

LATTY international s.a.

HEAD OFFICE

57 bis, rue de Versailles – F-91852 ORSAY Cedex – Tel.: +33 (0)1 69 86 11 12 – Fax: +33 (0)1 69 86 96 25

SUBSIDIARIES

nv LATTY international Belgium s.a.

Pepijnstraat 51 – B-3400 LANDEN

Tel.: +32 (0) 11 88 29 51 – Fax: +32 (0) 11 83 29 51

LATTY international 2RS GmbH

Renzertstraße 45 – D-53819 NEUNKIRCHEN

Tel.: +49 (0) 2247 8701 / 02 – Fax: +49 (0) 2247 8703

LATTY international Ltd

Westfield Road – RETFORD NOTTS DN22 7BT - U.K.

Tel.: +44 (0) 1 777 708 836 – Fax: +44 (0) 1 777 707 474

Estanqueidad LATTY Ibérica s.l.

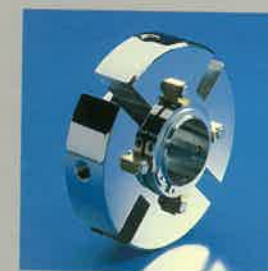
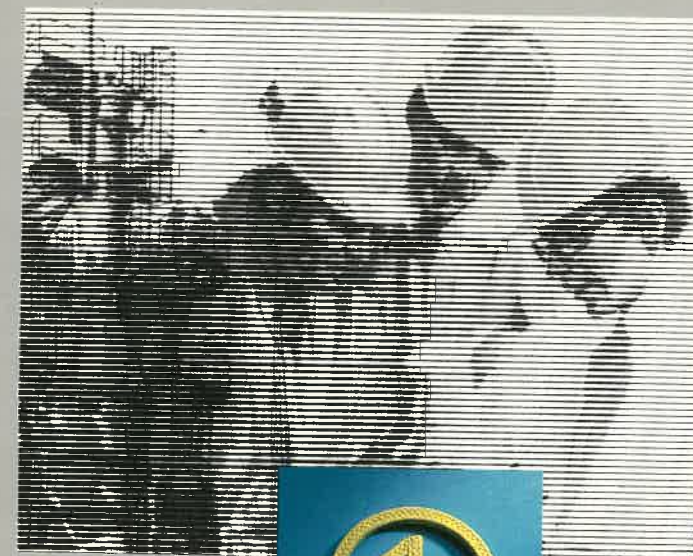
Cristóbal de Moura 105-111 3o. 3a – E-08019 BARCELONA

Tel.: +34 93 307 49 08* – Fax: +34 93 308 58 02

LATTY international svenska ab

August Barks gata 24 – S-421 32 VÄSTRA FRÖLUNDA

Tel.: +46 (0) 31 47 37 70 – Fax: +46 (0) 31 47 27 60



Seventyfive years of experience speak for our commitment to customers and to our policy of Quality, Research and Development.



LATTY
international s.a.
For the best in modern sealing technique

the continuity The company LATTY international s.a. was founded by Xavier LATTY in 1920. Led and developed further under the presidency of his son Cyril Xavier, it is now led by his grandson Christian-Xavier LATTY.

the means The production units are located in the Paris area for calendered gaskets and in the department of Eure-et-Loir for packings and mechanical seals. The equipment needed for the manufacture of these three product groups are, for gaskets, seven calenders and for packings, sixty braiding machines, the latter being installed on a 5-hectare site which allows for further expansion of the company. This makes LATTY international s.a. one of the leading sealing companies in Europe.

the quality The cornerstone of LATTY international s.a. is the quality of products due to skilled human resources as well as customised machines and products used. As a result of the steady development of quality assurance, LATTY international was awarded the **certification AFAQ ISO 9002** in March 1993.

the innovation LATTY international s.a. designs or makes specialists design raw products such as compound yarns exclusively for its packings, and it develops production processes such as the impregnation by its 'Filcoat' process. The same applies to the production of its mechanical seals and gaskets whose original designs are patented.

the specialisation Research and Development play an increasingly more important role in the development of products for specific applications. Through customers' needs, LATTY international s.a. provides sealing solutions throughout a wide area of activity.

the service A staff of more than 200 people contributes to quality and improved technology. This technical backup is provided for by a threefold network of sales engineers belonging to the mother company, subsidiaries and distributors worldwide.



Patrick Hembert Sales Manager, France	Lars-Gunnar Thordenberg Subsidiary Manager, Sweden	Didier Lamy Manager, Mechanical Seals Dpt	Michel Vallet Sales Manager, Industry	Louis Pungier Sales Manager, Marine & Energy	Peter Klein Subsidiary Manager, Germany
Félix Bueno Bartrina Subsidiary Manager, Spain	Christian-Xavier Latty Chairman & Managing Director	Jim A. Reynolds Sales Manager, England	Bruno Roy Production Manager at Brou	Jacques Vandecan Subsidiary Manager, Belgium	

**For better environmental protection,
LATTY international s.a. offers the best in modern sealing technique.**

ASBESTOS FREE packings and rings

ACRYLIC FIBRES



LATTYtex 2761

LATTYtex 2761

Packing made of high tensile strength synthetic fibres. Continuous yarn impregnation with special lubricants and graphite during plaiting operation.
Rotary movements. Low pressure valves.
Moderately aggressive fluids.

Temperature	- 50°C to + 260°C
Pressure	100 bar
Speed	15 m/s
pH	1 - 13

LATTYflon 2790

Special acrylic yarns. High tensile strength, pre-treated with PTFE using our "Filcoat"-process. Plaited in a bath consisting of PTFE and an inert food grade lubricant.
Rotary pumps.
All fluids, abrasive products, chemicals, except corrosive products.
Drinking water, foodstuffs.
Approvals: FMFA, WRC (LATTYflon 2790 AL).

Temperature	- 50°C to + 260°C
Pressure	100 bar
Speed	15 m/s
pH	1 - 13

PTFE FIBRILLATED POWDER



LATTYflon 3210

LATTYflon 3210

Packing made of fibrillated PTFE powder, high-temperature and chemically neutral lubricant and graphite.
Mixers, stirrers and agitators, screw conveyors, valves and fittings.
May be used with heavily contaminated or crystallising products.

Temperature	- 100°C to + 250°C
Pressure	50 bar
Speed	10 m/s
pH	0 - 14

PTFE FIBRES



LATTYflon 3206

LATTYflon 3206

Packing made of 100% PTFE fibres, pre-treated under pressure with our "Filcoat"-process. Re-impregnated throughout during plaiting operation and lubricated.
Pumps, valves.
Dynamic applications, perfect inertness. All fluids up to 280°C.

Temperature	- 200°C to + 280°C
Pressure	100 bar
Speed	10 m/s
pH	0 - 14

LATTYflon 3206 S

Packing made of pure PTFE yarns. Pre-treated under pressure with our "Filcoat"-process using a PTFE powder mix.
Control valves.
Chemical industry. Sealing of reactor covers.
FMFA-approved.

Temperature	- 200°C to + 300°C
Pressure	300 bar
Speed	5 m/s
pH	0 - 14

PTFE FIBRES



LATTYflon 3206 SO

LATTYflon 3206 SO

Packing made of PTFE yarns, impregnated and treated with a PTFE dispersion.
Valves, control valves.
Foodstuffs, oxygen.
Approvals: BAM, FMFA, WRC.

Temperature	- 200°C to + 300°C
Pressure	300 bar
Speed	5 m/s
pH	0 - 14

LATTYflon 3206 AL

Packing made of PTFE yarns impregnated throughout during plaiting operation and lubricated.
Pumps.
Foodstuffs.
Approvals: FMFA, WRC.

Temperature	- 200°C to + 280°C
Pressure	100 bar
Speed	10 m/s
pH	0 - 14

PTFE FIBRES



LATTYflon 3260 LM

LATTYflon 3260 LM

Packing consisting of a PTFE-impregnated core made of carbon yarns, covered with a plaited sleeve made of impregnated and lubricated PTFE yarns.
Control valves.
Approvals: BAM, TÜV.

Temperature	- 100°C to + 280°C
Pressure	300 bar
Speed	1 m/s
pH	0 - 14

LATTYflon 4308

Packing made of PTFE yarns pre-treated with continuous graphite impregnation then re-impregnated with an inert running-in lubricant.
Outstanding resistance to chemicals. High peripheral speeds.
Rotary movements.
Chemical industries, powders, fertilisers, dyeing, pulp and paper mills.

Temperature	- 200°C to + 300°C
Pressure	110 bar
Speed	26 m/s
pH	0 - 14

PTFE ARAMID AND FIBRES



LATTYflon 4757

LATTYflon 4757

High-performance multi-yarns packing combining the advantages of graphited PTFE and those of aramid fibres.
Reciprocating pumps, mixers, stirrers, reactors, industrial and chemical process valves.
Multipurpose applications, reciprocating, rotary uses.
High-pressure capability.
Can replace lip seals in many applications.

Temperature	- 200°C to + 300°C
Pressure	1,800 bar
Speed	22 m/s
pH	2 - 14

LATTYflon 4758

Packing made of aramid fibres on the corners and in the core with pure PTFE fibres on all four faces, then impregnated with a PTFE dispersion and treated with an inert Codex lubricant.
Reciprocating pumps, mixers, stirrers, rotary pumps.
Can be used to replace lip seals on press pistons.
General service, chemical, fertiliser and food-processing industries.

Temperature	- 220°C to + 300°C
Pressure	1,000 bar
Speed	10 m/s
pH	2 - 14

LATTY
international s.a.
For the best in modern sealing technique



• Approvals:

AECL: nuclear industry, BAM: oxygen, DVGW: gas, EXXON: fire, FMFA: food industry, GDF: gas, KTW: drinking water, LNE: food industry, TÜV: environment (TA-Luft), WRC: drinking water.

Type of seal:

- Rotary
- Reciprocating
- Valve
- Static

Unless otherwise stated, all our packings are diagonal plaited.
Maximum temperature, pressure and speed given in this leaflet can in no case be associated.

ASBESTOS FREE
packings and rings

ARAMID FIBRES



LATTYflon 4788

LATTYflon 4788

Packing made entirely of aramid fibres (yellow fibres). Each single yarn is impregnated with PTFE and an inert lubricant using our "Filcoat"-process. Contains a food and pharmaceutical lubricant.
Pumps, rotary movements.
Food, sugar, chemical, petrochemical and pharmaceutical industries, pulp and paper mills, power stations.

Table with 2 columns: Property (Temperature, Pressure, Speed, pH) and Value (-220°C to +300°C, 200 bar, 25 m/s, 2-13).

LATTYflon 4789

Packing made of aramid/staple rayon, impregnated yarn by yarn with a mix of PTFE and a special lubricant using our "Filcoat"-process. Contains a food and pharmaceutical lubricant.
Pumps, rotary movements.
General use, marine (in particular propeller-shaft glands).
All fluids (except the most corrosive ones).
Also suitable for the food and pharmaceutical industries.
FMMA-approved.

Table with 2 columns: Property (Temperature, Pressure, Speed, pH) and Value (-200°C to +275°C, 100 bar, 20 m/s, 2-12).

LATTYtex 4777

Structure combining the characteristics of a blended yarn (aramid and synthetic fibres) on the corners and those of another blended yarn in the centre (glass and polyacrylic fibres) impregnated throughout with PTFE.
Pumps.
All industries for general applications. Also for cement works, paper mills and sugar plants.

Table with 2 columns: Property (Temperature, Pressure, Speed, pH) and Value (-50°C to +200°C, 60 bar, 15 m/s, 3-11).

COMPOUND FIBRES



LATTYflon 4488

LATTYflon 4488

Packing based on a LATTY exclusive yarn of intimately blended aramid and carbon fibres, retaining the mechanical properties of aramid yellow fibre while introducing the heat dissipation and lubricating properties of carbon fibres. Very high speeds.
Pumps, agitators, mixers, refiners, screw conveyors, pulp mills.
Paper pulp, slurries.

Table with 2 columns: Property (Temperature, Pressure, Speed, pH) and Value (-220°C to +300°C, 300 bar, 30 m/s, 1-13).

LATTYflon 7188

Packing made of composite yarns based on "Filcoat"-impregnated phenolic fibres. Very good mechanical characteristics combining softness and strength.
Rotary applications.
Miscellaneous fluids, abrasive slurries.

