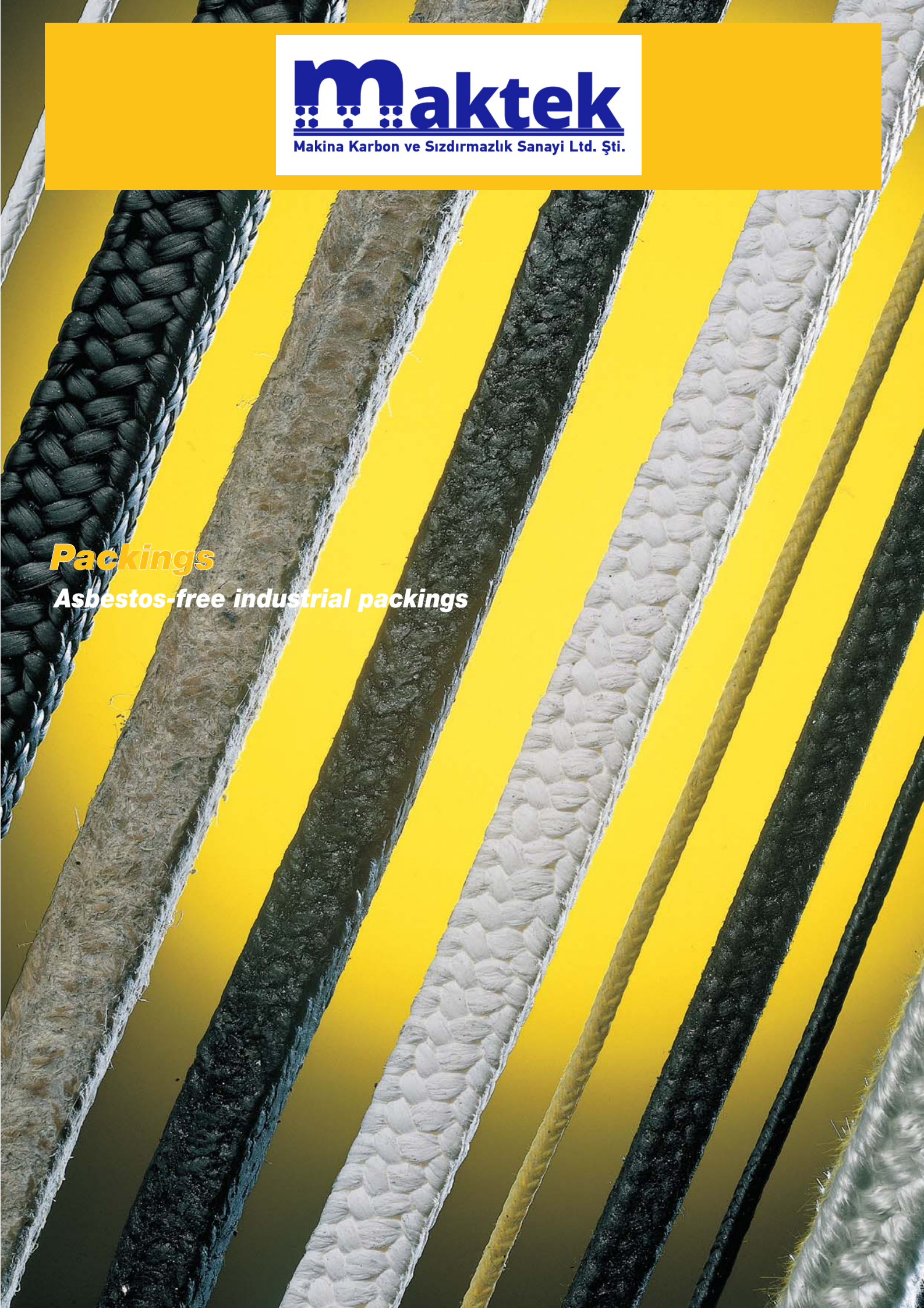
Maktek

Makina Karbon ve Sızdırmazlık Sanayi Ltd. Şti.



Packings

Asbestos-free industrial packings

packings

The braided packings are used in the industries in order to isolate hermetically shafts, rods and housing from the blow-by of fluids and gas of contact and transit.
The main uses are:

- **Rotary shaft seals:**
centrifugal pumps, agitators, blendors.
- **Motion shaft seals:**
piston pumps.
- **Rods seals:**
valves.
- **Static seals:**
covers, closings, oven doors.

According to the final uses, it is essential to do an appropriate selection of the braided packing. The basic characteristics of all braided packing are:

- **Plasticity:**
To adapt to the walls and to the rod with a gradual compensatory action.
- **Perfect seal:**
To create a barrier to the passage of fluids and gas.
- **Resistance to wear:**
to prevent the volume loss in order to avoid continuous controls;
- **Low coefficient of friction:**
So as not to cause overheating.

The packings are intended to operate in diverse areas and therefore in their construction it has been necessary to work with a diverse range of materials

BASE COMPONENTS

Graphite fibres:
suitable for applications where it is necessary a very good chemical resistance.

Vegetable fibres:
COTTON - FLAX - HEMP - RAMIÉ*: these are particularly recommended for use where the main requirements are strong resistance to wear and to cold water.*

Synthetic fibres:
P.T.F.E. - ARAMID - PHENOLIC - PAN - POLYESTER - ACRYLIC:
are used in order to obtain braided packings with a very good resistance to chemical and corrosive agents.

Insulating fibres:
glass or ceramic fibers are normally used for termoresistant static seals.

