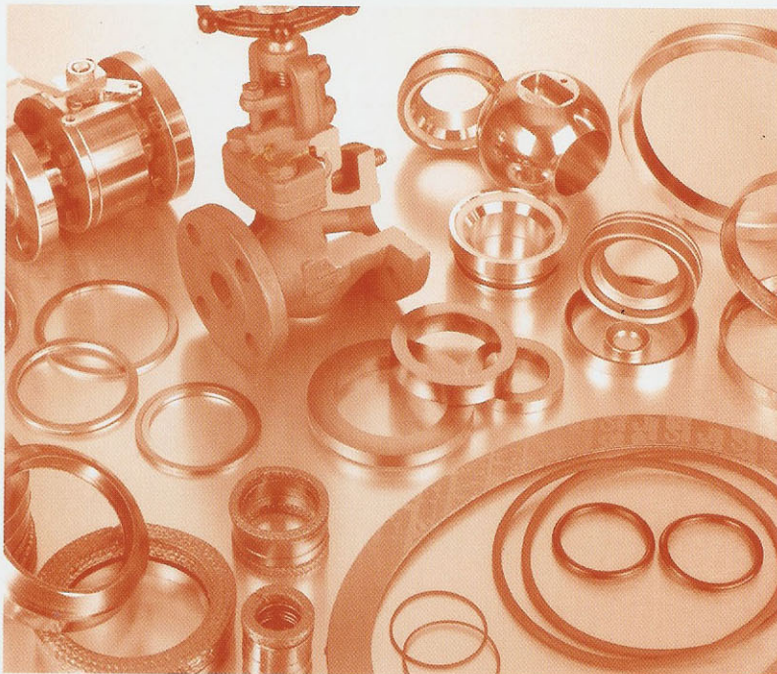
# Setting Valve



Gaskets for Valves

 **CARRARI®**  
PACKINGS AND GASKETS

# Gaskets for Valves



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# Setting Valve

*Carrara's product range addressed to the Valve Manufacturers, appears everyday to be more complete and rich of novelty. Innovative products and technical office of high quality to offer the best supplemented seal Solution. Carrara S.p.a., gaskets and competence at your service!*

## Carrara, your resource



Carrara S.p.a. operates in the International gasket market of the industrial valves for more than a two-decade period and can display prestigious customers. For them and with them, Carrara has developed within the years a complete Product Range, leading technically and plenty of high performance products.

"TOGETHER" is the word that better qualifies the Carrara S.p.a philosophy while understanding the relationship of supply and demand which binds them to the customers. Carrara S.p.a. believes in the modern SUPPLIER meaning: be a resource! A resource that is competent, flexible, innovative, available, always oriented to the necessities of the customer, and in continuous

interaction with the customers. Carrara S.p.a.'s product range form a real combination of "integrated seal solutions" to satisfy the demands of different Valve Manufacturers and for different seal requirements.

With the very rich Sealing Graphite set line for the stem seal, which with the certified Controller-One is equipped, you will find FIRE SAFE gaskets in graphite, metal and plastic gaskets for the Bonnet, Pressure Seal Gaskets, O-Rings, seal seats with all kinds of insert and Dry Bearings. In a short sentence, everything you need for your valve.

**Enter our Product Range and you will not find only products.**



# Carrara, a partner for the future



Carrara S.p.a. within the time is one  
of the most important European producers  
of seal systems for valves.  
Only a Supplier of products? One of the many?  
We believe not.

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The First Italian company of this sector to believe on the value of the certification for his own system, acquiring since '94 the ISO 9002.

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First Italian company of this sector to believe in the Partnership between producers, joining since the beginning to ESA, the European Sealing Association, where it has an active role inside the Work Group "Valves Fugitive Emissions".

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The only company in Italy among few in the world that independently produce packings, with which realize the Seal Sets.

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Carrara S.p.a. is among the principal customers of SGL Carbon Group, the worldwide giant of the graphite, for the expanded graphite.

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The First Italian company to invest in the research of special Low Emissions products.

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The First Italian company manufacturer that has brought to the market its own laboratories to realize the fugitive emissions prototypes tests.

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We have dedicated ample space for the logistic management of your gaskets.

## Here is Carrara!



Competitive strategy is to be a step ahead  
of the market requirements and to be ready  
for the expectations of the customers.

Our **MISSION** is quickly identified.

## Control Plan of the raw materials

In the creation of the value chain, of which we feel to be part of, the selection of suppliers of raw materials and semi manufactured is a fundamental aspect: all our suppliers are ISO 9000 certified. Graphite fibres, expanded graphite, steels, PTFE, elastomers and special products are carefully selected and tested within the time. Therefore, good products emerge from good materials!



*More than 7.000 moulding tools are our and your resource.*

## Control Plan of productive processes

To standardize the quality that can last within the time is a daily effort, which involves resources, expertise, passion and constant attention.

## Capacity and flexible productivity

To be able to answer the necessities of the Customer and capable to provide the requested quantities, quickly and at sustainable prices, it is a priority asset! Carrara S.p.a. has structured its manufacturing plants to respond in a winning mode to the demand of the market.

5



We produce quickly at sustainable prices and also provide series with contained quantities of gaskets because we are equipped with modern equipment and with advanced systems of programming for the production.



## Certification of product

An accurate certificate apparatus is essential in the modern commercial dynamics as guarantee of our products.

Our products are provided with certification of FIRE SAFE, LOW EMISSIONS, LONG LIFE and ANTI CORROSION in the LONG TERM.



*First Italian Company to invest in the research of special Low Emissions products.*

## Technical competence

Systematically the Carrara S.p.a. technical staff participates to international symposiums of sector, such as the bi-annual Valve World, to know the evolution of the valve world, the regulations which involve them, the new targets requested by the End Users, to the periodic ESA meetings and at the technical meetings organized by the producers of raw materials. The interaction with the technical and designing offices of the valve producers completes the necessary and continuous technical updating which makes Carrara S.p.a. a true point of reference regarding the knowledge of the seal systems.

## Additional services to the Carrara S.p.a customers

Carrara S.p.a. has been the first Italian producer to arrange a permanent laboratory in their plants for the tests in helium, to study and develop their knowledge within the field of the Fugitive Emissions.

For the continuous expansion of the "Prototype tests" of fugitive emission that valve producers encounter to answer the regulations of the End Users, Carrara S.p.a. provides the customers their own equipped laboratory, that will be able to accept valves up to 12.

During the execution of the "Prototype tests" external Fugitive Emissions inspectors are present, in agreement to the current regulations, integrating all that in a common project with the valve producer.



*Our expertise at your disposal to work easier and better.*



The Product Range of Carrara S.p.a. is articulated to meet all the seal requirements of the industrial valves and provides a dynamic and differentiated offer.

## Gaskets for the Stem

Graphite seal sets Low Emissions  
CONTROLLER-ONE

Standard graphite seal sets VALVOGRAPH

Graphite packings

Seal sets in PTFE Chevron

O-RINGS

## Gaskets for the Bonnet

Flat gaskets

PLANIGRAPH™, PLANIFLEX™, PLANIFLON™

PLANISTEEL

Pressure Seals gaskets STEELGRAPH

## Seal seats

Non-metallic

Metallic

Metallic with insert in all materials

O-RINGS and seal gaskets of the seat

## Graphite gaskets

VALVOGRAPH

## Components

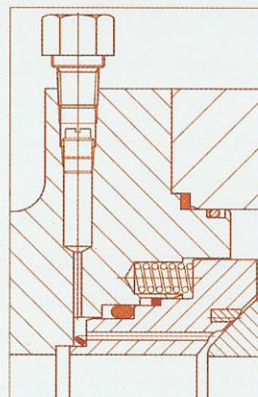
DRY BEARINGS



We use only the best materials manufacturing them with the best equipment.



We produce graphite gaskets from few mm. up to 2,300.



Contact us with confidence and you will have all the information about our products!

**www.carrara.it**



# Controller-One

*Low Emission*



**CONTROLLER-ONE** is a seal set of variable geometry, planned and realized to answer the request for a **secure product, reliable and corresponding to the regulations concerning the reduction of the fugitive emissions of VOC and HAP.**

In the middle, three graphite rings with a conical torso configuration of very low density "activated" by two graphite rings with a conical torso configuration at a different angle and at high density. All that is contained by two, GR8807 Incobraid® rings, as wiper and Anti-Extrusion Rings: here is the **CONTROLLER-ONE** configuration!

