

**HECKER®**  
**STUFFING**  
**BOX**  
**PACKINGS**

**HECKER®**  
**STUFFING BOX**  
**PACKINGS**

**GARNITURES DE**  
**PRESSE-ÉTOUPE**  
**HECKER®**

**GUARNIZIONI DI**  
**TENUTE A**  
**PREMISTOPPA**  
**HECKER®**

**english**





*Heinrich Hecker*

*Gertrud Hecker*

*Heinrich Hecker*

*Hans-Joachim Hecker*



*Rüdiger Hecker*

*Rüdiger Hecker*

**HECKER**  
**SEALS & MORE**  
**SINCE 1904**



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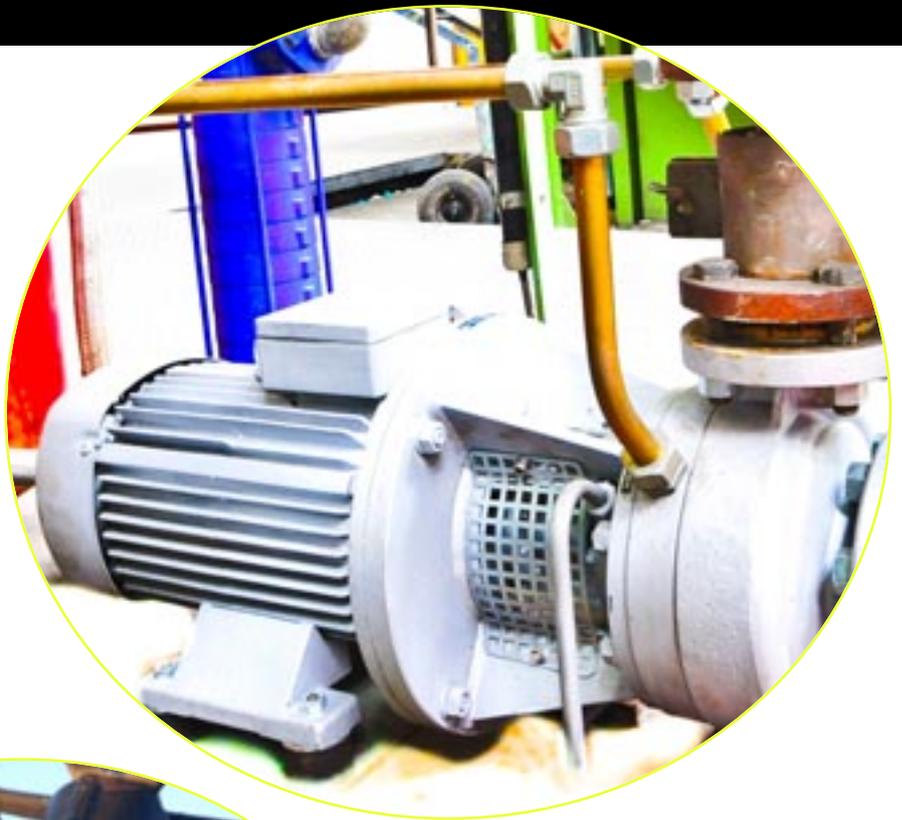
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The information given in this brochure is not binding and should only be seen as a general guideline. Due to the great range of application possibilities and demands placed on the materials we produce, we are unable to offer standard values for every individual application. The information given in the brochure can not offer guarantees with respect to suitability or lifetime of a particular sealing system since operating and application conditions play an important role and are not subject to our control. Therefore we cannot assume liability for the information given.



# PUMPS

- |      |      |      |
|------|------|------|
| 1485 | 1636 | 1681 |
| 1683 | 1689 | 1690 |
| 1700 | 1710 | 1720 |
| 1727 | 1761 | 1771 |
| 1784 | 1785 | 1786 |
| 1787 | 1788 | 1794 |
| 1795 | 1796 | 1797 |
| 1798 | 1799 | 1820 |
| 1832 | 1931 | 1941 |
| 1943 | 1955 |      |



# FITTINGS

- 1409
- 1410
- 1420
- 1421
- 1432
- 1433
- 1601
- 1682
- 1699
- 1721
- 9500
- 9525
- 9590



# STATIC USES

- 1309
- 1360
- 1369
- 1382
- 1721
- 1730
- 6000
- 6001
- 6260
- 6360
- 7015
- 7621



# TANK CAPS

- |      |        |
|------|--------|
| 1670 | 1671   |
| 1675 | 1678   |
| 1938 | PEREL® |



# BRIEF OVERVIEW - PACKING MATERIALS

Type	T [° C]		rot.	P [bar]			V [m/s]		Fibre	Impregnation		Oil
	min.	max.		osc.	stat.	rot.	osc.					
1309	-200	550	156	20	200	5	2	E-Glass	Graphite	-	-	
1360	-200	1000	-	-	-	-	-	SiO2	-	-	-	
1369	-200	700	15	20	200	5	2	SiO2	Graphite	-	-	
1382	-200	550	-	-	-	-	-	E-Glass	-	-	-	
1409	-60	400	35	150	300	25	2	Carbon	Graphite	-	-	
1410	-200	500	50	100	250	25	3	Graphite	Graphite	-	-	
1420	-240	450	50	250	300	25	2	Graphitefoil	-	-	-	
1421	-240	450	30	450	500	20	2	Graphitefoil/Wire-	-	-	-	
1432	-160	300	50	100	200	20	2	Carbon	PTFE	-	-	
1433	-200	300	20	100	200	20	3	Graphite	PTFE	-	-	
1485	-100	280	25	-	-	20	-	Carbon/PTFE	PTFE	-	Paraffinoil	
1601	-200	280	-	1000	500	-	2	PTFE	PTFE	-	-	
1636	-200	280	20	300	300	20	2	PTFE	Graphite	-	Paraffinoil	
1681	-200	280	50	300	400	25	5	gPTFE	-	-	Silikonoil	
1682	-200	280	-	200	250	-	5	gPTFE	-	-	-	
1683	-200	280	25	300	300	20	2	gPTFE	-	-	Silikonoil	
1690	-200	280	10	150	150	12	2	PTFE	PTFE	-	Paraffinoil	
1693	-200	280	20	100	100	20	2	ePTFE	Tallow	-	Silikonoil	
1699	-200	280	-	1000	500	-	2	PTFE	PTFE	-	-	
1700	-100	280	35	200	250	25	10	Aramide	PTFE	-	Silikonoil	
1710	-100	280	25	100	100	30	2	Aramide	Graphite	-	Silikonoil	
1720	-100	280	35	200	250	25	10	Aramide	PTFE	-	Paraffinoil	
1721	-100	280	-	-	300	-	-	Aramide	PTFE	-	-	
1727	-100	280	25	100	100	25	2	Aramide	PTFE	-	Paraffinoil	
1761	-100	280	50	100	100	30	2	Aramide	PTFE	Graphite	Paraffinoil	
1771	-50	280	25	50	100	25	2	Aramide	PTFE	-	Silikonoil	
1784	-100	280	30	500	500	20	2	Aramide/PTFE	Graphite	-	Paraffinoil	
1785	-100	280	20	200	200	20	5	Aramide/PTFE	PTFE	Graphite	Paraffinoil	
1786	-100	280	20	200	200	20	2	Aramide/PTFE	PTFE	-	Paraffinoil	
1787	-100	280	50	1400	500	25	2	Aramide/gPTFE	PTFE	-	Paraffinoil	
1788	-100	280	50	1400	500	25	2	Aramide/PTFE	PTFE	-	Paraffinoil	
1794	-100	280	50	1400	500	25	2	Aramide/gPTFE	-	-	Silikonoil	
1795	-100	280	50	250	250	30	5	Aramide/gPTFE	PTFE	-	Silikonoil	
1796	-100	280	20	200	200	20	5	Aramide/PTFE	PTFE	-	Silikonoil	
1797	-100	280	20	100	200	25	5	Aramide/Graph.	PTFE	-	Silikonoil	
1798	-100	280	50	500	500	25	2	Aramide/PTFE	PTFE	-	Silikonoil	
1799	-100	280	20	-	100	15	2	Aramide/Glass	Graphite	-	Paraffinoil	
1820	-100	200	25	200	250	20	2	Polyimid	PTFE	-	Silikonoil	
1832	-50	140	25	100	100	25	2	Polyacryl	PTFE	-	Paraffinoil	
1931	-50	140	25	900	200	20	2	Ramie	PTFE	-	Paraffinoil	
1941	-20	120	15	100	150	10	2	Cotton	Graphite	Grease	-	
1943	-20	120	15	100	150	10	2	Cotton	-	Grease	-	
1955	-20	140	20	200	200	15	2	Ramie	Graphite	Grease	-	
7015	-100	250	25	-	150	15	-	PTFE	-	-	-	
7621	-100	250	25	-	150	15	-	PTFE	Graphite	-	-	



## STUFFING BOX PACKINGS

### STUFFING BOX PACKINGS

#### Braided:

with threads made of natural fibers, synthetic fibers (for example PTFE, aramide, polymer, polybenzimidazole), graphite, glass

#### Pressed:

from expanded graphite, moulded fibrous composites

#### Available forms:

uncut continuous length  
preformed rings ready for installation

#### Applications:

centrifugal and piston pumps, ventilators, agitating devices and fittings

### LIDS AND STATIC SEALING

#### Wrapped:

with lamers made of natural fibers, synthetic fibers (for example aramide, glass, ceramic)

#### Pressed:

out of expanded graphite

#### Available forms:

uncut continuous length  
preformed rings ready for installation

#### Static Applications:

hand and manhole covers, boiler covers and doors, tank dome lids and lever flaps

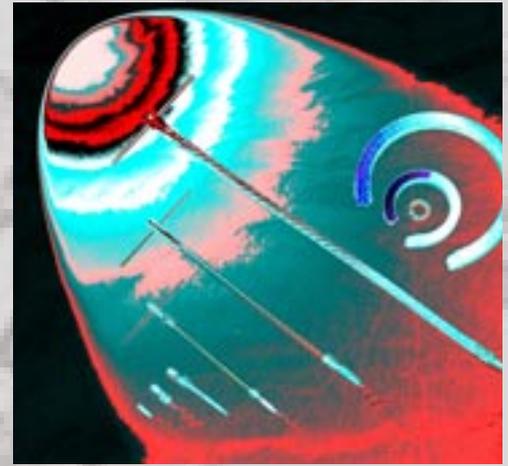
#### Graphite applications:

self-sealing closures (for example according to the Bredtschneider principle)



## PACKING EXTRACTOR

The special tool for removing used packings from stuffing box chambers.



