



Spiral-Wound Gaskets

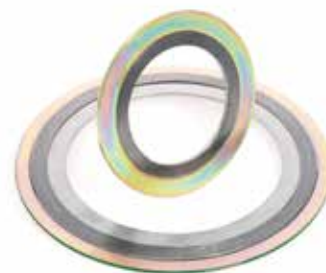
A solution to your static
sealing problems

1) TECHNETICS GROUP'S RANGE OF SPIRAL-WOUND GASKETS

1.1) INTRODUCTION

The VITAFLEX® and FLEXSEAL® spiral-wound gasket concept can solve a large variety of the most difficult sealing problems. Although its basic fundamental principle has changed little since its creation, the production techniques and materials that have been developed over the last 40 years have enabled our gaskets to be adapted to a much broader range of applications.

The winding, or the active part of the gasket, consists of an alternating combination of a formed metal strip and soft filler material wound together. The soft filler material is selected to suit the medium to be sealed (pressure, temperature, fluid). Several consecutive turns of the metal strip are welded together at the beginning and end of the winding in order to maintain the tension.



GASKET	CHARACTERISTICS	APPLICATIONS
VITAFLEX®	High-end gasket - Graphite (high purity, 99.8%) or PTFE "TOTAL" approved The custom technical gasket All materials - dichromate plating/zinc plating	Flanges Specific applications High temperature Low leakage
VITAFLEX® BPA	High-end, low-stress gasket - Graphite (high purity, 99.8%) "TOTAL" approved The custom technical gasket All materials - dichromate plating/zinc plating	Flanges Flat replacement gasket Specific applications Low leakage
VITAFLEX® load certified	Controlled-stress gasket Can be used in metal-metal-type grooves	High pressure Valves / piping
VITAFLEX® special	Custom gasket adapted to special problems (different shapes and materials)	Corrosive fluids High temperature Specific applications
(*) FLEXSEAL®	Standard industrial gasket Stainless steel/graphite, 98%/ADX - Stainless steel/PTFE/ADX	Flanges Exhaust gases










(*) FLEXSEAL® is a registered trademark of Garlock Sealing Technologies

1.2) MATERIALS

METAL STRIPS	GASKET THICKNESS				INSERT STRIP	INTERNAL REINFORCEMENT	EXTERNAL CENTER FINDER
VITAFLEX® EN/AISI standard	2.5	3.2	4.5	6.4	- GRAPHITE · CEFIGRAF® NP (quality with corrosion inhibitor and 99.8% carbon graphite)	EN/AISI standard soft steel with anti-corrosion coating	
1.4307 / 304 L	x	x	x	x		1.4307 / 304 L	
1.4404 / 316 L	x	x	x	x		1.4404 / 316 L	
1.4571 / 316 Ti			x			1.4571 / 316 Ti	
1.4541 / 321		x	x		· CEFIGRAF® NS200	1.4541 / 321	
MONEL 400		x	x		EDF product	MONEL 400	
NICKEL 201			x			NICKEL 201	
TITANIUM UT40			x	x	· Impregnated graphite	TITANIUM UT40	
INCONEL 600		x	x	x	- PTFE	INCONEL 600	
HASTELLOY B2			x		- MICA	HASTELLOY B3	
Other materials, contact us							
(*) FLEXSEAL® 1.4404 / 316 L			x		- 98% carbon graphite, PTFE	1.4404 / 316 L soft steel with anti-corrosion coating	

(*) FLEXSEAL® is a registered trademark of Garlock Sealing Technologies

1.3) MAIN TYPES OF SPIRAL-WOUND GASKETS (VITAFLEX® AND FLEXSEAL®)

TYPE	GASKETS	ASSEMBLIES	
501 SW*			Composed solely of the spiral winding. Generally used in double insertion assemblies for standardized or similar flanges.
501R SWI*			Composed of one type 501 spiral-wound gasket. Equipped with an internal metal reinforcing ring. Recommended for single insertions to re-establish the conditions of use of the double insertion.
503 RW*			Composed of one type 501 spiral-wound gasket. Equipped with an external metal ring that ensures centering of the gasket between the bolts and the proper positioning of the winding on the sealing faces. Assembled between flat face or raised face flanges. In the case of a VITAFLEX® BPA (see p. 8), the external ring serves as a crushing limiter (metal-metal contact).
503R RWI*			Composed of one type 503 spiral-wound gasket equipped internally with a metal reinforcement ring protecting the winding. Particularly recommended for: - aggressive and/or hazardous fluids - high pressure and/or temperatures - CEFIGRAF® or PTFE inserts - reducing the effects of fluid turbulence which causes premature flange wear*.
504			Composed of one type 501 gasket. Equipped with two parts formed by the metal strip which enable positioning on two bolts and ensure the winding is centered on the sealing faces. Use at low pressure and/or temperatures.