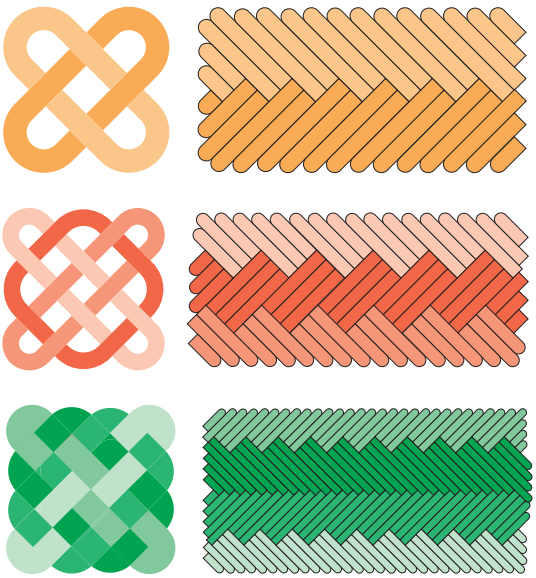
Metals:

STAINLESS STEEL - INCONEL - COPPER - CARBON STEEL: these are used as reinforcing agents in the braids in order to increase mechanical resistance to high pressure and temperature.

Bonding agents and lubricants:

Lubricants are a fundamental part in the packing component.
First of all they must be resistant to fluids with which they are in contact and they must not corrode metals and have an antifriction action. They belong to this group:
A) mineral and vegetable oils and synthetic greases for universal uses;
B) graphite in dispersion or dry for external treatments with an high self-lubricating and anti-friction power;
C) P.T.F.E. dispersion for lubricating and anti-frictional treatments for braided packings in contact with chemical and corrosive agents.
D) molybdenum bisolphide (Mos2) is used especially for external treatments with anticorrosive and self-lubrificating characteristics.

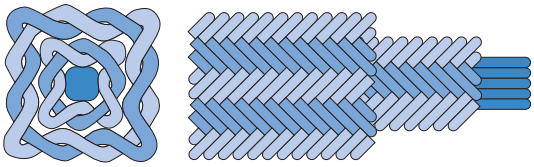
TYPES OF BRAIDING



Diagonal braiding:

This new braiding system has proven to be superior to all the others previously developed, as it offers the following advantages:
- *LONGER LIFE*
- *GREAT FLEXIBILITY*
- *TIGHT AND COMPACT EXTERNAL FINISH*
- *OPTIMUM RESISTANCE TO WEAR.*

Packings manufactured with a DIAGONAL structure show perfect adaptability in the presence of high peripheral velocity and also allow to produce for packings rod seals with a small diameter, avoiding structural deformations of the braid which may compromise a perfect seal.



Tubular braiding:

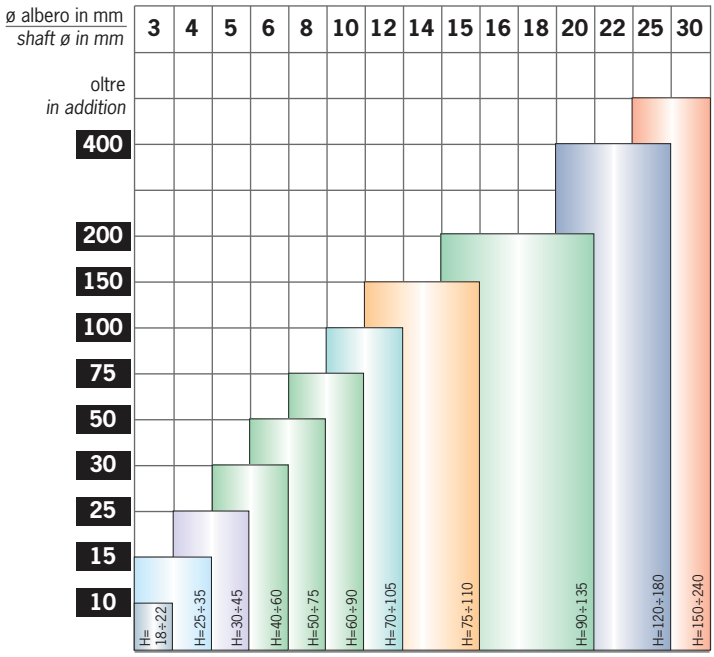
With this type of braiding the packing has perfectly smooth external surfaces but low resistance to wear and to the high peripheral velocity.

HOUSING

The housings are the sealing chamber of the stuffing box, it means the space between the diameter of the shaft and the internal part of the machine body.
This space houses the set of braided seals, which is formed from various overlaid rings, with their edges offset.
It is essential that a stuffing box set, formed from braided rings, must not act as a support. So supports or bearings must be available in order to provide the shaft with a perfectly rectilinear and aligned movement, so as to maintain constant radial thickness of the seal in all the positions of the stuffing box.
In some cases, due to problems of insufficient lubrication, it is essential to provide the interior of the seal chamber with a "spider" connected with the exterior in such a way as to be able to send a lubricating liquid to the moving shaft.

fig a

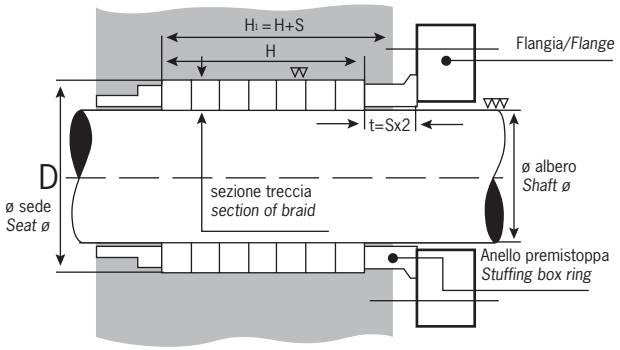
S: sezione della treccia in mm/*S: section of the braid in mm*



a

Chart showing the section of the seal in relation to the diameter of the shaft and the values of maximum length (H) of the packing set.

fig b



Design of stuffing box on the basis of the section (S) and the length (H) of the packing set. Any spiders are added to the measurement (H).