## PACKING CUTTER

Packing cutters allows separation of the packing lengths with exact diagonal cut, suitable for the specific shaft diameter.



## NOTES FOR INSTALLATION

### CHOOSE THE CORRECT PACKING MATERIAL

What has to be respected with the choice of the right packing ?

- composition of the medium (pH-range, gases or liquids, solids or share of solids, crystallising.)
- temperature of the medium in dependence of friction.
- sliding speed

### MOUNT THE PACKING RINGS CORRECTLY

- packing rings have to be inserted one after the other
- carefully bend up the rings in axial direction and insert cutted end first (shifted installation of the rings (60° up to 90°))
- if there is a lantern ring used, look for axial fixation to the shaft and for the direction to the port
- tight the cap screws carefully and even. When tightening the screws turn the shaft by hand.
- before starting the pump retight the cap screws and slightly tight them by hand.
- start pump and tighten the screws slightly until you reach the normal leakage
- if a cooling device exists it has to be opened.
- for cooling and greasing the pump it is useful to have a minimum leakage.



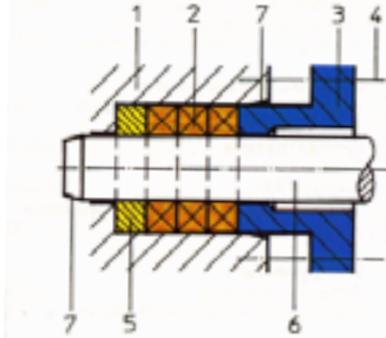
# INTRODUCTION - APPLICATION

Stuffing box serve for sealing the connecting passages of the shafts through the housing.

Typical ranges of application are:

- sealing of rotary shafts, e.g. in circulation pumps or agitators
- sealing of axially moving shafts e.g. in pumps
- sealing of spindles, e.g. in valves
- static sealing of frames and covers
- heat insulations on frames, fire doors

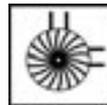
## DESIGN



Design of a stuffing box:

- 1 stuffing box housing
- 2 packing space and stuffing box rings
- 3 stuffing box cup
- 4 stud bolts
- 5 basic ring
- 6 shaft, spindle, rod, plunger
- 7 entry bush

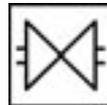
## SYMBOLS OF AGGREGATES



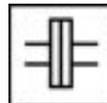
Circulating pump  
(rotary shaft)



piston pump  
(reciprocating piston)



armature (sealing of the spindle)



static seal (flanges, frames etc.)

UNITS :

$v_g$  [m/s]: Sliding speed

$p$  [bar]: Pressure

$t$  [°C]: Temperature

pH [ ] : Acid and lye concentration

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HECKER®,

EURAFLO®,

EURASIL®,

EURAFLEX® ,

CENTELLEN®

PEREL®

GRAFOTHERM® AK®

## PLAITING METHODS



2-diagonally



3-diagonally



4-diagonally



braid-over-braid



## DESIGN

For all requirements HECKER® - stuffing box packings are plaited from yarns made of the following fibres:

Natural fibres:

- ramie
- cotton

synthetic fibres:

- polytetrafluorethylen (PTFE), polyaramide and polyimide, polybenzimidazole (PBI)
- polyacrylate, graphite, carbon

anorganic fibres:

- glass

By means of impregnation with special compounds the packing is adapted to every respective application purpose, e.g. lubricants for pump packings, binding and filling agents and dry lubricants for valve packings or PTFE for piston pump packings.

For the sealing of stuffing boxes which are exposed to higher temperatures and pressures where plaited packings cannot be used, the application of packing rings and bushings of expanded graphite, the HECKER® Grafotherm® seals are recommended.

HECKER® EURAFILON® (PTFE) universal flat seals with adhesive strip as well as the so-called AK®-seals (asbestos-free fabric caoutchouc), which are produced of gummed fabrics are available for the static sealing of covers.

## NOTES FOR SELECTION

The selection of stuffing box packings must be effected under consideration of the following factors:

- application conditions:
  - e.g. aggregates (pump, valve), maximum values of temperature, pressure and sliding speed
- media:
  - the tables on the following pages indicate the technical values, the suitability for the different applications as well as the resistance to various media of the packings.

## SHAPES AVAILABLE

Plaited packings

- with a cross section of 3x3 mm to 50x50 mm
- as yarded goods or rolled packings
- as prepressed rings, bushes or combined packing sets

Grafotherm

- as rings, continuous or open (diagonal cut, jump jointed cut)
- as half rings
- as bushes

PTFE:

- as flat seal with adhesive strip from 3 x 1,5mm to 20 x 7 mm



# NOTES FOR INSTALLATION ON STARTING-UP OF GLANDBOX PACKINGS IN CIRCULATION PISTON PUMPS, AS WELL AS IN ARMATURES

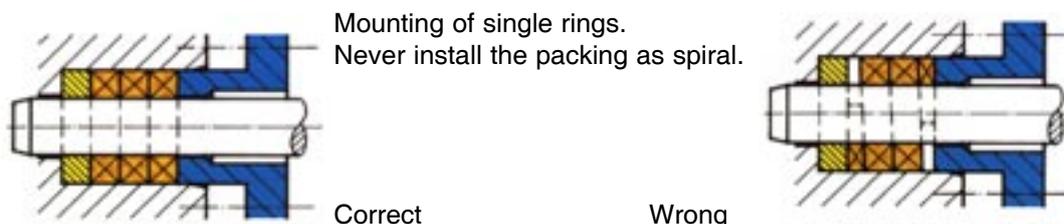
## TECNICAL REQUIREMENTS FOR AN OPTIMAL FUNCTION

Stroke of shaft max.  $0,001 \times$  shaft diameter at sliding speed  $> 2$  m/s. Surface roughness of the shaft, spindle or piston  $R_t < 5$  mm. Surface within sealing area smooth, without any scores or rust formation.

Gap between shaft and housing or cup  $< 0,2$  mm. In the case of a larger gap, extrusion-free packings or supporting rings of such packing are necessary.

Install well dimensioned packings only (for the range of dimensions 6 to 20 mm:  $+0,3\text{mm}/-0,5\text{mm}$ ). Packings which do not fit exactly are not allowed to be aligned by hammering. After installation they are subject to expansion causing increased friction. Such packings applied in circulating pumps may start burning !

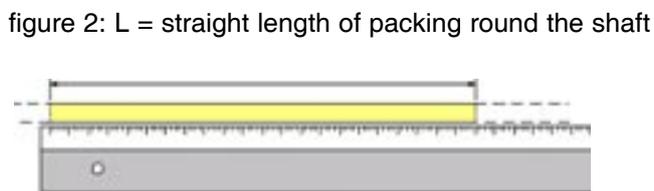
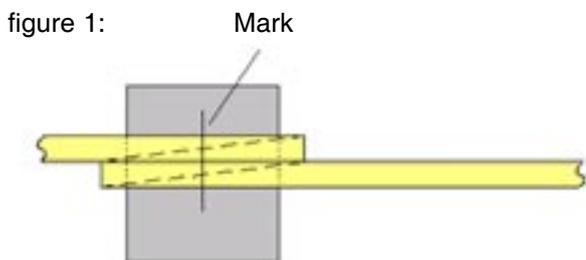
## MOUNTING OF PACKING RINGS



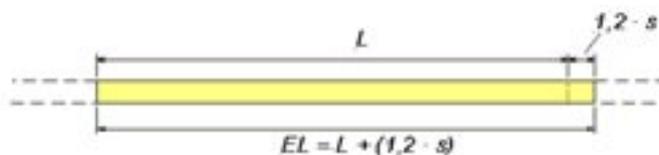
When yard goods is applied: selection of appropriate length of packing !

## CUTTING BY USE OF YARD WARE

- Lay the Packing rings provisoriosly round the shaft and mark them (figure 1). So you get the straight length of the packing L (figure 2).
- !! Please pay attention, that the packing rings have fully contact with the shaft. !!



- take the packing away and add the width of packing  $s \times 1,2$  to the length L. You get the length for mounting (EL, figure 3).
- cut on both marks of the length for mounting (EL) by approx.  $45^\circ$  (figure 4).
- use our HECKER® packing cutter for accurate cuts of packings.

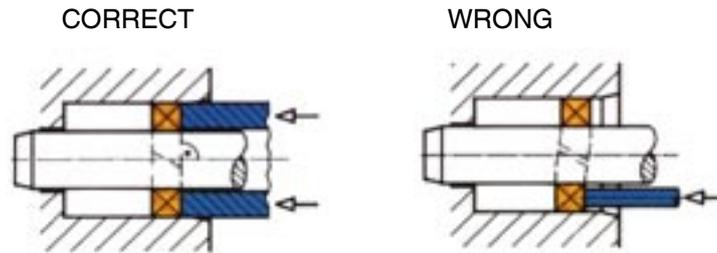


- figure 3:
- as an alternative, application of prepressed packing rings are recommended.