*FLEXSEAL® references

EXTERNAL CENTERING RING: this ring must be wide enough to prevent excessive deformation due to the external radial reaction of the gasket when tightening. Stainless steel or soft steel for reinforcing the center finder: generally protected by zinc plating or dichromate plating, other protections may be applied on request (paint, Epoxy resin).

GASKET WITH INSERT: Option of producing gaskets with MICA filler, with CEFIGRAF® graphite insert.

PRODUCTION POSSIBILITIES

For general applications, the gasket width is determined by the diameters and installation conditions by referring to existing standards. The maximum winding width is determined by the component materials, thickness, and gasket diameter. Standard external winding diameters range from 12 mm to 1500 mm. For larger diameters, please contact us.

FIRE SAFETY

The VITAFLEX® and FLEXSEAL® spiral-wound gaskets have passed the fire test according to specification API6FB.

DEGREASED GASKET

For special applications, such as liquid oxygen service, transporting certain liquefied products, or others. VITAFLEX® spiral-wound gaskets with PTFE or CEFIGRAF® inserts may be degreased and shipped in individual packaging: **specify this when submitting a request.**

INTERNAL REINFORCEMENT: generally speaking, the use of internal reinforcement is recommended, except for:

- double tongue and groove installations
- spiral-wound VITAFLEX® BPA for low PN (see p. 8)
- installations with center guides and internal vertical supports (autoclave buffer type)
- other cases, contact us.

TECHNETICS GROUP

EnPro Industries companies

90, rue de la Roche du Geai
CS 52913

42029 Saint Etienne cedex 1 FRANCE

Phone: +33 (0) 4 77 43 51 00

Fax: +33 (0) 4 77 43 51 51

france@technetics.com
technetics.com

Technetics
GROUP

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1.4) OPERATING PRINCIPLE

The VITAFLEX® spiral-wound gasket operates by the axial compression of the winding, which results in the plastic deformation of the filler material (PTFE or CEFIGRAF®) on the sealing faces. The metal strip's optimized profile provides elastic recovery, a vital function in order to maintain sealing on a bolted assembly.

THREE OPERATING GRAPHS CAN BE USED TO EVALUATE THE PERFORMANCE OF THE GASKET:

- The characteristic graph shows the changes in real specific pressure based on the crushing of the gasket (or its loss of thickness) (Figure 1).
- The change in the level of sealing based on the real tightening pressure applied to the gasket, both in compression and in decompression (Figure 2).
- The change in contact pressure of the gasket on the sealing face, based over time for constant crushing assemblies (no metal to metal) (groove, mechanical stop, etc.) (Figure 3).

THESE THREE GRAPHS ARE CLOSELY DEPENDENT ON THE FOLLOWING GASKET AND ASSEMBLY PARAMETERS:

GASKETS

- Rib shape
- Winding compactness
- Type, quality, and thickness of filler strip

ASSEMBLY

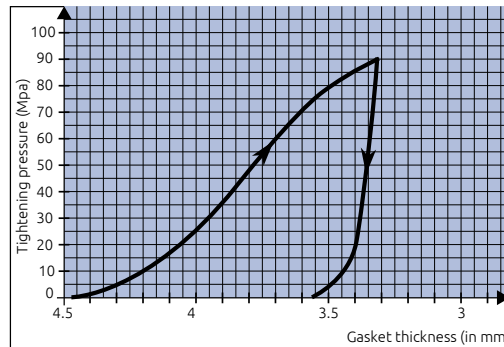
- Surface condition of sealing faces
- Deformation of contact planes with the gasket
- Admissible stresses in the flange and bolts

The behavior of the VITAFLEX® spiral-wound gasket is subject to different loads:

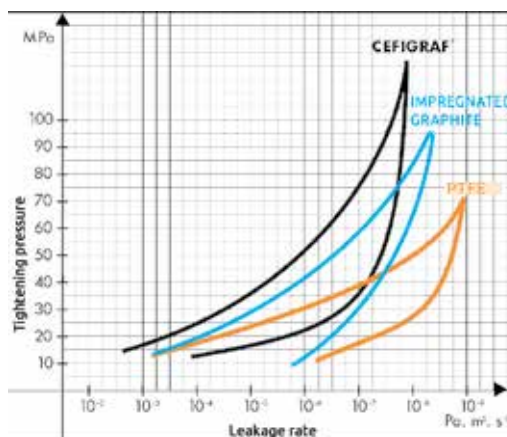
- 1 - The stress exerted by the bolts
- 2 - The hydrostatic force
- 3 - The radial action of the fluid on the internal windings
- 4 - Stresses due to bending moments external to the installation.