Table with 2 columns: Property (Temperature, Pressure, Speed, pH) and Value (-200°C to +300°C, 200 bar, 20 m/s, 1-13).

VEGETABLE FIBRES



LATTYflon 1779

LATTYflon 1779

Antiriot, high-quality ramie yarns impregnated under pressure using our "Filcoat"-process with a PTFE mix and an inert lubricant.
Rotary, reciprocating pumps, hydraulic presses, ship's propeller shaft seal.
Clean fluids or slurries, except corrosive ones, cold or not exceeding 60°C to 80°C.
Water, sea water, oils, hydrocarbons, solvents, paper pulp, emulsified water.

Table with 2 columns: Property (Temperature, Pressure, Speed, pH) and Value (-40°C to +120°C, 400 bar, 15 m/s, 4-11).

LATTYtex 14

Plaited cotton yarn packing impregnated with a special tallow and mica mixture.
Rotary and reciprocating movements.
Hydraulic applications up to 60°C.

Table with 2 columns: Property (Temperature, Pressure, Speed, pH) and Value (-40°C to +60°C, 10 bar, 6 m/s, 5-9).

CARBON + GRAPHITE FIBRES



LATTYgraf 6785

LATTYgraf 6785

Diagonal-plaited packing made of carbon yarns, impregnated with a graphite-based mix.
Pumps.
All chemicals except strong oxidising products.

Table with 2 columns: Property (Temperature, Pressure, Speed, pH) and Value (-200°C to +600°C, 300 bar, 25 m/s, 0-14).

LATTYgraf T/TSP

Packing made of pure graphite yarns (LATTYgraf T) or of carbon yarns coated with a graphite-based mix (LATTYgraf TSP).
High-speed pumps.
Low friction coefficient. Good heat dissipation. All fluids except oxidising products. High temperatures.

Table with 3 columns: Property (Temperature, Pressure, Speed, pH) and Values for LATTYgraf T and LATTYgraf TSP.

CARBON + GRAPHITE FIBRES



LATTYgraf 6940

LATTYgraf 6118

Packing made of compound yarns (high-strength carbon fibres and nickel-chrome wires intimately mixed) and graphite yarns, reinforced with Inconel wires. Impregnated and coated with a graphite-based mix containing a sacrificial anode and a corrosion inhibitor.
High-performance valves.
Thermal power stations, refineries, boiler plants, steam systems.

Table with 2 columns: Property (Temperature, Pressure, Speed, pH) and Value (-200°C to +600°C, 300 bar, 1 m/s, 0-14).

LATTYgraf 6940

Packing made of expanded graphite yarns reinforced with Inconel wires, braided to form a square packing.
High-performance valves.
High-pressure, high-temperature systems.
Fire-safe. Refineries. For applications with PTFE and halogen gas bans.
Approvals: BAM, amended fire test API 607.

Table with 2 columns: Property (Temperature, Pressure, Speed, pH) and Value (-200°C to +600°C, 400 bar, 1 m/s, 0-14).

CARBON + GRAPHITE FIBRES



LATTYgraf E1+6117

LATTYgraf 6117

Packing made of compound yarns: intimately mixed high-strength carbon fibres and nickel-chrome wires. Impregnated and coated with a graphite-based mix containing a sacrificial anode and a corrosion inhibitor. All components are selected so as to meet the purity requirements of the nuclear industry.
Valves.
Especially power stations, nuclear or conventional. Steam and water systems. Also suitable for refineries.
AECL-approved.

Table with 2 columns: Property (Temperature, Pressure, Speed, pH) and Value (-200°C to +600°C, 400 bar, <1 m/s, 0-14).

LATTYgraf E1+6117

Same characteristics as LATTYgraf 6117 but this configuration is recommended for high-performance valves and controlled valves, particularly in nuclear power stations.
AECL-approved.

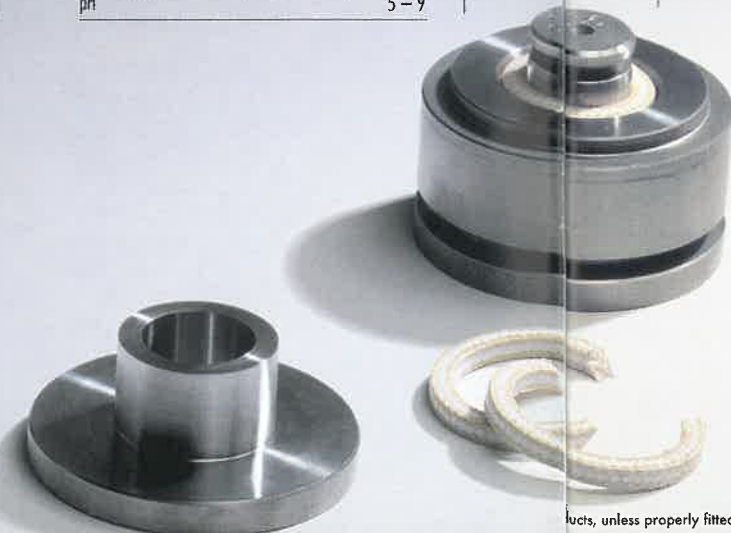
Table with 2 columns: Property (Temperature, Pressure, Speed, pH) and Value (-220°C to +600°C, 400 bar, <1 m/s, 0-14).

LATTY international s.a.
For the best in modern sealing technique

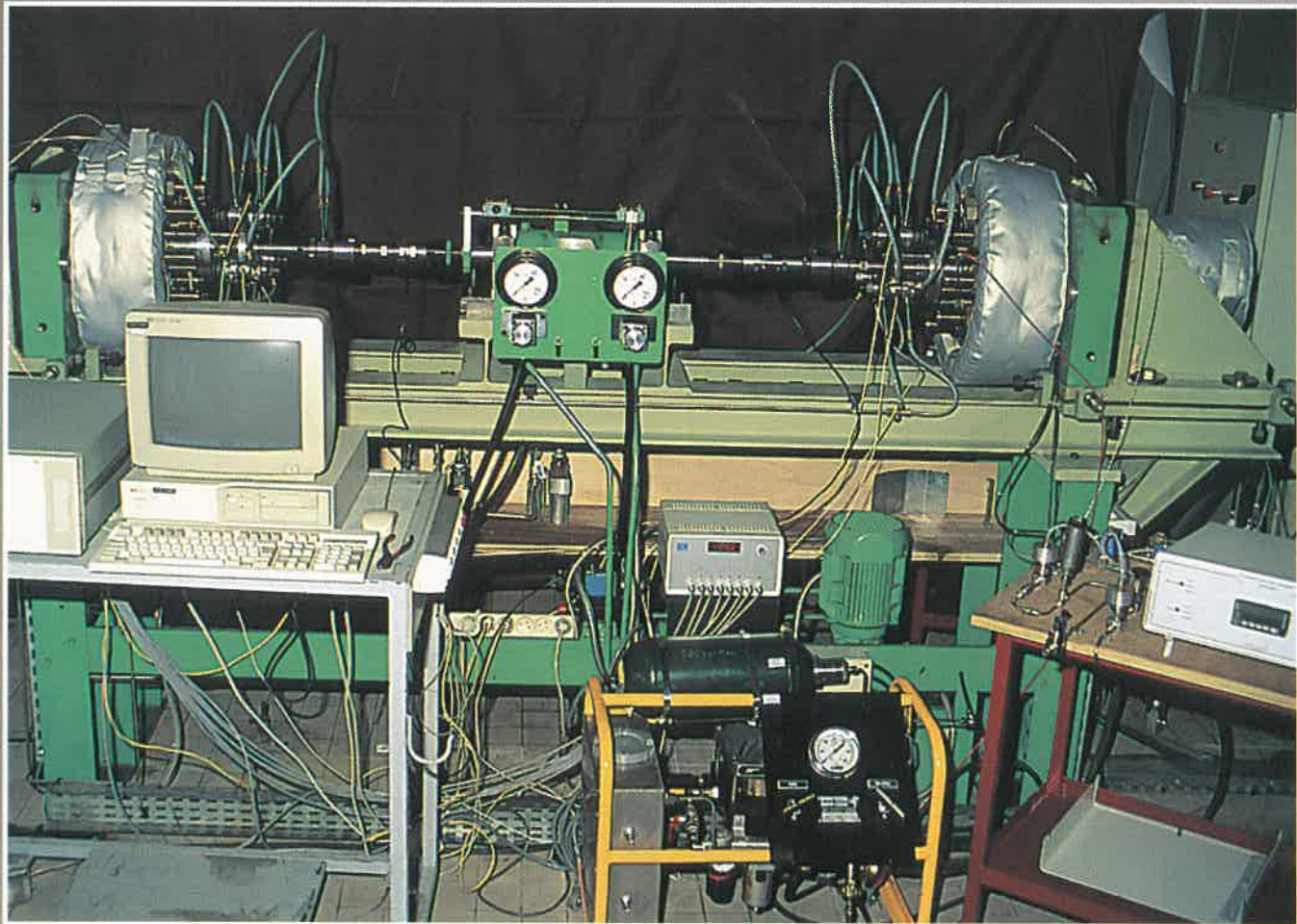
Approvals:
AECL: nuclear industry, BAM: oxygen, DVGW: gas, EXXON: fire, FMMA: food industry, GDF: gas, KTW: drinking water, LNE: food industry, TÜV: environment (TA-Luft), WRC: drinking water.

Type of seal:

Table with 2 columns: Seal Type (Rotary, Reciprocating, Valve, Static) and Description (Unless otherwise stated, all our packings are diagonal plaited. Maximum temperature, pressure and speed given in this leaflet can in no case be associated).



Tests on stuffing box bench



IN KEEPING WITH THE
CONTINUOUS OVERALL
DEVELOPMENT PROGRAMME FOR
ALL THE SEALING PRODUCTS,
LATTY INTERNATIONAL S.A.
SHARES WITH ELECTRICITE DE FRANCE
THE RESULTS OF THEIR OWN
TESTS ON LATTY PRODUCTS
ON THEIR OWN TEST FACILITIES.

LATTY international, in conjunction with CETIM (Centre for Technical Tests in the Mechanical Industry) located in Nantes, have developed a very specific test bench, benefiting from the significant experience gained by the tests conducted by E.D.F. on the JAPET test bench.

- This bench provides the continuous measurement and recording of the following:
- gland tightening up to 2,500 daN as per tie rod;
 - stem handling force: up to 10,000 daN in traction and in compression;
 - leak rate on stem side and on stuffing box side in a differentiated way:
 - from 1E-9 to 1E-1 g.s-1 with water and steam;
 - from 1E-9 to 100 atm.cm3.s-1 with helium (from one drop per year to one drop per second);
 - fluid temperature: 300°C under normal operating conditions;
 - fluid pressure: 200 bar under normal operating conditions;
 - number of cylinder motion cycles.

The possible test fluids are water, steam and helium.

A control and capture unit controls and follows up the tests automatically.

This process is part of a global programme for the designation of all components developed by LATTY international:

- corrosion tests cold and hot (300°C, 90 bar);
- tests on valves;
- fire tests.



mechanical seals, cartridge

STANDARDISED



LATTYseal B 14

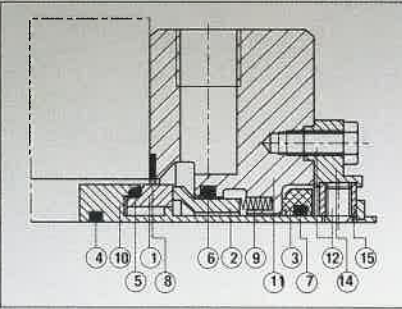
LATTYseal B 14

LATTYseal B 14 is a factory pre-set cartridge seal up to DIN 24960 and NFE 29991. Its revolutionary feature lies in its modular configuration which changes with the needs of the customer. Its main advantages are presented using an exploded view.

Chemical and petrochemical industry, water treatment and sewage, food-processing industry, boiler plants, power plants and paper mills.

All corrosive, abrasive and slightly clogging fluids.