## MOUNTING OF PACKING RINGS

Packing rings have to be inserted one after the other. Carefully bend up the packing ring in axial direction and insert cut end first, with longitudinally divided sleeve and press rectangularly against the axis of the shaft.



## MOUNTING OF CIRCULATION PUMP PACKINGS

- packing set during idle running has to be well compressed (min. approx. 5 N/mm<sup>2</sup>)
- afterwards pressure on packing set has to be released again
- remove cap by approx. 8% of the height of packing set
- if a cooling device exists it has to be opened
- start the pump and wait for approximately 1 hour. Interference will be necessary only in the case of vapour, then slightly release the cap a little bit. As per experiences - overheating of the packing occurs only in the case of very unfavourable conditions – in most cases no interference will be necessary
- an obvious heating of the packing during this starting time is normal and there is no reason for an alarm

Due to our experiences the packing becomes stable after 1 hour. If necessary, the leakage can now be adjusted by carefully retightening the cap screws.

A minimum leakage is necessary in all cases. In the case of sliding speed up to 5 m/s there will be drip leakage. By increasing the sliding speed up to 20 m/s the leakage will reach about 20 ml/min.

## STARTING-UP OF VALVE PACKINGS

Packing set has to be well pressed. The release cap can be actuated as far as the handlever allows.



# ARAMIDE, FILAMENT



## MATERIAL

	1700	1720	1771
Fibre:	aramide	aramide	aramide
Fibre type:	filament	filament	filament
Impregnation:	PTFE	PTFE	PTFE
Lubricant:	silicon oil	paraffin oil	silicon oil
Density [g/cm³]	1,35	1,3	1,35
T [°C]	-100 to 280	-100 to 280	-50 to 280
pH [ ]	2 to 13	2 to 13	1 to 13

p [bar]	35	35	25	
v [m/s]	25	25	25	
p [bar]	200	200	50	
v [m/s]	10	10	2	
p [bar]	250	250	100	
v [m/s]	2	2	2	
p [bar]	--	--	25	

## Peculiarities:

WS 1700:

Very high abrasion resistance. Application against media with abrasive components.

WS 1720:

Very high abrasion resistance. Applicable against media with abrasive components.

WS 1771:

Very good chemical resistance. Applicable against most media. Very good use in hot and wet conditions, also hot oils. Packing didn't contaminate the agent. „White“ packing for general use, good mechanical resistant also for media with abrasive components.

## Structure:

EURAFLEX®-diagonal plaiting

## Form of delivery:

Piece goods from 3 mm to 50 mm square

## Media resistance:

Applicable against most media. Not applicable against concentrated acids and alkaline-solutions, few organic compounds, alkali metals, elementary fluorine and fluorine compounds.

## Notes:

The packings WS 1700 and WS 1720 have a very high mechanical stability and excellent sliding properties.



# ARAMIDE, STAPLE FIBRE



## MATERIAL

**1721**      **1727**

Fibre:	aramide	aramide
Fibre type:	staple fibre	staple fibre
Impregnation:	PTFE	PTFE
Lubricant:	-	paraffin oil
Density: [g/cm <sup>3</sup> ]	1	1,1
T [°C]	-100 to 280	-100 to 280
pH [ ]	2 to 13	2 to 13

p [bar]	-	25	
v [m/s]	-	25	
p [bar]	-	100	
v [m/s]	-	2	
p [bar]	300	100	
v [m/s]	-	2	
p [bar]	5	--	

**Peculiarities:** WS 1721:  
Especially for the use in fittings, in steam up to 200°C. Applicable against media with abrasive components and hot water.

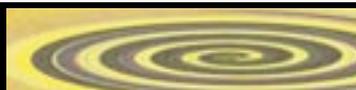
WS 1727:  
Soft but high abrasive resistance. Applicable against media with abrasive components.

**Structure:** EURAFLEX®-diagonal plaiting

**Form of delivery:** Piece goods from 3 mm to 50 mm square

**Media resistance:** Applicable against most media. Not applicable against concentrated acids and alkaline-solutions, few organic compounds, alkali metals, elementary fluorine and fluorine compounds.

**Notes:** The packings WS 1721 and WS 1727 have very high mechanical stability and excellent sliding properties.



# ARAMIDE, BLACK



MATERIAL	1710	1761	1799	
Fibre:	aramide	aramide	aramide/glass	
Fibre type:	filament	filament	filament/core	
Impregnation:	graphite	PTFE/graph.	graphite	
Lubricant:	silicon oil	paraffin oil	paraffin oil	
Density: [g/cm³]	1,35	1,25	1,4	
T [°C]	-100 to 280	-100 to 280	-100 to 280	
pH [ ]	2 to 13	2 to 13	2 to 13	
p [bar]	25	50	20	
v [m/s]	30	30	15	
p [bar]	100	100	--	
v [m/s]	2	2	--	
p [bar]	100	100	100	
v [m/s]	2	2	2	
p [bar]	--	--	--	

**Peculiarities:**

**WS 1710:**  
Surface graphited. In centrifugal pumps packing has already rendered a service life of more than 15.000 hours.

**WS 1761:**  
In centrifugal pumps this packing has already rendered a service life of more than 15.000 hours.

**WS 1799:**  
Cheap alternative for low mechanical requirements. Core serves as reservoir for lubricant.

**Structure:** EURAFLEX®-diagonal plaiting

**Form of delivery:** Piece goods from 3 mm to 50 mm square

**Media resistance:** Applicable against most media.  
Not applicable against concentrated acids and alkaline-solutions, few organic compounds, alkali metals, elementary fluorine and fluorine compounds.

**Notes:** The packings "Aramide black" are suitable for applications with high sliding velocity e.g. piston- and centrifugal pumps. Through the use of a graphite as an impregnation on the fibre, the heat conductivity has been increased.



# ARAMIDE-COMBINATED, "EDGE"



MATERIAL	1787	1788	1794	1798	
Fibre:	aramide/G4®	aramide/PTFE	aramide/gPTFE	aramide/PTFE	
Fibre type:	filament/filament	filament/filament	filament/filament	filament/fil.	
Impregnation:	PTFE/Incorp. GR	--	Incorp. GR	PTFE	
Lubricant:	--	--	silicon oil	silicon oil	
Density:[g/cm³]	1,7	1,5	1,5	1,5	
T [°C]	-100 to 280	-100 to 280	-100 to 280	-100 to 280	
pH [ ]	2 to 13	2 to 13	2 to 13	2 to 13	
p [bar]	50	50	50	50	
v [m/s]	25	25	25	25	
p [bar]	1400	1400	1400	500	
v [m/s]	2	2	2	2	
p [bar]	500	500	500	500	
v [m/s]	2	5	2	2	
p [bar]	2	1	--	--	

**Peculiarities:**

**WS 1787:**  
For use in piston-pumps at extreme pressures. Yarn combination results in low friction and good heat conductivity.

**WS 1788:**  
Especially developed for piston-pumps. The aramide fibre prevents an extrusion of the PTFE-yarn.

**WS 1794:**  
High strength and good sliding properties. Suitable for high sliding velocity in piston-pumps

**Structure:** EURAFLEX®-diagonal plaiting, "edge reinforced"

**Form of delivery:** Piece goods from 5 mm to 50 mm square

**Media resistance:** Applicable against most media. Not applicable against concentrated acids and alkaline-solutions, few organic compounds, alkali metals, elementary fluorine and fluorine compounds.

**Notes:** "Edge reinforced" qualities are especially for piston pumps. Through the aramide reinforcement the extrusion of packing can be decreased. The PTFE in the sliding surface makes it possible to seal against high pressure and support very good sliding properties of the pump rod.



# ARAMIDE-COMBINATED, "ZEBRA"



## MATERIAL

**1785**

**1786**

**1795**

**1796**

Fibre:	aramide/PTFE	aramide/PTFE	aramide/gPTFE	aramide/PTFE
Fibre type:	filament/filament	staple fibre/filament	filament/filament	filament/filament
Impregnation:	graphite/PTFE	PTFE	PTFE/ Incorp.gr.	PTFE
Lubricant:	paraffin oil	paraffin oil	silicon oil	silicon oil
Density: [g/cm <sup>3</sup> ]	1,5	1,4	1,5	1,6
T [°C]	-100 to 280	-100 to 280	-100 to 280	-100 to 280
pH [ ]	2 to 13	2 to 13	2 to 13	2 to 13
p [bar]	20	20	50	20
v [m/s]	20	20	30	20
p [bar]	200	200	250	200
v [m/s]	5	2	5	5
p [bar]	200	200	250	200
v [m/s]	2	2	2	2
p [bar]	2	2	2	2

## Peculiarities:

WS 1785:

Because of the good sliding properties it can be used in centrifugal pumps at high sliding velocities.

WS 1786:

Through the use of aramide staple-fibre the packing is very pliant and elastic.

WS 1795:

High strength and good sliding properties. Suitable for higher sliding velocities in centrifugal pumps.

WS 1796:

Suitable for higher sliding velocities in centrifugal pumps.

## Structure:

EURAFLEX®-diagonal plaiting, "Zebra"

## Form of delivery:

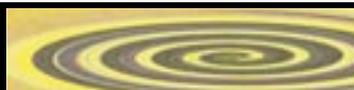
Piece goods from 3 mm to 50 mm square

## Media resistance:

Applicable against most media. Not applicable against concentrated acids and alkaline-solutions, few organic compounds, alkali metals, elementary fluorine and fluorine compounds.

## Notes:

Packings with "zebra" plait are especially for centrifugal pumps. This plait makes it possible to combine materials with good supporting behaviour (aramide) and materials with good sliding behaviour (PTFE) in the face. So running-in can be avoided.