These four loads are specific to each application, which is why the density of the structure of a VITAFLEX® spiral-wound gasket must be altered based on how it will be used. Therefore, it is important for our technical department to have all the pre-study information requested (see technical information sheet, page 19).

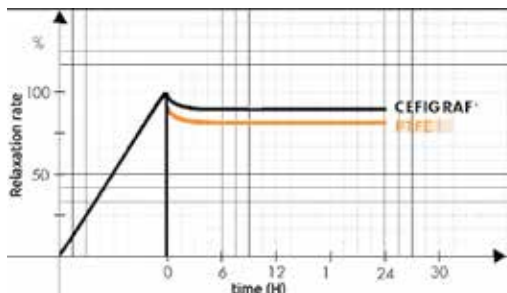
CHARACTERISTIC GRAPH (FIGURE 1)



LEVEL OF SEALING (FIGURE 2)



RELAXATION (FIGURE 3)



TECHNETICS GROUP

EnPro Industries companies

90, rue de la Roche du Geai
CS 52913

42029 Saint Etienne cedex 1 FRANCE

Phone: +33 (0) 4 77 43 51 00

Fax: +33 (0) 4 77 43 51 51

france@technetics.com

technetics.com

Technetics
GROUP

EnPro Industries companies

1.5) USAGE CONDITIONS

Because of its excellent performance characteristics and the wide range of materials that can be used, the VITAFLEX® spiral-wound gasket is a suitable sealing solution for a number of extreme applications in critical industries.

EXAMPLES OF THE VITAFLEX® SPIRAL-WOUND GASKET IN USE

Composition of the winding		Max. temperature (1)	Max. pressure (1)	Fluids
STAINLESS STEEL	CEFIGRAF®	550°C	350 bars	Liquid circuits, saturated steam, hydrocarbons, low temperatures, heat-transfer fluids
STAINLESS STEEL	CEFIGRAF® (BPA)	400°C	50 bars	Steam, hydrocarbons
STAINLESS STEEL	PTFE	220°C	From vacuum to 100 bars	Cryogenics, acidic circuits, low temperatures
INCONEL	CEFIGRAF®	600°C 800°C in inert environment	350 bars	High temperature
INCONEL	MICA	900°C	Low pressure	Very high temperature: hot gases

(1) As long as the assembly (flanges, nuts and bolts, gaskets) is thoroughly suited to the service conditions. The maximum values indicated mutually influence one another, so that one cannot take all these values simultaneously. For limit cases, please contact us.

PRINCIPAL APPLICATIONS

- **Chemical/petrochemical industry:** catalytic synthesis, heat exchangers, gaskets on devices, pipes, valves, taps, storage (possibility of O² degreasing on request), etc.
- **Industry:** high- and low-pressure steam circuit, autoclaves, reheaters, heat-transfer fluids, hydraulic pipes, high pressure, taps, compressors, pumps, etc.
- **Nuclear:** cooling circuit, taps, manholes, handholes, exchangers with or without bars, etc.

1.6) INSTALLATION CONDITIONS

The reliability of a bolted assembly depends not only on the gasket and its characteristics, but also on other important elements, including:

ASSEMBLY

Ensure that the faces of flanges are parallel, aligned, and clean. Ensure that they do not have anything that may trigger leaks, including cuts, scratches, deformations, etc. The faces shall be obtained by turning (no radial grooves). Ensure that the rigidity of the assembly (flange + bolts) is sufficient to keep the initial

tightening force on the gasket and to maintain the sealing level over time, checking the stress of the assembly.

STORAGE

The gaskets must be stored flat in a clean, dry place, preventing any significant load on the gasket.

HANDLING

The gaskets must be handled carefully, in order to prevent any risk of damage to the seal track such as cuts, scratches, impurities, deformations, etc.

RECOMMENDED SURFACE CONDITION

LCA-CEA No. Ra Rt	N10 12.5 50	N9 6.3 37	N8 3.2 21	N7 1.6 11	N6 0.8 6.2	Insert strip
Liquids Low-saturation steam Hydrocarbons ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	GRAPHITE, PTFE MICA
Gases Cryogenics Saturated steam Heat-transfer fluids ...	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	GRAPHITE, PTFE MICA
<input checked="" type="checkbox"/> Value not recommended <input type="checkbox"/> Value accepted <input checked="" type="checkbox"/> Recommended value						

TECHNETICS GROUP

EnPro Industries companies

90, rue de la Roche du Geai
CS 52913

42029 Saint Etienne cedex 1 FRANCE

Phone: +33 (0) 4 77 43 51 00

Fax: +33 (0) 4 77 43 51 51

france@technetics.com
technetics.com

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GROUP

EnPro Industries companies

BOLTING

Check the condition of the threads, the lubrication method, the presence of a support washer, parameters resulting in a very significant variation in the friction coefficient. Another tightening possibility is the stud tensioner. Don't forget to calibrate the entire tightening system, verification of stress/torque/extension.