Temperature	- 40°C to + 220°C
Pressure	25 bar
Speed	< 20 m/s



Item	Designation	Material	LiCode
1	Solid rotary face	Silicon carbide	U3
2	Solid stationary face	Carbon graphite	B1
		Silicon carbide	U3
3	Quench rotary face	LATTYtex 21	X
4,5,6,7	O-rings	Fluorocarbon elastomer	V
		Ethylene propylene elastomer	E
		Kalrez®	K
8	Gasket	LATTYgold 92	F1
9	Spring	Hastelloy® C4	T2
10	Sleeve	1.4404	G1
11	Flange	1.4404	G1
12	Locking screws	1.4401	G
13	Drive ring	1.4404	G1
14	Setting clamps	Cu Zn23 A/4	N2
15	Circlips	1.4401	G

SOME TRUE FEATURES

Unique dynamically balanced drive system.

The solid silicon carbide rotary face is flexibly mounted on an O-ring to cater for slight equipment misalignment.

LATTYseal B 14 relies upon a stationary spring seal concept.

Lack of space around the friction faces is often the reason for the rapid failure of the seal through overheating or erosion.

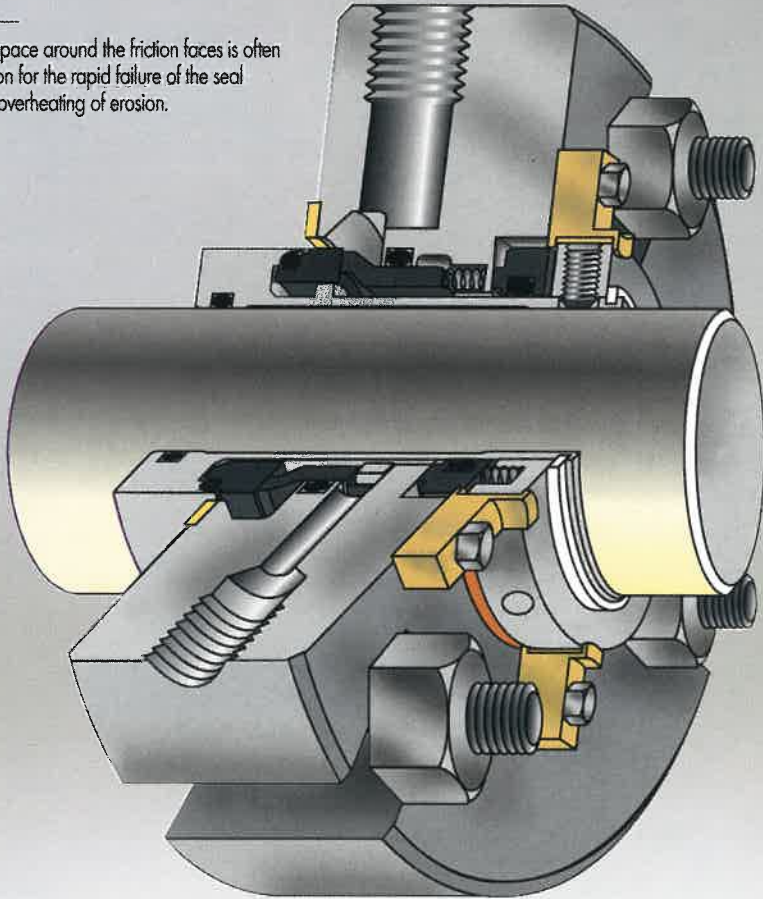
New versions of cartridge mechanical seals have been added to our seal family LATTYseal B 14:

- B 14 PP: for any products which must not be diluted by flush
- B 14 D: double seal
- B 14 T: tandem seal
- B 14 ECO: specially dedicated to applications with low to moderate requirements

Releasing the setting clamps to run the seal is quick and simple.

The stationary springs, located outside the pumped fluid, are hardly susceptible to clogging.

An asbestos free flat gasket of wide profile makes it feasible to apply the seal on a wide range of stuffing box sizes.



In real life, mechanical seals are not even given a chance to run since they can be destroyed during fitting.

The seal overall length is short and common to all diameters.

The flush and quench ports are of wide diameter (1/4") and positioned perpendicularly to the shaft.

The cover is fitted with 4 wide slots located very close to the shaft centreline.

The LATTYseal B 14 mechanical seal includes, in a limited space, a true water quench.

The setting clamps are made of a soft and non-sparking material.

The grub screws are located below the surface of the drive ring.

During the installation of the seal, the module containing the sleeve, drive ring and setting clamps is fixed in all directions.

LATTYseal B 14 is rebuildable and never has to leave the plant.

This cartridge concept LATTYseal B 14 has been designed to reach the highest standard of customer satisfaction. Each seal is individually tested in our ISO 9002 approved plant.

mechanical seals

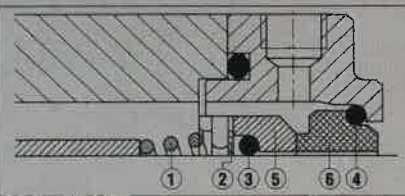
STANDARDISED



LATTY U 1000

LATTY U 1000 is an unbalanced mechanical seal with conical spring, dependent on the direction of rotation, which conforms to NFE 29991 and DIN 24960 standards.
Chemical, petrochemical and food-processing industries.
All slightly corrosive, non-abrasive and non-clogging fluids.

Temperature	- 20°C to + 180°C
Pressure	10 bar
Speed	20 m/s



Item	Designation	Material	LiCode
1	Spring	1.4571	G2
2	Washer	1.4404	G1
3-4	O-rings	Fluorocarbon elastomer	V
5	Solid rotary face	1.4571	G2
6	Solid stationary face	Carbon graphite	B

* For diameter > 50 mm

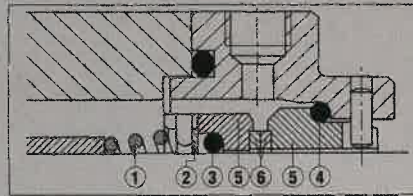
STANDARDISED



LATTY U 1313

LATTY U 1313 is an unbalanced mechanical seal with conical spring, dependent on the direction of rotation, which conforms to NFE 29991 and DIN 24960 standards.
Food-processing industry, treatment of water and sewage.
All slightly corrosive, abrasive and non-clogging fluids 3<pH<9.

Temperature	- 20°C to + 120°C
Pressure	10 bar
Speed	10 m/s



Item	Designation	Material	LiCode
1	Spring	1.4571	G2
2	Washer	1.4404	G1
3-4	O-rings	Fluorocarbon elastomer	V
5	Face holder	1.4057	F1
6	Brazed face	Tungsten carbide	U1

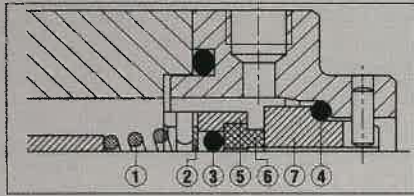
STANDARDISED



LATTY U 11

LATTY U 11 BV is an unbalanced mechanical seal with conical spring, dependent on the direction of rotation, which conforms to NFE 29991 and DIN 24960 standards.
Chemical and food-processing industries.
All corrosive, slightly abrasive and non-clogging fluids.

Temperature	- 20°C to + 180°C
Pressure	10 bar
Speed	20 m/s



Item	Designation	Material	LiCode
1	Spring	1.4571	G2
2	Washer	1.4404	G1
3-4	O-rings	Fluorocarbon elastomer	V
5	Face holder	1.4404	G1
6	Shrink fit rotary face	Carbon graphite	B
7	Solid stationary face	Silicon carbide	U3
		Ceramic	V
		Special cast CrMo-Steel	S2

STANDARDISED

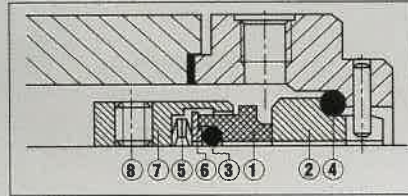


LATTY U 68

LATTY U 68

LATTY U 68 is an unbalanced mechanical seal, independent from the direction of rotation, which conforms to NFE 29991 and DIN 24960 standards.
Chemical and petrochemical industries (process pumps), boiler plants.
All corrosive, abrasive and slightly clogging fluids.

Temperature	- 20°C to + 180°C
Pressure	15 bar
Speed	20 m/s



Item	Designation	Material	LiCode
1	Solid rotary face	Carbon graphite	B
		Silicon carbide	U3
2	Solid stationary face	Silicon carbide	U3
		Ceramic	V
		Special cast CrMo-Steel	S2
3-4	O-rings	Fluorocarbon elastomer	V
5	Spring	1.4571	G2
6	Washer	1.4404	G1
7	Drive ring	1.4404	G1
8	Locking screws	1.4401	G

STANDARDISED

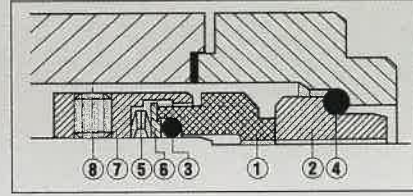


LATTY B 68

LATTY B 68

LATTY B 68 is a balanced mechanical seal, independent from the direction of rotation, which conforms to NFE 29991 and DIN 24960 standards.
Chemical and petrochemical industries (process pumps), boiler plants.
All corrosive, abrasive and slightly clogging fluids.

Temperature	- 20 °C to + 180 °C
Pressure	25 bar
Speed	20 m/s



Item	Designation	Material	LiCode
1	Solid rotary face	Carbon graphite	A
		Silicon carbide	U3
2	Solid stationary face	Silicon carbide	U3
		Ceramic	V
		Special cast CrMo-Steel	S2
3-4	O-rings	Fluorocarbon elastomer	V
5	Spring	1.4571	G2
6	Washer	1.4404	G1
7	Drive ring	1.4404	G1
8	Locking screws	1.4401	G

STANDARDISED

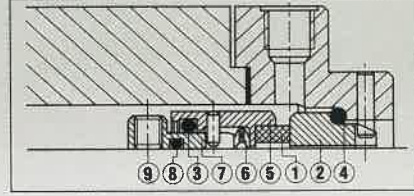


LATTY B 7

LATTY B 7

LATTY B 7 is a balanced mechanical seal with protected wave spring, independent from the direction of rotation, which conforms to NFE 29991 and DIN 24960 standards.
Chemical, petrochemical, iron and steel industries, sugar and paper industries.
All corrosive, abrasive and clogging fluids.

Temperature	- 20°C to + 200°C
Pressure	20 bar
Speed	25 m/s



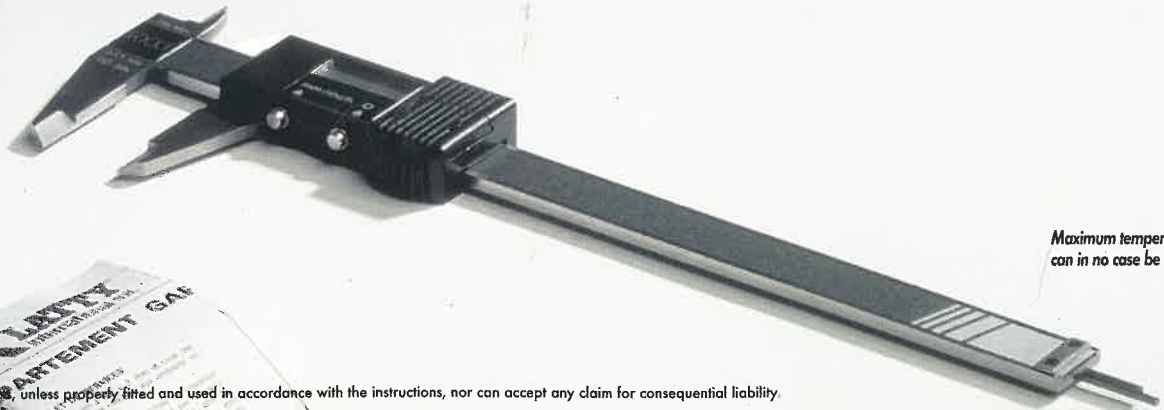
Item	Designation	Material	Li-Code
1	Shrink fit rotary face	Carbon graphite	B
		Silicon carbide	U3
2	Solid stationary face	Silicon carbide	U3
		Ceramic	V
3-4	O-rings	Special cast Cr-Mo-Steel	S2
		Fluorocarbon elastomer	V
5	Carbon holder	Ethylene propylene elastomer	E
		1.4404	G1
6	Spring	Carbon holder	G3
		1.4571	G2
7	Sleeve	1.4404	G1
		Fluorocarbon elastomer	V
8	O-ring	Ethylene propylene elastomer	E
		1.4401	G
9	Locking screws		



For the best in modern sealing technique

• Approvals:

AECL nuclear industry, BAM: oxygen, DVGW: gas, EXXON: fire, FMFA: food industry, GDF: gas, KTW: drinking water, LNE: food industry, TÜV: environment (TA-Luft), WRC: drinking water



Maximum temperature, pressure and speed given in this leaflet can in no case be associated.

mechanical seals

STANDARDISED

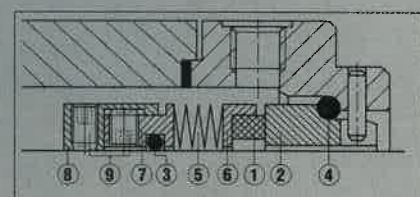


LATTYseal B 17

LATTYseal B 17

LATTYseal B 17 is a balanced welded metal bellows seal, independent from the direction of rotation, which conforms to NFE 29991 and DIN 24960 standards. Chemical, petrochemical and paper industries. All corrosive, abrasive and slightly clogging fluids.