SELECTION OF DIMENSION

Normally the braids are manufactured in square section;
the required section is calculated using the following:

$$\frac{\text{seat diameter (D) - shaft diameter (d)}}{2}$$

In packing a seal chamber, where there is excessive radial compression under increased temperature, In packing a seal chamber, it is essential to use braids with an exact section. Increased sections could create excessive radial compression with temperature increase.. For high and average pressure, it is advisable to interpose diaphragms of elastic and compact material (AF rubber, P.T.F.E.) between the various braid rings, bearing in mind that the first diaphragm ring must be resting on the bottom of the chamber and the last must be in contact with the stuffing box ring.

packings

PACKAGING

- *standard packings - plastic envelopes of 10-50 mt.*
- *PVC or carton spools*
- *cut and preformed rings*
- *cut and preformed rings with relative diaphragms*

INSTALLATION

1 *After having removed the flange and the stuffing box ring, remove all the rings from the old seal, using the special* ***"ammiragliato extractor"*** *to facilitate the operation.*

2 *Carefully clean the chamber and the shaft of any deposits.*

3 *Check that the shaft is not scored and that it has no incisions or pitting.*
In order to be reliable, if possible, a shaft must be chromium-plated and have ground surfaces, whilst it is sufficient for the walls of the chambers to be turned and smooth.

4 *Having performed the above operations, one then proceeds to prepare the new stuffing box set by selecting the type of packing and the exact section.*

5 *Having established the exact size and the length of the rings, with a well sharpened knife one proceeds to cut them, taking care to maintain an inclination of 45° and to avoid fraying the braid.*
Never apply the packing in a continuous spiral.
Alternatively it is possible to use preformed stuffing box rings.

6 *Having prepared all the rings, very carefully begin to pack the chamber.*
It is of fundamental importance that the first ring rests perfectly on the bottom of the chamber. For this purpose it is expedient to use a special packing ring.
Having arranged the first ring, introduce the other rings one by one, without forcing them excessively, so that the edge of each of the various rings is offset by ***90°****.*

7 *After fitting the number of rings required to fill the chamber (bearing in mind that the stuffing box ring must be able to be inserted in the chamber to a depth of at least 5 mm), begin tightening on alternate sides, possibly using dynamometric spanners.*
Avoid initial over-tightening; after tightening, loosen the bolts of the flange until the shaft can move without difficulty. Then put the machine into operation.
In initial use a slight dripping should be noted, which is preferable to an increase in temperature caused by excessive friction.
After around one hour, if the dripping decreases, slightly loosen the bolts to re-establish it.
After a certain period, if there are no perceptible increases in temperature, the final stage is started with the slow and gradual tightening of the bolts, in order to reduce to a minimum or eliminate the dripping, with the minimum of friction on the shaft.

Prospetto delle baderne premistoppa e raccomandazioni d'impiego
Summary of packings and reccommendation

Packing	T min °C	T max °C	PH	P bar	V m/s	P bar	V m/s	P bar	V m/s
Packing in graphite fibres									
Top graf	-100	+700	0-14	30	30	100	3	400	1
Top graf armata	-100	+700	0-14	-	-	-	-	450	1,5
Energy	-250	+650	0-14	-	-	100	1,5	400	1
Gra 9000 HT	-100	+550	0-14	25	25	80	2	250	1,5
Gra 9000 HT armata	-100	+550	0-14	-	-	-	-	350	1
Carbo pack	-100	+650	0-14	-	-	-	-	350	0,5
Carbo 75	-100	+400	0-14	30	20	50	1	100	1
Trecce in fibre poliacrilonitriliche - *Packing in polyacrylnitrilic fibres*									
Ascar	-100	+350	2-12	10	2	30	10	50	1
Ascar armata	-100	+350	2-12	-	-	-	-	100	1,5
Dubacar	-50	+350	2-12	40	2	40	1	100	1
Trecce in fibre di P.T.F.E. - *Packing in P.T.F.E. fibres*									
P.T.F.E. 18/24	-200	+280	0-14	15	6	50	2	200	1
P.T.F.E. 18/24 lub	-200	+280	0-14	20	10	50	2	100	1
P.T.F.E. GRAF	-200	+280	0-14	50	20	150	2	250	1,5
GFO®	-200	+280	0-14	50	25	200	2	300	1,5
P.T.F.E. estruso	-100	+250	0-14	10	4	-	-	20	1
P.T.F.E. estruso grafitato	-100	+280	0-14	25	10	-	-	100	1
Trecce in fibre aramidiche - *Packing in aramide fibres*									
2555	-100	+280	2-12	30	15	100	2	250	1,5
2555 P	-100	+280	2-12	20	15	80	2	150	1,5
2800	-100	+280	2-12	-	-	100	2	250	2
Trecce in fibre sintetiche - *Packing in synthetic fibres*									
NEW STAR 2702 P	-100	+260	1-13	30	8	30	1,5	100	0,5
SINT 260/B	-100	+260	2-12	20	10	20	2	50	1
SINT 260/N	-10	+280	2-12	20	12	20	3	50	1
Trecce in fibre isolanti - *Packing in insulating fibres*									
Dragovet	-50	+400	5-11	5	0,5	5	0,5	20	0,5
Dragovet P.T.F.E.	-40	+280	5-11	15	1	20	1,5	60	10
Dragovet graf	-50	+400	5-11	5	0,5	5	0,5	20	0,5
Dragocer inconel	-ø	+1250	-	-	-	-	-	100	10
Dragocer vetro - glass	-ø	+650	-	-	-	-	-	100	10
Trecce in fibre vegetali - *Packing in vegetable fibres*									
Cottonal	-30	+100	2-12	15	10	15	1	20	0,5
Cottonal P.T.F.E.	-50	+130	2-12	20	15	20	1,5	30	1
Makò	-50	+100	2-12	5	1	10	0,5	20	0,5
Plata	-30	+100	2-12	15	10	15	1	20	0,5
Plata P.T.F.E.	-30	+100	2-12	15	10	15	1	20	0,5
Turbosol MOS2	-50	+100	2-12	30	20	50	5	50	1
Ramiè	-50	+130	2-12	20	15	20	1,5	30	1
Bimetallica	-50	+150	2-12	-	-	250	0,2	350	0,2
Triplex	-50	+130	2-12	15	10	15	1	20	0,5

