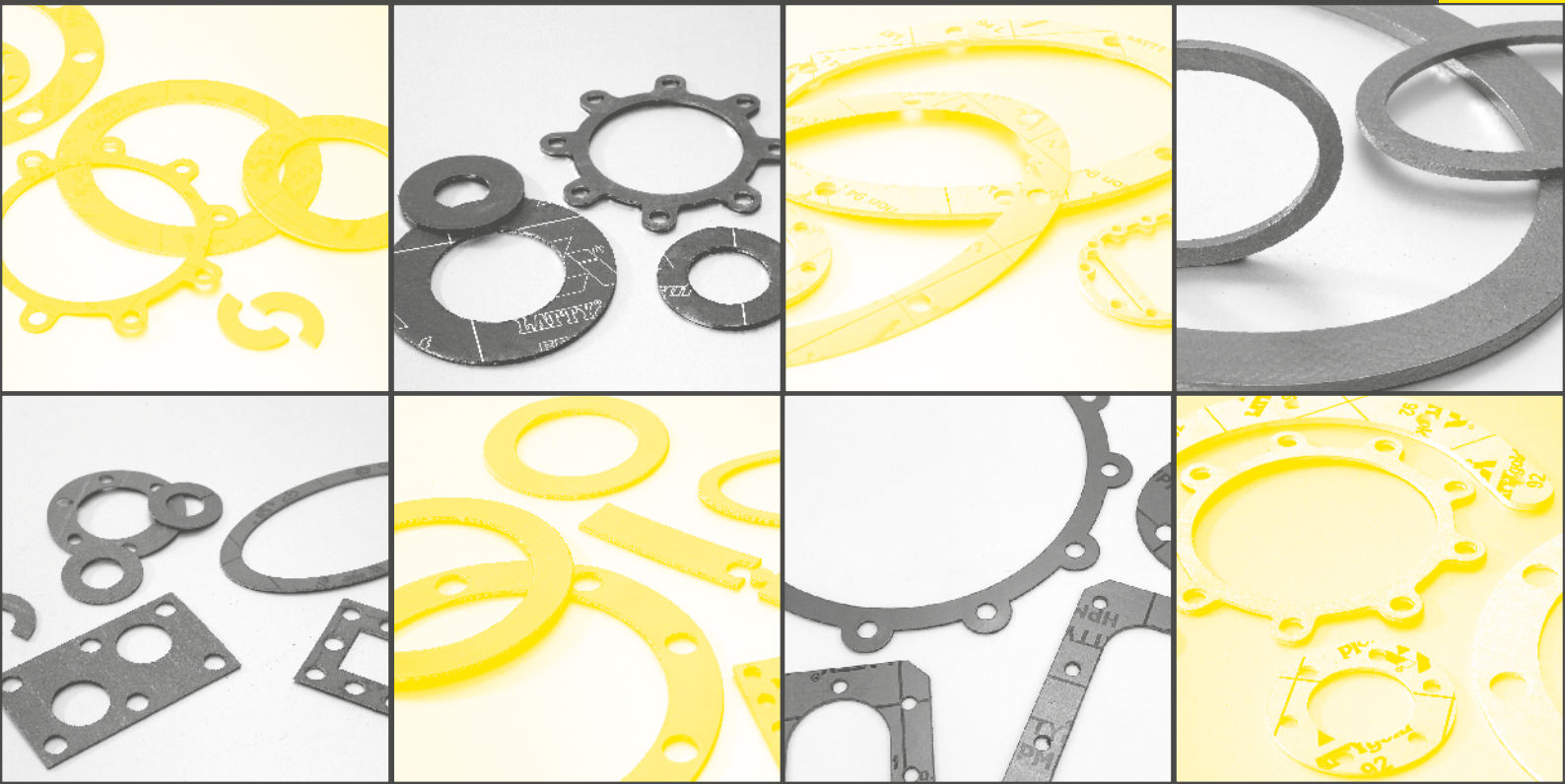


*Industrial sealing designer*



## STATIC SEALING



# YOUR SOURCE FOR INDUSTRIAL SEALING SOLUTIONS SINCE 1920

GROUPE LATTY has been designing and manufacturing industrial sealing solutions for over a century for a wide variety of sectors. It owes its longevity to its constant desire to innovate and meet new technical challenges, both in France and internationally.

Food processing, chemicals, petrochemicals, pharmaceuticals, water treatment, wood and paper, energy production, aircraft and automotive construction, shipbuilding, mining... if the companies that place their trust in GROUPE LATTY come from such diverse industrial sectors, it's because the men and women who design and manufacture Latty® products know what it means to rise to a challenge.

They combine their know-how with state-of-the-art facilities in Brou, in the Eure-et-Loir region, in the business park, in the research and development centre, but also in the seal cutting, repair and mechanical seal reconditioning workshops throughout France.

Braids, mechanical seals, swivel joints, gaskets or flange joints all meet the same high quality standards. They guarantee repeated use in demanding environments with the same sealing efficiency.



## GROUPE LATTY

*Industrial sealing designer*

# A GASKET FOR EACH TYPE OF STATIC SEALING

The primary function of a static seal is to provide a seal between a liquid or gaseous substance and the atmosphere.

Our range of gaskets provides solutions for the static sealing of:

- Pipe flanges
- Valve bodies
- Pump bodies

The selection of a seal and its fit depend on specific criteria:

- Temperature
- Pressure
- Fluid
- Stresses (vibrations, water hammer, cycles)
- Thickness

### Our approvals, your guarantee of confidence

PRODUCT NAME	Approvals, standards, directives						
	OXYGEN	FOOD		ENERGY	FUGITIVE EMISSIONS	GAS	WATER
	BAM, Oxygen Service	FDA	EC 1935/2004	PMUC	TUV	DVGW	WRAS
FIBRE / ARAMID	LATTYgold 92			17-0053			
	LATTYgold 925			17-0237			
	LATTYgold 92 G2F			17-0235			
PTFE	LATTYcarb 96						
	LATTYflon 94 L			17-0188			
	LATTYflon 84 L						
	LATTYflon 95						
GRAPHITE	LATTYflon 97						
	LATTYgraf EFI						
	LATTYgraf EFA						
	LATTYgraf HPML NUC-S			17-0404			
	LATTYgraf HPML NUC-D			17-0405			
	LATTYgraf Reflex NUC			17-0185			
EPDM	LATTYgraf EHT NUC			17-0106			
	LATTYgraf BA NUC			17-0186			
	LATTY-E 48Z11 LY 1700			17-0389			
SERVICE PRODUCTS	LATTYflon Uniseal						
	LATTYflon Multiseal						