The innovative conical torso configuration of the graphite rings with different density, allows a great radial expansion already with modest torque loads.

It fully allows to utilize the elastic properties, reducing the friction strength exercised by the gasket on the stem during the movement, decreasing in such a way the damaging sustained by the gasket itself, and allowing a reduction of the effort requested to the actuator in the motion act. The great radial expansion capacities of the **CONTROLLER-ONE** allows to execute with success the re-torque required within the time to compensate the loss of weight of the gasket caused by the scratching of the stem, and keeping an unchanged seal efficiency within the time.

## COMPOSITION

### V48/E

- high purity graphite with inorganic corrosion inhibitor
- variable density

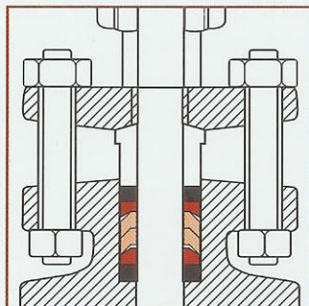
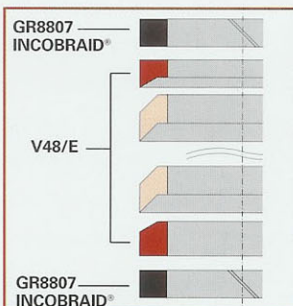
### GR8807 INCOBRAID®

- high purity graphite PAN fibres
- multistage impregnation with pure graphite
- inorganic corrosion inhibitor
- density from 1.3 gr/cm<sup>3</sup>
- metallic discontinuous reinforcement micrometrical

(*)	P bar	lbf/in <sup>2</sup>	Vm/S	f/pm	pH	T °C	F
	300	4500	1	200	0 ÷ 14	-100/+450 <sup>(1)</sup> +650 <sup>(2)</sup>	-150/+840 <sup>(1)</sup> +1200 <sup>(2)</sup>

(1) With oxidizing agents - (2) With steam and non oxidizing products

(\*) Do not use the product to the maximum values of temperature and pressure combined without consulting the producer.



Rings Set of expanded graphite V48/E, with rings in graphite packing top and bottom GR8807 INCOBRAID®.

## Controller-One: your solution for the fugitive emissions!

- HIGH TIGHTNESS CLASS
- GREAT RADIAL EXPANSION
- VERY LOW COEFFICIENT FRICTION
- ACTIVE WITH REDUCED TORQUE LOADS
- IT REDUCES THE POWER ASKED TO THE ACTUATOR



## Controller-One

**Controller-One is the new seal set that maximizes efficiency under all points of view.**

### CHARACTERISTICS

#### • HIGH TIGHTNESS CLASS

**CONTROLLER-ONE** meets the most pressing standard regulations to contain the emissions.

#### • TOP CERTIFICATION LEVEL

The certification level is certainly able to satisfy the requests of the principal Players.

Certification TUV I-05953

Fire Safe API 607 SwRI 6-445

#### • VERY LOW COEFFICIENT FRICTION

The resistant strength exercised on the stem by **CONTROLLER-ONE** becomes lower than 30% compared to the strength exercised by a gasket with a standard configuration.

#### • GREAT RADIAL EXPANSION

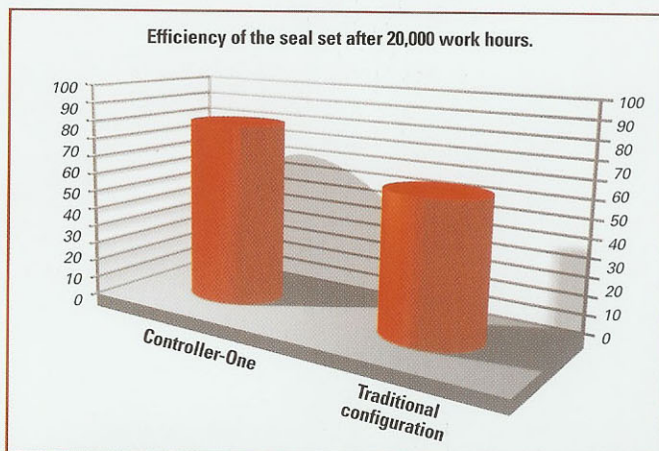
The particular configuration of **CONTROLLER-ONE** allows a radial expansion up to 18% of the ring section  $\frac{(D - d)}{2}$ .

#### • HIGH PURITY OF THE MATERIALS

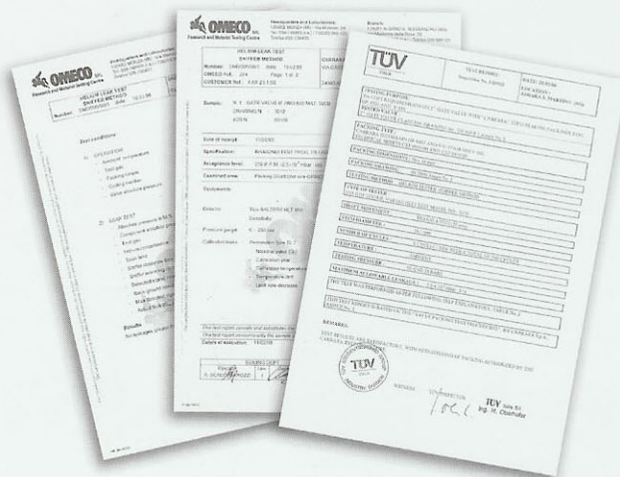
The high purity of the materials used for the **CONTROLLER-ONE** production, are a guarantee of high protection towards the stem and high resistance to the loss of the gasket weight.

#### • REDUCED TORQUE LOADS

**CONTROLLER-ONE** is activated with modest torque loads and is particularly suitable for valves with frequent movements. It is easy to install and guarantees long service cycle warranted by Long Life.



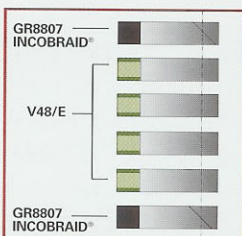
The high tightness class of Controller-one is being tested on the field and not only through laboratory tests. The conducted inquiry on a representative sample of gaskets that they have been left in service for more than 20,000 hours has shown that almost all of the installed Controller-one have maintained a high seal class.





# Controller-2

*New*



**CONTROLLER-2** is a set of high tightness Class with a special configuration of expanded graphite rings "Orthogonal Stratification" which constitutes a great element of innovation for a packing of exceptional elasticity and versatilities.

**CONTROLLER-2** is realized with

very pure materials and treated with special impregnations, to guarantee the security against the corrosion for long running periods. Separately manufactured with its control tag to guarantee the maximum reliability.


## COMPOSITION

### V48/E

- high purity graphite with inorganic corrosion inhibitor
- variable density

### GR8807 INCOBRAID®

- high purity graphite PAN fibres
- multistage impregnation with pure graphite
- inorganic corrosion inhibitor
- density from 1.3 gr/cm<sup>3</sup>
- metallic discontinuous reinforcement micrometrical dimension

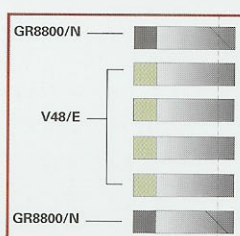
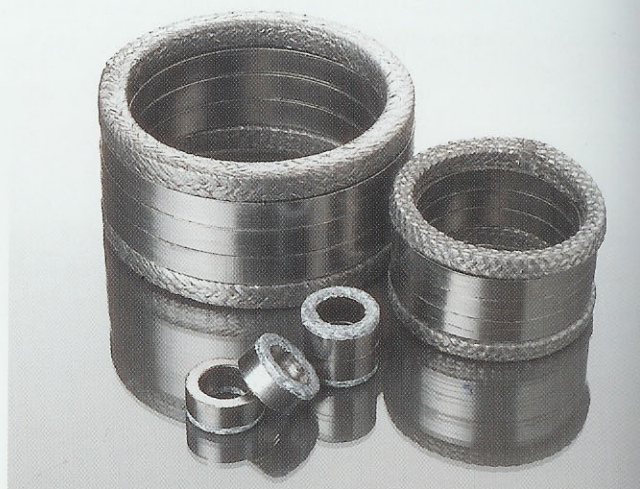
(*)	P bar	lbf/in <sup>2</sup>	Vm/S	f/pm	pH	T °C	F
	300	4500	1	200	0 ÷ 14	-100/+450 <sup>(1)</sup> +650 <sup>(2)</sup>	-150/+840 <sup>(1)</sup> +1200 <sup>(2)</sup>

(1) With oxidizing agents - (2) With steam and non oxidizing products

(\*) Do not use the product to the maximum values of temperature and pressure combined without consulting the producer; the graphite products are not to be used with strong oxidant substances.