Water, aqueous solutions, alcohols and glycols	*Abrasive mediums, for example suspensions, dirty water*	*Vapour up to 250 °C*	*Vapour up to 400 °C*	*Vapour up to 500 °C*	*Acids or alcohols, strongly diluted*	*Concentrated organic acids*	*Concentrated oxidant acids and other strong oxidants*	*Concentrated alkalis*	*Solvents, such as aldehydes, ketones, esters or ethers*	*Hydrocarbons, oils and greases*	*Organic compounds*	*Gas, vapours*	*Oxygen*	*Chemical, paper, sugar industries*
A	C	A	A	A	A	A	B	A	A	A	A	A	C	C
A	C	A	A	A	A	B	B	B	A	A	A	A	C	C
A	C	A	A	A	A	A	B	A	A	A	A	A	C	C
A	C	A	A	A	A	A	C	B	A	A	A	A	C	C
A	C	A	A	A	A	A	C	B	A	A	A	A	C	C
A	C	A	A	A	A	A	C	B	A	A	A	A	A	C
A	C	A	B	C	A	A	C	B	A	A	A	A	C	C
A	C	B	C	C	A	B	C	C	B	A	A	A	C	C
A	C	B	C	C	A	B	C	C	C	A	A	A	C	C
A	C	B	C	C	A	B	C	C	B	A	A	A	C	C
A	B	B	C	C	A	A	A	A	A	A	A	A	A	A
A	B	B	C	C	A	A	B	B	A	A	A	A	B	B
A	B	B	C	C	A	A	C	A	A	A	A	A	A	A
A	B	B	C	C	A	A	C	A	A	A	A	A	A	A
A	C	C	C	C	A	A	A	A	A	A	A	A	C	C
A	C	C	C	C	A	A	C	A	A	A	A	A	C	C
A	A	C	C	C	A	B	C	C	A	A	B	A	C	C
A	A	C	C	C	A	B	C	C	A	A	B	A	C	C
A	A	C	C	C	A	B	C	C	A	A	B	A	C	C
A	A	B	C	C	A	A	B	B	A	B	B	A	B	A
A	B	B	C	C	A	C	C	B	A	B	B	A	C	C
A	B	B	C	C	B	C	C	C	C	B	C	A	C	C
C	C	B	C	C	C	C	B	C	C	B	A	C	C	C
A	C	B	C	C	C	B	B	B	B	B	A	B	C	C
C	C	B	C	C	C	C	B	C	C	B	A	C	C	C
C	C	C	C	C	C	C	C	C	C	B	A	C	C	C
C	C	C	C	C	C	C	C	C	C	B	A	C	C	C
A	C	C	C	C	C	C	C	C	C	A	B	C	C	C
A	B	C	C	C	B	B	C	C	B	A	B	B	C	C
A	C	C	C	C	C	C	C	C	C	A	C	C	C	C
A	C	C	C	C	C	C	C	C	C	A	C	C	C	C
A	B	C	C	C	B	B	C	C	C	A	B	B	C	C
A	C	C	C	C	C	C	C	C	C	A	C	C	C	C
A	C	C	C	C	C	C	C	B	C	B	B	B	C	C
A	B	C	C	C	C	C	C	C	C	A	C	C	C	C
A	B	C	C	C	C	C	C	C	C	A	C	C	C	C

Centrifugal pumps

Piston pump

Valves

A **Consigliata**
Raccomended

B **Consigliata con riserve**
Limited application

C **Non idonea**
Not suitable

Top graf

CHARACTERISTICS

This special braid is realized with continuous filaments of graphite fibers, obtained from a special graphitizing process and with a carbon content of >99,7%.
The structure of this braided packing allows to obtain excellent results and adaptability for all type of sealing, also with bad conditions.
The purity of the filaments allows TOP GRAF a self-lubricating and anti-abrasive action on metallic parts.

APPLICATIONS

TOP GRAF is suggested for sealing of valves and pumps in petrolchemical industries and in all other industrial uses where severe conditions require the highest degree of pureness.

SPECIAL VERSION

reinforced top graf

This braid is the same above mentioned braid; reinforced with inconel wire, which grant it an improvement for sealing with strong pressures.

valori limite limit value	Top graf	Top graf armata	Top graf	Top graf armata	Top graf	Top graf armata
V (m/s)	30	-	3	-	1	1,5
P (bar)	30	-	100	-	400	450
T (°c)	-100 +700					
PH	0÷14					
D gr/cm³	Top graf **1,15**		Top graf armata **1,3**			

Energy

CHARACTERISTICS

This special braid is realized with filaments of pure graphite, twisted and interlaced with discontinuous microfilaments of inconel, with a content of 15/16% and a section of ~6 micron.
These filaments are treated with pure graphite and inorganic corrosion inhibitors.
The diagonal braiding INTERCENTER of this braid allows to obtain excellent adaptability also on small sections.
The innovative characteristics of the materials allows the braid to carry out far better performance with respect to asbestos braids, which were considered unreplaceable.