Industrial sealing designer



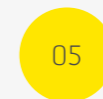
	LATTYgold 32R	LATTYgold 32	LATTYgold 92
<b>Composition</b>	- Synthetic fibres bonded with a mixture of NBR type elastomers - Double-sided anti-adhesive treatment (PTFE film)	- Synthetic fibres bonded with a mixture of NBR-SBR elastomers - Double-sided anti-adhesive treatment (PTFE film)	- Mineral fibres reinforced with aramid fibres bonded with a mixture of NBR elastomers - Double-sided anti-adhesive treatment (PTFE film)
<b>Areas of application *</b>	All industries, water, assembly on standard fluids (water, oil, air, gas, fuel)	All industries, water, assembly on standard fluids (water, oil, air, gas, fuel)	All industries on non or slightly aggressive fluids (water, hydrocarbons, oils, gases, refrigerants, weak acids and bases, low pressure steam)
<b>Observations</b>	- Suitable for basic conditions of use - Economical static sealing solution - Flexible quality - Easy to cut - Double-sided anti-adhesive treatment (PTFE film) to limit sticking	- Suitable for basic conditions of use - Economical static sealing solution - Wider range of applications - Flexible quality - Easy to cut - Double-sided anti-adhesive treatment (PTFE film) to limit sticking	- Very good behaviour under mechanical, thermal and chemical stresses - Exceptional value for money - Flexible quality - Easy to cut - Double-sided anti-adhesive treatment (PTFE film) to limit sticking
<b>Approvals, standards, directives</b>	-	-	Food industry: EC 1935/2004 Drinking water: KTW, WRAS BS 6920-1:2000 Gas: DVGW DIN 3535-6 Oxygen: BAM Energy: PMUC 17-0053 Fugitive emissions: TUV - Ta Luft VDI 2440
<b>Temperature in °C min/max *</b>	-50 °C to 180 °C	-196 °C to 300 °C	-200 °C to 440 °C
<b>Pressure in bar min/max *</b>	0 to 40 bar	0 to 60 bar	0 to 100 bar
<b>Density in g/cm<sup>3</sup></b> <small>Test carried out under DIN 28090-2 and/or NFT 48-102</small>	1,8 g/cm <sup>3</sup>	1,85 g/cm <sup>3</sup>	1,7 g/cm <sup>3</sup>
<b>Clamping coefficient «m»</b> (for thickness 2)	Liquid: coeff 2 Gas: coeff 3	Liquid: coeff 2 Gas: coeff 3	Liquid: coeff 2 Gas: coeff 3
<b>Minimum seating pressure «y» in N/mm<sup>2</sup> **</b>	20 Mpa	20 Mpa	20 Mpa
<b>Minimum tensile strength in N/mm<sup>2</sup></b> <small>Test performed under ASTM F36 J and/or NFT 48-103 **</small>	8 N/mm <sup>2</sup>	8 N/mm <sup>2</sup>	10 N/mm <sup>2</sup>
<b>Ignition loss in %</b> <small>Test carried out under DIN 52911 and/or NFT 48-104</small>	-	22 %	23 %
<b>Residual load relaxation in N/mm<sup>2</sup></b> <small>Mohr test according to DIN 52913</small>	20 N/mm <sup>2</sup> at 175 °C	-	34 N/mm <sup>2</sup> at 300 °C
<b>Compressibility in % of initial thickness</b> <small>Test performed under ASTM F36 J</small>	9 %	7 - 13 %	6 - 12 %
<b>Elastic recovery in % of crushing</b> <small>Test performed under DIN 3535-6 and/or ASTM F 36 J</small>	60 %	≥ 50%	≥ 55 %
<b>Elastic limit in N/mm<sup>2</sup>:</b> - at 20 °C - at 200 °C	-	-	150N/mm <sup>2</sup> 50 N/mm <sup>2</sup>
<b>Gas tightness test carried out under:</b> - DIN 3535/6 - DIN 28090-2	max 0,1 mg / (s x m)	-	< 1 cm <sup>3</sup> / min < 0,1 mg / (s x m)
<b>Chlorine dosage</b>	-	-	< 100 ppm
<b>Standard formats (Sheet)</b>	1,5x1,5m	1x1,5m / 1,5x 2m	1x1,5m / 1,5x1,5m / 1,5x 2m
<b>Standard thicknesses</b>	1,5 mm, 2 mm, 3 mm, 4 mm	1 mm, 1,5 mm, 2 mm, 3 mm	0,5 mm, 0,8 mm, 1 mm, 1,5 mm, 2 mm, 3 mm, 4 mm

The maximum temperature, pressure and speed parameters indicated in this document cannot be combined in any way.