# Valvograph First

*New*



**VALVOGRAPH FIRST** is a seal set which reply to the most severe restrictions regarding the content of halogens and sulphur, guaranteeing at the same time high levels of reliability and tightness Class.

**VALVOGRAPH FIRST** is a product

with performance and safe, realized on a square geometry, using high purity graphite, impregnations and treatments with special corrosion inhibitors to guarantee the maximum security. It is carefully manufactured to preserve the characteristics of purity.


## COMPOSITION

### V48/E

- high purity graphite with inorganic corrosion inhibitor
- variable density

### GR8800/N

- high purity graphite PAN fibres
- pure graphite impregnation
- inorganic corrosion inhibitor
- density 1.3 gr/cm<sup>3</sup>

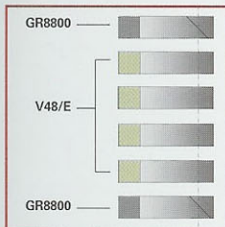
(*)	P bar	lbf/in <sup>2</sup>	Vm/S	f/pm	pH	T °C	F
	300	4500	1	200	0 ÷ 14	-100/+450 <sup>(1)</sup> +650 <sup>(2)</sup>	-150/+840 <sup>(1)</sup> +1200 <sup>(2)</sup>

(1) With oxidizing agents - (2) With steam and non oxidizing products

(\*) Do not use the product to the maximum values of temperature and pressure combined without consulting the producer; the graphite products are not to be used with strong oxidant substances.



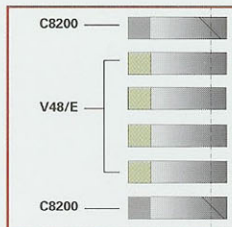
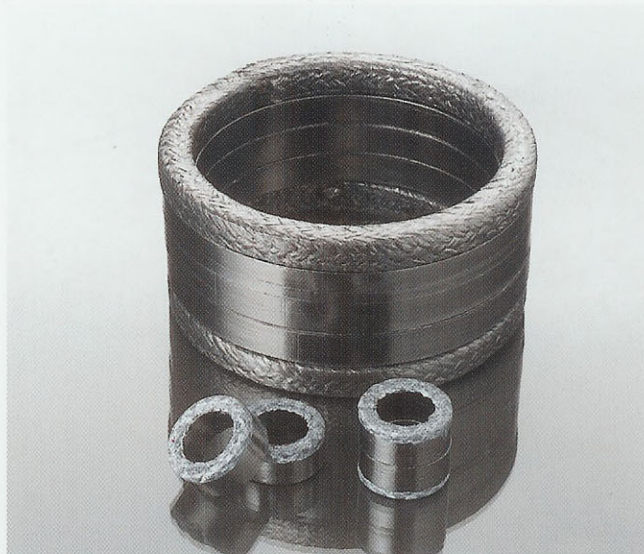
## Valvograph Special



**VALVOGRAPH SPECIAL** is a reliable seal set and tested for all the applications with steam and process fluids. Composed by rings in pure expanded graphite and from packing in pure P.A.N. graphite, **VALVOGRAPH SPECIAL** has great resistance to temperature

and pressure and offers extreme guarantees of security in the industrial applications. The product is treated with special corrosion inhibitors to guarantee the maximum protection of the stems.

## Valvograph Economy



**VALVOGRAPH ECONOMY** is a reliable seal set and tested for more general applications from steam to process fluids. Effective and versatile, **VALVOGRAPH ECONOMY** is the seal set with Top & Bottom rings in pre-oxidized Carbon graphite packing that

does not vitrify, harden or extrude, better suitable for routine jobs. It offers an excellent performance fully optimizing the cost efficiency of the product.

### COMPOSITION

#### V48/E

- high purity graphite with inorganic corrosion inhibitor
- variable density

#### GR8800

- high purity graphite PAN fibres
- pure graphite impregnation
- inorganic corrosion inhibitor
- density 1.3 gr/cm<sup>3</sup>

The VALVOGRAPH SPECIAL/R version is available with Top & Bottom in GR8800/R

(*)	P bar	lbf/in <sup>2</sup>	Vm/S	f/pm	pH	T °C	F
	300	4500	1	200	0 ÷ 14	-100/+450 <sup>(1)</sup> +650 <sup>(2)</sup>	-150/+840 <sup>(1)</sup> +1200 <sup>(2)</sup>

(1) With oxidizing agents - (2) With steam and non oxidizing products  
(\*) Do not use the product to the maximum values of temperature and pressure combined without consulting the producer; the graphite products are not to be used with strong oxidant substances.

### COMPOSITION

#### V48/E

- high purity graphite with inorganic corrosion inhibitor
- variable density

#### C8200

- pre-oxidized PAN carbon fibres
- pure graphite impregnation
- inorganic corrosion inhibitor
- density 1.2 gr/cm<sup>3</sup>

The VALVOGRAPH ECONOMY/R version is available with Top & Bottom in C8300/R

(*)	P bar	lbf/in <sup>2</sup>	Vm/S	f/pm	pH	T °C	F
	200	3000	1	200	2 ÷ 12	-50/+500 **	-60/+940 **

(\*) Do not use the product to the maximum values of temperature and pressure combined without consulting the producer; the graphite products are not to be used with strong oxidant substances.  
(\*\*) Peak value for short exposures.



# The choice of the packing: Top & Bottom



**12** Carrara S.p.a. has a packing product range so complete and articulate that you will be able to find everything that is needed for your valves.

Graphite packings on P.A.N or Rayon base, in Expanded Mineral Graphite or mixed fibre, reinforced and non reinforced, with impregnation or without impregnation: a certified heterogeneous product range to meet the most modern demands.

Enter [www.carrara.it](http://www.carrara.it) and you will find all the technical data sheet and detailed information of the packing range.

Of extreme importance, in the selection of the most functional gasket to the application, is the **PACKING** with which realizes the top rings and lower part of the seal set, better known as Top & Bottom.

The Top & Bottom rings perform to the following services:

- **Anti-extruder**
- **Scraper**
- **Compensator of out of line movements**

The packings that better perform to the T&B role are the ones realized in P.A.N fibre, resistant and suitable for the purpose, or those with mixed P.A.N fibre and expanded graphite. The material with which is realized the Carbon-graphite packing is the P.A.N. fibre (Polyacrilonitrile) refined up to the graphitisation stadium, in such a way that the carbon value C is at least 95%. The fibre can be reinforced with filaments, continuous or discontinuous of bound steel, diameter less than 0.1 mm or micrometrical order.

In our graphite packings Product Range to be used as **Top & Bottom** we suggest:

• **GR8807 Incobraid®**

Pure graphite P.A.N. with metallic discontinuous reinforcement at micrometrical dimension and corrosion inhibitor

• **GR8800**

Pure graphite P.A.N. with corrosion inhibitor.



# GR8807 Incobraid®



## Innovation

GR8807 Incobraid®, is a special and innovative packing which performs the most severe service conditions guaranteeing:

- LONG LIFE
- FIRE SAFE
- CORROSION PROTECTION in the LONG TERMS
- HIGH TIGHTNESS CLASS

The high purity P.A.N. yarn and thousands of discontinuous metal microfilaments allow to obtain an extremely compact packing body, however flexible and resistant. The special impregnation techniques allow a homogeneous distribution of the corrosion inhibitor.

## Application fields

GR8807 Incobraid®, is usable for all the H.T. - H.P. services with steam and non-oxidant process fluids. It can be entirely used to realize the seal set and not only as Top & Bottom. It is recommended for services with high frequency of the valve movements.