APPLICATIONS

ENERGY is the braided packing created for valves in the thermoelectric power stations.
It is the most suitable for sealing on valve spindles, for superheated steam, water for boilers, gases, solvents and chemical products.

valori limite limit value			
V (m/s)	-	1,5	1
P (bar)	-	100	400
T (°c)	-100 +650		
PH	0÷14		
D gr/cm³	1,4		

GRA 9000 HT

CHARACTERISTICS

This special braid is realized with continuous filaments of graphite fibers, obtained from a special carbonization process and with a high carbon content.
GRA 9000 HT has got an excellent performance in applications with high pressures and temperatures.
The special filaments, type "Carbonized" are self-lubricating and have got very good anti-friction features; the structure of this braided packing allows to obtain excellent results and adaptability for all type of sealing, also with strong conditions.

APPLICATIONS

GRA 900 HT has got universal uses: for sealing of valves and pumps, with gases, steam, dowterm, solvents, chemical products, acids with the exception of oxidizing media.

SPECIAL VERSION
reinforced GRA 9000 HT

This braid is the same above mentioned braid; reinforced with steel or inconel wire (on request), which grant it an improvement for sealing with strong pressures.

valori limite limit value	Gra 9000 HT	Gra 9000 HT armata	Gra 9000 HT	Gra 9000 HT armata	Gra 9000 HT	Gra 9000 HT armata
V (m/s)	25	-	2	-	1,5	1
P (bar)	25	-	80	-	250	350
T (°c)	-100 +550					
PH	0÷14					
D gr/cm³	GRA 9000 HT **1,15**		GRA 9000 HT armata **1,3**			

Carbo pack

CHARACTERISTICS

Squared section flexible expanded graphite braids for sealing of valves and pumps.
They are made of strands of very pure expanded graphite, singularely wrapped by a stainless steel net.
This structure allows far better mechanical performance with respect to braids obtained from twisted graphite tape.
Excellent thermal and chemical resistance the pure expanded graphite does not deteriorates and does not loses weight when it is exposed to high temperature, making re-tightening non necessary.
The chemical compatibility is with all fluid in 0 - 14 pH range, with the exception of strong oxidizing media, such as nitric acid and oleum.
Not needing special tools for installation, CARBO - PACK is the ideal solution for ready maintenance and repair.

APPLICATIONS

CARBO PACK has got universal uses: for sealing of valves and pumps, with gases, steam, dowterm, solvents, chemical products, acids with the exception of oxidizing media.

valori limite limit value			
V (m/s)	-	-	0,5
P (bar)	-	-	350
T (°c)	-100 +650		
PH	0÷14		
D gr/cm³	1,2		

Carbo 75

CHARACTERISTICS

Squared section braids made with discontinuous filaments of graphite fibers with an high content of carbon; its diagonal braiding grant it dimensional stability and a perfect adaptability for sealing.
High mechanical resistance, which yield it suitable for every applications with low and high temperatures.
A special surface treatment with Mos2 (molybdenum bisolphide) grant it characteristics as corrosion inhibitor.

APPLICATIONS

CARBO 75 has got universal uses: for sealing of valves and pumps, with gases, steam, solvents, chemical products, acids with the exception of oxidizing media.

valori limite limit value			
V (m/s)	20	1	1
P (bar)	25	50	100
T (°c)	-100 +400		
PH	0÷14		
D gr/cm³	1,1		

Ascar

CHARACTERISTICS

Braid realized with preoxidized polyalcrylnitril (PAN) yarn.
It has got a diagonal braiding with light impregnation of special lubrificant and pure graphite.
It is treated with corrosion inhibitor molybdenum bisolphide.

APPLICATIONS

ASCAR has got universal uses: for sealing of valves and pumps with alternative movement, for steam with low and mean pressure, chemical and petrolchemical products, (with the exception of oxidizing media).

SPECIAL VERSION

reinforced Ascar

This braid is a braid realized with preoxidized polyacrylnitrilic yarn, reinforced with inox steel wires.

valori limite limit value	Ascar	Ascar armata	Ascar	Ascar armata	Ascar	Ascar armata
V (m/s)	2	-	10	-	1	1,5
P (bar)	10	-	30	-	50	100
T (°c)	-100 +350					
PH	2÷12					
D gr/cm³	Ascar 1		Ascar armata 1,15			

Dubacar

CHARACTERISTICS
Braid realized with preoxidized polyacrylnitril yarns and treated with corrosion inhibitor molybdenum bisolphide.

APPLICATIONS
Suitable for pumps and valves, for steam with mean pressure, oils, for petrolchemical products with the (exception of oxiding products).

valori limite limit value			
V (m/s)	2	1	1
P (bar)	40	40	100
T (°c)	-50 +350		
PH	2÷12		
D gr/cm³	1,1		

P.T.F.E. 18/24

CHARACTERISTICS
Braid realized with pure P.T.F.E. yarn, wire by wire impregnated with P.T.F.E. dispersion.
The structure of this braided packing allows to obtain excellent results and adaptability for all type of sealing, also with strong conditions.

APPLICATIONS
Has got universal uses: for sealing of valves and pumps with alternative movement, and it is used in the chemical, foodstuffs and pharmaceutical industries (with exception of strong concentreted acid).