	LATTYgold 92 G2F	LATTYgold 92S	LATTYcarb 96	LATTYcarb 96 G2F	LATTYcarb 96S
<b>Composition</b>	- Mineral fibres reinforced with aramid fibres bonded with a mixture of NBR elastomers - Double-sided anti-adhesive treatment (specific graphiting)	- Mineral fibres reinforced with aramid fibres bonded with NBR elastomers - Joint reinforced with an internal metal mesh - Double-sided anti-adhesive treatment (specific graphiting)	- Carbon fibres reinforced with aramid fibres bonded with a mixture of NBR elastomers - Double-sided anti-adhesive treatment (PTFE film)	- Carbon fibres reinforced with aramid fibres bonded with a mixture of NBR elastomers - Double-sided anti-adhesive treatment (specific graphiting)	- Carbon fibres reinforced with aramid fibres bonded with a mixture of NBR elastomers - Joint reinforced with an internal metal mesh - Double-sided anti-adhesive treatment (specific graphiting)
<b>Areas of application *</b>	All industries on non or slightly aggressive fluids (water, hydrocarbons, oils, gases, refrigerants, weak acids and bases, low pressure steam)	All industries on non or slightly aggressive fluids (water, hydrocarbons, oils, gases, refrigerants, weak acids and bases, low pressure steam)	Versatility of use in all industries on non or slightly aggressive fluids (water, hydrocarbons, oils, gases, refrigerants, weak acids and bases, low pressure steam)	Versatility of use in all industries on non or slightly aggressive fluids (water, hydrocarbons, oils, gases, refrigerants, weak acids and bases, low pressure steam)	Versatility of use in all industries on non or slightly aggressive fluids (water, hydrocarbons, oils, gases, refrigerants, weak acids and bases, low pressure steam)
<b>Observations</b>	- Very good behaviour under mechanical, thermal and chemical stresses - Exceptional value for money - Flexible quality - Easy to cut - Double-sided anti-adhesive graphite treatment to limit the risks of corrosion and sticking - Easy to assemble and disassemble	- Very good behaviour under mechanical stresses thanks to the metal reinforcement - Rigid quality - Very good resistance on large joints thanks to the metal reinforcement - Double-sided anti-adhesive graphite treatment to limit the risks of corrosion and sticking - Easy to assemble and disassemble	- Very good behaviour under thermal stress thanks to the presence of carbon fibres and under mechanical stress thanks to the presence of aramid fibres - Flexible quality - Easy to cut - Double-sided anti-adhesive treatment (PTFE film) to limit sticking	- Very good behaviour under thermal stress thanks to the presence of carbon fibres and under mechanical stress thanks to the presence of aramid fibres - Flexible quality - Easy to cut - Double-sided anti-adhesive graphite treatment to limit the risks of flange corrosion and sticking - Easy to assemble and disassemble	- Very good behaviour under thermal stress thanks to the presence of carbon fibres and under mechanical stress thanks to the presence of aramid fibres and the metal reinforcement - Rigid quality - Very good resistance on large joints thanks to the metal reinforcement - Double-sided anti-adhesive graphite treatment to limit the risks of corrosion and sticking - Easy to assemble and disassemble
<b>Approvals, standards, directives</b>	Energy: PMUC 17-0235	Energy: PMUC 17-0237	Drinking water: WRAS Oxygen: BAM Fugitive emissions: TUV	-	-
<b>Temperature in °C min/max *</b>	-200 °C to 440 °C	-200 °C to 440 °C	0 to 450 °C	0 to 450 °C	0 to 450 °C
<b>Pressure in bar min/max *</b>	0 to 100 bar	0 to 130 bar	0 to 130 bar	0 to 130 bar	0 to 150 bar
<b>Density in g/cm<sup>3</sup></b>	1,7 g/cm <sup>3</sup>	2 g/cm <sup>3</sup>	1,6 g/cm <sup>3</sup>	1,7 g/cm <sup>3</sup>	1,8 g/cm <sup>3</sup>
<b>Clamping coefficient «m»</b> (for thickness 2)	Liquid: coeff 2 Gas: coeff 3	Liquid: coeff 2 Gas: coeff 3	Liquid: coeff 2 Gas: coeff 3	Liquid: coeff 2 Gas: coeff 3	Liquid: coeff 2 Gas: coeff 3
<b>Minimum seating pressure «y» in N/mm<sup>2</sup> **</b>	20 Mpa	30 Mpa	20 Mpa	20 Mpa	30 Mpa
<b>Minimum tensile strength in N/mm<sup>2</sup></b>	10 N/mm <sup>2</sup>	13 N/mm <sup>2</sup>	10 N/mm <sup>2</sup>	10 N/mm <sup>2</sup>	14 N/mm <sup>2</sup>
<b>Ignition loss in %</b>	< 23%	-	< 24%	< 24%	-
<b>Residual load relaxation in N/mm<sup>2</sup></b>	34 N/mm <sup>2</sup>	36 N/mm <sup>2</sup>	35 N/mm <sup>2</sup>	35 N/mm <sup>2</sup>	35 N/mm <sup>2</sup>
<b>Compressibility in % of initial thickness</b>	6 - 12 %	6 - 12 %	7 - 13 %	7 - 13 %	7 - 15 %
<b>Elastic recovery in % of crushing</b>	≥ 55 %	≥ 55%	≥ 55%	≥ 55%	≥ 55%
<b>Elastic limit in N/mm<sup>2</sup>:</b> - at 20 °C - at 200 °C	150N/mm <sup>2</sup> 50 N/mm <sup>2</sup>	150N/mm <sup>2</sup> 50 N/mm <sup>2</sup>	150N/mm <sup>2</sup> 50 N/mm <sup>2</sup>	150N/mm <sup>2</sup> 50 N/mm <sup>2</sup>	150N/mm <sup>2</sup> 50 N/mm <sup>2</sup>
<b>Gas tightness test carried out under:</b> - DIN 3535/6 - DIN 28090-2	< 1 cm <sup>3</sup> / min < 0,1 mg / (s x m)	< 2 cm <sup>3</sup> / min	< 0,5 cm <sup>3</sup> /min	< 0,5 cm <sup>3</sup> /min	< 2 cm <sup>3</sup> /min
<b>Chlorine dosage</b>	< 100 ppm	< 100 ppm	< 100 ppm	< 100 ppm	< 100 ppm
<b>Standard formats (Sheet)</b>	1x1,5m / 1,5x 2m	1x1,5m / 1,5x 2m	1x1,5m / 1,5x1,5m / 1,5x 2m	1x1,5m / 1,5x 2m	1x1,5m / 1,5x 2m
<b>Standard thicknesses</b>	1 mm, 1,5 mm, 2 mm, 3 mm	1 mm, 1,5 mm, 2 mm, 3 mm	0,5 mm, 0,8 mm, 1 mm, 1,5 mm, 2 mm, 3 mm	1 mm, 1,5 mm, 2 mm, 3 mm	1 mm, 1,5 mm, 2 mm, 3 mm

\* subject to fluid/pressure/temperature compatibility  
\*\* for a thickness of 2 mm



Industrial sealing designer



	LATTYgold 5 ACID	LATTYflon 84 L	LATTYflon 94 L
<b>Composition</b>	- Selected synthetic fibres bonded with a mixture of resins and elastomers resistant to aggressive products	- Charged modified PTFE with isotropic structure thanks to its multidirectional fibres	- Modified PTFE with isotropic structure thanks to its multidirectional fibres and charged with amorphous silica
<b>Areas of application *</b>	All industries using moderately aggressive fluids such as mineral acids and diluted bases	All industries using acidic fluids, solvents, hydrocarbons, chlorine, water and steam. With the exception of hydrofluoric acid and molten alkali metals.	All industries using acidic fluids, solvents, hydrocarbons, chlorine, water and steam. With the exception of hydrofluoric acid and molten alkali metals.
<b>Observations</b>	- Suitable for moderately aggressive chemical conditions - Economical static sealing solution - Flexible quality - Easy to cut	- Superior chemical resistance - Good creep resistance - Good compressibility - Waterproof and non-flammable seal - Flexible quality - Easy to cut	- Suitable for all chemical applications - Multidirectional fibres for excellent creep resistance - High mechanical strength - Reduced permeability and flexibility - Easy to cut and process - High elastic recovery and low relaxation - High sealing performance
<b>Approvals, standards, directives</b>	-	Food industry: FDA	Food industry: FDA, EC 1935/2004 Oxygen: BAM Energy: PMUC
<b>pH min/max</b>	0 - 14	0 - 14	0 - 14
<b>Temperature in °C min/max *</b>	0°C to 200°C	-200°C to 260°C	-210°C to 260°C
<b>Pressure in bar min/max *</b>	0 to 60 bar	0 to 85 bar	0 to 80 bar
<b>Density in g/cm<sup>3</sup></b> <small>Test carried out under ASTM D7962 and/or DIN 28090-2 and/or NFT 48-102</small>	1,75 g/cm <sup>3</sup>	2,1 g/cm <sup>3</sup>	2,2 g/cm <sup>3</sup>
<b>Minimum tensile strength in N/mm<sup>2</sup></b> <small>Test performed under DIN 28092 and/or ASTM F36 J and/or NFT 48-103 **</small>	10 N/mm <sup>2</sup>	-	-
<b>Residual load relaxation in N/mm<sup>2</sup></b> <small>Mohr test according to DIN 52913</small>	32 N/mm <sup>2</sup>	at 150°C - 4%	≥ 14 N/mm <sup>2</sup>
<b>Compressibility in % of initial thickness</b> <small>Test performed under ASTM F36 J</small>	6 - 12 %	-	8 to 12%
<b>Elastic recovery of crushing</b> <small>Test performed under DIN 3535-6 and/or ASTM F36 J</small>	≥ 50%	0,07 mm	> 45%
<b>Elastic limit in N/mm<sup>2</sup> :</b> - at 20°C - at 200°C	150N/mm <sup>2</sup> 50 N/mm <sup>2</sup>	-	-
<b>Standard formats (Sheet)</b>	1x 1,5m /1,5x 2m	1x 1,5m	1x 1,5m
<b>Standard thicknesses</b>	1mm, 1,5 mm, 2 mm, 3 mm	1,5 mm, 2 mm, 3 mm	0,5 mm, 1mm, 1,5 mm, 2 mm, 3 mm