# COTTON / SOLVENT



## MATERIAL

### 1941      1943

Fibre:	cotton	cotton
Fibre type:	long fibre	long fibre
Impregnation:	graphite	-
Lubricant:	grease	grease
Density: [g/cm <sup>3</sup> ]	1,4	1,4
T [°C]	-20 to 120	-20 to 120
pH [ ]	5 to 13	5 to 13
p [bar]	15	15
v [m/s]	10	10
p [bar]	100	100
v [m/s]	2	2
p [bar]	150	150
v [m/s]	2	2
p [bar]	-	-



### Peculiarities:

WS 1941:  
Inexpensively.

WS 1943:  
Especially suitable for dirt sensitive application.

### Structure:

EURAFLEX®-diagonal plaiting

### Form of delivery:

Piece goods from 5 mm to 50 mm square

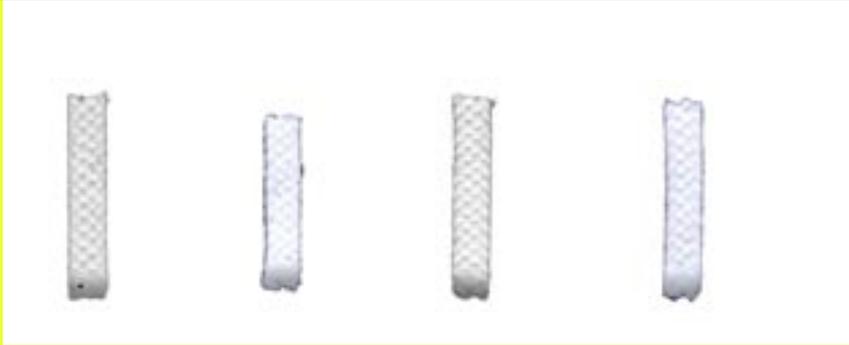
### Media resistance:

Hot and cold water, aqueous solutions, dissolved alkalis, fat and oil. Not applicable against acid and abrasive media.

### Notes:

WS 1941 and WS 1943 are recommended as cheap alternative for uses with low requirements to the packing.





MATERIAL	1601	1690	1699	1693
Fibre:	PTFE	PTFE	PTFE	ePTFE
Fibre type:	filament	filament	filament	-
Impregnation:	PTFE	PTFE	PTFE	Tallow/PTFE
Lubricant:	-	paraffin oil	-	silicon oil
Density:[g/cm <sup>3</sup> ]	1,7	1,72	1,7	1,8
T [°C]	-200 to 280	-200 to 280	-200 to 280	-200 to 280
pH [ ]	0 to 14	0 to 14	0 to 14	0 to 14
p [bar]-	10	-	20	
v [m/s]-	12	-	20	
p [bar]	1000	150	1000	100
v [m/s] <sup>2</sup>	2	2	2	
p [bar] 500	150	500	100	
v [m/s] <sup>2</sup>	2	2	2	
p [bar] 5	-	5	-	

**Peculiarities:** WS 1601:  
No restriction of pressure and packing temperatures in use against liquid oxygen.

**Releases:** WS 1601:  
BAM, TA-Luft, FDA CRF Title 21§177.1550, EU 10/2011

WS 1699:  
BAM

**Structure:** EURAFLEX<sup>®</sup>-diagonal plaiting

**Form of delivery:** Piece goods from 3 mm to 50 mm square

**Media resistance:** Applicable against almost all media. Not applicable against alkaline metals in melted or dissolved form, as well as elementary fluorine and fluorine compound at high temperatures and pressure.

**Notes:** In employments where it is necessary to seal against aggressive chemicals, we recommend to use these packing materials of PTFE.



# EURAFLON® (PTFE), GRAPHITE



## MATERIAL

	<b>1636</b>	<b>1681</b>	<b>1682</b>	<b>1683</b>
Fibre:	PTFE	100% GFO®	gPTFE	gPTFE
Fibre type:	filament	filament	filament	filament
Impregnation:	graphite	incorp. GR	incorp GR	incorp. GR
Lubricant:	paraffin oil	silicon oil	-	silicon oil
Density:[g/cm³]	1,7	1,54	1,5	1,6
T [°C]	-200 to 280	-200 to 280	-200 to 280	-200 to 280
Releases	-	-	-	-
pH [ ]	0 to 14	0 to 14	0 to 14	0 to 14
p [bar]	20	50	-	25
v [m/s]	20	25	-	20
p [bar]	300	300	200/500*)	300
v [m/s]	2	5	5	2
p [bar]	300	400	250	300
v [m/s]	2	2	5	2
p [bar]	-	-	-	-

\*)chambered

## Peculiarities:

WS 1636:

Good heat conductivity by graphite coated yarn.

WS 1681:

High chemical resistance. Good lubrication and heat conductivity.

WS 1682:

High chemical resistance. High pressure resistance and good heat conductivity.

## Structure:

EURAFLEX®-diagonal plaiting

## Form of delivery:

Piece goods from 3 mm to 50 mm square

## Media resistance:

Applicable against almost all media. Not applicable against alkaline metals in melted or dissolved form, as well as elementary fluorine and fluorine compound at high temperatures and pressure.

## Notes:

The packing quality WS 1636 is extremely chemical resistant. They are only attacked by strong oxidizing substances which are aggressive against the graphite. The graphite in WS 1681, 1682 and WS 1683 can not be rubbed off. Through the microporous structure the packings are very flexible.



# EURAFLO<sup>®</sup> (PTFE) EXTRUSION MOLDED



MATERIAL	7015	7621	
Fibre:	PTFE	PTFE	
Fibre type:	unsintered	unsintered	
Impregnation:	-	graphite	
Lubricant:	-	-	
Density:[g/cm <sup>3</sup> ]	1,9	1,9	
T [°C]	-100 to 250	-100 to 250	
pH [ ]	0 to 14	0 to 14	
p [bar]	-	-	
v [m/s]	-	-	
p [bar]	-	-	
v [m/s]	-	-	
p [bar]	2	2	
v [m/s]	1	1	
p [bar]	2	1	

**Peculiarities:** 7015: Plastic extrusion. Molded material made of 100% unsintered PTFE  
7621: Plastic extrusion. Molded material made of unsintered PTFE with graphite as lubricant

**Form of delivery:** 7015: Piece goods between 0,75 to 30mm round, square from 3 to 25 mm.  
7621: Piece goods square from 3 to 25mm.

**Media resistance:** Applicable against near all media.  
Not applicable against alkali metals in melted or dissolved form and elementary fluorine at high temperature and pressure.

**Notes:** Suitable as a flange- and shaft sealing in pipeline and equipment construction.



## RAMIE & OTHER PACKINGS



### MATERIAL

	1931	1955	1820	1832	
Fibre:	ramie	ramie	P84(polimide)	PAN	
Fibre type:	long fibre	long fibre	filament	filament	
Impregnation:	PTFE	graphite	PTFE	PTFE	
Lubricant:	paraffin oil	grease	silicon oil	silicon oil	
Density: [g/cm <sup>3</sup> ]	1,2	1,2	1,3	1,0	
T [°C]	-50 to 140	-20 to 140	-100 to 200	-50 to 140	
pH [ ]	5 up to 14	5 up to 14	0 up to 12	1 to 13	
p [bar]	25	20	25	25	
v [m/s]	20	15	20	25	
p [bar]	900	200	200	100	
v [m/s]	2	2	2	2	
p [bar]	200	200	250	100	
v [m/s]	2	2	2	2	
p [bar]	1	1	-	1	

### Peculiarities:

1931: Special packing for alkaline solutions. For tank business, paper industry, water plants etc.

1955: Special packing for alkaline solutions, heat and caustic solutions resistant.

1820: High working capacity and flexibility. The yarn is soft and textile. Applicable in steam up to 260°C.

1832: Packing made of polyacrylenitrile. Especially adapting.

### Form of delivery:

Piece goods from 3 to 50mm.

### Media resistance:

1931/1955: Aqueous- and alkaline media, especially abrasive media and cristalline solutions, sandy soles, salt grained sludge, chemical pulp. Not applicable against acid media. Qualities with core made of NBR are applicable against hydrocarbons.

1820/1832: Applicable against almos all organic solvents, as well as concentrated acids at low temperatures. Not applicable against alkaline solutions and strong polar solvents.

### Notes:

1931/1955: Against media with high mechanical abrasive potential, packings made of wear resistance ramie fibre are well suited. Through the high rotproof behaviour of the ramie fibre the packing support high durability in cases where the graphite content of the packing disturbs, we recommend 1931 with an bright PTFE-/grease-lubricant.

1820/1832: For uses at high pressures or abrasive media we recommend packings made of polyamide like 1700 or poliamide yarn like 1820.



# CARBON



MATERIAL	1409	1432
Fibre:	carbon	carbon
Fibre type:	filament	filament
Impregnation:	Graphite	PTFE
Lubricant:	-	-
Density: [g/cm <sup>3</sup> ]	1,2	1,2
T [°C]	-60 to 350	-160 to 300
pH [ ]	2 to 14	0 to 14
p [bar]	35	50
v [m/s]	25	20
p [bar]	150	100
v [m/s]	2	2
p [bar]	300	200
v [m/s]	2	3
p [bar]	3	3



**Peculiarities:**

WS 1409:  
Packing for valves up to 400°C. The packing is compact and compression proof.

WS 1432:  
The packing can be used in cases of very difficult sealing conditions.

**Structure:** EURAFLEX® - diagonal plaiting

**Form of delivery:** Piece goods from 3 mm to 50 mm square/round.

**Media resistance:** Applicable against almost all media.  
Not applicable against concentrated acids and oxidating media.

**Notes:** This packings are well suited for very difficult sealing conditions, e.g. in the case of high temperatures and aggressive media.