SPECIAL VERSION
P.T.F.E. 18/24 lub
This type of packing is made of pure P.T.F.E. yarn, wire by wire impregnated with P.T.F.E. dispersion and lubrified with an inert oil (on request with silicone oil).

valori limite limit value	PTFE 18/24	PTFE 18/24 lub	PTFE 18/24	PTFE 18/24 lub	PTFE 18/24	PTFE 18/24 lub
V (m/s)	6	10	2	2	1	1
P (bar)	15	20	50	50	200	100
T (°c)	-200 +280					
PH	0÷14					
D gr/cm³	PTFE 18/24 **1,5**		PTFE 18/24 lub **1,6**			

P.T.F.E. GRAF

CHARACTERISTICS

This type of packing is made of P.T.F.E. yarn with a very high content of graphite and inert lubrificant.
It has got a diagonal braiding, which grant it a perfectly square section and a low friction figures due to a special graphite.
It does not become hard, because the graphite-P.T.F.E. combination dissipates the heat produced by shaft rotation.

APPLICATIONS

Suitable for high speed pumps, water, steam, oils, solvents and it is used in the chemical and petrolchemical industries, paper mill and dyeing plant.
It has got a very good chemical resistance with the exception of oleum, nitromuriatic acid, fuming nitric acid.

valori limite limit value			
V (m/s)	20	2	1,5
P (bar)	50	150	250
T (°c)	-200 +280		
PH	0÷14		
D gr/cm³	1,6		

GFO®

CHARACTERISTICS

Braid made with an original GFO® filament.
The constituent microporous components, with high thermal conductivity, give to the braid high quality characteristics, such as a high lubricating capacity, exceptional plasticity, flexibility, long life, low coefficient of friction, optimum heat dissipation and optimum resistance to abrasion and extrusion.
Particular attention during processing allows homogeneous and perfectly square sections to be obtained which may be easily inserted into the stuffing box.

APPLICATIONS

The GFO® braid is an extremely versatile packing that is used universally, both for pumps and for valves, and is therefore suitable for any heavy-duty application in various industrial sectors, including the food sector.

valori limite limit value			
V (m/s)	25	2	1,5
P (bar)	50	200	300
T (°c)	-200 +280		
PH	0÷14		
D gr/cm³	1,6		

P.T.F.E. estruso/extruded

CHARACTERISTICS
This packing is made with an extrusion process using non-sintered P.T.F.E. with the addition of lubricants.
The special plastic structure allows optimum adaptability to seats and guarantees reduced wear of stems.

APPLICATIONS
EXTRUDED P.T.F.E. packing is particularly suitable for applications with almost all acidic fluids, with the exception of those that are very aggressive and concentrated, as well as being suitable for all valve and pump seals in contact with oil, solvents, vapour and gas.

valori limite limit value			
V (m/s)	4	-	1
P (bar)	10	-	20
T (°c)	-100 +250		
PH	0÷14		
D gr/cm³	1,9		

P.T.F.E. estruso grafitato/extruded graphited

CHARACTERISTICS
This packing is made with an extrusion process using unsintered P.T.F.E. with the addition of lubricants and GRAPHITE. The special plastic structure allows optimum adaptability to seats and guarantees reduced wear of stems.

APPLICATIONS
EXTRUDED GRAPHITED P.T.F.E. packing is particularly suitable for applications with almost all acidic fluids, with the exception of those that are very aggressive and concentrated, as well as being suitable for all valve and pump seals in contact with oil, solvents, vapour and gas.

valori limite limit value			
V (m/s)	10	-	1
P (bar)	25	-	100
T (°c)	-100 +280		
PH	0÷14		
D gr/cm³	1,9		

2555

CHARACTERISTICS

Braid realized with aramid fibers impregnated with P.T.F.E. Its diagonal braiding grants it a dimensional stability and perfect square sections.
The aramid fibers have got an high resistance and toughness.
The braid, for the presence of P.T.F.E., has got a low friction coefficient.
For particular requirements it can be lubricated with silicon-based oil.

APPLICATIONS

It has got a universal using, with the exception of strong alkaline products and oxygen.
Suitable for pumps, valves, for applications and shaft seals, expansion bend.
It does not make termic expansion problems and it does not stain.

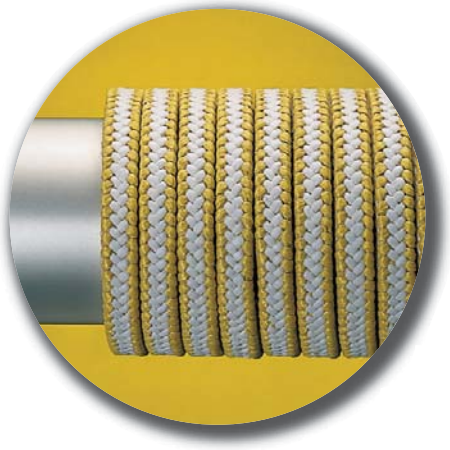
SPECIAL VERSION

2555/P

This braid is the same above mentioned braid but with a treatment of paraffin oil with P.T.F.E. in dispersion and special lubricants.

valori limite limit value	2555	2555/P	2555	2555/P	2555	2555/P
V (m/s)	15	15	2	2	1,5	1,5
P (bar)	30	20	100	80	250	150
T (°c)	-100 +280					
PH	2÷12					
D gr/cm³	2555 **1,4**			2555/P **1,4**		