Temperature	-20°C to +200°C
Pressure	20 bar
Speed	25 m/s



Item	Designation	Material	LiCode
1	Shrink fit rotary face	Carbon graphite	A
		Silicon carbide	U6
2	Solid stationary face	Silicon carbide	U3
		Ceramic	V
3-4	O-rings	Fluorocarbon elastomer	V
		Ethylene propylene elastomer	E
5	Welded metal bellows	Carbonifer 20 Cb3	G6
6	Face holder	1.4582	G3
7	Ring	1.4582	G3
8	Drive ring	1.4582	G3
9	Locking screws	1.4401	G

NOT STANDARDISED

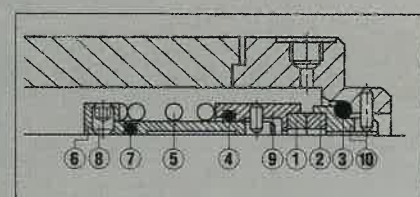


LATTYseal B 18

LATTYseal B 18

LATTYseal B 18 is a balanced mechanical seal with over-dimensioned outer cylindrical spring, independent from the direction of rotation. Chemical, petrochemical, iron and steel industries, sugar and paper industries. All corrosive, abrasive and clogging fluids.

Temperature	-20°C to +180°C
Pressure	25 bar
Speed	20 m/s



Item	Designation	Material	LiCode
1	Shrink fit rotary face	Carbon graphite	B
		Tungsten carbide	U1
		Silicon carbide	U3
2	Shrink fit stationary face	Tungsten carbide	U1
		Silicon carbide	U3
3-4	O-rings	Fluorocarbon elastomer	V
5	Spring	1.4571	G2
6	Sleeve	1.4404	G1
7	O-ring	Fluorocarbon elastomer	V
8	Locking screws	1.4401	G
9	Carbon holder	1.4404	G1
	Carbide holder	1.4582	G3
10	Face holder	1.4582	G3

NOT STANDARDISED

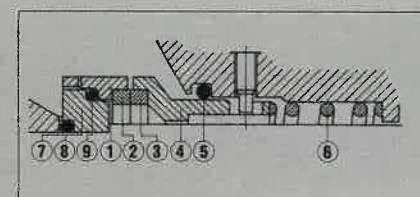


LATTYseal B 10712

LATTYseal B 10712

LATTYseal B 10712 is a balanced mechanical seal with spring located outside the product, independent from the direction of rotation. Pulp and paper mills, chemical, petrochemical, food industries, treatment of water and sewage. All corrosive, abrasive and highly clogging fluids.

Temperature	-20°C to +180°C
Pressure	10 bar
Speed	10 m/s



Item	Designation	Material	LiCode
1	Face holder	1.4582	G3
2	Shrink fit rotary face	Tungsten carbide	U2
3	Shrink fit stationary face	Tungsten carbide	U2
4	Face holder	1.4582	G3
5	O-ring	Fluorocarbon elastomer	V
6	Spring	1.4571	G2
7	O-ring	Fluorocarbon elastomer	V
8	Drive ring	1.4404	G1
9	O-ring	Fluorocarbon elastomer	V

mechanical seals specific for the industry

CHEMICAL INDUSTRY



Materials such as Hastelloy®, Titanium, Uranus® for steels or Kalrez®, PTFE for secondary seals, are commonly used to meet the aggressivity and corrosion criteria for the fluids conveyed. The sealing systems as well as their auxiliary devices are complex and monitored in order to guarantee unfailing reliability and accurate control of emissions conforming to environmental standards EPA and TA-Luft.

PHARMACEUTICAL INDUSTRY



The shapes and surface finishes of the parts in contact with pharmaceuticals are designed and manufactured to guarantee process sterility and facilitate cleaning operations. To prevent from contamination of active substances, the more sophisticated sealing systems are made using friction materials that tolerate dry continuous operation under a static pressure of nitrogen. Each seal is designed to reach vacuum levels of approximately 10 mbar.

E N E R G Y



Voluminous construction files, qualification tests that sometimes take up to three years, as well as an individual product check during production are the price to pay to guarantee the safety in nuclear plants. Reliability and endurance are required for these elements of rotary machines designed to reach 24,000 hours of operation and pressures of 40 bar with speeds of 6,000 rpm.

PAPER INDUSTRY



From chemically aggressive fluids in a pulp mill to high solid content fluids in a paper mill or various foreign matters such as steel wires, etc. in a pulper from a waste paper unit, mechanical seals are often exposed to severe working conditions. The products are designed to operate without flushing fluid at a high production rate in an industry where the duration of planned production interruptions for maintenance purposes is always shorter.

M A R I N E



This industry combines all the requirements of the nuclear industry with, in addition, the use of materials designed to resist salt water such as Uranus®, Inconel® or cupro-aluminium, constraining vibration specifications to reduce the characteristic noise propagation level and the non-contacting backup systems, etc. Sophisticated and impressive products are designed for shaft lines in ships (mechanical seals in two parts with a diameter of 480 mm).

LATTY the specialist of specials

The Mechanical Seal Division of LATTY international has acquired a solid reputation over the last twenty years in solving difficult technical applications. This success is the result of a permanent policy of investment in human resources as well as in efficient data processing equipment (2D and 3D CAD systems, calculations by finite elements) and test benches to test the materials and configurations.

This interest in difficult problems lies in a willingness to learn and challenge oneself.

LATTY international intends to persist in doing so.

LATTY, the specialist of specials

LATTY
international s.a.
For the best in modern sealing technique

Maximum temperature, pressure and speed given in this leaflet can in no case be associated.

Asbestos free static seals

CARBON FIBRES



LATTYcarb 96

LATTYcarb 96

Asbestos free gasket material made of carbon and mineral fibres.
Good chemical resistance due to the inertness of carbon. High-performance quality meeting most needs.
Pressure: 130 bar - Temperature: + 450°C.
Multipurpose: steam, high pressure, all hydrocarbons.
Approvals: BAM, KTW, LNE, WRC.

LATTYcarb 96 G2F

As for LATTYcarb 96, with specific graphite treatment on both sides.

LATTYcarb 96S

As for LATTYcarb 96, with steel reinforcement.

LATTYgold 92 G2F

Asbestos free gasket material made of synthetic and mineral fibres bonded with a mix of acrylonitrile elastomers. Both sides are treated with specific graphite. For general purpose: graphite makes disassembling operations easier and prevents flange corrosion (avoid strong acids and high-temperature steam).
Pressure: 100 bar - Temperature: + 440°C.

LATTYgold 92S

Asbestos free gasket material made of mineral fibres, bonded with a mix of acrylonitrile elastomers and compressed in sheets, with steel reinforcement.
Pressure: 130 bar - Temperature: + 440°C.

• Approvals:

AECL: Nuclear industry, BAM: oxygen, DVGW: gas, EXION: fire, FMFA: food industry, GDF: gas, KTW: drinking water, LNE: food industry, TÜV: environment (TA-Luft), WRC: drinking water.

ARAMID FIBRES



LATTYgold 1 / 3 / 92

LATTYgold 1

Asbestos free gasket material made of aramid fibres, compressed and bonded with a special elastomer-based mix. Outstanding sealing efficiency and high bursting strength.
For general purpose. High versatility (except water 180°C/20 bar and steam 180°C/10 bar).
pH: 0-14 - Pressure: 210 bar.
Temperature: - 240°C to + 315°C.
DVGW-approved.

LATTYgold 3

Asbestos free gasket material. Multiservice, easy to cut, suitable for the automobile industry.
Pressure: 100 bar - Temperature: + 300°C.
Approvals: DVGW, GDF.

LATTYgold 92

Asbestos free gasket material made of synthetic and mineral fibres, bonded with a mix of acrylonitrile elastomers and compressed in sheets.
For general purpose. Good elastic limit (avoid high-temperature and corrosive fluids).
Pressure: 100 bar - Temperature: + 440°C.
Approvals: BAM, KTW, LNE, WRC.

LATTYgold 32

Asbestos free gasket material made of a mix of synthetic fibres coated with elastomers.
Pressure: 60 bar - Temperature: + 300°C.
LNE-approved.

LATTYgold 5 ACID

Asbestos free gasket material made of synthetic fibres and resins. High performance with highly corrosive fluids such as mineral acids.
This grade is specially suitable for use with bases, acids and all corrosive fluids.
Pressure: 60 bar - Temperature: + 200°C.

PTFE AND OTHERS



LATTYflon 93 / 97

LATTYflon 93

Gasket material made of expanded PTFE (Goretex®). Suitable for all chemical applications (except fluorine-containing gases and melting alkaline metals). Provides good sealing efficiency in spite of possible defects on flange surfaces.
pH: 0-14 - Pressure: 210 bar.
Temperature: - 240°C to + 315°C.

LATTYflon 97

Moulded PTFE gasket reinforced with buried metal insert. Creeping is not tolerated by the specific design of the insert. This gasket combines the chemical resistance of PTFE with the mechanical resistance of metal. All chemical industries, strong acids and bases (except fluorhydric acid).
pH: 0-14 - Pressure: 40 bar.
Temperature: + 250°C.
TUV-approved.

LATTYrit P

Asbestos free gasket material made of cellulose-impregnated fibres.
Recommended when high compressibility associated with high resistance to oils and fuels are required.
Pressure: 50 bar.
Temperature: + 200°C.

LATTYrit CORK

High-quality cork compound and binder containing butadiene copolymer with medium acrylonitrile content.
Marine, aeronautical and automobile applications.

LATTY
international s.a.
For the best in modern sealing technique

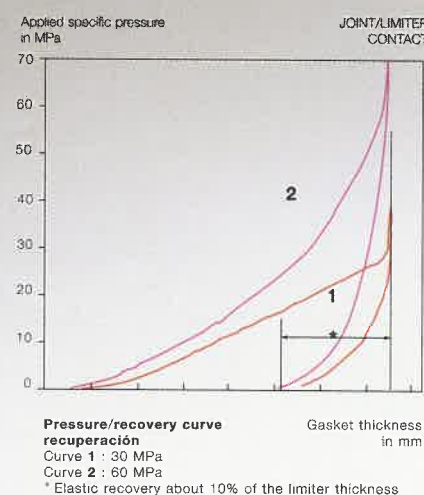
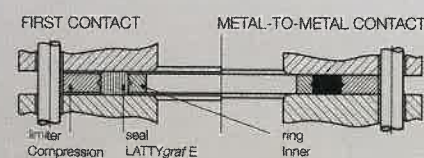
EXPANDED GRAPHITE AND STEEL



LATTYgraf Reflex

LATTYgraf REFLEX

Compound gasket made of steel and graphite, consisting of a sealing component made of tightly wound expanded graphite and outer stainless steel reinforcement rings for compression limitation. This seal is designed for metal-to-metal contact.
High performances. High elastic recovery.
Pressure: 500 bar** - Temperature: + 600°C*.