# GRAPHITE



MATERIAL	1410	1420	1421	1433	
Fibre:	graphite	graphite	graph./inco.	graphite	
Fibre type:	filament	foil	foil/wire	filament	
Impregnation:	graphite	-	-	PTFE	
Lubricant:	-	-	-	-	
Density:[g/cm <sup>3</sup> ]	1,2	1,2	1,3	1,2	
T [°C]	-200 to 500	-240 to 450	-240 to 450	-200 to 300	
pH [ ]	0 to 14	1 to 14	1 to 14	0 to 14	
p [bar]	50	50	30	20	
v [m/s]	25	25	20	20	
p [bar]	100	250	450	-	
v [m/s]	3	2	2	-	
p [bar]	250	300	500	200	
v [m/s]	3	2	2	3	
p [bar]	3	5	10	-	

**Peculiarities:** WS 1410:  
Packing consists of 100% graphite and withstands service temp. up to approx. 2000°C in non oxidizing atmosphere.

WS 1420:  
Packing combines the advantage of plaited packing with the good characteristics of expanded graphite.

WS 1421:  
Packing combines the advantage of plaited packing with the good characteristics of expanded graphite.

WS 1433:  
Very high heat conductivity. Very good chemical resistance.

**Structure:** EURAFLEX®-diagonal plaiting

**Form of delivery:** Piece goods from 3 mm to 50 mm square

**Media resistance:** Applicable against almost all media like acids, alkalines, organic chemicals, salty solutions, vapours, water, oils, solvents and aggressive gases.  
Not applicable against pure oxygen.

**Notes:** These packings are well suited for very difficult sealing conditions, e.g. in the case of high temperatures and aggressive media.



# GRAFOTHERM® - FOR PUMP SHAFTS AND FITTING SPINDELS

	pump shafts	fitting spindles
$v_g$ :	40 m/s	3 m/s
$p$ [bar]	40 bar	100 bar at 1,2 g/cm <sup>3</sup> 200 bar at 1,4 g/cm <sup>3</sup> 325 bar at 1,6 g/cm <sup>3</sup>
$t$ [°C] water (inert):	- 200 up to +550	
$t$ [°C] inert atmosph.	- 200 up to +2000	
pH [ ]	0 up to 14	



**MEDIA:** Resistant against most media. Not applicable against strong oxidants e.g. concentrated nitric acid, sulphuric acid and perchloric acid and chrome (VI) solutions, alkaline salt e.g. calcium chlorate, nitrate aggressive gases with bromine, chlor dioxide or sulphuric trioxide.

**DESIGN:** GRAFOTHERM® consists of pure graphite, which has been expanded in a special procedure. This material is densified to foils without using any binders or fillers and cut in strips. These strips (as mentioned below) can be pressed as sealing rings into glandbox rings on site. As a rule, we supply finished prepressed rings of Grafotherm® strips.

**CHARACTERISTIC FEATURES:** Ductility up to 50% of original thickness at a density of 1,0 g/cm<sup>3</sup>. Resilience of approx. 10% of the original thickness. Continuous elasticity, resistant to thermal shocks, non-ageing, no hardening or softening, no warm- or cold flow. High heat conductivity, depending on density 100...400 W/K\*m. Low friction value  $\mu = 0,05 - 0,09$ ; self lubricating. Resistant to radiation  $5 \times 10^6$  rad. Good sectional density, at shafts only very low leakage is necessary.

	WS 9525	WS 9500	WS 9590
Purity	≥ 98 % C	≥ 99,8 % C	≥ 99,8 % C (+2% Inhibitor)
Chloride contents	< 50 ppm	< 20 ppm	< 20 ppm
Iron contents	< 300 ppm	< 300 ppm	< 300 ppm

9525 is the standard quality, whereby 9500 is applied in the case of high purity requirements. 9590 with corrosion inhibitor (barium molybdate) is recommended in the case of special requirements of the corrosion safety, e.g. in the case of long storing periods, long idle running times at water- and vapour fittings of combinations of high-alloy spindle materials and low-alloy housing materials.

**ADVANTAGES:** Wide range of application, thus easy stock-keeping. No disturbance due to a wrong selection of the gaskets. Easy mounting, short idle running times, less maintenance service: no resealing, only remounting in the case of increased leakage. Long lifetime at low leakage. Protection of shafts and spindles. For fittings, decrease of the glandbox depth is possible.

**SHAPES AVAILABLE:** Types of Grafotherm WS 9525, WS 9500 and WS 9590 with densities of 1.2 to 1.8 g/cm<sup>3</sup> depending on the respective application: Packing-rings pressed on foil, continuous, with a cut or separated. Profile rings, e.g. with angular cut for covers. Profile rings with small cross sections as part of replacement for elastomer-rings.

**MADE OF WS 9500:** Strips with transverse ribs 0,38 mm thick, in 10, 15, 20 and 25 mm width, for self rolling and pressing in the glandbox. Strips with transverse ribs, 1,0 mm thick with adhesive strip for the sealing of flanges, covers etc..



## HECKER® - TANK HATCH PACKINGS

HECKER® tank hatch packings are available in different implementations. Combinable in the choice of the yarns in connection with different cores, the packing can be produced according to the individual application areas.

The materials made with rubber cores features high elasticity and flexibility. By the choice of suitable elastic profiles e.g., moss, tube and full rubber and the choice of a suitable kind of rubber, these materials can be adapted to many-sided cases of application.

Tank hatch packings are primarily used in the static sealing from lids, containers and tanks, as well as in tank-ships etc.

Another application area is, the use in mixing works, mixers and heavy duty Mixers, because of very flexible properties.

Due to the elastic construction these packings have a high resilience, and because of their flexible adaptation they are also useable in applications with bigger shaft runouts.

Possible forms of delivery for example are yard goods with a measure of 8 to 50 mm, with a round, square or rectangular cross section. Just as well glued endlessly rings or pushed together rings wrapped with PTFE are available.

The chemical and mechanical resistance is depending on the used yarn and core material.

### TANK HATCH PACKINGS - RAMIE



Are suitable for example against watery and alkaline fluids in particular also for abrasive media like crystal-containing solutions, sandy-containing soles, salt mash and cellulose pulps.

The packing is even well suitable against fluids with a high mechanical wear effect, because of the persistence of the Ramie-yarn.

The good imputrescible of the Ramie-yarn provides a long lifetime of the packing.

The Ramie-yarn is not suitable against acid fluids.

### TANK HATCH PACKINGS - ARAMID



The aramide yarn provides a high mechanical stability combined with a high elasticity of the rubber core and it is suitable against most of the fluids.

The aramide yarn is not suitable for the use with concentrated acids and alkaline lyes, some few organic combinations, alkali metals, fluorine and fluorine compounds.

### TANK HATCH PACKINGS - PTFE



Is well suited against all fluids and gases used on tankships.

The temperature resistance of the rubber core up to 150 ° C allows to clean the tanks by evaporation without damaging the seal.



**PTFE  
special sealing  
for manholes on  
tank wagons**



- Special sealing for folding tank caps according to DIN EN 12 561-6.
- Safety for transport of liquid chemicals.
- No contamination of the goods by the sealing material.
- The permanent flexibility of the PEREL® seal is the key for long lasting tightness.
- Long life because of tough design and very small stress on the sealing.
- Adaptability at rough surfaces and simple assembling.
- Compact and dimensionally stable.
- Stable against all chemicals.
- Environmentally friendly because of high tightness.
- Storable without hardening or ageing.

Structural principle of the PEREL® tank cap seal:

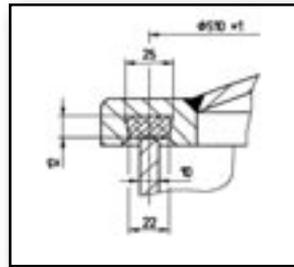
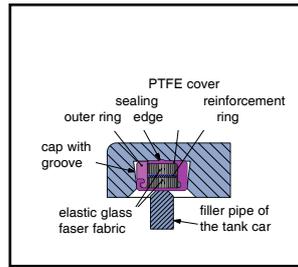
The cover made by turning machines out of PTFE or TFM PTFE allows a clean sealing of manhole caps on chemical wagons. There is no contamination of the carriage contents by sealing components. PTFE is practically resistant to all chemicals. TFM PTFE has, in addition, a decreased permeability and better mechanical qualities like the low plastic flow under loading conditions.

The soft material insert exists of PTFE impregnated fiberglass fabric. The fiber structure is the basis of the constantly elasticity of the PEREL® sealing which leads to the outstanding qualities. The almost chemically inert fiberglass insert has good emergency sealing qualities, for example, by damage of the cover. The cup seal of the type PE has an extremely long state time, has a high liability and also stands firm to coarse contact. Production kind, product and name are a property of the Gommec S.A., Switzerland.