2800



CHARACTERISTICS

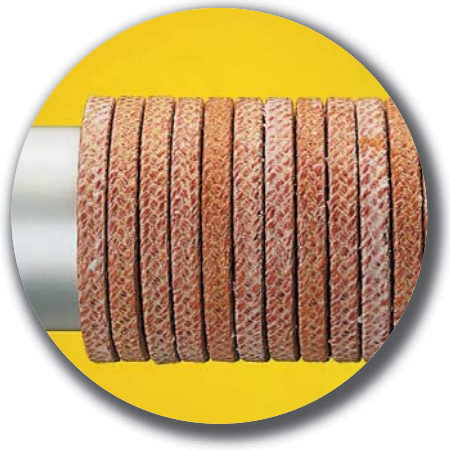
This braid is made with a pure P.T.F.E. filament, impregnated wire by wire with a P.T.F.E. dispersion, with the four edges reinforced with aramid filaments.
The special composition of this packing and the particular type of braiding allow a braid of high resistance to be obtained which is capable of superior results in the presence of strong pressure (in these conditions the extrusion of P.T.F.E. is prevented by the aramid filament edge reinforcement).

APPLICATIONS

2800 braid has been specially designed to deal with sealing problems where a packing is necessary which is particularly soft and resistant to the majority of chemical agents as well as having a high resistance to abrasive substances.
Therefore the areas of application are in valves and pumps used in sectors with heavily abrasive components, such as sugar mills.

valori limite limit value			
V (m/s)	-	2	2
P (bar)	-	100	250
T (°c)	-100 +280		
PH	2÷12		
D gr/cm³	1,5		

NEW STAR 2702 P



CHARACTERISTICS

Belongs to a new generation of synthetic heat-resistant fibres.
Braided using special processes, the NEWSTAR 2702 P is impregnated with P.T.F.E. dispersion and inert lubricants. The NEW STAR 2702 P braid combines the mechanical characteristics of aramid fibres, resistance to the chemical products of P.T.F.E. and the high thermal resistance of graphite braids, with the flexibility and adaptability of asbestos braids. The NEW STAR 2702 P braid, as well as having optimum qualities guaranteed by the special filament used, allows optimum performance in use, such as a low coefficient of friction, ecologically safe environmental impact, is non-polluting, non-staining, does not cause wear or pitting of shafts and does not present problems of electrolytic corrosion.
The NEW STAR 2702 P braid does not harden even after long periods of use, adapts perfectly to seats and shafts with minimum loads and can be defined as the ideal seal for maintenance and for general applications.

APPLICATIONS

The NEW STAR 2702 P braid is particularly recommended for: Chemical installations, the paper and cellulose industry, the textile and purification industries. It is resistant to the majority of chemical products and to solvents. It is inert to all acids (non-oxidant) and to organic solvents and diluted bases (excluding high concentrations of sulphuric and nitric acid).

valori limite limit value			
V (m/s)	8	1,5	0,5
P (bar)	30	30	100
T (°c)	-100 +260		
PH	1÷13		
D gr/cm³	1,35		

SINT 260

SINT 260/B

CHARACTERISTICS

Braid realized with acrylic synthetic yarn type HT. It has got a diagonal braiding, wire by wire impregnated with P.T.F.E. dispersion and inert lubrificants.

APPLICATIONS

It is used with centrifugal pumps at high speed.

SPECIAL VERSION

The version with a core of silicone rod grants a good elasticity

Sint 260/N

CHARACTERISTICS

Braid realized with acrylic synthetic yarn type HT. It has got a diagonal braiding, impregnated with inert lubrificants and treated with graphite.

APPLICATIONS

Suitable for pumps and valves.

valori limite limit value	SINT 260/B	SINT 260/N	SINT 260/B	SINT260/N	SINT 260/B	SINT 260/N
V (m/s)	10	12	2	3	1	1
P (bar)	20	20	20	20	50	50
T (°c)	Sint 260/B -100 +260			Sint 260/N -100 +280		
PH	2÷12					
D gr/cm³	SINT 260/B **1,25**			SINT 260/N **1,3**		

Dragovet

CHARACTERISTICS

Braid made with a filament of textured glass braided diagonally. The DRAGOVET packing presents an optimum resistance to temperatures without particularly undergoing mechanical variations in the initial geometry.
Other qualities of glass fibre braids are their particular resistance to humidity and to the chemical agents between pH 2 and 12.

APPLICATIONS

Glass braids are used mainly in static seals, insulating servings and all general applications where a good thermal resistance is required.

SPECIAL VERSIONS

Dragovet/P.T.F.E.

Is the Dragovet braid described above treated with P.T.F.E. dispersion.
This treatment allows a more compact packing to be obtained, which is also suitable for general use in situations of light pressure.

Dragovet/GRAF

This is the Dragovet braid.
Treated externally with graphite and recommended for generic uses and where a self-lubricating seal is required.

valori limite limit value	Dragovet Dragovet GRAF	Dragovet PTFE	Dragovet Dragovet GRAF	Dragovet PTFE	Dragovet Dragovet GRAF	Dragovet PTFE
V (m/s)	0,5	1	0,5	1,5	0,5	10
P (bar)	5	15	5	20	20	60
T (°c)	Dragovet -50 Dragovet GRAF +400		Dragovet ptfe -40 +280			
PH	Dragovet - Dragovet GRAF **2÷12**		Dragovet PTFE **5÷11**			

Dragocer

CHARACTERISTICS

The DRAGOCER braid is manufactured with ceramic fibre threads obtained from a mixture composed of treated and lubricated ceramic fibres with long filaments, and organic support fibres, usually cellulose or derivatives.
The percentages of the above-mentioned components in the finished product are 85% ceramic fibre and 15% cellulose. In the presence of temperatures greater than 200°C, the cellulose undergoes complete carbonisation without producing toxic substances or fumes, delegating to the thread reinforcements (glass or inconel with a diameter of approx. 0.1/0.2 mm) the task of maintaining the necessary mechanical resistance.
The reinforcements used determine the two classes of manufactured ceramic materials in current use:

Dragocer/glass

ceramic fibre braids with glass reinforcement for use at temperatures up to 650°C.