COMPOSITION	
GR8807 INCOBRAID®	
• high purity graphite PAN fibres	
• multistage impregnation with pure graphite	
• inorganic corrosion inhibitor	
• density from 1.3 gr/cm³	
• metallic discontinuous reinforcement micrometrical dimension	

(*)	P bar	lbf/in²	Vm/S	f/pm	pH	T °C	F
	300	4500	1	200	0 ÷ 14	-100/+450 (1) +650 (2)	-150/+840 (1) +1200 (2)

(1) With oxidizing agents - (2) With steam and non oxidizing products  
(\*) Do not use the product to the maximum values of temperature and pressure combined without consulting the producer; the graphite products are not to be used with strong oxidant substances.

# GR8800



## Reliability

CARBOGRAPH GR8800 is a packing of high purity P.A.N. yarn that performs the service conditions guaranteeing:

- LONG LIFE
- FIRE SAFE
- CORROSION PROTECTION in the LONG TERMS

CARBOGRAPH GR8800 is a flexible compact packing that does not extrude or harden. The purity of the materials and the special impregnation with corrosion inhibitors guarantee LONG LIFE service cycles.

## Application fields

CARBOGRAPH GR8800 is usable for all services except ones with strong oxidizers. It can be used to realize the whole seal set and not only as Top & Bottom. Suggested for services with high frequency of the valve movement is also available in the reinforced version GR8800/R.

COMPOSITION	
GR8800	
• high purity graphite PAN fibres	
• pure graphite impregnation	
• inorganic corrosion inhibitor	
• density 1.3 gr/cm³	

(*)	P bar	lbf/in²	Vm/S	f/pm	pH	T °C	F
	300	4500	1	200	0 ÷ 14	-100/+450 (1) +650 (2)	-150/+840 (1) +1200 (2)

(1) With oxidizing agents - (2) With steam and non oxidizing products  
(\*) Do not use the product to the maximum values of temperature and pressure combined without consulting the producer; the graphite products are not to be used with strong oxidant substances.



# Pressure Seal Gaskets

## The Anti-extrusion seal systems

Carrara S.p.a. has developed a high level of technical solutions especially dedicated to the seal systems for the valves called **"Pressure Seal"**, and for the heat exchangers. However adaptable to every circumstances where the danger of extrusion of the gasket could emerge.

The particular care in the design and realization of these gaskets makes the products of the **"Pressure Seal"** line particularly reliable and suitable to replace the old gaskets in silver-plated Armco iron used in the past in the Pressure Seal Valves.

The seal properties of the graphite gaskets are exalted and preserved by the combination with steel in different solutions that prevent the extrusion of the graphite itself in critical points. For such reason, these gaskets are useable in all combinations where existing conditions of high pressure and temperature conjugate to a strong extrusion risk, such as high and low pressure condensers of the electric plants.

The different adoptable technical solution is agreed with the user after a verification of the operating conditions of the system and the variety of the combinations. A feasible cooperation between Carrara S.p.a.'s technical office and user to always use the most efficient and secure gasket.

# G11 Steelgraph



## The Strength


**G11 STEELGRAPH** is a gasket obtained from a cold moulding of an intimate mix of graphite and steel of predetermined proportions according to the requested elastic return of the gasket.

**G11 STEELGRAPH** is a high-density gasket, very resistant, specifically planned for heavy engagements and where the extrusion risks are high.

The elastic return of this gasket is in decimal order equal to the outdated Armco iron gaskets, which are from **G11 STEELGRAPH** replaced.

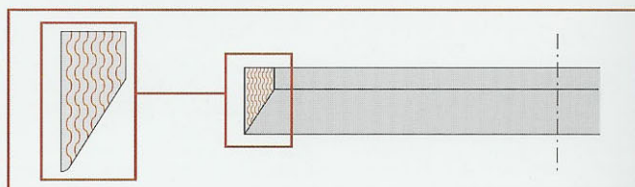
### COMPOSITION

- high purity expanded mineral graphite
- AISI 316 L
- treatment with corrosion inhibitor

(*)	P bar	lbf/in <sup>2</sup>	pH	T °C	F
	1500	22.500	0-14	450 (1) 650 (2)	800 (1) 1.200 (2)

(1) With oxidizing agents - (2) with steam and non oxidizing products

(\*) Do not use the product to the maximum values of temperature and pressure combined without consulting the producer.





## G22 Steelgraph



### The Resistance

**G22 STEELGRAPH** is a gasket obtained from cold moulding of pure expanded mineral graphite assembled with 2 Covers, superior and lower, of steel 316 L. This solution, allow to protect the gasket from the extrusion and take advantage of the exceptional elastic properties of the expanded graphite.

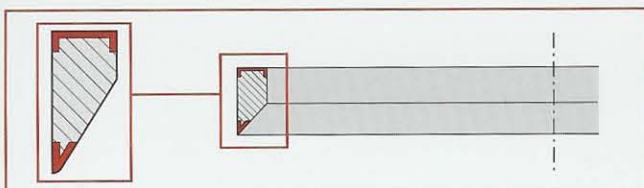
**G22 STEELGRAPH** is an innovative gasket at programed density, very resistant, Long Life, with an exceptional performance at low pressures and in general during the pressure cycles when the gasket elasticity is fundamental to prevent leakage.

#### COMPOSITION

- high purity expanded mineral graphite
- superior and lower Cover AISI 316 L
- treatment with corrosion inhibitor

(*)	P bar	lbf/in <sup>2</sup>	pH	T °C	F
	1500	22.500	0-14	450 (1) 650 (2)	800 (1) 1.200 (2)

(1) With oxidizing agents - (2) with steam and non oxidizing products  
(\*) Do not use the product to the maximum values of temperature and pressure combined without consulting the producer.



## G33 Steelgraph



### The Elasticity

**G33 STEELGRAPH** is a gasket obtained through cold moulding of pure expanded mineral graphite assembled with a variable number of AISI 316L springs which are placed on the corners. This solution, allows to protect the gasket from the extrusion and to take advantage of the exceptional elastic properties of the expanded graphite. It is particularly indicated where the dimensions of the gaskets need an Anti-extruder of greater flexibility.

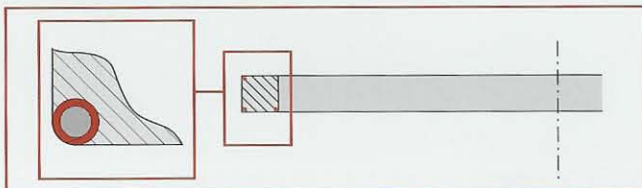
**G33 STEELGRAPH** is a versatile gasket, very resistant, Long Life, with an exceptional performance at low pressures and in general during the pressure cycles when the elasticity of the gasket is fundamental to prevent leakage.

#### COMPOSITION

- high purity expanded mineral graphite
- springs AISI 316 L
- treatment with corrosion inhibitor

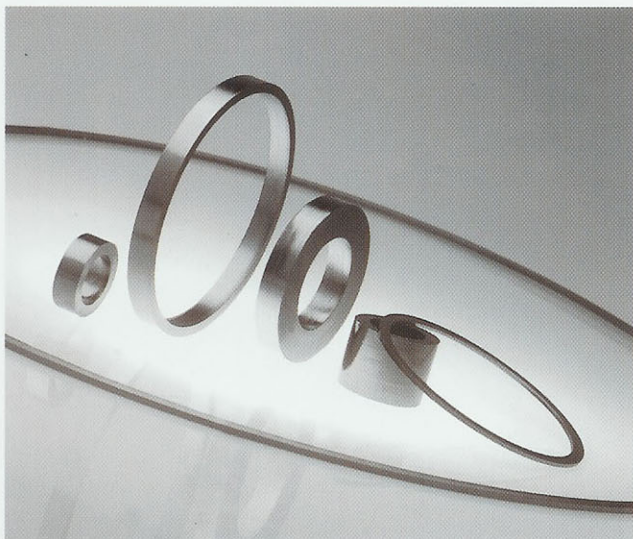
(*)	P bar	lbf/in <sup>2</sup>	pH	T °C	F
	1500	22.500	0-14	450 (1) 650 (2)	800 (1) 1.200 (2)

(1) With oxidizing agents - (2) with steam and non oxidizing products  
(\*) Do not use the product to the maximum values of temperature and pressure combined without consulting the producer.