EXPANDED GRAPHITE AND STEEL



LATTYgraf Métal

LATTYgraf METAL

Compound gasket material made of steel and graphite, consisting of two expanded graphite rings contained in a stainless steel reinforced ring.
Standard dimensions.
Pressure: 100 bar** - Temperature: + 500°C*.

LATTYgraf EFA/EFAI

LATTYgraf EFA
Expanded graphite sheet jointing material clamped to perforated stainless steel reinforcement (no adhesives). Compatible with all fluids except strong acids and oxidising products.
BAM-approved.

LATTYgraf EFA-I

Impregnated expanded graphite sheet jointing material clamped to perforated stainless steel reinforcement (no adhesives). Compatible with all fluids except strong acids and oxidising products.
pH: 0-14 - Pressure: 650 bar.
Temperature: - 200°C to + 550°C.
BAM-approved.

LATTYflex

Spiral wound gaskets with steel strip and inserts made of various materials depending on the operating conditions (i.e. expanded graphite, PTFE, LATTYgold, Héphaïstos).
Different versions depending on the kind of strip, with or without inner and/or outer reinforcement rings.
Standard dimensions or special on request.
Chemical, petrochemical, food-processing industries, cryogenics, steam.
pH: depending on the materials.
Temperature: - 200°C to + 1,000°C**.

GRAPHITE



LATTYgraf E / EFI / EFN

LATTYgraf B.A.

Expanded graphite rings with anti-extrusion rings to reduce maintenance on autoclave valves.
Range from Ø 60 mm (NP 250 bar) to Ø 1,000 mm (NP 160 bar).
Water, steam, gas, hydrocarbons.

LATTYgraf E

Pure expanded graphite without binder.
Temperature resistant up to 3,000°C*. Very low friction coefficient, very high self-lubricating capability, high thermal conductivity.
Tape - density: 0.7 to 1.1 - thickness: 0.25 to 1 mm.
Sheet - thickness: 2 mm. Over 2 mm thick on request.
For use as flange gaskets.
BAM-approved.

LATTYgraf EFI

High-performance gasket material with 4401 stainless steel reinforcement.
Thicknesses: 1, 1.5, 2 and 3 mm.
For use as flange gaskets.
DVGW-approved.

LATTYgraf EFN

High-performance gasket material with pure nickel reinforcement.
Particularly suitable for contact with sea water.

* In inert atmosphere
** Depending on the materials

Maximum temperature, pressure and speed given in this leaflet can in no case be associated.

Asbestos free static seals

CARBON FIBRES



LATTYcarb 96

LATTYcarb 96

Asbestos free gasket material made of carbon and mineral fibres.
Good chemical resistance due to the inertness of carbon. High-performance quality meeting most needs.
Pressure: 130 bar - Temperature: + 450°C.
Multipurpose: steam, high pressure, all hydrocarbons.
Approvals: BAM, KTW, LNE, WRC.

LATTYcarb 96 G2F

As for LATTYcarb 96, with specific graphite treatment on both sides.

LATTYcarb 96S

As for LATTYcarb 96, with steel reinforcement.

LATTYgold 92 G2F

Asbestos free gasket material made of synthetic and mineral fibres bonded with a mix of acrylonitrile elastomers. Both sides are treated with specific graphite. For general purpose: graphite makes disassembling operations easier and prevents flange corrosion (avoid strong acids and high-temperature steam).
Pressure: 100 bar - Temperature: + 440°C.

LATTYgold 92S

Asbestos free gasket material made of mineral fibres, bonded with a mix of acrylonitrile elastomers and compressed in sheets, with steel reinforcement.
Pressure: 130 bar - Temperature: + 440°C.

• Approvals:

AECL: Nuclear industry, BAM: oxygen, DVGW: gas, EXION: fire, FMFA: food industry, GDF: gas, KTW: drinking water, LNE: food industry, TÜV: environment (TA-Luft), WRC: drinking water.

ARAMID FIBRES



LATTYgold 1 / 3 / 92

LATTYgold 1

Asbestos free gasket material made of aramid fibres, compressed and bonded with a special elastomer-based mix. Outstanding sealing efficiency and high bursting strength.
For general purpose. High versatility (except water 180°C/20 bar and steam 180°C/10 bar).
pH: 0-14 - Pressure: 210 bar.
Temperature: - 240°C to + 315°C.
DVGW-approved.

LATTYgold 3

Asbestos free gasket material. Multiservice, easy to cut, suitable for the automobile industry.
Pressure: 100 bar - Temperature: + 300°C.
Approvals: DVGW, GDF.

LATTYgold 92

Asbestos free gasket material made of synthetic and mineral fibres, bonded with a mix of acrylonitrile elastomers and compressed in sheets.
For general purpose. Good elastic limit (avoid high-temperature and corrosive fluids).
Pressure: 100 bar - Temperature: + 440°C.
Approvals: BAM, KTW, LNE, WRC.

LATTYgold 32

Asbestos free gasket material made of a mix of synthetic fibres coated with elastomers.
Pressure: 60 bar - Temperature: + 300°C.
LNE-approved.

LATTYgold 5 ACID

Asbestos free gasket material made of synthetic fibres and resins. High performance with highly corrosive fluids such as mineral acids.
This grade is specially suitable for use with bases, acids and all corrosive fluids.
Pressure: 60 bar - Temperature: + 200°C.

PTFE AND OTHERS



LATTYflon 93 / 97

LATTYflon 93

Gasket material made of expanded PTFE (Goretex®). Suitable for all chemical applications (except fluorine-containing gases and melting alkaline metals). Provides good sealing efficiency in spite of possible defects on flange surfaces.
pH: 0-14 - Pressure: 210 bar.
Temperature: - 240°C to + 315°C.

LATTYflon 97

Moulded PTFE gasket reinforced with buried metal insert. Creeping is not tolerated by the specific design of the insert. This gasket combines the chemical resistance of PTFE with the mechanical resistance of metal. All chemical industries, strong acids and bases (except fluorhydric acid).
pH: 0-14 - Pressure: 40 bar.
Temperature: + 250°C.
TUV-approved.

LATTYrit P

Asbestos free gasket material made of cellulose-impregnated fibres.
Recommended when high compressibility associated with high resistance to oils and fuels are required.
Pressure: 50 bar.
Temperature: + 200°C.

LATTYrit CORK

High-quality cork compound and binder containing butadiene copolymer with medium acrylonitrile content.
Marine, aeronautical and automobile applications.

LATTY
international s.a.
For the best in modern sealing technique

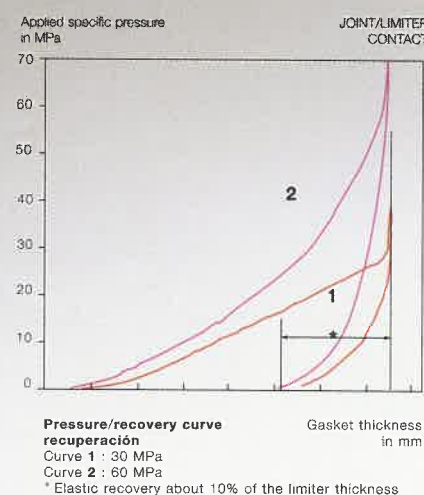
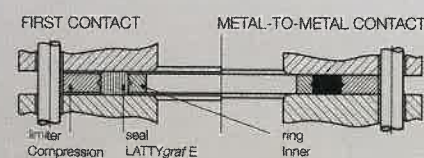
EXPANDED GRAPHITE AND STEEL



LATTYgraf Reflex

LATTYgraf REFLEX

Compound gasket made of steel and graphite, consisting of a sealing component made of tightly wound expanded graphite and outer stainless steel reinforcement rings for compression limitation. This seal is designed for metal-to-metal contact.
High performances. High elastic recovery.
Pressure: 500 bar** - Temperature: + 600°C*.



EXPANDED GRAPHITE AND STEEL



LATTYgraf Métal

LATTYgraf METAL

Compound gasket material made of steel and graphite, consisting of two expanded graphite rings contained in a stainless steel reinforced ring.
Standard dimensions.
Pressure: 100 bar** - Temperature: + 500°C*.

LATTYgraf EFA/EFAI

LATTYgraf EFA

Expanded graphite sheet jointing material clamped to perforated stainless steel reinforcement (no adhesives). Compatible with all fluids except strong acids and oxidising products.
BAM-approved.

LATTYgraf EFA-I

Impregnated expanded graphite sheet jointing material clamped to perforated stainless steel reinforcement (no adhesives). Compatible with all fluids except strong acids and oxidising products.

pH: 0-14 - Pressure: 650 bar.
Temperature: - 200°C to + 550°C.
BAM-approved.

LATTYflex

Spiral wound gaskets with steel strip and inserts made of various materials depending on the operating conditions (i.e. expanded graphite, PTFE, LATTYgold, Héphaïstos).
Different versions depending on the kind of strip, with or without inner and/or outer reinforcement rings.
Standard dimensions or special on request.
Chemical, petrochemical, food-processing industries, cryogenics, steam.
pH: depending on the materials.
Temperature: - 200°C to + 1,000°C**.

GRAPHITE



LATTYgraf E / EFI / EFN

LATTYgraf B.A.

Expanded graphite rings with anti-extrusion rings to reduce maintenance on autoclave valves.
Range from Ø 60 mm (NP 250 bar) to Ø 1,000 mm (NP 160 bar).
Water, steam, gas, hydrocarbons.

LATTYgraf E

Pure expanded graphite without binder.
Temperature resistant up to 3,000°C*. Very low friction coefficient, very high self-lubricating capability, high thermal conductivity.
Tape - density: 0.7 to 1.1 - thickness: 0.25 to 1 mm.
Sheet - thickness: 2 mm. Over 2 mm thick on request.
For use as flange gaskets.
BAM-approved.

LATTYgraf EFI

High-performance gasket material with 4401 stainless steel reinforcement.
Thicknesses: 1, 1.5, 2 and 3 mm.
For use as flange gaskets.
DVGW-approved.

LATTYgraf EFN

High-performance gasket material with pure nickel reinforcement.
Particularly suitable for contact with sea water.

* In inert atmosphere
** Depending on the materials

Maximum temperature, pressure and speed given in this leaflet can in no case be associated.

Asbestos free static seals

EXPANDED GRAPHITE TAPES



LATTYgraf E / E1 / E2 / E2 adhesive

LATTYgraf E

Pure expanded graphite without binder. Temperature resistant up to 3,000°C*. Very low friction coefficient, very high self-lubricating capability, good chemical inertness, high thermal conductivity. Tape - density: 0.7 - thickness: 0.5 mm. For use as compressed sealing rings. BAM-approved.

LATTYgraf E1

Tape - density: 0.9 - thickness: 0.5 mm. Contains a thoroughly mixed corrosion inhibitor. For use as compressed sealing rings.

LATTYgraf E2

Tape - density: 0.7 - thickness: 0.5 mm. 98% pure graphite, general use for all industrial applications. For use as sealing rings. DVGW-approved.

LATTYgraf E adhesive

Tape - density: 0.7 - thickness: 0.5 mm. 98% pure adhesive graphite. Allows on site fabrication of quality gaskets.

*In inert atmosphere.

LATTY
international s.a.
For the best in modern sealing technique

• Approvals:

AECL: nuclear industry, BAM: oxygen, DVGW: gas, EXXON: fire, FMMA: food industry, GDF: gas, KTW: drinking water, LNE: food industry, TÜV: environment (TA-Luft), WRC: drinking water.

ALUMINA-SILICATE



Héphaïstos

HEPHAISTOS

Alumina-silicate fibres withstanding temperatures up to 1,200°C.

HÉPHAÏSTOS® 800 and R

Rigid compressed sheets. Good mechanical strength. Excellent insulating material. Furnace lining, boiler hearths. Insulation: ingot mould seals, boiler panels.

HÉPHAÏSTOS® N

Tissue made of alumina-silicate fibres without binder. Furnace insulation and linings. Flame protection during welding operations.

HÉPHAÏSTOS® C

Cord made of alumina-silicate yarns. Replaces asbestos cords in all applications.

HÉPHAÏSTOS® VS 250

Sheath consisting of borosilicate yarns coated with a thick layer of silicone.

Cable protection, flexible conduit and tubing. Prevents fire hazards due to short-circuits.

Iron and steel industry, metallurgy, foundry, automobile, aeronautical, chemical and petrochemical industries.