Dragocer/inconel

ceramic fibre braids with inconel reinforcement for use at temperatures up to 1250°C.

APPLICATIONS

Ceramic fibres are used mainly on static seals, insulating coatings and in all special applications where a thermal seal is required that is superior to glass fibre braids.

valori limite limit value			
V (m/s)	-	-	10
P (bar)	-	-	100
T (°c)	Dragocer vetro/glass -0 +650 Dragocer inconel -0 +1250		
PH	**2÷12**		

Cottonal

CHARACTERISTICS
Yarn of pure twisted cotton, wire by wire impregnated with grease lubrificants.

APPLICATIONS
Suitable for cold water pumps, for shaft seals, for low and mean pressure.

SPECIAL VERSION
Cottonal/P.T.F.E.
This braid is the same above-mentioned braid with a treatment of P.T.F.E. dispersion. This version permits to obtain a resistent braided paacking.

valori limite limit value	Cottonal	Cottonal PTFE	Cottonal	Cottonal PTFE	Cottonal	Cottonal PTFE
V (m/s)	10	15	1	1,5	0,5	1
P (bar)	15	20	15	20	20	30
T (°c)	Cottonal	-30 +100			Cottonal ptfe	-50 +130
PH	2÷12					
D gr/cm³	Cottonal - Cottonal PTFE **1,1**					

Makò

CHARACTERISTICS
Braid realized with twisted extra cotton yarns with a high mechanic resistance. White - dry.

APPLICATIONS
Suitable for compressors and refrigerators.

valori limite limit value			
V (m/s)	1	0,5	0,5
P (bar)	5	10	20
T (°c)	-50 +100		
PH	2÷12		
D gr/cm³	0,6		

Plata

CHARACTERISTICS
Yarn of greased hemp and talcked.

APPLICATIONS
Suitable with cold water.

SPECIAL VERSION
Plata/P.T.F.E.
is the same above-mentioned braid with a treatment of P.T.F.E. dispersion.
This version permits to obtain a resistent braided packing.

valori limite limit value			
V (m/s)	10	1	0,5
P (bar)	15	15	20
T (°c)	-30 +100		
PH	2÷12		
D gr/cm³	1,1		

Turbosol MOS2

CHARACTERISTICS
Yarn of pure twisted cotton, greased andgraphitized wire by wire and at the and treated with Mos2 (molybdenum bisolphide).

APPLICATIONS
It is used in applications involving rotative pumps at high speed with the presence of water thanks to its special structure.

valori limite limit value			
V (m/s)	20	5	1
P (bar)	30	50	50
T (°c)	-50 +100		
PH	2÷12		
D gr/cm³	1,1		

Ramiè

CHARACTERISTICS
This braid is realized with ramiè yarn, impregnated wire by wire with P.T.F.E. dispersion.

APPLICATIONS
It is used in applications involving cold and hot water, oils and grease, foodstuffs.

valori limite limit value			
V (m/s)	15	1,5	1
P (bar)	20	20	30
T (°c)	-50 +130		
PH	2÷12		
D gr/cm³	1,3		

Bimetallica

CHARACTERISTICS
Greased and graphited braid of hemp and flax reinforced with a high percentage of soft metal.
The particular characteristic of this packing allows it to support high pressure; it is well suited for use in devices such as accumulators, presses, hydraulic pumps, distributors and hydro-pneumatic telemotors where particularly heavy conditions of use are encountered.

APPLICATIONS
The BIMETALLIC braid is a packing which, due to its structure, is recommended in applications such as pumps, valves and all devices which are in contact with water at high pressure.

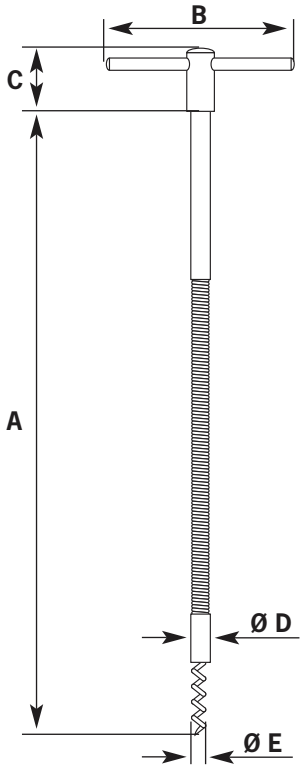
valori limite limit value			
V (m/s)	-	0,2	0,2
P (bar)	-	250	350
T (°c)	-50 +150		
PH	2÷12		
D gr/cm³	2,5		

They are absolutely necessary for the stuffing-box maintenance. They are supplied in set of three pieces in a special box, or also separately.

CHARACTERISTICS
Braid realized with hemp and flax fibers joint together, wire by wiregraphitized and greased.

APPLICATIONS
Suitable for stuffing boxes, positive-displacement pumps of mean pressure, rotary pumps.
For hot water.

formato - Sizes in mm	A	B	C	D	E
grande - small	310	90	30	10	8
medio - medium	230	75	25	7	5
piccolo - large	185	60	20	5	3



valori limite limit value			
V (m/s)	10	1	0,5
P (bar)	15	15	20
T (°c)	-50 +130		
PH	2÷12		
D gr/cm³	1,1		