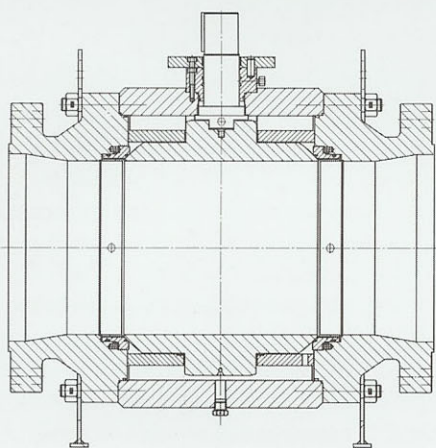
# Valvograph Rings



To answer the large expansion of the BALL VALVES segment, Carrara S.p.a. has organized its own Valvograph Rings productions according to the most modern demands. Carrara S.p.a. has arranged the dimensions of its own production plants to fulfill flexibility to the necessities of the customers.

Thanks to a really impressive quantity of equipment and to a programming of a modern and precise production, Carrara S.p.a. is able to manage any kind of production demand, using great quality materials, regularly checking the conformity of the gaskets produced.

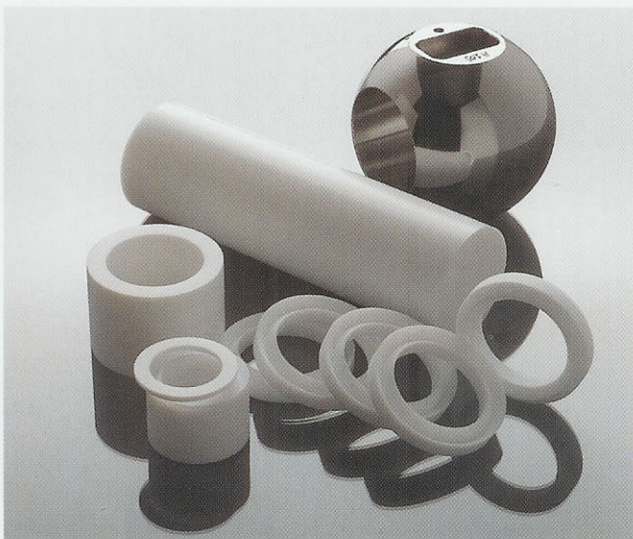
**Being a Customer of ours  
will become a pleasant habit  
of many advantages!**



## Valvograph Rings

<b>Graphite</b>	C > content 99.00 %				
	Content of < 1.00 % ashes				
	Treatment with passive corrosion inhibitor				
<b>Dimensions</b>	from 10 up to 2300 mm				
	<b>Standard production tolerances</b>				
	Inner Diam.	Outer Diam.	Strip	Thickness	Density
Up to 250	+0,20	0,00	0,00	+/-0,20	1,25
	0,00	-0,20			
from 251 up to 500	+0,25	0,00		+/-0,20	
	0,00	-0,25			
from 501 up to 750	0,30	0,00		+/-0,25	fino a 1,65
	0,00	-0,30			
from 751 up to 1.000	0,40	0,00		+/-0,25	
	0,00	-0,40			
from 1.001 up to 1.250	0,45	0,00		+/-0,30	
	0,00	-0,45			
from 1.251 up to 2.300	+0,50	0,00		+/-0,30	
	0,00	-0,50			

The chart displays the usual adopted tolerances. Carrara S.p.a. can produce also in conformity of your specifications. Consult our technical office and every need you have will be evaluated and satisfied.



The PTFE gaskets enlarge our offer to give you complete service.



## Valvograph Rings

### Quality objective

We use only the best materials and check all produced gaskets.

### Great flexibility

We produce quickly at sustainable prices and also provides series with contained quantities of gaskets.

### High productive capacity

We are equipped with modern equipment and with advanced systems of programming for the production.

### Large die store

More than 7.000 different mould equipment are ours and your, resource.

### Interaction planning

We contain your costs by giving you some advice.



Our control is extensive and efficient for your security and satisfaction.

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The cure that we use into the packaging guarantees the integrity of your gaskets in order to be always precise and perfectly exact of how we have produced them.

## Products



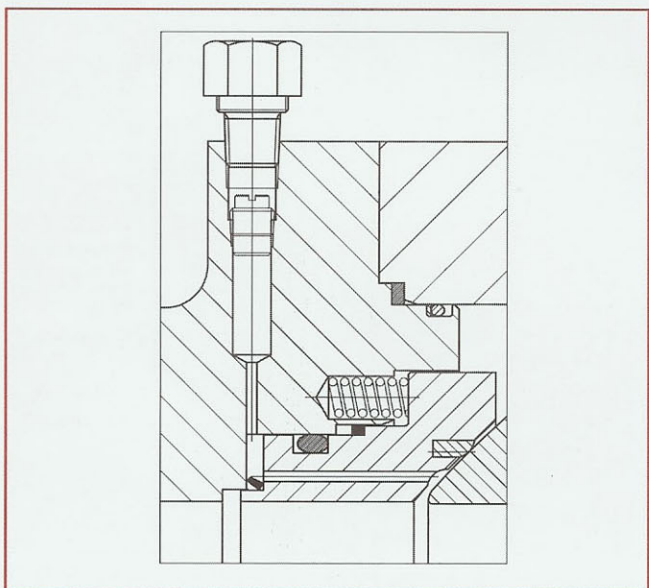
# Sealing Seats



Carrara S.p.a. has inserted in its Product Range the **SEALING SEATS** line completely dedicated to the producers of ball valves.

In the **SEALING SEATS** line available are seats entirely metallic or equipped with plastic inserts of any kind, and seats realized in the most common plastic materials, starting with the PTFE up to the PEEK.

The Carrara S.p.a.'s technical office is at the customer disposal for the Engineering of the seats, to research the optimizations and the best planning choices.



## SEALING SEATS CODE

### Non metallic

TFE **SS NM TFE**

Reinforced TFE fire seal design **SS NM TFE Fire Control 1**

HiLoad TFE fire seal design **SS NM RTFE Fire Control 2**

Carbon Graphite **SS NM CG**

Peek **SS NM P**

Ceramic **SS NM C**

### Metallic

Metal & non galling high nickel content alloy **SS M 316\* S1**

Metal & cobalt-chromium-tungsten alloy **SS M 316\* S2**

Metal & TFE insert **SS M 316\* TFE**

Metal & RTFE insert **SS M 316\* RTFE**

Metal & Peek insert **SS M 316\* P**

Metal & Carbon Graphite **SS M 316\* CG**

(\*) All kinds of metals are available.



## Sealing Seats

### SS NM TFE

Virgin Polytetrafluoride. The material has a low coefficient friction and anti stick properties really unique, FDA approved for alimentary and pharmaceutical use. The material is resistant to the oxidation, to the most part of the chemical agents and gas. Even though compatible with the organic products, the virgin TFE is not suggested for applications with halogeant solvents and permeating substances (Vinyl Chloride, Styrene). White colour.

### SS NM TFE Fire Controll 1

Polytetrafluoride glass loaded. The material, qualified 607 4th edition, is loaded with resins at a certain glass percentage to improve the load properties, resistance to the abrasion, to the cold flowing and to reduce the superficial permeability of the seat. The loads allow the use at pressures and temperatures not reachable from the virgin TFE. Not usable for not pertaining glass applications. Colour grey/white.

### SS NM RTFE Fire Controll 2

Polytetrafluoride carbon loaded. The material, qualified API 607 4th edition, is loaded with resins at a certain graphite percentage acquiring exceptional property resistance to the load, to the abrasion and to the penetration of the fluids. It can function in saturate steam up to 208°C and in the pertaining chemical conditions up to 288°C. Normally the product is used in flammable applications, dangerous and on an average abrasive level. Black colour.

### SS NM CG

Carbon and pure sintered graphite is obtained by moulding at high temperature of an intimate mixture of carbon and graphite soaked with special resins. The result is a material resisting to the pressure, to the abrasion, chemically inert and thermally stable. The typical use of this material is for the applications from 288°C to 538°C (in non oxidative environments). In oxidizing environments such as (nitric acid, chromic acid, Sulphuric acid, chlorine, peroxides, nitrates, nitrites, oxygen, air) the temperature is limited to 371°C. Excellent for the application with steam up to 47.6 bar and 400°C. **for PET applications.**

### SS NM P

PEEK reinforced carbon with polyetherketone. This material has excellent properties in the applications with high number of cycles for the reliability that performs in the long term. It can function at 85 bar, 182°C. and up to 315°C. recommended for applications on steam and non-sticking polymer services.