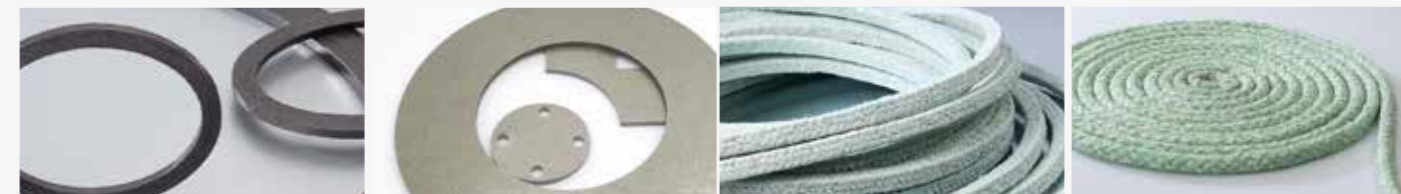


LATTYflon 95	LATTYflon 97	LATTYflon Multiseal	LATTYflon Uniseal
- modified «expanded» e-PTFE with isotropic structure thanks to its multidirectional fibres	Overmoulded PTFE gasket, reinforced with a perforated stainless steel reinforcement ISO1.4306.	Self-adhesive e-PTFE «expanded» tape gasket for flat sealing with uni-directional microfibre structure	Self-adhesive ePTFE «expanded» tape gasket for flat sealing with a multidirectional microfibre structure
All industries using acidic fluids, solvents, hydrocarbons, chlorine, water and steam. With the exception of hydrofluoric acid and molten alkali metals.	All industries using acidic fluids, solvents, hydrocarbons, chlorine, water and steam. With the exception of hydrofluoric acid and molten alkali metals.	All industries using acidic fluids, solvents, hydrocarbons, chlorine, water and steam. With the exception of hydrofluoric acid and molten alkali metals.	All industries using acidic fluids, solvents, hydrocarbons, chlorine, water and steam. With the exception of hydrofluoric acid and molten alkali metals.
- High malleability ensuring sealing of even damaged flanges - Very low relaxation under stress, ensuring reliable assembly - Multidirectional fibres for excellent creep resistance - The low clamping force required ensures a quality particularly adapted to fragile flanges (enamelled or plastic)	- Excellent cold creep resistance thanks to the special design of the perforated reinforcement	- High malleability ensuring sealing of even damaged flanges - Very low relaxation under stress, ensuring reliable assembly - Multidirectional fibres for excellent creep resistance - The low clamping force required ensures a quality particularly adapted to fragile flanges (enamelled or plastic)	- High malleability ensuring sealing of even damaged flanges - Very low relaxation under stress, ensuring reliable assembly - Multidirectional fibres for excellent creep resistance - The low clamping force required ensures a quality particularly adapted to fragile flanges (enamelled or plastic)
Food industry: FDA, CE 1935/2004 Medical: USP class VI	Food industry: FDA Fugitive emissions: TUV	Food industry: FDA	Food industry: FDA Oxygen: BAM
0 - 14	0 - 14	0 - 14	0 - 14
-240°C to 270°C	-100°C to 250°C	-240°C to 260°C	-240°C to 290°C
0 to 210 bar	0 to 100 bar	0 to 200 bar	0 to 200 bar
-	2,16 g/cm <sup>3</sup>	-	-
-	32 N/mm <sup>2</sup>	-	-
-	-	-	-
-	-	-	-
-	-	-	-
1x 1,5m	DN 15 to 350 and PN 10 to 40	-	-
1,5 mm, 2 mm, 3 mm, 6mm		Thickness from 1,5 to 9 mm	Thickness from 1,5 to 7mm

Industrial sealing designer



	LATTYgraf EFI	LATTYgraf EFA	LATTYgraf HPML
<b>Composition</b>	- Expanded graphite, purity higher than 98%, glued and laminated on a smooth stainless steel sheet ISO1.4404 with thickness 50µ	- 98% pure expanded graphite, laminated and stapled on a stainless steel pinned sheet. Composite structure, without addition of binder.	- Expanded multilayer graphite of very high purity (99%), reinforced with 316L stainless steel strips and impregnated with an oxidation inhibitor
<b>Areas of application *</b>	- All industries on applications with high temperatures and/or pressures - Compatible with all fluids, except strong oxidants.	- All industries on applications with high temperatures and/or pressures - Compatible with all fluids, except strong oxidants.	- All industries on applications with high temperatures and/or pressures - Compatible with all fluids (water, steam, gas, etc.) and high pressure and high or very low temperature applications
<b>Observations</b>	- Good performance when pressures and temperatures are combined - Low tightening - Easy cutting of seals on site and quick installation in inaccessible areas where seal flexibility is required.	- High performance when pressure and temperature are combined - Low tightening - Low relaxation - Stability under thermal shock - Excellent chemical resistance (except strong oxidants)	- Very high performance when pressure and temperature are combined - Oxidation inhibitor reduces weight loss to improve pressure resistance and clamping capacity - Low tightening - Low relaxation - High sealing performance - Very poor flange sticking
<b>Approvals, standards, directives</b>	Gas: DVGW	Drinking water: WRAS Oxygen : BAM	Gas: DVGW Oxygen: Oxygen and Liquid Service Fire test: API 6FB
<b>pH min/max</b>	0 - 14	0 - 14	0 - 14
<b>Temperature in °C min/max *</b>	-200°C to 600°C	-200°C to 650°C	-210°C to 650°C
<b>Pressure in bar min/max *</b>	0 to 650 bar	0 to 650 bar	0 to 650 bar
<b>Density in g/cm<sup>3</sup></b> <small>Test carried out under ASTM D7962 and/or DIN 28090-2 and/or NFT 48-102</small>	1 g/cm <sup>3</sup>	1.5 g/cm <sup>3</sup>	1.1 g/cm <sup>3</sup>
<b>Clamping coefficient «m»**</b>	Liquid: coeff 2 Gas: coeff 3	Liquid: coeff 2 Gas: coeff 3	Coeff 3,6
<b>Minimum seating pressure «y»**</b>	30 Mpa	30 Mpa	44 Mpa
<b>Residual load relaxation in N/mm<sup>2</sup></b> <small>Mohr test according to DIN 52913</small>	≥ 45 N/mm <sup>2</sup>	≥ 48 N/mm <sup>2</sup>	≥ 49 N/mm <sup>2</sup>
<b>Compressibility in % of initial thickness**</b> <small>Test performed under ASTM F 36J</small>	30 to 50 %	30 to 40 %	35 %
<b>Elastic recovery of crushing</b> <small>Test performed under DIN 3535-6 and/or ASTM F 36J</small>	10 to 15 %	15 to 20 %	> 17%
<b>Standard formats (Sheet)</b>	1x1 m	1x1m, 1,5x 1,5m	1x1m, 1,5x 1,5m
<b>Standard thicknesses</b>	1m, 1,5 mm, 2 mm, 3 mm	1,5 mm, 2 mm, 3 mm	1,5 mm, 2 mm, 3 mm