HÉPHAÏSTOS® 1200

Alumina-silicate sheet reinforced with ceramic fibres. Sheet heat insulation, heat insulation of pipeworks obtained by forming.

REINFORCED GRAPHITE



LATTYpack

LATTY pack 960

Joint (circular or elliptic) made of a mix of synthetic fibres coated with nickel-chrome-reinforced graphite yarns.

Industrial boilers, manholes, handholes.

Can be used with temperatures up to 350°C and pressures up to 40 bar.

Please consult us.

LATTY pack 940

Joint (circular or elliptic) made of expanded graphite coated with a nickel-chrome plated envelope.

Industrial boilers, handholes, manholes.

Can be used with temperatures up to 450°C and pressures up to 80 bar.

Please consult us.

Service and maintenance products

P T F E



LATTYflon UNISEAL

LATTYflon UNISEAL

Flat gasket made of pure PTFE.

Self-adhesive, resistant to chemicals.

Flanges, housings, compressors, pipes, covers, etc.

pH: 0-14.

Temperature: from 240°C to +290°C.

Approvals: BAM, DVGW, TÜV.

A E R O S O L S



LATTYservice

LATTYservice

DL 101	Anti-seize lubricant
AG 102	Non-adhesive ceramic paste
CF 103	Transmission chain lubricant
GC 104	Open gear lubricant
GF 105	Cold galvanising agent
GN 106	High-temperature lubricant
HD 107	Detergent oil
SL 108	Silicone lubricant
DI 109	Universal cleaner
HC 110	Cutting oil
PN 111	Electrical contact cleaner
GT 112	PTFE lubricant
PE 113	Anti-stick for welding
TC 114	Anti-slip for drive belts
FE 115	PTFE lubricating film
AA 116	Anti-stick

M A I N T E N A N C E



TOOLS

• Machine for cutting out circular joints and gaskets from 80 to 1,250 mm in diameter. All materials. Manual or electric.

• Joint-cutting kit.

• Box of cutting tools.

Ring-cutting tools easing the cutting of packing rings to the exact length.

Easy to use. Dimensional reliability, clean cuts, economical use.

• Packing extractors. Flexible or rigid stem. Fixed or removable screw ends.

Extractors allow the quick removal of packings even from the most inaccessible glands.



Maximum temperature, pressure and speed given in this leaflet can in no case be associated.

Selection table

Static applications

		Speed in m/s	Temp. in °C	Pressure in bar	pH	LP water and steam 250°C, 16 bar	HP water and steam 560°C, 190 bar	Hydrocarbons	Light acids	Light bases	Strong acids	Strong bases	Hot gases	Drinking water, foodstuffs
Héphaïstos T/ G	Alumina-silicate yarns with Ni-Cr reinforcement T = packing, G = coating	0,2	1260	T=100	0 to 9									
LATTYflon 2790	Acrylic yarns + PTFE impregnation + neutral lubricant	15	260	100	1 to 13									2790 AL
LATTYtex 4777	Aramid yarns + acrylic yarns + grease	15	200	60	3 to 11									
LATTYgraf 6940	Expanded graphite yarns + Ni-Cr + corrosion inhibitor and sacrificial anode	1	600	400	0 to 14									
LATTYgraf EFI/ EFA/ EFAI	Graphite sheet + metal foil	0,1	550	650	0 to 14									

Valves

LATTYgraf 6940	Expanded graphite yarns + Ni-Cr + corrosion inhibitor and sacrificial anode	1	600	400	0 to 14									
LATTYgraf 6117	Carbon fibres and Ni-Cr + graphite yarns + corrosion inhibitor and sacrificial anode	1	600	400	0 to 14									
LATTYgraf 6118	Carbon fibres and Ni-Cr + graphite yarns + corrosion inhibitor and sacrificial anode	1	600	300	0 to 14									
LATTYgraf E/ E2/ E2P	Pure graphite without binder (E = 99.8%) (E2 = 98%) (E2P = 99% + corrosion inhibitor)	1	2500 ⁽¹⁾	400 ⁽¹⁾	0 to 14									
LATTYflon 3206 S	PTFE yarns + PTFE impregnation	5	300	300	0 to 14									
LATTYflon 3206 SO	PTFE yarns + PTFE impregnation Approval for foodstuffs and oxygen	5	300	300	0 to 14									*
LATTYflon 3260 LM	PTFE coating on core made of PTFE-impregnated yarns - special for control valves	1	280	300	0 to 14									
LATTYflon 3210	Fibrillated PTFE + graphite + neutral lubricant	10	250	50	0 to 14									

Rotary movements

LATTYflon 4788	Aramid yarns + PTFE impregnation + neutral lubricant	25	300	200	2 to 13									
LATTYflon 4789	Aramid/viscose compound yarns + PTFE impregnation + neutral lubricant	20	275	100	2 to 12									
LATTYflon 4777	Aramid yarns + acrylic yarns + grease	15	200	60	3 to 11									
LATTYflon 4488	Thoroughly mixed carbon and aramid fibres + PTFE impregnation + neutral lubricant	30	300	300	1 to 13									
LATTYflon 4308	PTFE yarns pre-treated throughout with graphite + specific neutral lubricant for running-in	26	300	110	0 to 14									
LATTYflon 3206	PTFE yarns + PTFE impregnation + neutral lubricant	10	280	100	0 to 14									3206 AL
LATTYflon 2790	Acrylic yarns + PTFE impregnation + neutral lubricant	15	260	100	1 to 13									2790 AL
LATTYflon 7188	Phenolic yarns + PTFE impregnation + neutral lubricant	20	300	200	1 to 13									
LATTYgraf T	Pure graphite yarns	35	600	300	0 to 14									
LATTYgraf 6785	Carbon yarns + graphite-mix impregnation	25	600	300	0 to 14									

Reciprocating/rotary movements

LATTYflon 4757	Combination of aramid yarns (corners) + graphited PTFE + PTFE impregnation	2/22	300	1,800	2 to 14									
LATTYflon 4758	Combination of aramid yarns (corners) + PTFE yarns + neutral lubricant	2/10	300	1,000	2 to 14									

(1) In inert atmosphere (2) With top and bottom rings Ni-Cr= Nickel Chrome

Maximum temperature, pressure and speed given in this leaflet can in no case be associated.

* Approved to be used in contact with foodstuffs

applications

MAIN REFERENCES

FRANCE

Aishom Fluides Sapag
Aluminium Pechiney
Arjomari
Bailey Sereg
Bergeron Rataeu
Brasseries Kronenbourg
C.R.D. Total France
Chantiers de l'Atlantique
Cogema
D.C.N.
EDF/SPT/UTO
Elf Atochem
Fischer Controls sa
I.C.I. France
La Cellulose du Rhône
Lamort
Malaxeurs Mélangeurs Guédu
Masoneilan
Naphthachimie
Papeteries de Gollbey
PCM Pompes
Pompes Guinard
Rhône-Poulenc
Solvay et Cie
Unisabi

GERMANY

Degussa
Ford (Köln)
Hauhinco (Köln)
Hoechst
KSB
Matthews & Weber
ROW
Zimmermann & Jansen (Düren)

BELGIUM

Interbrew Artois
Janssen Pharmaceutica
KNP (CTNP)
T.C.T.

UNITED-KINGDOM

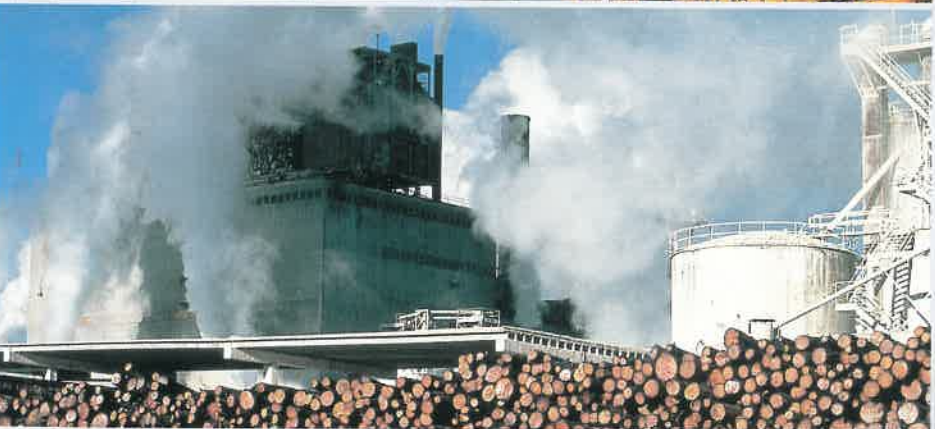
Dewrance Division Dresser U.K. Ltd
Hattersley Heaton Limited
Mono Pumps Limited
Triangle Valve Co. Ltd
Warman International Limited
Worthington Simpson Div. of Dresser U.K. Ltd

SWEDEN

ABS Scapump
Assi (Lövholmens Bruk)
Holmen Paper (Braviken Mill)
MoDo (Skärblacka)
Munksjö AB (Aspa Bruk)
SUNDS Delibrator AB
Stora (Feldmühle Hylte Bruk)
Tour & Andersson AB

SPAIN

Asociacion Nuclear de Trillo
Central Nuclear de Almaraz
Central Nuclear de Vandellós II
Asociacion Nuclear de Asco
Nuclearor
Endesa-Compañia Sevillana de Electricidad
Sandoz
Tampella
Nestle



PLAITED PACKINGS

APPLICATIONS ON VALVES

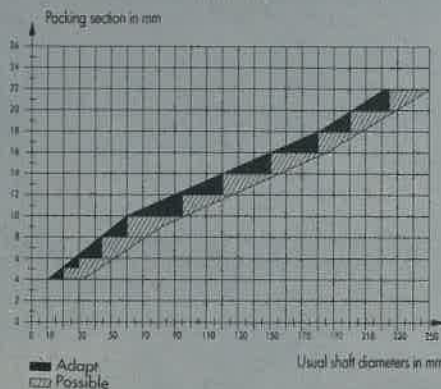
Physical characteristics of a packing for valves

Choosing the section

The section is chosen in the empirical way from the following tables

$s = f(\varnothing)$

It is recommended to choose the largest section available from the stock standard



Choosing the number of rings
 The number of rings or depth of the stuffing box to be used is defined by the above graph according to the pressure to be sealed. However, as the packing hardly transmits the tightening torque, the best compromise is obtained by a stack height defined as follows:

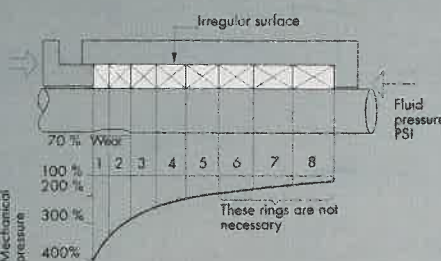
$$h \text{ (after tightening)} = \varnothing \text{ mm stem} + 1.5 \text{ mm}$$

the minimum number of rings being 5.

Tightening torque

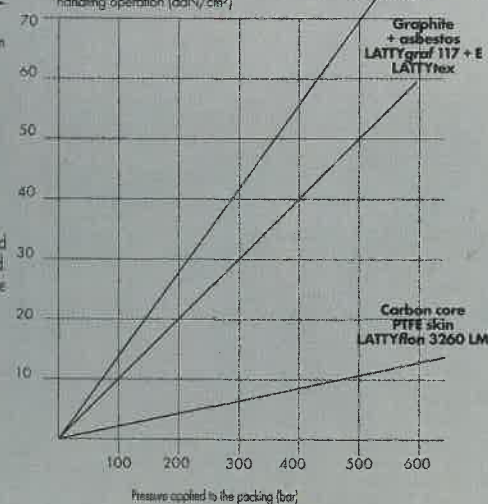
The tightening torque to be applied to a gland depends on the type of packing.

- 2.5 to 3 times the operating pressure for graphite and asbestos packings, with a minimum of 150 bar.
- 1.5 time the operating pressure for a packing based on PTFE or for a set consisting of expanded graphite and a carbon or asbestos packing, with a minimum of 100 bar.



First operation

Effort to be exerted by surface unit to separate the stem on the first handling operation (daN/cm²)



The diagram above shows the theoretical distribution of the tightening pressure inside the stuffing box.