### SS NM C

Ceramic. The resistance to the abrasion and the temperature, combined with great chemical inertia, makes this material sometimes preferable to the metal seats.

### SS M 316\* S1 or S2

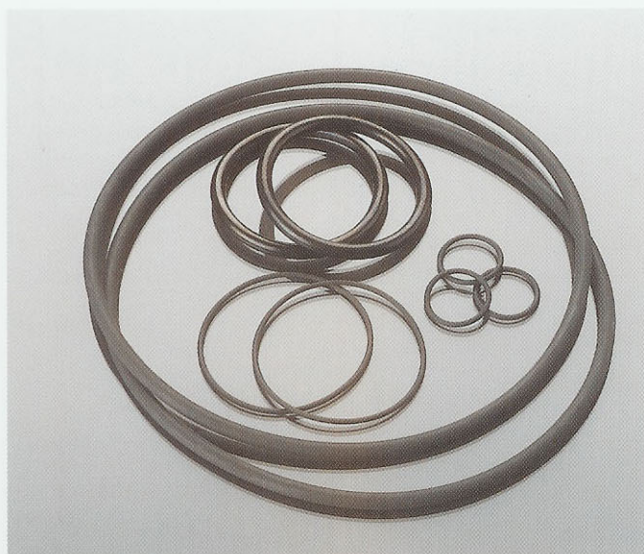
Metal seats with superficial filling materials. The use of the metal seats is to be considered for severe services, where other materials are impossible to use. They are particularly recommended in abrasive services. The filling material S1 (non Galling High Nickel Content Alloy) is recommended in corrosive and abrasive services up to 370°C, and the filling material S2 (stellite) for abrasive services up to 800°C.

### Metal & Insert SS M 316\* TFE RTFE P CG

Metal seats with polymeric inserts. The use of a metal seat with plastic insert is a convenient option compared to the seats entirely polymeric. Carrara has developed a technology of insertion that allow the practice of this option in total security. Other polymeric materials are available for the inserts.



# O-Rings



Carrara S.p.a. displays in its Product Range a wide variety of **O-RINGS** completely dedicated to the producers of ball valves. Besides the usual materials, in our range you will be able to find the black FKM, GLT with certifications "Decompression test" of important Players of the refining and the very special Perfluorelastomero 80 for high temperature applications and Stream Chetonic. Carrara S.p.a. has developed itself a technology to make **O-RINGS** available, with dimensions superior than 200 mm, also in limited number of pieces, meeting the demand of the market segment specialized in production of little series.

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		PERFLUORELASTOMERO 80	FKM 90 ED-T	FKM 90 nero GLT	FKM 90 ED	FKM 90 nero TER
	Elastomer base	FKKM	FKM terpolim			
	Property	ASTM D2000	ASTM D2000			
	Vulcanization test	180°Cx10h, 290°Cx24h	180°Cx10h, 232°Cx24h			
ORIGINAL PROPERTIES	Specific weigh Gr/Cm3 ASTM D1817	1.90	1.88	1.85	1.82	1.90
	Hardness-Points ASTM D2240	80	93	87	91	91
	Load up to break point-Mpa ASTM D412	20	16	13	17	15
	Stretching up to break point-% ASTM D412	155	120	140	110	170
	Compression set-% ASTM D395 B/1 24h	-	19	30	11	20
	Compression set-% ASTM D395 B/1 70h	25	25	35	15	25
RESISTANCE TO THE COLD	Brittle Point-°C ASTM D746	-	-18	-37	-25	-25
	TR10-°C ASTM D1329	-	-15	-30	-15	-15
AGEING IN HOT AIR ASTM D573	Hardness-Points	-1	1	2	3	1
	Load up to break point-%	-15	-15	7	-12	-8
	Stretching up to break point-%	+40	-10	10	-15	-10
AGEING IN ASTM N ° 2 ASTM D471	Hardness-Points	-8	-	-	-	-
	Load up to break point-%	-	-	-	-	-
	Stretching up to break point-%	-	-	-	-	-
AGEING IN ASTM N ° 3 ASTM D471	Volume-%	+6	-	-	-	-
	Hardness-Points	-3	-	-	-	-2
	Load up to break point-%	-	-	-	-	-10
AGEING IN FLUID 101 ASTM D471 SERVICE	Stretching up to break point-%	-	-	-	-	-10
	Volume-%	+6	-	-	-	1
	Hardness-Points	-	-6	-	-5	-4
AGEING IN IRM 903 ASTM D471	Load up to break point-%	-	-15	-	-15	-15
	Stretching up to break point-%	-	15	-	15	15
	Volume-%	-	7	-	8	7
AGEING IN FUEL B ASTM D471	Hardness-Points	-	2	-	2	-
	Load up to break point-%	-	-15	-	-12	-
	Stretching up to break point-%	-	-15	-	-15	-
AGEING IN FUEL C ASTM D471	Volume-%	-	+1.5	-	1	-
	Hardness-Points	-	-	-3	-	-
	Load up to break point-%	-	-	-17	-	-
AGEING STAUFFER BLEND ASTM D471	Stretching up to break point-%	-	-	-7	-	-
	Volume-%	-	-	8	-	-
	Hardness-Points	-	-3	-	-2	-2
AGEING STAUFFER BLEND ASTM D471	Load up to break point-%	-	-18	-	-13	-1
	Stretching up to break point-%	-	15	-	-18	13
	Volume-%	-	4	-	3	+1.5
HOMOLOGATIONS	Hardness-Points	-	-	-8	-	-
	Load up to break point-%	-	-	-25	-	-
	Stretching up to break point-%	-	-	-15	-	-
HOMOLOGATIONS	Volume-%	-	-	16	-	-
	Hardness-Points	-	MERL	-	MERL	-
	Load up to break point-%	-	-	-	-	-
	Stretching up to break point-%	-	-	-	-	-
	Volume-%	-	-	-	-	-



# Dry Bearings



## CHARACTERISTICS

- FOR DRY APPLICATIONS
- LOW COEFFICIENT FRICTION
- OPTIMAL SLIDING CHARACTERISTICS
- APPLICABLE FOR ROTARY AND OSCILLATING MOVEMENTS
- ELEVATED CHEMICAL RESISTANCE

Carrara S.p.a **DRY BEARINGS** are available in the Carbon Steel DB-CS10 version, with excellent load capacity, heat dissipation, and in the version inox steel DB-SS30 which add an excellent corrosion resistance. The internal surface is covered by a PTFE/Pb film of 0.01 - 0,03 mm, that rests itself on a film of sintered bronze powder of thickness 0,20 - 0,35 mm. This treatment allows to increase the thermal conductivity of the bearing and constitutes a reservoir for the production of the lead oxides that tie to the PTFE, feeding the rubbing surface with lubricating compound. In the Carrara S.p.a. program available are other types of Slide Bearings, in order to answer any kind of technical requirement. **Consult us!**

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Inner diameter	Cut thickness	Tolerance of the cut thickness
$5 \leq d < 20$	1.0 mm	+0.005 -0.020
$20 \leq d < 28$	1.5 mm	+0.005 -0.025
$28 \leq d < 45$	2.0 mm	-0.005 -0.030
$45 \leq d < 80$	2.5 mm	+0.005 -0.040
$80 \leq d < 120$	2.5 mm	-0.010 -0.060
$120 \leq d$	2.5 mm	-0.035 -0.085

## TECHNICAL DATA

<b>Maximum load</b>	
Static	250 N/mm <sup>2</sup>
At low speed	140 N/mm <sup>2</sup>
With oscillating rotation	60 N/mm <sup>2</sup>
<b>Maximum value P * velocity for dry rubbing</b>	
Peak value	3.6 N/mm <sup>2</sup> * m/s
At regimen	1.8 N/mm <sup>2</sup> * m/s
<b>Maximum value P * velocity in hydrodynamics conditions</b>	
	1.8 N/mm <sup>2</sup> * m/s
<b>Temperature limit</b>	
	-195°C // +280°C
<b>Maximum speed</b>	
In dry conditions	2 m/s
In Hydrodynamics conditions	> 2 m/s
<b>Thermal conductivity</b>	
	42 W/(m*K-1)
<b>Thermal coefficient expansion</b>	
	15*10 <sup>-6</sup> *K-1
<b>Coefficient friction</b>	
In dry conditions	0.08 - 0.20
Hydrodynamic	0.02 - 0.08



# Bonnet gaskets

The Bonnet gasket range is rich of products to give you a vast choice to satisfy any requirement you might have. You will find the gaskets in graphite **PLANIGRAPH™** and those in fibre **PLANIFLEX™**, the products **PLANIFLON™** and the metallic gaskets, spiral, Jacketed and Ring Joints, of the **PLANISTEEL** line.