LATTYpack 960	LATTYtex MHT	Héphaistos 2000 T	Héphaistos 2000 G
- Moulded graphite, made from a blend of synthetic fibres sheathed in nickel-chromium reinforced expanded graphite wire.	- Phlogopite paper impregnated and bonded with a high thermal resistance silicone resin.	- High-temperature treated glass fibre reinforced with nickel-chromium wire, impregnated with a mica-based mixture	Flexible braided sheath, made of high temperature treated fibreglass wire, reinforced with nickel-chromium alloy filaments, around a composite roving of high temperature carded fibreglass and a natural fibre
All industries, industrial boilers, paper mills or manhole seals.	All industries on very high temperature applications	- High temperature applications, various insulations.	High temperature applications, insulation, expansion joints.
- Available as circular or elliptical seals - Tolerates thermal cycling - High elastic recovery	- Very high performance at high temperatures	- For oven doors, boilers, burners, etc. - Various insulations	Excellent thermal insulation properties, high resistance to thermal shock - Good sound insulation properties
-	-	-	-
-	-	2-13	2-13
0 to 350°C	1000°C	0 to 850°C	0 to 850°C
0 to 80 bar	5 bar	-	-
-	-	0.7 to 1 g/cm <sup>3</sup>	0.30 to 0.50 g/cm <sup>3</sup>
-	2,5	-	-
-	30 Mpa	-	-
-	40 N/mm <sup>2</sup>	-	-
-	20%	-	-
-	40%	-	-
Different sizes available	1x1 m	Ø 6 to 20mm	Ø 5 to 50mm
-	1,5 mm, 3 mm	-	-



*Industrial sealing designer*



### LATTYGRAF HPML NUC

**Multi-layer graphite sheets and cut gaskets, high pressure, high temperature.**

Natural expanded graphite-based seal sheet, carbon content > 99%. Includes multiple stainless steel inserts and is impregnated with an oxidation inhibitor.

The insertion of stainless steel sheets improves pressure resistance, and facilitates handling and seal cutting. The integration of smooth sheets gives the joint flexibility and makes it easy to cut.

### LATTYGRAF REFLEX NUC

**Graphite/metal seal for high temperature and high pressure.**

Metal gasket, consisting of an expanded graphite ring, pressed between two stainless steel rings, used as a crush limiter, which protects the gasket by withstanding all mechanical stresses caused by piping, thermal shocks, etc.

The LATTYgraf REFLEX gasket remains sealed under extreme and variable pressures and temperatures (-200 to +600 °C / 500 bar max.).

### LATTYGRAF EHT NUC

**High-purity expanded graphite die-cast rings**

LATTYgraf EHT NUC rings are made of 99.5% pure expanded graphite, without binder. Their temperature resistance can reach 600 °C. These rings have a very good chemical inertia and a very high thermal conductivity. High self-lubricating power, good chemical inertia and high thermal conductivity. Very good resistance in oxidising environments and has an oxidation inhibitor giving it a weight loss less than 4%/h at 670 °C.

### LATTYGRAF BA NUC

**Expanded graphite autoclave rings with or without cups**

Rings made from high-purity expanded graphite, without binder, with or without stainless steel anti-extrusion cups. They can contain a corrosion inhibitor that guarantees the integrity of the materials and lasting protection for your equipment. Accept surface defects and respect valve components for optimised maintenance.

### LATTY- E 48Z11 LY 1700

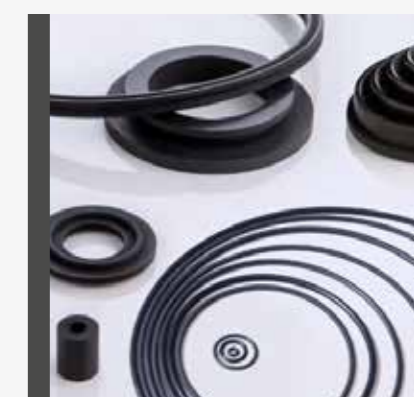
**EPDM-based elastomer seal qualified up to 1,700 kGy**

EPDM seal developed for nuclear applications and qualified for radiosensitive environments up to 1,700 kGy. Seal with halogen and sulphur content values below 200 ppm. These seals are suitable for dynamic or static sealing. For pumps, industrial valves, bolted assemblies, compressors, motors, instrumentation, etc.



### PMUC

A long-standing partner of major energy producers, GROUPE LATTY has within its range, PMUC approved products such as LATTYgold 92, LATTYflon 94, LATTYgold 925 and LATTYgold 92 G2F sheet gaskets.



**MANUAL  
CUTTING  
MACHINE**

**Manual machine for cutting  
circular gasket**

Manual gasket cutting machines allow precise cutting of all materials such as leather, rubber, plastics, felt, vulcanised fibre or PTFE up to a thickness of 8 mm. Its design allows quick and easy cutting of gaskets from 80 to 1,250 mm diameter without marking.



**ELECTRIC  
CUTTING  
MACHINE**

**Electric machine for cutting  
circular gaskets**

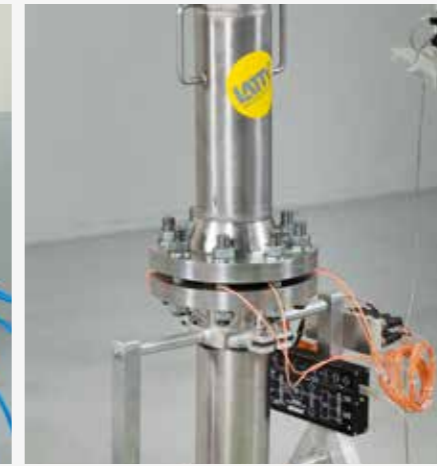
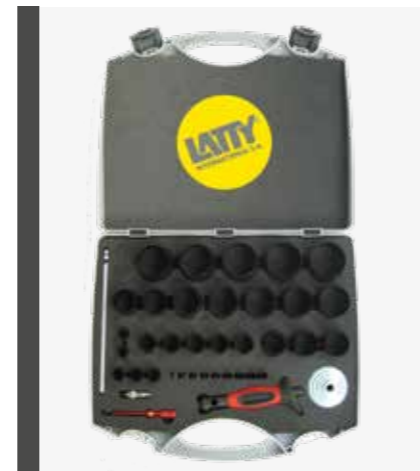
The electric gasket cutting machines have the same specifications as the manual versions. They make it easier to cut joints with the assistance of the motor. In addition, the electric version has a safety device that prevents accidental starting when connected.