In theory, sealing is achieved when the pressure on the last ring is equal to the operating pressure.

In order to obtain the best possible distribution of the tightening pressure, it is necessary to place the rings one by one and pre-tighten them individually. Because this is a time-consuming operation, it is recommended to make pre-formed or pre-compressed rings whenever possible.

Pre-forming

In order to seal, a packing must be as compact as possible, which means that the spaces between fibres have to be brought to a minimum. Therefore, the packing must be strongly compressed to overcome the friction between the fibres.

The best means is to use a die whose dimensions are adapted to those of the stem and the box. The compression is obtained by a press, its value is that of the later tightening once the stuffing box is installed.

Friction force

After fitting the packings and tightening the gland, the valve stem should be moved easily. The resulting friction forces play an important role in the quality of a packing in particular in the case of a motorised valve (motor power) or a control valve (accuracy of the valve position).

For dry packings, the friction forces are calculated as follows:

$$F_t = f \times S \times \frac{\text{Tightening pressure}}{100}$$

f in daN/cm² of friction surface / 100 bar (tightening)

With:

- $f = 10$ for graphite and asbestos mounting (at least)
- $f = 5$ for asbestos PTFE
- $f = 2$ for our LATTYron 3260 LM
- S = friction surface

Example: to obtain the tightening torque and friction force for a graphited asbestos packing

fluid water
 operating pressure 45 bar
 stem \varnothing 12 mm or 1.2 cm
 packing section 6 mm or 0.6 cm

- Tightening pressure $= 3 \times \text{operating pressure}$
 $= 3 \times 45 = 135 \text{ bar}$
 $= 150 \text{ bar}$

Minimum tightening pressure

- Tightening torque: F_s
 $F_s = P \times s$

$$\text{with } s = \frac{\pi}{4} \times (D^2 - d^2)$$

$$= \frac{\pi}{4} \times (D + d) \times (D - d)$$

$$= \frac{\pi}{4} \times (2.4 + 1.2) \times (2.4 - 1.2)$$

$$= \frac{\pi}{4} \times (3.6) \times (1.2)$$

$$= 3.39 \text{ cm}^2$$

$$\text{from which } F_s = 150 \times 3.39 = 510 \text{ daN}$$

- Friction force: F_f
 $S = \pi \times \varnothing \text{ cm} \times h \text{ cm}$

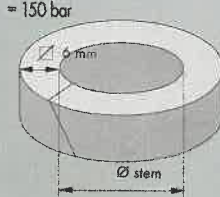
$$= \pi \times 1.2 \times 2.7$$

$$= 10.178 \text{ cm}^2$$

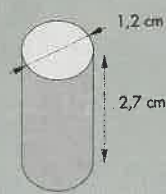
$$F_f = 10 \times S \times \frac{\text{tightening pressure}}{100}$$

$$= 10 \times 10.178 \times \frac{150}{100}$$

$$= 150 \text{ daN min.}$$



Friction surface
 h height of lining =
 stem \varnothing + 15 mm



APPLICATIONS ON PUMPS

Preliminary precautions

a) Checking of the surface condition

Shaft or sleeve in good condition

Ra: 0.6 / 0.8 Rt: new (max. 20)

On stuffing box

Ra: 1.6 - 3.2 (to avoid rotation of rings)

Choose lubricants carefully

- MOS2 (molybdenum disulphide) not recommended

- Silicon grease prevents the lubricating film from forming between the friction faces

b) Checking of plays and clearances at the bottom of the box and gland

The play relative to the shaft should be approximately:

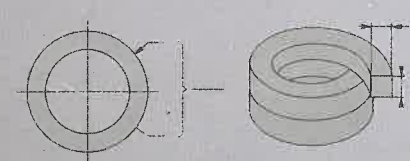
0.3 / 0.5 mm to the radius for shaft \varnothing up to 30

0.5 / 1 mm to the radius for shaft \varnothing from 30 to 100

1 / 1.5 mm over 100

Determination of the packing and its use

To determine the section



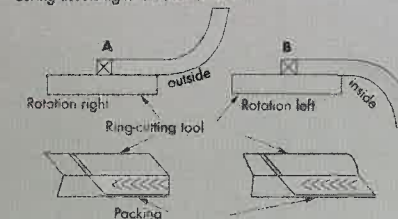
Side A (friction side)

Side B (stacking side)

Direction of the spool coil (manufacturing winding)

Direction of rotation (right or left cutting)

- Cutting according to direction of rotation



- Direction of rotation, right (A)

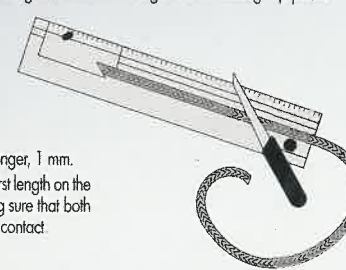
The wound packing still being in the box, pull out the end of the packing and position the outer part on the cutting equipment as in A, then cut with a knife.

- Direction of rotation, left (B)

The wound packing still being in the box, position the inner part as in B on the cutting equipment, then cut with a knife.

Note: the inner part of the wound packing is always on the friction side (shaft).

- Making a ring from a material length with the cutting equipment



1st length:

cut a little longer, 1 mm.

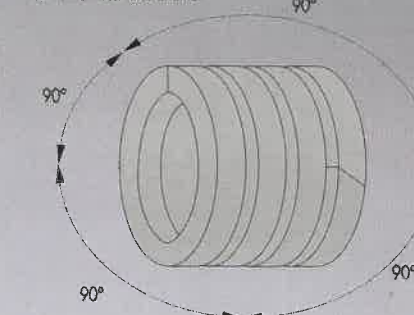
Adjust the first length on the

box, making sure that both

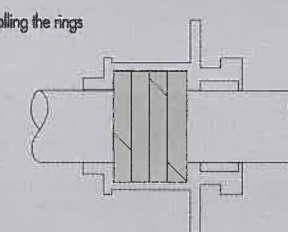
ends are in contact.

Fitting the ring in the stuffing box

Cut at 90° from one another



Installing the rings



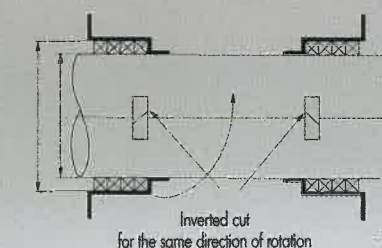
The cut on the last ring should be in the lower position.

Carefully position the rings with an appropriate tool which does not scratch.

Each cut at 45° must be placed 90° from one another.

Caution: cutting direction left or right.

Mounting of two stuffing boxes, coupling side and stop side.



Individual fitting

Direction of rotation: right

Direction of rotation: left



Gland approach



Check:

- correct engagement,

- parallelism.

The initial gland follower (g) enables to make sure that the number of rings is correct.

Gland setting



Careful tightening of the gland by hand so that it does not move when starting.

Make sure the gland is not in contact with the sleeve by passing a shim between the shaft and the gland.

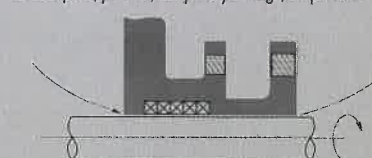
Check parallelism.

Check the height (gland follower).

Equipment ready for starting operation.

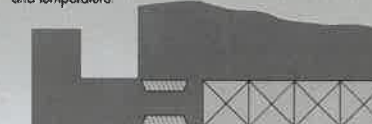
Starting-up

Check: speed, pressure, compulsory leakage, temperature.



Setting the leakage

Caution: re-tightening may be required depending on the leakage and temperature.



Setting of the leakage depending on the temperature.

Conclusion

The fitting of the packing is a delicate and long operation, but it will affect both the life and the operation of the stuffing-box if not performed correctly.

TECHNICAL SPECIFICATION OF MECHANICAL SEALS

Balancing the seals

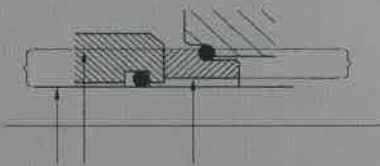
In order to meet the many different problems, mechanical seals are divided into two categories:

- unbalanced seals for pressures generally below 10 bar, that we refer to with the letter U;
- balanced seals suitable for pressures above 10 bar, that we refer to with the letter B.

1. Unbalanced mechanical seals (U)

When the hydraulic surface (SH) exceeds the friction surface (SF), the mechanical seal is said to be unbalanced. Balancing coefficient (K):

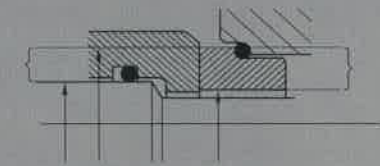
$$K = \frac{SH}{SF} > 1 \text{ with } SH = \frac{(de^2 - di^2) \times \pi}{4}$$
$$SF = \frac{(de^2 - di^2) \times \pi}{4}$$



2. Balanced Mechanical seals (B)

When the hydraulic surface (SH) is less than the friction surface (SF), the mechanical seal is said to be balanced. The balancing coefficient is usually between 0.6 and 0.8.

$$K = \frac{SH}{SF} \text{ between } 0.6 \text{ and } 0.8 \text{ with } SH = \frac{(de^2 - di^2) \times \pi}{4}$$
$$SF = \frac{(de^2 - di^2) \times \pi}{4}$$

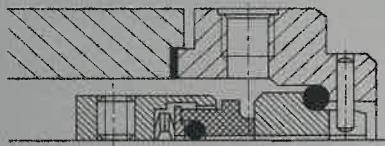


Various mounting types can be arranged from our stock mechanical seals.

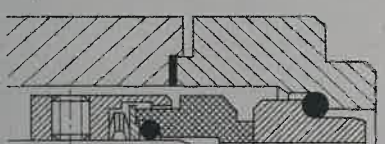
Simple mechanical seal

The medium to be sealed is separated from the atmosphere by a single mechanical seal, the lubricating film is provided by the medium to be sealed. This mounting type is the most economical and widespread one. If pressure ≤ 10 bar = U 68. If pressure ≥ 10 bar = B 68.

U 68 type



B 68 type



Double mechanical seal (back to back)

The medium to be sealed is separated from the atmosphere by an auxiliary liquid compatible with it. The pressure of that liquid must always be higher than that of the medium in the maximum possible operating conditions. The mechanical seals then seal the auxiliary liquid. It is obvious that this type of mechanical seal is specially recommended to seal products whose leakage into the atmosphere is absolutely not tolerated: noxious, polluting, radioactive and corrosive products.



This mounting type is also used when the pressure is negative (vacuum), when the product to be sealed is a gas or when temperatures are very low or very high.

Tandem mechanical seals

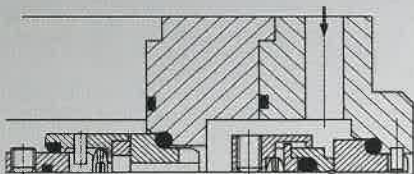
They consist of two simple mechanical seals mounted one after the other. The primary seal seals the pumped product. The secondary seal seals an auxiliary fluid (contained in a tank or coming from an external source).

The pressure P2 of the auxiliary fluid must never exceed the pressure P1 of the product at the level of the primary seal (except in particular application cases).

One of the aims is to limit the polluting effects of the product in the atmosphere.

In the event of primary seal failure, the secondary seal must make up for it the time of the intervention on the process.

An alternative solution is to use a secondary seal capable of operating in dry conditions, that is without auxiliary fluid, thus avoiding the installation of an ancillary system.