# PEREL® TANK CAP SEAL

PEREL®  
Tank cap seal  
type PE:



Technical data:

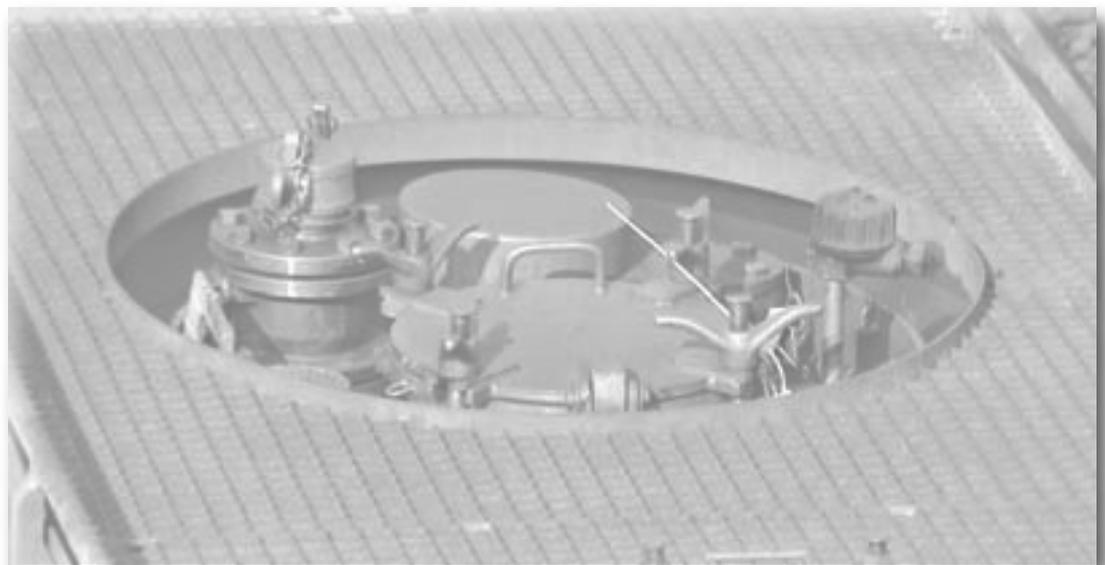
- |                         |   |
|-------------------------|---|
| • Cover of the sealing: | PTFE or TFM PTFE                              |
| • Outer ring:           | PTFE  |
| • Reinforcement ring:   | 1.4404 (type PE/PTFE)<br>1.4571 (type PE/TFM) |
| • Soft material insert: | PTFE, glass fibre kernel                      |
| • Temperature:          | - 80°C up to 200°C                            |
| • Test pressure:        | 4,5 bar                                       |

Specific values of  
the sealing

$Q_{min}$  4 MPa  
 $Q_{SMAX}$  20 MPa  
 $Q_{CRIT}$  40 MPa

Installation  
information:

- Insert sealing by hand in the clean groove.
- Pay attention to right position; sealing edge on basis of the groove.
- Suit torque: Tight toggle female screws by hand or with adequate lengthening pull.
- The sealing is already tight with low surface pressure.  
Recommended installation surface pressure in the working condition:  
From 8 to 12 MPa.



# GLASS & GLASS CHORDS



MATERIAL	1309	1382	6001	6002	6004	
Fibre:	e-glass	e-glass	e-glass	e-glass	e-glass	
Fibre type:	filament	filament	-	-	-	
Impregnation:	graphite	-	-	-	-	
Braiding technique	braided	braided	knitted cord	cover braided	twisted cord	
Density: [g/cm³]	1,2	1,1	1,0	1,0	1,0	
T [°C]	-200 to 550	-200 to 550	-200 to 550	-200 to 550	-200 to 550	
pH [ ]	2 to 14	2 to 14	2 to 14	2 to 14	2 to 14	
p [bar]	15	-	-	-	-	
v [m/s]	5	-	-	-	-	
p [bar]	20	-	-	-	-	
v [m/s]	2	-	-	-	-	
p [bar]	200	-	-	-	-	
v [m/s]	2	-	-	-	-	
p [bar]	2	1	1	1	1	

**Peculiarities:**

WS 1309: Higher gasproof as 1382.  
 WS 1382: Good temperature resistance.  
 WS 6001: Made of a special fibre pliable and comfortable to skin. Core wrapping 100% e-glass.  
 WS 6002: Compactly wrapped with special fibre which is pliable and comfortable to skin.  
 Wrapping: 100% e-glass  
 Many parallel/lightly turned robes with braiding.

**and**

**Form of delivery:** WS 1309 / WS 1382: Piece goods from 4 mm to 60 mm square  
 WS 6001: Knitted cords and woven fabric tapes  
 WS 6002: Cover braided cords  
 WS 6004: S- or Z-axis adjusted yarn

**Media resistance:** Applicable against air, vapour and gases, aggressive and acid gases too.  
 Not applicable against hydrofluoric acid and fluorides.  
 WS 6001, 6002 and WS 6004 are additionally resistant against organic solvents.

**Notes:** Static sealings for high temperatures, for example oven doors, tunnel covers



# EURASIL® PACKINGS AND CORDS FOR HIGH TEMPERATURES



## MATERIAL

	<b>1369</b>	<b>1360</b>	<b>6260</b>	<b>6360</b>	
Fibre	modified silicic fibre		modified silicic fibre		
Fibre type:	filament	filament			
Impregnation:	graphite	-			
Braiding technique:	round or square		twisted	S-or Z-axis adjusted	
Density:[g/cm³]	1,1	1,1	1,1	1,1	
T [°C]	-200 to 700	-200 to 1000	-200 to 1000	-200 to 1000	
pH [ ]	0 up to 13	0 up to 13	0 up to 13	0 up to 13	
p [bar]	15	-	-	-	
v [m/s]	5	-	-	-	
p [bar]	20	-	-	-	
v [m/s]	2	-	-	-	
p [bar]	200	-	-	-	
v [m/s]	2	-	-	-	
p [bar]	2	1	1	1	

### Peculiarities:

1369: Applicable against air, vapour and gases, aggressive and acid gases (except HF) too. The graphite prevents sticking of the packing to oven doors. An alternative for packings made of ceramic up to 700°C. Schott free. No known risk to health.

1360: Applicable against air, vapour and gases, aggressive and acid gases (except HF) too. An alternative for packings made of ceramic up to 1000°C. Very good heat-insulating (low thermal conductivity). Schott free. No known risk to health.

### Notes:

1369 & 1360: Static sealing for high temperatures, for example oven doors, tunnel covers, ...

### Form of delivery:

1369 & 1360: 2D plait, Piece goods from 4 mm to 50 mm square or round.  
6260 & 6360: From 3mm to 30 mm round.

We are also able to deliver fabric ribbons out of this high-temperature yarn.

Brand-name: **HT-GEWEBEBAND EURASIL® 6060**

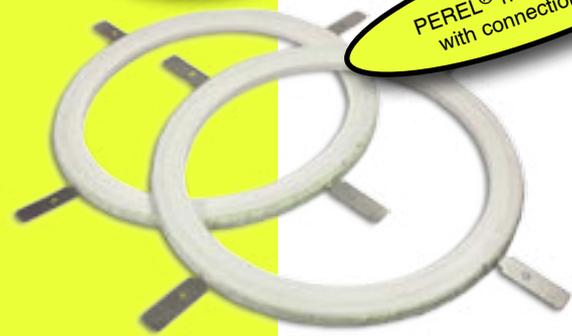
Thickness: 2, 3, 4 and 5 mm / width: 20 up to 300 mm.

Form of delivery: 25 meters on each roll.



# PEREL® HAND- & MANHOLE SEAL

**Reusable permanent elastic seal for manhole caps from enamelled or rustproof steel**



PEREL® handhole seals with connection flaps

DN 200 Handhole with winder clasp and PEREL® handhole seal on enamelled steel agitator kettle



Opened DN 300 fill in cap on manhole cap with winder clasp and PEREL® handhole-seal.



- Characteristics:** Clean and lasting connections thanks to the long-term elasticity of the PEREL® seal.
- Operational areas:** In the process technology of the chemical and pharmaceutical industry as well as into related areas.
- Trouble-free:** Thanks to good thick sealing with low surface pressure.
- High mechanical resilience:** The long-term elasticity of the PEREL® seal allows the application under demanding operating conditions, e.g. repeated opening and closing.
- Unrestricted storage time:** The seal does not harden and has no ageing process.
- Suitable for:** The most different material combinations such as Steel email / steel email, steel email / graphite, glass / glass, rustproof steel / glass, rustproof steel / Rustproof steel and connections with synthetic-coated parts (PTFE, PVDF or Halar).

## CONSTRUCTION PRINCIPLE of the PEREL® HAND and MANHOLE SEAL:

The cover made by turning machines out of PTFE TFM with diffusion barrier prevents the penetration of products in the seal. The permanent-elastic seal insert is resistant to corrosion and exists from PTFE impregnated fiberglass fabric. The three-dimensional lying fibre structure causes the elasticity of the PEREL® seal. This chemically inert fiberglass insert has good emergency sealing qualities, e.g., when cover is damaged.

The hand and manhole seals are made with a rustproof strengthening ring to protect a blowing out.

Connection flaps allow a good fixation of the seal in the hand or manhole cap. The so achieved positioning allows, together with the permanent-elastic qualities, a repeated opening and closing.

The product, the production kind and the trade name are property of the company Gommec S.A., Switzerland.



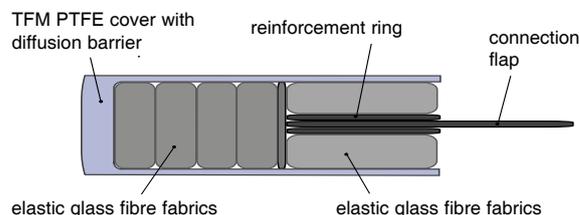
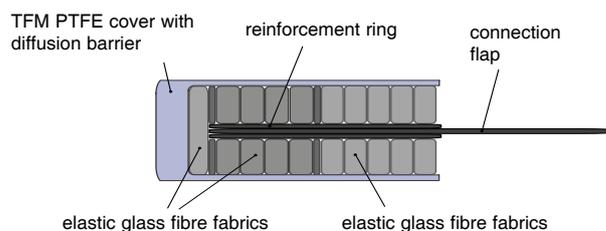
# PEREL® HAND- & MANHOLE SEAL

Handhole seal HL according to  
DIN 28148 / BN 83 part 8:

label	dimensions
HL 125	145 x 185 x 9/7 mm
HL 150	168 x 210 x 9/7 mm
HL 200	218 x 265 x 9/7 mm
HL 200 K <sup>oo</sup>	211 x 258 x 9/7 mm
HL 250	268 x 315 x 9/7 mm

Seal for filler cap DN 300 on manhole cap:  
(compensates irregularities up to 2,5 mm)

HL 300	298 x 342 x 11/8 mm
HL 300 E <sup>oo</sup>	298 x 342 x 13/10 mm



Manhole seal ML according to DIN 28148 / BN 83 part 8:  
(compensates irregularities up to 3mm)

ML 500	528 x 605 x 12/8,5 mm*
ML 600	628 x 705 x 12/8,5 mm*
ML 300x400°	324/424 x 380/480 x 12/8,5 mm*
ML 320x420°	344/444 x 395/495 x 12/8,5 mm*
ML 350x450	374/474 x 430/530 x 12/8,5 mm*



Technical data:

Seal cover: TFM PTFE / reinforcement ring 1.4404  
Soft material insert: elastic PTFE-glass faser fabric  
Temperature range: -20°C up to 200°C  
Pressure: vacuum up to 6 bar  
Resistant practically to all medias (ph 0-14) according to the TFM-cover and the PTFE-glassfaser fabric insert.