**CUTTING  
TOOL  
KIT**

**Circular gasket cutting tool kit**

The kit includes a die holder and 25 dies for easy cutting of circular gaskets from 3 to 50 mm (graduated every 2 mm from 4 mm). The combination of the large number of dies covers a very wide range of joint diameters.



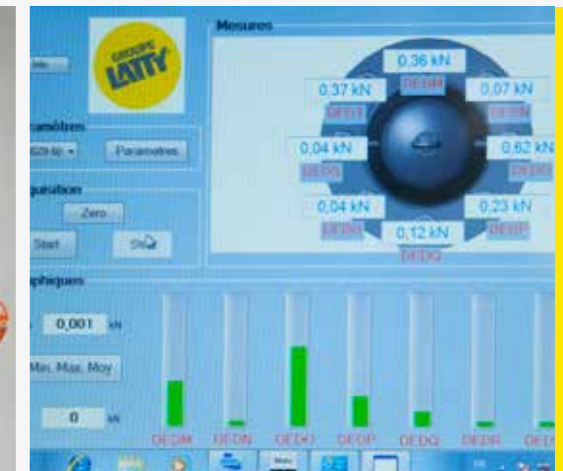
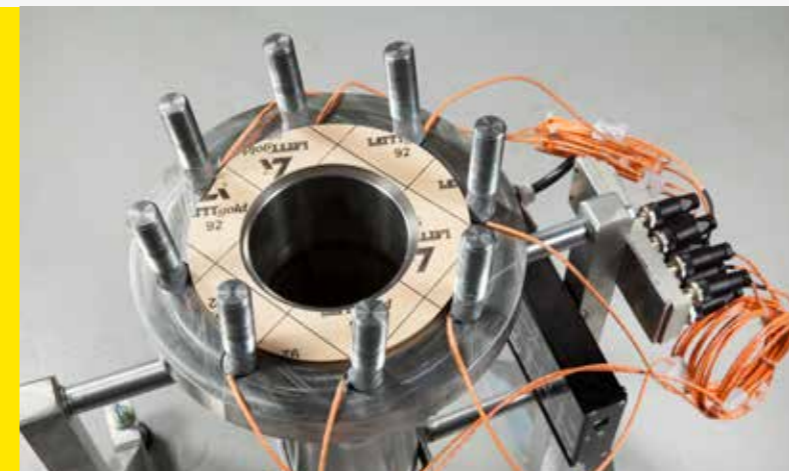
**TECHNICAL TRAINING**

**FOCUSED ON SAFETY AND PROTECTION  
OF THE ENVIRONMENT**

**Every year, GROUPE LATTY organises multilingual training courses for bolted assemblies**

Our training courses are dedicated to the selection of sealing solutions for bolted joints. They are geared towards the implementation of good assembly practices, to ensure the safety of your personnel. The reliability of your equipment and protection of the environment are also at the heart of the training courses with the selection of the most suitable seals.

Our training has a theory component and a practical component. They teach about the design and specific technical details of sealing systems. The training aims to cover the different leakage phenomena and the establishment of specifications. Recommending and selecting a sealing system according to the service conditions, and acquiring good practices for the assembly and maintenance of sealing on our instrumented benches are the main objectives.



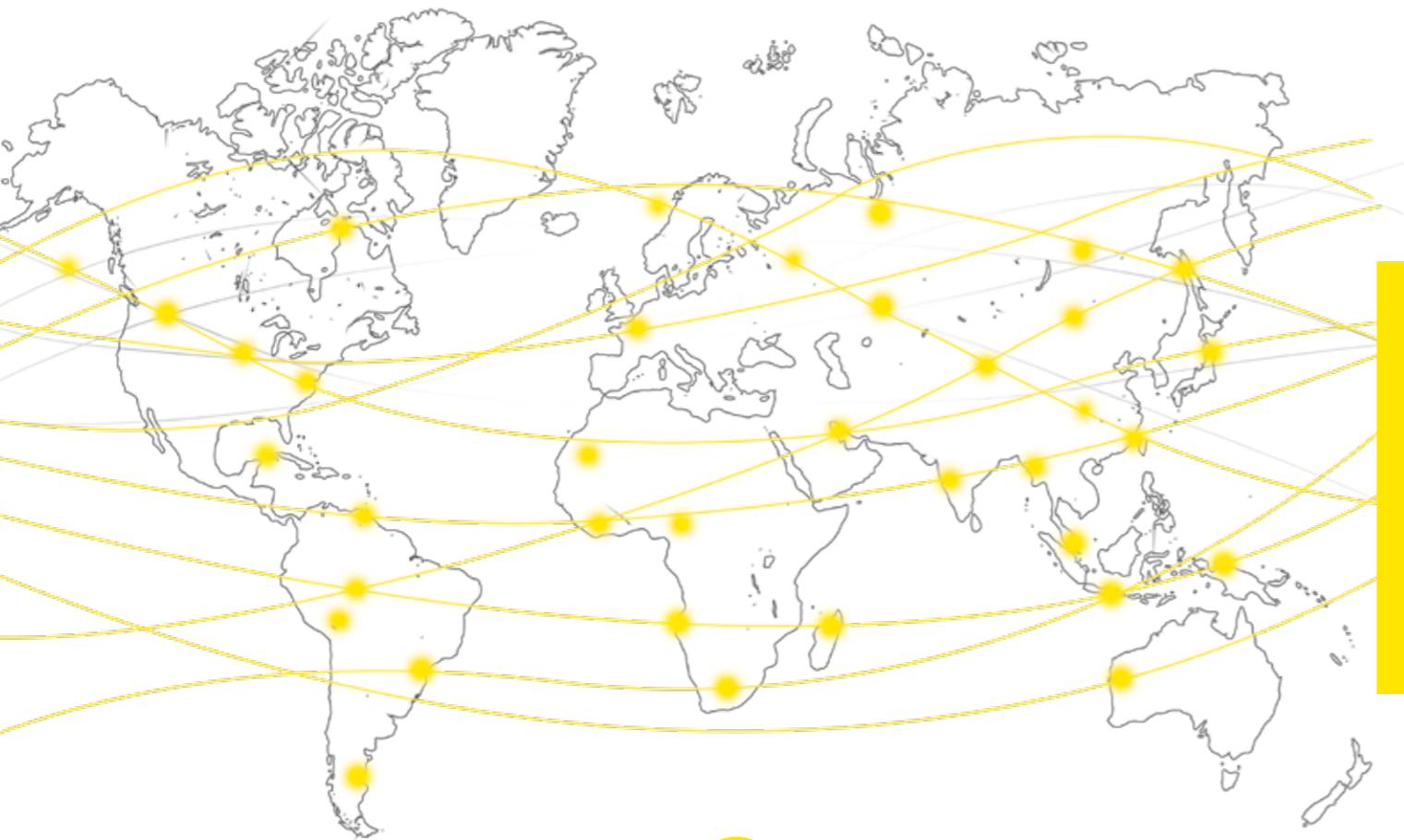




## THE STRENGTH OF A NETWORK OF GASKET CUTTERS

**GROUPE LATTY** relies on a dense and competent network for marketing and cutting of gaskets

France and abroad, GROUPE LATTY is able to offer its customers a gasket cutting service equal to its products. GROUPE LATTY's partners are specialists in their field. They market and cut gaskets of all shapes and materials.