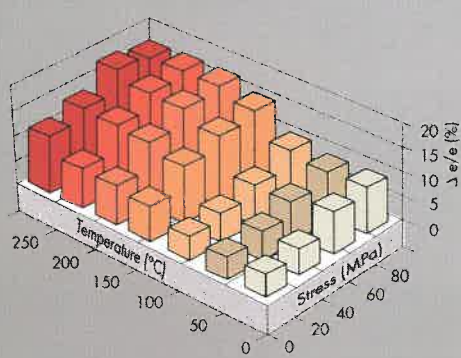
Type B 7110 + U 6810

SPECIFIC STUDY OF SOME GASKETS

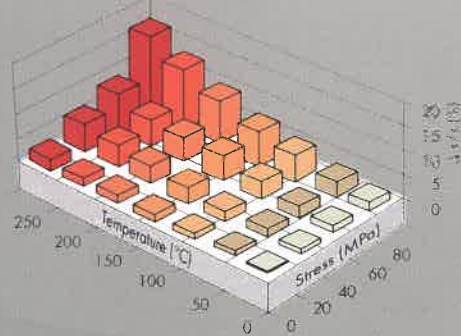
Calendered gaskets (traditional technique)

The calendering technique enables us to manufacture various thicknesses of sheets by superimposing thin films. Depending on the quality of the fibres, the loads, the elastomers, it is possible to promote certain characteristics of the gasket: tightness to water, mechanical resistance to creep, resistance to chemicals, heat, etc. Example: analysis of the mechanical characteristics of a non-asbestos gasket LATTYgold 92. This analysis allows to define the limits for use.

Thickness variations For an initial thickness e = 1.5 mm



Surface variations For an initial thickness e = 1.5 mm



Tests carried out by an independent French laboratory

Expanded graphite gaskets

Expanded graphite can be used in many different applications, in a large variety of forms which can be manufactured as rings, reinforced sheets, non-reinforced sheets, etc.

Characteristics of expanded graphite

- Very easy to use
- Very high-purity level
- Very high thermal resistance and insensitivity to thermal shocks
- Very flexible
- Very high chemical inertia
- Very good elastic recovery

$$\text{Recovery in \%} = \frac{\text{thickness after recovery} - \text{thickness under load}}{\text{initial thickness} - \text{thickness under load}}$$

CHEMICAL COMPATIBILITY of LATTYgold and LATTYgraf EFi/EFN

	LATTYgold92 and LATTYgold92S	LATTYgraf EFi/EFN	LATTYgold1 and LATTYgold3	LATTYgold92 and LATTYgold92S	LATTYgraf EFi/EFN	LATTYgold1 and LATTYgold3
Acetic acid	*	*	*	*	*	*
Acetone	*	*	*	*	*	*
Acetylene	*	*	*	*	*	*
Aliphatic solvents	*	*	*	*	*	*
Aluminium acetate	*	*	*	*	*	*
Aluminium chloride	*	*	*	*	*	*
Aluminium nitrate	*	*	*	*	*	*
Aluminium sulphate	*	*	*	*	*	*
Ammonia	*	*	*	*	*	*
Ammonia solution	*	*	*	*	*	*
Ammonium carbamate	*	*	*	*	*	*
Ammonium chloride	*	*	*	*	*	*
Ammonium nitrate	*	*	*	*	*	*
Ammonium phosphate	*	*	*	*	*	*
Ammonium sulphate	*	*	*	*	*	*
Animal oil	*	*	*	*	*	*
Antigel	*	*	*	*	*	*
Asphalt	*	*	*	*	*	*
Beer	*	*	*	*	*	*
Beef molasses	*	*	*	*	*	*
Benzene	*	*	*	*	*	*
Benzene hexachloride	*	*	*	*	*	*
Benzoic acid	*	*	*	*	*	*
Benzyl benzoate	*	*	*	*	*	*
Benzyl chloride	*	*	*	*	*	*
Bichromate of potash	0	0	0	*	*	*
Black and white liquor	*	*	*	*	*	*
Boric acid	*	*	*	*	*	*
Brine	*	*	*	*	*	*
Butadiene	*	*	*	*	*	*
Butane	*	*	*	*	*	*
Butter	*	*	*	*	*	*
Butyl acetate	*	*	*	*	*	*
Butyl alcohol	*	*	*	*	*	*
Butyl oxide	*	*	*	*	*	*
Calcium bisulphite	*	*	*	*	*	*
Calcium carbonate	*	*	*	*	*	*
Calcium chloride	*	*	*	*	*	*
Calcium nitrate	*	*	*	*	*	*
Calcium sulphate	*	*	*	*	*	*
Carbon dioxide	*	*	*	*	*	*
Carbon monoxide	*	*	*	*	*	*
Carbon tetrachloride	*	*	*	*	*	*
Carbonic acid	*	*	*	*	*	*
Casein	*	*	*	*	*	*
Castor oil	*	*	*	*	*	*
Cellulose	*	*	*	*	*	*
Chlorinated lime	*	*	*	*	*	*
Chlorobenzene	*	*	*	*	*	*
Chloroform	*	*	*	*	*	*
Chromic acid	*	0	*	*	*	*
Cider	*	*	*	*	*	*
Citric acid	*	*	*	*	*	*
Coconut oil	*	*	*	*	*	*
Cod liver oil	*	*	*	*	*	*
Copper chloride	*	*	*	*	*	*
Copper sulphate	*	*	*	*	*	*
Cotton oil	*	*	*	*	*	*
Cresol	*	*	*	*	*	*
Demeralised water	*	*	*	*	*	*
Detergents	*	*	*	*	*	*
Dibenzyl oxide	*	*	*	*	*	*
Dibutyl oxide	*	*	*	*	*	*
Dibutyl phthalate	*	*	*	*	*	*
Dichloroethane	*	*	*	*	*	*
Diethylene glycol	*	*	*	*	*	*
Diethyl phthalate	*	*	*	*	*	*
Diphenyl	*	*	*	*	*	*
Distilled water	*	*	*	*	*	*
Dowtherm	0	*	0	*	*	*
Drinking water	*	*	*	*	*	*
Dry chlorine	0	*	0	*	*	*
Dye fluid	*	*	*	*	*	*
Ethane	*	*	*	*	*	*
Ethyl acetate	*	*	*	*	*	*
Ethyl alcohol	*	*	*	*	*	*
Ethyl benzene	*	*	*	*	*	*
Ethyl oxide	*	*	*	*	*	*
Ethylene	*	*	*	*	*	*
Ethylene glycol	*	*	*	*	*	*
Fatty acid	*	*	*	*	*	*
Formaldehyde	*	*	*	*	*	*
Formic acid	*	*	*	*	*	*
Freon 12	*	*	*	*	*	*
Freon 22	*	*	*	*	*	*
Fruit juice	*	*	*	*	*	*
Fuel oil	*	*	*	*	*	*
Gelatine	*	*	*	*	*	*
Glucose	*	*	*	*	*	*
Glucose solution	*	*	*	*	*	*
Glues	*	*	*	*	*	*
Glycerine	*	*	*	*	*	*
Glycol	*	*	*	*	*	*
Greases	*	*	*	*	*	*
Heated juice	*	*	*	*	*	*
Heptane	*	*	*	*	*	*
Hexane	*	*	*	*	*	*
High-aromatic solvents	*	*	*	*	*	*
Hot wash	*	*	*	*	*	*
Hydraulic oil	*	*	*	*	*	*
Hydrazine	*	*	*	*	*	*
Hydrochloric acid (conc. < 20%)	*	*	0	*	*	*
Hydrofluoric acid	0	*	0	*	*	*
Hydrogen	0	*	0	*	*	*
Hydrogen peroxide 30%	*	*	*	*	*	*
Isobutene	*	*	*	*	*	*
Isobutyl alcohol	*	*	*	*	*	*
Isocane	*	*	*	*	*	*
Isopropyl acetate	*	*	*	*	*	*
Isopropyl alcohol	*	*	*	*	*	*
Isopropyl glycol	*	*	*	*	*	*
Isopropyl oxide	*	*	*	*	*	*
Kerosene	*	*	*	*	*	*
Lactic acid	*	*	*	*	*	*
Lead acetate	*	*	*	*	*	*
Lemonade	*	*	*	*	*	*
Lime	*	*	*	*	*	*
Lime paint	*	*	*	*	*	*
Liquid ammonio	*	*	*	*	*	*
Magnesia	*	*	*	*	*	*
Magnesium chloride	*	*	*	*	*	*
Magnesium sulphate	*	*	*	*	*	*
Maize oil	*	*	*	*	*	*
Maleic acid	*	*	*	*	*	*
Methane	*	*	*	*	*	*
Methyl alcohol	*	*	*	*	*	*
Methyl chloride	*	*	*	*	*	*
Methyl ethyl ketone	*	*	*	*	*	*
Methyl isobutylketone	*	*	*	*	*	*
Methyl methacrylate	*	*	*	*	*	*
Methyl oxide	*	*	*	*	*	*
Milk	*	*	*	*	*	*
Mineral oil	*	*	*	*	*	*
Molal chlorine	0	*	0	*	*	0
Mustard	*	*	*	*	*	*
Naphtha	*	*	*	*	*	*
Naphthenic acid	*	*	*	*	*	*
Natural gas	*	*	*	*	*	*
Nickel acetate	*	*	*	*	*	*
Nickel chloride	*	*	*	*	*	*
Nickel nitrate	*	*	*	*	*	*
Nickel sulphate	*	*	*	*	*	*
Nitric acid (conc. < 20%)	*	*	*	*	*	0
Nitric acid (conc. < 70%)	0	0	0	*	*	0
Octane	*	*	*	*	*	*
Oleic acid	*	*	*	*	*	*
Olive oil	*	*	*	*	*	*
Paint	*	*	*	*	*	*
Paper pulp	*	*	*	*	*	*
Paraffin	*	*	*	*	*	*
Pentane	*	*	*	*	*	*
Pentachloroethylene	*	*	*	*	*	*
Petroleum	*	*	*	*	*	*
Phenol	*	*	*	*	*	*
Phenyl oxide	*	*	*	*	*	*
Phosphoric acid	*	*	*	*	*	*
Phthalic acid	*	*	*	*	*	*
Picric acid	*	*	*	*	*	*
Potash (conc. < 20%)	*	*	*	*	*	*
Potassium acetate	*	*	*	*	*	*
Potassium bicarbonate	*	*	*	*	*	*
Potassium bisulphate	*	*	*	*	*	*
Potassium bisulphite	*	*	*	*	*	*
Potassium carbonate	*	0	*	*	*	*
Potassium chlorate	*	0	*	*	*	0
Potassium chloride	*	*	*	*	*	*
Potassium chlorite	*	*	*	*	*	*
Potassium chromate	*	*	*	*	*	*
Potassium cyanide	*	*	*	*	*	*
Potassium nitrate	*	*	*	*	*	*
Potassium sulphate	*	*	*	*	*	*
Potassium sulphite	*	*	*	*	*	*
Propane	*	*	*	*	*	*
Propyl alcohol	*	*	*	*	*	*
Raw liquor of sugar refinery	*	*	*	*	*	*
Sea water	*	*	*	*	*	*
Sewage water	*	*	*	*	*	*
Soda (conc. < 0%)	*	*	*	*	*	*
Sodium bicarbonate	*	*	*	*	*	*
Sodium bisulphate	*	*	*	*	*	*
Sodium bisulphite	*	*	*	*	*	*
Sodium carbonate	*	*	*	*	*	*
Sodium chloride	*	*	*	*	*	*
Sodium chlorite	*	*	*	*	*	*
Sodium phosphate	*	*	*	*	*	*
Sodium sulphate	*	*	*	*	*	*
Sodium sulphite	*	*	*	*	*	*
Soya bean oil	*	*	*	*	*	*
Starch	*	*	*	*	*	*
Steam 180°C/10 bar (associated according to ND-NP)	*	*	*	*	*	*
Steam 250°C/40 bar (according to ND, flange type and thickness)	*	*	*	*	*	0
Stearic acid	*	*	*	*	*	*
Sugar sirup	*	*	*	*	*	*
Sulphuric acid	0	0	*	*	*	0
Sulphuric anhydride	0	*	*	*	*	0
Sulphurous anhydride	0	*	*	*	*	0
Tar	*	*	*	*	*	*
Tartaric acid	*	*	*	*	*	*
Toluene	*	*	*	*	*	*
Trichloroethylene	*	*	*	*	*	*
Turpentine	*	*	*	*	*	*
Vegetable oil	*	*	*	*	*	*
Vinegar	*	*	*	*	*	*
Volatile oil	*	*	*	*	*	*
Water 180°C/20 bar associated (according to ND for LATTYgold)	*	*	*	*	*	*
White spirit	*	*	*	*	*	*
Wine	*	*	*	*	*	*
Wood turpentine	*	*	*	*	*	*
Wort	*	*	*	*	*	*
Xylene	*	*	*	*	*	*

* Compatible subject to operating conditions.
0 Not recommended: consult us.