Installation  
recommendations:

Starting torque: by using clip screws absolutely look for the guideline of the enamel manufacturer.

Use the grounding clip to fix the seal at the filler-, manhole- or handhole-cap (with clip ring or safed screws).

Sealing  
parameters:

Q <sub>min</sub> :	2 MPa
Q <sub>SMAX</sub> :	40 MPa
Q <sub>CRIT</sub> :	50 MPa

footnote:

\* thickness of the seal under no pressure / installation height pressed (approximation)

° oval special dimensions

oo round special dimensions



# PEREL® - SEAL FOR TECHNICAL GLASS

**Permanent elastic PTFE seal for the sure connection of glass flanges on enamelled steel and other materials**

Pilot Plant with kettle of enameled steel, PEREL® seal and glass construction



**Characteristics:**

Clean and lasting connections thanks to long-term elasticity of the PEREL® seal.

According to GMP, suitable for CIP and SIP.

**Operational areas:**

In the process technology of the chemical and pharmaceutical industry as well as in related areas.

The best compensation property from rough or rippled surfaces, plan divergences with spoilt flanges, variances in the axis and skew positions.

**Ability to work under pressure:**

The long-term elasticity of the PEREL® seal allows the application under demanding operating conditions, like they seem with aggressive chemicals, frequent temperature changes or in uses with repeated opening and fastenings.

**Shelf live:**

The seal does not harden and is defeated by no ageing process.

**Suitable for:**

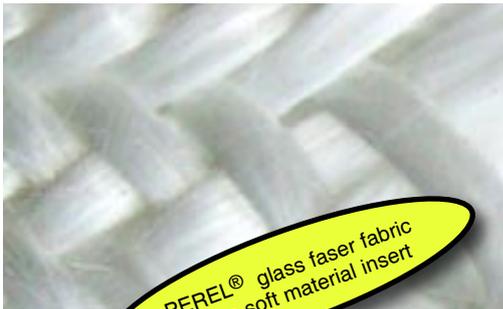
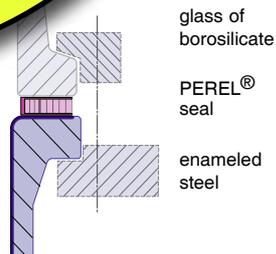
The most different material combinations such as: steel email / glass, steel email / steel email, steel email / graphite, glass / glass, rustproof steel / glass, rustproof steel / rustproof steel and connections with synthetic-coated parts (PTFE, PVDF or Halar).

**Technical data:**

Seal cover: TFM PTFE  
 Soft material insert: elastic fiberglass  
 Core: PTFE  
 Temperature area: -20°C to 220°C  
 Pressure: Vacuum up to 4 bar (respectively according to the maximum pressure of the glass components)  
 Resistant: With all media (pH 0-14) according to the TFM cover and the fiberglass PTFE insert.

Sealing parameters:  $Q_{min}$ : 0.5 MPa     $Q_{SMAX}$ : 30 MPa     $Q_{CRIT}$  50 MPa

PEREL® seal EG



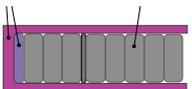
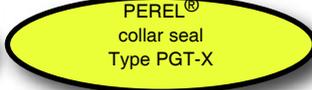
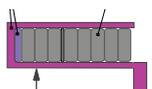
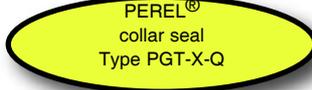
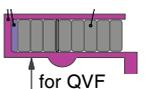
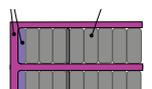
PEREL® glass faser fabric for the soft material insert



## Construction principle of the permanent-elastic PEREL® seal:

The cover is made by turning machines out of TFM PTFE. The permanent-elastic and resistant to corrosion seal insert exists of PTFE impregnated fiberglass fabric. The elastic qualities of the three-dimensional lying fibreglasses cause the elasticity of the PEREL® seal. The special seal construction guarantees a higher surface pressure in the area of the inner rim. A diffusion barrier prevents the penetration of the product in the seal. The insert is protected with slugfest glass faser bandages. The rustproof fiberglass insert has good emergency sealing qualities, e.g., by damage of the cover. The product, the kind of production and the trade name are a property of the Gommec S.A., Switzerland.

## Offered PEREL®- flat and collar seals for Schott and QVF glass:

 <p><b>PEREL® Flat Seal Type EG and EG-E</b></p> <p>TFM PTFE-cover with diffusion barrier    Elastic PTFE-Glass faser fabrics</p> 	 <p><b>PEREL® collar seal Type PGT-X</b></p> <p>TFM PTFE-cover with diffusion barrier    Elastic PTFE-Glass faser fabrics</p>  <p>for Schott RE 3 smooth, polished</p>	 <p><b>PEREL® collar seal Type PGT-X-Q</b></p> <p>TFM PTFE-cover with diffusion barrier    Elastic PTFE-Glass faser fabrics</p>  <p>for QVF security flange with grooves</p>	 <p><b>PEREL® Flat seal Type DEG</b></p> <p>TFM PTFE-cover with diffusion barrier    Elastic PTFE-Glass faser fabrics</p> 																																																										
<p><b>PEREL® Seal Type EG DN 25 up to 150 Schott glass</b> balances of unevennesses up to 1 mm</p> <table border="0"> <thead> <tr> <th>Label</th> <th>dimensions d x D x s</th> </tr> </thead> <tbody> <tr><td>EG 25</td><td>27 x 43 x 5/4 mm*</td></tr> <tr><td>EG 40</td><td>42 x 61 x 5/4 mm*</td></tr> <tr><td>EG 50</td><td>52 x 76 x 5/4 mm*</td></tr> <tr><td>EG 80</td><td>83 x 110 x 5/4 mm*</td></tr> <tr><td>EG 100</td><td>102 x 130 x 5/4 mm*</td></tr> <tr><td>EG 150</td><td>155 x 184 x 5/4 mm*</td></tr> </tbody> </table>	Label	dimensions d x D x s	EG 25	27 x 43 x 5/4 mm*	EG 40	42 x 61 x 5/4 mm*	EG 50	52 x 76 x 5/4 mm*	EG 80	83 x 110 x 5/4 mm*	EG 100	102 x 130 x 5/4 mm*	EG 150	155 x 184 x 5/4 mm*	<p><b>PEREL® Seal Type PGT-X DN 25 up to 300 Schott glass</b> balances of unevennesses up to 1mm ***</p> <table border="0"> <thead> <tr> <th>Label</th> <th>dimensions d x D x s</th> </tr> </thead> <tbody> <tr><td>PGT-X 25</td><td>27 x 43 x 5/4 mm*</td></tr> <tr><td>PGT-X 40</td><td>42 x 61 x 5/4 mm*</td></tr> <tr><td>PGT-X 50</td><td>52 x 76 x 5/4 mm*</td></tr> <tr><td>PGT-X 80</td><td>83 x 110 x 5/4 mm*</td></tr> <tr><td>PGT-X 100</td><td>102 x 130 x 5/4 mm*</td></tr> <tr><td>PGT-X 150</td><td>155 x 184 x 5/4 mm*</td></tr> <tr><td>PGT-X 200</td><td>204 x 233 x 6/5 mm*</td></tr> <tr><td>PGT-X 300</td><td>306 x 338 x 6/5 mm*</td></tr> </tbody> </table>	Label	dimensions d x D x s	PGT-X 25	27 x 43 x 5/4 mm*	PGT-X 40	42 x 61 x 5/4 mm*	PGT-X 50	52 x 76 x 5/4 mm*	PGT-X 80	83 x 110 x 5/4 mm*	PGT-X 100	102 x 130 x 5/4 mm*	PGT-X 150	155 x 184 x 5/4 mm*	PGT-X 200	204 x 233 x 6/5 mm*	PGT-X 300	306 x 338 x 6/5 mm*	<p><b>PEREL® Seal PGT-X-Q DN 15 up to 300 QVF glass</b> balances of unevennesses up to 1mm ***</p> <table border="0"> <thead> <tr> <th>Label</th> <th>dimensions d x D x s</th> </tr> </thead> <tbody> <tr><td>PGT-X-Q 15</td><td>18 x 30 x 5/4 mm*</td></tr> <tr><td>PGT-X-Q 25</td><td>27 x 43 x 5/4 mm*</td></tr> <tr><td>PGT-X-Q 40</td><td>41 x 58 x 5/4 mm*</td></tr> <tr><td>PGT-X-Q 50</td><td>51 x 71 x 5/4 mm*</td></tr> <tr><td>PGT-X-Q 80</td><td>77 x 100 x 5/4 mm*</td></tr> <tr><td>PGT-X-Q 100</td><td>108 x 133 x 5/4 mm*</td></tr> <tr><td>PGT-X-Q 150</td><td>155 x 184 x 5/4 mm*</td></tr> <tr><td>PGT-X-Q 200</td><td>204 x 233 x 6/5 mm*</td></tr> <tr><td>PGT-X-Q 300</td><td>306 x 338 x 6/5 mm*</td></tr> </tbody> </table>	Label	dimensions d x D x s	PGT-X-Q 15	18 x 30 x 5/4 mm*	PGT-X-Q 25	27 x 43 x 5/4 mm*	PGT-X-Q 40	41 x 58 x 5/4 mm*	PGT-X-Q 50	51 x 71 x 5/4 mm*	PGT-X-Q 80	77 x 100 x 5/4 mm*	PGT-X-Q 100	108 x 133 x 5/4 mm*	PGT-X-Q 150	155 x 184 x 5/4 mm*	PGT-X-Q 200	204 x 233 x 6/5 mm*	PGT-X-Q 300	306 x 338 x 6/5 mm*	<p><b>PEREL® Seal Type DEG DN 600 up to 1000 Schott / QVF</b> balances of unevennesses up to 3,5 mm</p> <table border="0"> <thead> <tr> <th>Label</th> <th>dimensions d x D x s</th> </tr> </thead> <tbody> <tr><td>DEG 800</td><td>835 x 915 x 11/8 mm*</td></tr> <tr><td>DEG 1000</td><td>1037 x 1088 x 11/8 mm*</td></tr> </tbody> </table>	Label	dimensions d x D x s	DEG 800	835 x 915 x 11/8 mm*	DEG 1000	1037 x 1088 x 11/8 mm*
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## Installation tips:

Seal cleanly and drily insert, centre.

Pull screws steadily about the cross.

Provide screws with suitable compression springs, the spring tension has to compensate a possible overpressure.

The seal surfaces must be sharpened fire-polished or very smooth and may show no radial running grooves.

## Remarks:

\* Seal thickness of the cover (unpressed to 2 mm thicker) / installation height pressed (approximate values)

\*\* Inside x external diameter x thickness (mass without seal collar)

\*\*\* DN 200 and 300: balances of unevennesses up to 1.5 mm



## HECKER® PACKING ACCESORIES

### HECKER® PACKING EXTRACTOR

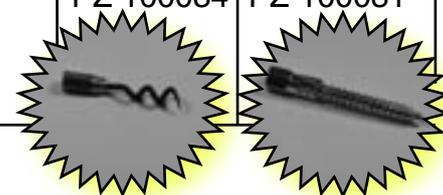
A torsion free, pliant shaft allows easy grasping of the packing, even in stuffing boxes that are difficult to reach. The spin drill is constructed in such a way that it bores open any kind of packing cords and ensures their complete removal. Proved thousandfold, the packing extractor reduces the time needed for replacing the packing material. The special tool for removing used packings from stuffing box chambers has in standard a corkscrew thread. The sizes with changeable tops can also fitted with a wooden screw top.

#### AVAILABLE DIMENSIONS:

Size	Top	Length of the pliant shafts	Length totally	Number of the article	No. of changeable top corkscrew	screw top
0	4	130	180	PZ 100023		
1	6*	95	180	PZ 100019	PZ 100032	PZ 100029
2	8*	170	270	PZ 100020	PZ 100033	PZ 100030
3	10*	250	360	PZ 100021	PZ 100034	PZ 100031
4	11,5	350	490	PZ 100024		
5	15,5	450	580	PZ 100025		
6	15,5	625	760	PZ 100026		

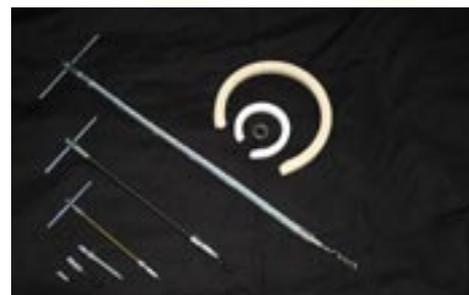
(all dimensions in [mm] and circa)

\*) = with changeable tops



#### Packing extractors stiff with corkscrew top

Size	Top	Length of the shaft	Length totally	No. of article
S1	6*	120	155	PZ 100041
S2	8*	210	260	PZ 100042
S3	10*	310	370	PZ 100043



#### Cleaning brush for packing extractors

Size	dimension	content	No. of article
1	6 mm	2 pieces	PZ 100035
2	8 mm	2 pieces	PZ 100036

## HECKER® PACKING CUTTER

Packing cutters allow separation of the packing lengths with exact diagonal cut, suitable for shaft diameters up to 120 mm and packing cross sections up to 20 mm.

#### Cross-section 12° (for pumps)

Size 1:	up to 110 mm diameter	PZ 100027
Size 2:	elongations up to 250 mm diameter working space	PZ 100028 up to 25 mm



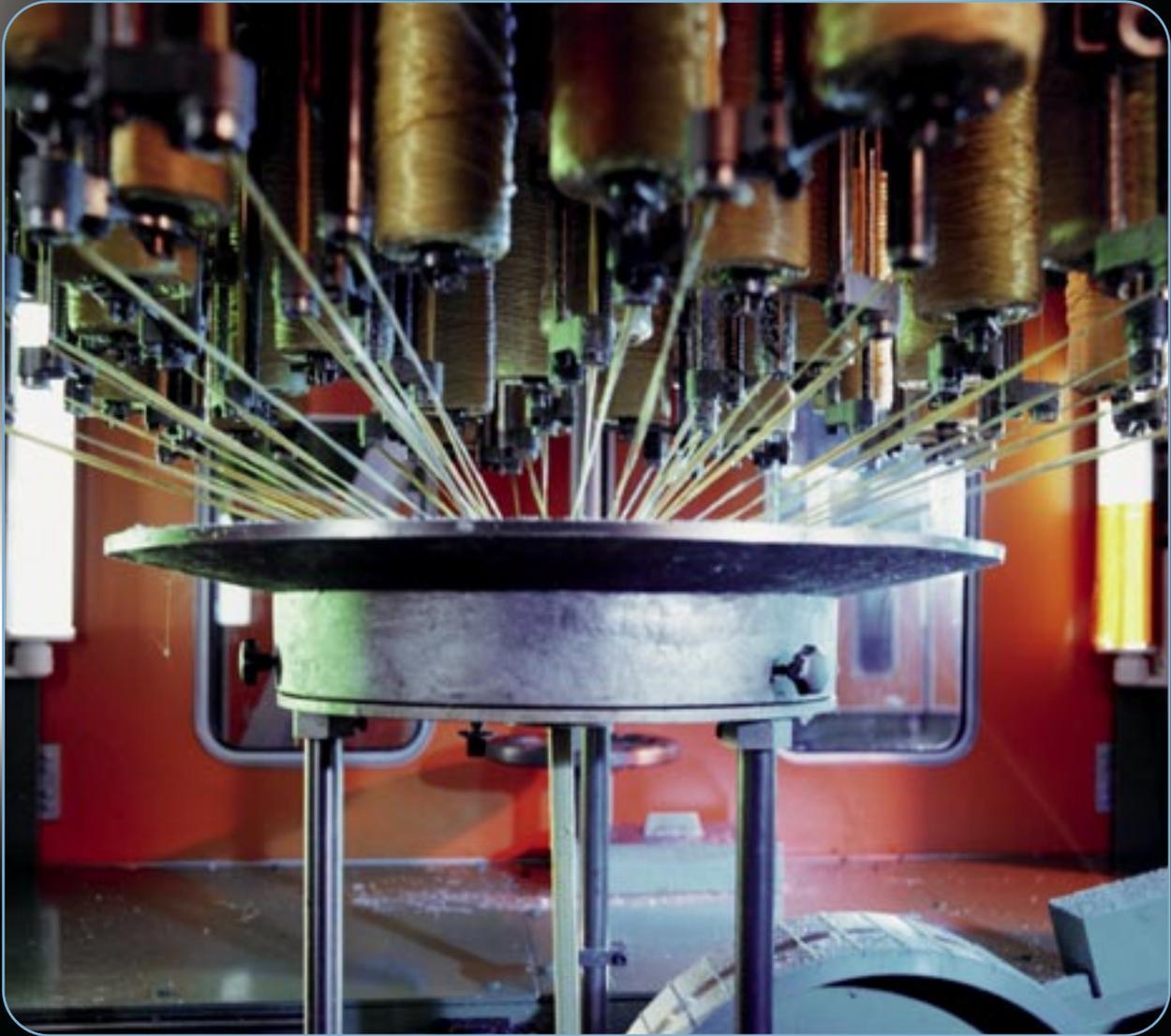
Replacement articles:

Knife	PZ 100022
Plastic scale	PZ 100047

#### Diagonal-cut 45° (for Armatures)

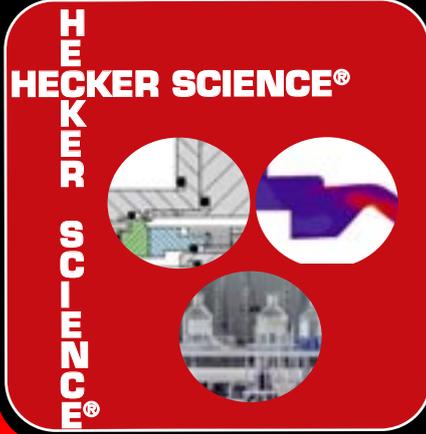
Size 1:	up to 130 mm diameter	PZ 100000
Size 2:	up to 360 mm diameter working space	PZ 100018 up to 25 mm





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**HECKER® PRODUCT LINE**  
**GAMME HECKER®**  
**PROGRAMMA HECKER®**

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**POLYURETHANE PRODUCTS**  
**PRODUITS EN POLYURÉTHAN**  
**PRODOTTI IN POLIURETANO**



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