## CUTTING EXPERTISE

**Each cutter has production tools such as cutting tables and manual or automatic presses**

In addition to this equipment, they also have high-performance digital tools such as waterjet cutting machines or cutter-type tables.

Thanks to the quality of GROUPE LATTY's gasket sheets, key clients place their trust in these cutters in industrial sectors such as food processing, chemicals, energy production, petrochemicals, aviation and automotive.

### THEIR STRENGTHS

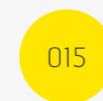
- Agility
- Quality of work
- Quality of delivered products
- Local service
- Traceability
- Prototypes, small and large production runs

### CONTACT US

**Please get in touch to find your nearest cutter.**



Through its network of cutters, GROUPE LATTY offers a range of materials such as different types of rubber, pure PTFE, tear-resistant paper, silicone, etc.



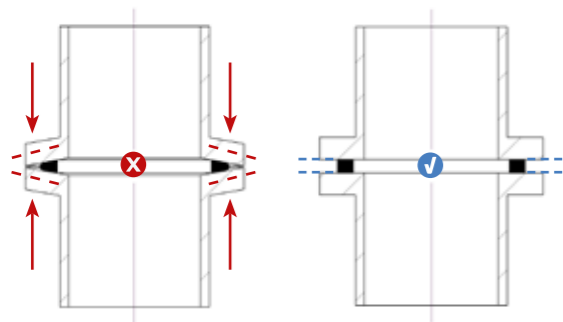


## RECOMMENDATION FOR GASKET ASSEMBLY

The best roughness for a surface to be sealed is between 3.2 and 6.3  $\mu\text{m Ra}$ .

### Bolt tightening

After determining the minimum and maximum stresses and the resulting torque, make sure that the flange can withstand the clamping forces without deforming.



Incorrect tightening (deformation)

Correct tightening

The tightening torque must be calculated according to the indications given by the stud manufacturers, according to the standards in force.

### Tightening procedure for improving efficiency:

- Use a torque wrench
- Lubricate the studs
- Tighten the bolts in a cross pattern, as shown in the figure below, after first doing them up by hand
- Tightening should be done in several stages: the first pass should be done with a torque equal to one third of the total torque
- After reaching the desired torque, make a final pass in the same tightening order.

### Retightening of joints

If joints need retightening, this should always be done cold.



### Installing a new seal

- Never refit a used seal.
- Check for grease or glue on the new seal.
- Clean and lubricate the rods, unless otherwise indicated or specified (BAM environment type).
- Clean the flange seats (brushing or polishing in the circumferential direction).
- Check that there are no remaining pieces of gasket, deposits, radial scratches or cracks on the gasket surface.
- Then check that the flanges are parallel and concentric.

## GASKET RECOMMENDATIONS SOME ESSENTIAL STEPS

In order to determine the most suitable seal, it is necessary to gather some information.

SOME INFORMATION IS ESSENTIAL, FOR INSTANCE TEMPERATURE, THE ASSOCIATED PRESSURES AND THE TYPE OF FLUID.

The dimensions of the flange (type, standard, materials) are necessary for calculating the torque as well as the operating or tightening conditions.

Optional information such as operating conditions, number of tie rods, quality of studs, etc. will allow us to make the best gasket recommendations. GROUPE LATTY has developed in-house software to respond quickly to your requests.

**FICHE DE SERRAGE - CLAMPING PROFILE**  
Pour condition de calcul - For condition calculation

**JOINT PRECONISÉ**  
SUGGESTED GASKET  
Nom/Name: LATTYgraf E2  
Note: Coef lub: 0,2

**DIMENSIONS DU JOINT**  
GASKET'S DIMENSIONS (mm)  
Ø int: 0 mm  
Ø ext: 0,0 mm  
Épaisseur / Thickness: 0

**PARAMÈTRES**  
PARAMETERS  
Pressions / Pressure: 0 bar  
Temperature: 0 °C  
Fluide / Fluid: NC

**DIMENSION VISSERIE**  
BOLTS'S DIMENSIONS  
Ø ext: 0 mm  
Pas / Threads: 0  
Nombre de vis / Bolts: 0  
Qualité de l'acier / Steel: classe 4,6 mini ou A1-50

**COUPLE DE SERRAGE / TORQUE (\*)**  
Couple à appliquer / Torque to apply (\*\*)  
1ère passe / 1st step: 0,00 N.m  
2ème passe / 2nd step: 0,00 N.m  
3ème passe / 3rd step: 0,00 N.m  
4ème passe / 4th step: 0,00 N.m

\* Couple calculé avec une incertitude de serrage de 1,2 et un coefficient de frottement de 0,15  
\*\* Calculated torque with a clamping uncertainty of 1.2 and a coefficient of friction of 0.15

\*\* Les 3 premières passes se font suivant l'ordre de serrage indiqué. La dernière se fait dans le sens des aiguilles d'une montre.  
\*\* The first 3 indicated passes are following the tightening sequence. The last is in the direction of clockwise.

LATTY international s'engage sur la qualité de ses produits en regard des paramètres de service donnés, mais ne maintient ni le serrage, ne peut être tenu responsable en cas de défaillance du produit.  
LATTY international is committed to the quality of our products based on the given operating parameters, but not overpowering mounting or clamping, can not be held liable for any product failure.