## PLANIGRAPH™

The graphite gaskets PLANIGRAPH™ are available in three versions:

- LG pure graphite
- LGR pure graphite with 316L insert
- LGRF pure graphite with 316L tanged insert

		LG	LGR	LGRF
Contained of Carbon	%	≥ 98	≥ 98	≥ 98
Insert thickness AISI 316L	mm		0.05	0.10
Compressibility	%	40 - 50	40 - 50	30-40
Compressibility	%	10-15	10-15	15-20
Relaxation stress DIN 52913	N/mm²	≥ 45	≥ 45	≥ 48
Temperature	°C	550	550	550
" m " Factor		2.00	2.00	2.50
" y " Factor	psi	900	900	4000
Not usable with oxidizing steam. 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"		

## PLANIFLEX™

The asbestos free gaskets PLANIFLEX™ are available in the versions:

- PF 41 cellulose + NBR
- PF 63 aramidic + NBR
- PF 81 aramidic + graphite + NBR

		PF 41	PF 63	PF 81
Composition		Cellulose	Aramidic	Aramidic Graphite
		NBR	NBR	NBR
Max Temperatures	°C	200	350	400
Max Pressure	Bar	50	100	100
Colour		Green	Blue	Black
Size	mm	1500 x 1500		
Thickness	mm	from 0.40 up to 5.00 mm		

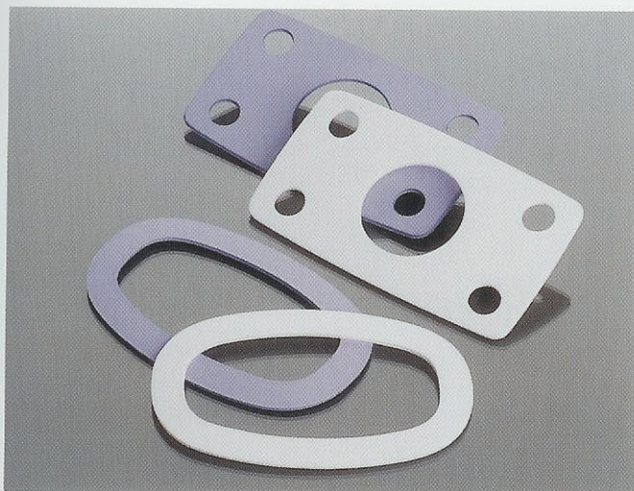
You will find all technical data sheet and other models of the PLANIFLEX™ range at [www.carrara.it](http://www.carrara.it).



PLANIFLEX™



# Bonnet gaskets



PLANIFLON™

## PLANIFLON™

The PTFE that's renewed!

The product range in PTFE PLANIFLON™ acquires 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™ is a step ahead in order not to remain behind!

Part of the PLANIFLON™ line models, are sizes from 1.200 up to 1.500 mm. in thickness from 0.50 up to 6.00 mm:

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

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



PLANISTEEL

## PLANISTEEL

In the PLANISTEEL™ line you will find a wide range of:

- Standard Spiral wounds ASTHMA, UNI and DIN
- Jacketed gaskets solid & jacketed
- Ring Joints, style R - RX - BX

Standard materials suggested by ANSI B16.20

ASTM	DIN Material No	Maximum HB	Maximum 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

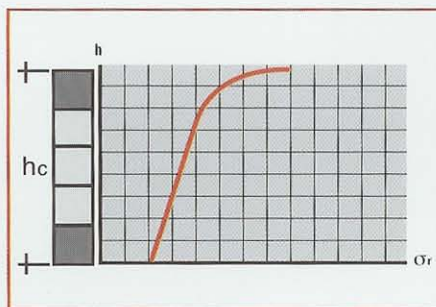
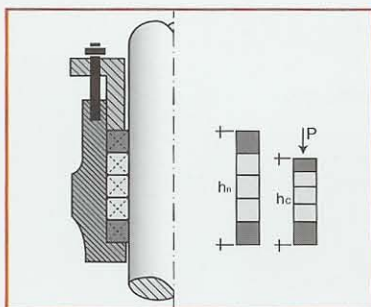


# Torque of the gaskets

Often the torque of the gaskets and the calculation of the compressions can constitute a slide issue.

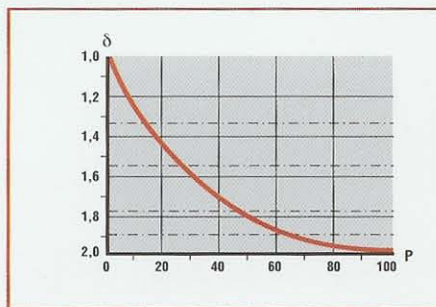
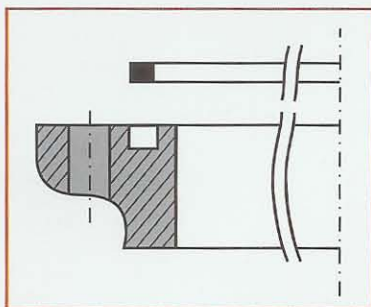
The gaskets have to work always in the elastic field: an excessive torque same as an insufficient torque, constitute an element of danger for the gasket that can

irreparably lose its own characteristics of elasticity deforming permanently. Following, we propose some simple suggestions for a torque always secure to exalt the elastic capacity of the Carrara S.p.a. gaskets.



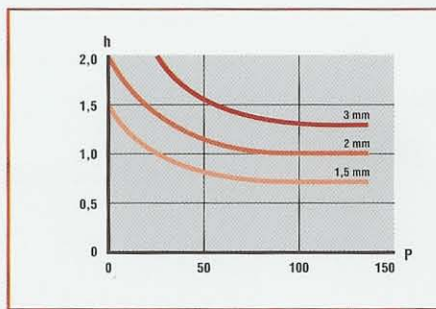
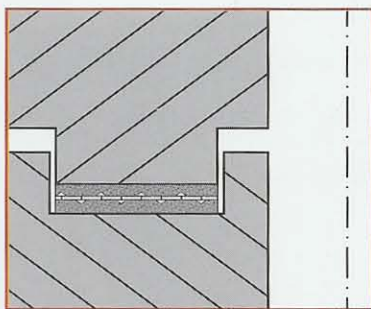
## GRAPHITE SEAL SET VALVOGRAPH

The quantity of the rings that constitute a seal set is usually included between 5 and 7. The radial thrust of every single ring is decreasing starting from the first till to the last. A fast system to perform a correct torque of the gland based its self on the seal set height measure: the installed set compress of a percent quote between 17 and 23% of its nominal height.



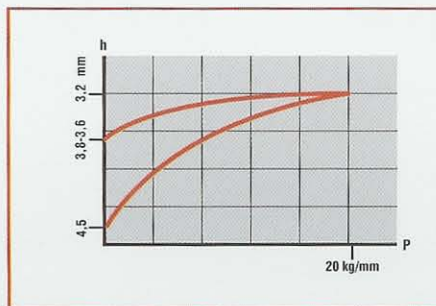
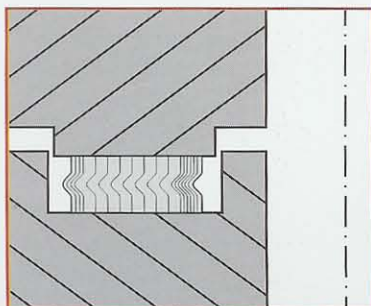
## VALVOGRAPH

The density of the unloaded ring is related to the preload assigned with the pressing. Determine the pressing of the ring and its final density is than very easy: if H is the nominal height of the unloaded ring at 1.6 gr/cm<sup>3</sup>, a compression of 20%, 0.8\*H, will bring its density (1.6/0.8)=2.00 gr/cm<sup>3</sup>.