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REPLIR UNIQUEMENT LES CASES ORANGE

Paramètres de fonctionnement

Pression de design Pd (bar)

Température fluide Tw (°C)

Joint		Bolts	
diamètre intérieur : Diamètre de contact (mm): diamètre de découpe (mm):	diamètre extérieur : Dc (mm) diamètre de contact (mm): diamètre de découpe (mm):	City of Bolt n De (mm)	2
Epaisseur du joint (mm):		pas p (mm)	
Q (MPa):		Friction Coefficient with lubrication $\mu$ : 0,15	
Option pleins trous : diamètre des trous		incertitude de serrage : 1,20	

assise mini (MPa)	25	Inner diameter of nut D <sub>1</sub> =d-1,0825d (mm)	#VALEURI
Surface Area of Sealing Face S = A(0,1 - 0,2) (mm <sup>2</sup> )	0	d <sub>1</sub> = d - 0,8496p (mm)	#VALEURI
F <sub>1</sub> = Q x S (N)	0	d <sub>2</sub> = d - 1,2268p (mm)	#VALEURI
F <sub>2</sub> = F <sub>1</sub> x (4) x 0,2 (N)	0	Section Area of Bolt s = (A) x (mm <sup>2</sup> )	#VALEURI
(F <sub>1</sub> +F <sub>2</sub> ) x incertitude serrage (N)	0	mm (1/3)(D <sub>1</sub> <sup>2</sup> -D <sub>2</sub> <sup>2</sup> )/4 (mm)	#VALEURI
F <sub>3</sub> = F <sub>2</sub> /n (N)	#DIV/0!		

max boulon classe 8.8 640 MPa  
contrainte boulon calculée: #DIV/0!  
soit: #DIV/0!

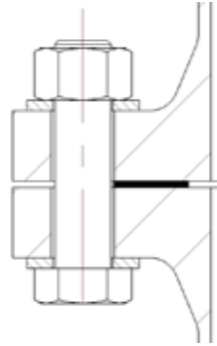
The information contained in this document is provided for information purposes only and is not in any way contractually binding on GROUPE LATTY.

## TECHNICAL TABLES

Industrial sealing designer

### IBC type gasket

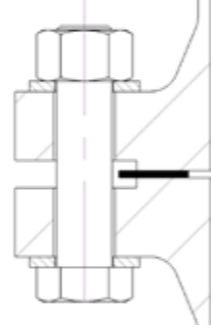
Flat flanges



IBC FLANGE TYPE A

### Raised-face IBC type gasket (registered)

Raised-face flanges



IBC FLANGE TYPE B

DN	Inside diameter of the seal (d)	Outside diameter of the seal (D)				
		PN2,5 and PN6	PN10	PN16	PN25	PN40
10	18	39		46		
15	22	44		51		
20	27	54		61		
25	34	64		71		
32	43	76		82		
40	49	86		92		
50	61	96		107		
60	72	106		117		
65	77	116		127		
80	89	132		142		
100	115	152		162		168
125	141	182		192		194
150	169	207		218		224
175	204*	239*		250*		256*
200	220	262		273	284	290
250	273	317	328	329	340	352
300	324	373	378	384	400	417
350	356	423	438	444	457	474
400	407	473	489	495	514	546
450	458	528	539	555	564	571
500	508	578	594	617	624	628

In accordance with NF EN 1514-1, for flanges PN 2.5-6-10-16-25-40, according to NF E 29-203 and/or NF EN 1092-1 or former standards (PN 64/100)

\* Dimensions according to former NF or DIN standards

\*\* Replaced but identical to PN63

\*\*\* Please note: PN100 is completely different from ISO PN100 (Class 600)

DN	NPS	Inside diameter of the seal (d)	Outside diameter of the seal (D)				
			"Class 150 (ISO PN 20*)"	"Class 300 (ISO PN 50*)"	"Class 400 (PN 68*)"	"Class 600 (ISO PN 100*)"	"Class 900 (ISO PN 150*)"
15	1/4	22	47		54		63
20	3/4	27	57		66		69
25	1	34	66		73		79
32	1 1/4	43	76		82		89
40	1 1/2	49	85		95		98
50	2	61	104		111		142
65	2 1/2	73	124		130		165
80	3	89	136		149		168
90	3 1/2	102***	162***	165***		162***	
100	4	115	174	181	178***	193	206
125	5	141	196	216	213***	241	247
150	6	169	222	251	248***	266	289
200	8	220	279	308	305***	320	358
250	10	273	339	362	359***	400	435
300	12	324	409	422	419***	457	498
350	14	356	450	485	483***	492	520
400	16	407	514	539	535***	565	574
450	18	458	549	597	595***	612	638
500	20	508	606	654	650***	682	698

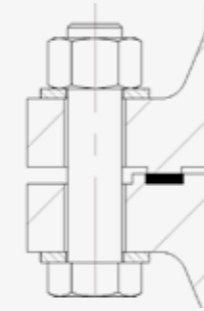
In accordance with NF EN 12560-1 and/or NF E 29 900-2, for class 150 to 900 flanges (ISO PN 20 to 150), according to NF E 29-203 and/or prEN 1759-1 or petroleum standards (ASME B16.5)

\* Former designations

\*\* Dimensions according to former standard NF E 29-900-2

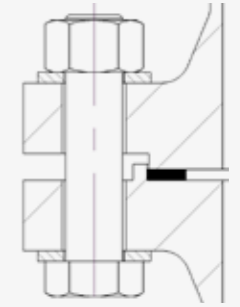
\*\*\* Dimensions not included in the standard

### Gasket for ED flange (double interlocking) or TG flange (tongue and groove)



FLANGE ED OR TG

### Gasket for ES flange (single interlocking) or ST flange (single tongue)



FLANGE ES OR ST

DN	Type ES (a)	Type ED (b)	D (mm) for ISO PN			
	d1 (mm)	d2 (mm)	10-16-25-40 Type ES & ED	50-100 Type ESL & EDL	20 Type ES 50 - 100 Type ESE	20 Type ED 50 - 100 Type EDE
10	18	24	-	34	-	-
15	22	29	25.5	39	35	35
20	27	36	33.5	50	43	43
25	34	43	38	57	51	47.5
32	43	51	47.5	65	63.5	57.5
40	49	61	54	75	73	63.5
50	61	73	73	87	92	82.5
65	77	95	85.5	109	105	95.5
80	89	106	108	120	127	117.5
100	115	129	132	149	157	144.5
125	141	155	160.5	175	186	173
150	169	183	190.5	203	216	203.5
200	220	239	238	259	270	254
250	273	292	286	312	324	305
300	324	343	343	363	381	362
350	356	395	374.5	421	413	394
400	407	447	425.5	473	470	448
450	458	497	489	523	533	511.5
500	508	549	533.5	575	584	559
600	610	649	641.5	675	692	667

(a) the d1 values do not apply to gaskets for ISO PN 20, ISO PN 50 and ISO PN 100 narrow single tongue flanges. For these gaskets, the customer must specify the diameter when ordering. This depends on the inside diameter of the tube.

(b) for the d2 values, take those in the left-hand column for ISO PN 0, ISO PN 16, ISO PN 25 and ISO PN 40 and those in the right-hand column for ISO PN 50 and ISO PN 100.



## OTHER TYPES OF FLANGES

There are different types of flanges with different faces.

On request, we can also supply these gaskets profiles.



GROUPE LATTY's service centres and subsidiaries are available worldwide  
to meet your requirements. List of locations on [www.latty.com](http://www.latty.com)