## PLANIGRAPH™

The compression of the flat graphite gaskets is very marked already with few N/mm<sup>2</sup> and right away the curve tends to be straightforward. The compression, reduce the thickness at about half of the initial thickness.



## PLANISTEEL

The elastic seal of a spiral wound gasket is realized in a field included between 25 and 35% of the nominal height. Because this is a metal gasket, the specific load is always very high (between 12 and 17 Kg/mm<sup>2</sup>).



# Torque load for Valvograph Sets

Stem diameter (mm)		9,5	11,1	12,7	14,3	15,9	17,5	19,1	20,7	22,2	23,8	25,4	27,0	28,6	30,2	31,8	33,4	34,9	36,5	38,1	39,7	41,3	42,9	44,5	46,1	47,6	49,2	50,8	52,4	54,0	55,6	57,2	58,8	60,3	61,9	63,5									
Stuffing box diameter (mm)	15,9	0,032	0,027	0,016	0,011																																								
	17,5	0,043	0,037	0,022	0,021	0,011																																							
	19,1	0,053	0,048	0,043	0,032	0,021	0,011																																						
	20,7	0,069	0,064	0,053	0,048	0,037	0,027	0,011																																					
	22,2	0,085	0,075	0,069	0,059	0,048	0,037	0,027	0,016																																				
	23,8	0,096	0,091	0,085	0,075	0,064	0,053	0,043	0,027	0,016																																			
	25,4	0,112	0,107	0,101	0,091	0,080	0,069	0,059	0,043	0,032	0,016																																		
	27,0	0,133	0,123	0,117	0,107	0,096	0,085	0,075	0,064	0,048	0,032	0,016																																	
	28,6	0,149	0,144	0,133	0,128	0,117	0,107	0,091	0,080	0,064	0,053	0,037	0,016																																
	30,2	0,171	0,160	0,155	0,144	0,133	0,123	0,112	0,101	0,085	0,069	0,053	0,037	0,021																															
	31,8	0,187	0,181	0,176	0,165	0,155	0,144	0,133	0,117	0,107	0,091	0,075	0,059	0,037	0,021																														
	33,4	0,208	0,203	0,199	0,187	0,176	0,165	0,155	0,139	0,128	0,112	0,096	0,080	0,059	0,043	0,021																													
	34,9	0,235	0,224	0,219	0,208	0,198	0,187	0,176	0,165	0,149	0,133	0,117	0,101	0,085	0,064	0,043	0,021																												
	36,5		0,251	0,240	0,235	0,224	0,214	0,198	0,187	0,171	0,160	0,144	0,123	0,107	0,085	0,069	0,048	0,021																											
	38,1			0,267	0,256	0,246	0,235	0,224	0,214	0,198	0,181	0,165	0,149	0,128	0,112	0,091	0,069	0,048	0,027																										
	39,7				0,283	0,272	0,262	0,251	0,235	0,224	0,208	0,192	0,176	0,155	0,139	0,117	0,096	0,075	0,048	0,027																									
	41,3					0,310	0,299	0,288	0,278	0,262	0,251	0,235	0,219	0,203	0,181	0,165	0,144	0,123	0,101	0,075	0,053	0,027																							
	42,9						0,326	0,315	0,304	0,288	0,278	0,262	0,246	0,230	0,208	0,192	0,171	0,149	0,128	0,101	0,080	0,053	0,027																						
	44,5							0,342	0,331	0,320	0,304	0,288	0,272	0,256	0,240	0,219	0,198	0,176	0,155	0,133	0,107	0,080	0,053	0,027																					
	46,1								0,363	0,347	0,336	0,320	0,304	0,288	0,267	0,251	0,230	0,208	0,187	0,160	0,139	0,112	0,085	0,059	0,032																				
	47,6									0,390	0,379	0,363	0,352	0,336	0,315	0,299	0,278	0,262	0,240	0,214	0,192	0,165	0,144	0,117	0,091	0,059	0,032																		
	49,2										0,411	0,395	0,384	0,363	0,347	0,331	0,310	0,294	0,272	0,246	0,224	0,198	0,176	0,149	0,123	0,091	0,064	0,032																	
	50,8											0,427	0,416	0,400	0,379	0,363	0,342	0,326	0,304	0,278	0,256	0,235	0,208	0,181	0,155	0,123	0,096	0,064	0,032																
	52,4												0,448	0,432	0,416	0,395	0,379	0,358	0,336	0,315	0,288	0,267	0,240	0,214	0,187	0,160	0,128	0,096	0,064	0,032															
	54,0													0,480	0,464	0,448	0,432	0,411	0,390	0,368	0,347	0,326	0,299	0,278	0,251	0,219	0,192	0,165	0,133	0,101	0,069	0,037													
	55,6														0,502	0,486	0,470	0,448	0,427	0,406	0,384	0,363	0,336	0,310	0,283	0,256	0,230	0,198	0,171	0,139	0,107	0,069	0,037												
	57,2															0,523	0,502	0,486	0,464	0,443	0,422	0,400	0,374	0,347	0,320	0,294	0,267	0,235	0,203	0,176	0,139	0,107	0,075	0,037											
	58,8																0,544	0,523	0,502	0,480	0,459	0,438	0,411	0,384	0,358	0,331	0,304	0,272	0,246	0,214	0,181	0,144	0,112	0,075	0,037										
	60,3																	0,582	0,560	0,539	0,518	0,496	0,475	0,448	0,427	0,400	0,368	0,342	0,315	0,283	0,251	0,219	0,181	0,149	0,112	0,075	0,037								
	61,9																		0,603	0,582	0,560	0,539	0,512	0,491	0,464	0,438	0,411	0,384	0,352	0,320	0,288	0,256	0,224	0,187	0,155	0,117	0,080	0,037							
	63,5																			0,625	0,603	0,577	0,555	0,528	0,507	0,480	0,454	0,422	0,395	0,363	0,331	0,299	0,267	0,230	0,192	0,160	0,117	0,080	0,043						
	65,1																				0,641	0,619	0,598	0,571	0,550	0,523	0,491	0,464	0,438	0,406	0,374	0,342	0,310	0,272	0,235	0,198	0,160	0,123	0,085	0,043					
	66,7																					0,689	0,662	0,641	0,614	0,593	0,566	0,539	0,507	0,480	0,448	0,416	0,384	0,352	0,315	0,278	0,240	0,203	0,165	0,128	0,085				
	68,3																						0,710	0,683	0,662	0,635	0,609	0,582	0,550	0,523	0,491	0,459	0,427	0,395	0,358	0,326	0,288	0,251	0,208	0,171	0,128				
	69,9																							0,731	0,705	0,678	0,651	0,625	0,598	0,566	0,539	0,507	0,475	0,438	0,406	0,368	0,331	0,294	0,256	0,214	0,176				
	71,5																								0,753	0,726	0,699	0,673	0,646	0,614	0,582	0,550	0,518	0,486	0,448	0,416	0,379	0,342	0,299	0,262	0,219				
	73,0																									0,801	0,774	0,747	0,721	0,689	0,662	0,630	0,598	0,566	0,534	0,496	0,464	0,427	0,390	0,347	0,310	0,267			
	74,6																										0,822	0,795	0,769	0,737	0,710	0,678	0,646	0,614	0,582	0,544	0,512	0,475	0,438	0,395	0,358	0,315			
	76,2																											0,843	0,817	0,790	0,758	0,726	0,694	0,662	0,630	0,598	0,560	0,523	0,486	0,448	0,406	0,363			
	77,8																												0,865	0,838	0,811	0,779	0,747	0,715	0,678	0,646	0,609	0,571	0,534	0,496	0,454	0,416			
	79,4																													0,918	0,891	0,859	0,827	0,801	0,763	0,731	0,699	0,662	0,625	0,587	0,550	0,507	0,464		
	81,0																														0,945	0,913	0,881	0,849	0,817	0,785	0,747	0,715	0,678	0,641	0,598	0,560	0,518		
	82,6																															0,966	0,934	0,902	0,870	0,838	0,801	0,769	0,731	0,694	0,651	0,614	0,571		
	84,2																																0,988	0,961	0,923	0,891	0,859	0,822	0,785	0,747	0,710	0,667	0,625		
	85,7																																	1,046	1,014	0,982	0,945	0,913	0,875	0,838	0,801	0,763	0,726	0,683	
	87,3																																		1,073	1,036	1,004	0,972	0,934	0,897					