TIGHTENING PROCEDURE

Make sure the gasket placement is centered. Tighten bolts according to the sketch opposite, 30% of the load calculated previously. Continue tightening in this pattern until the recommended stress is obtained in three or four phases and until the nuts no longer rotate.

As a general rule, one should not loosen an assembly and then re-tighten it to a lower or identical torque. This makes the gasket performance inconsistent.

COMPRESSION RATE

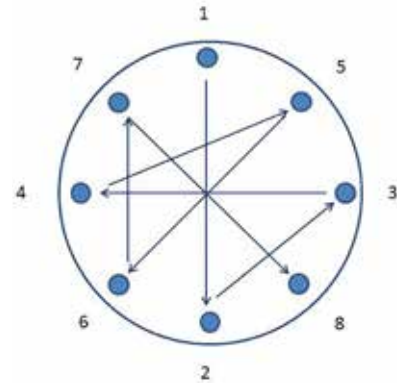
As a general rule, standard VITAFLEX® type 503 or 503 R spiral-wound gaskets with centering ring are not designed to be tightened in metal to metal contact. The recommended thickness after tightening is indicated in the table opposite. A special study is required for metal to metal use (see Special Manufacturing section, page 10).

MAXIMUM PRESSURE ON THE GASKET

In order to prevent mechanical damage to the winding, the maximum allowable pressure passing through the gasket is closely linked to the profile, gasket material, geometry of the housing, and service temperature.

TIGHTENING FORCES

Technetics Group can supply design calculations that can indicate the tightening force necessary for the gasket of your specific application. Provision of design calculations does not release users from consulting the codes and carrying out the calculations and verifications of the bolted assembly (gasket, bolting, flanges based on the method of their choice).



THICKNESS BEFORE TIGHTENING (mm)	AVERAGE THICKNESS AFTER TIGHTENING (mm)
2.5	1.8 to 2.1
3.2	2.3 to 2.7
4.5	3.2 to 3.7
6.4	4.7 to 5.4

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technetics.com

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GROUP

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1.7) REMINDER OF CROSS REFERENCE OF GASKET STANDARDS

		Gasket standards																Flange standards	
Former standards	NF (France) DIN (Germany)	PN10 2632	PN16 2633		PN25 2634	PN40 2635		PN64 2636	PN68		PN100 2637		PN160 2638		PN250 2628	PN320 2629	PN400	NF (France) DIN (Germany)	
	NF E 29 900-3 (*)	ISO PN10	ISO PN16	ISO PN20	ISO PN25	ISO PN40	ISO PN50	●	●	ISO PN100	●	ISO PN150	●	ISO PN250	●	●	●	NF E 29-203 NF E 29-209	V.1989 V.1985
In effect	ASME B 16.20 (e.g. API 601)	V.2012		Class 150			Class 300		Class 400	Class 600		Class 900		Class 1500				ASME/ANSI B16.5 ASME B16.47 series A (MSS-SP 44)	V.2013 V.2011
	NF EN 12560-2	V.2013		Class 150			Class 300		Class 600		Class 900		Class 1500					NF EN 1759-1	V.2005
	NF EN 1514-2	V.2014	PN10	PN16		PN25	PN40		PN63		PN100		PN160					NF EN 1092-1	V.2013

(*) The dimensional equivalences for the external Ø of 503 and 503R gaskets, between US and ISO PN standards, depend on the bolting used (UNC or ISO). This point should be checked, particularly for DN < 50.

● Standard eliminated in NF E 29-900-3. The external Ø of gaskets under NF E 29-900-3 are given for ISO bolting.

CAUTION: do not confuse PN 100 from the old **NF** standards and standard **NF EN 1514-2** with **ISO PN 100** from standard **NF E 29-900-3**.

Note, "class" gaskets are require UNC bolting. The information provided in these tables may be modified based on changes to the standardization.

1.8) SPIRAL-WOUND GASKET SUMMARY TABLE

Spiral Types	Types / Dimensions	Gasket standards		Flange standards		Bolting	Tables
503 BPA 503R BPA	DN - PN			NF EN 1092-1	Feb-2013	ISO bolting	T1
	CLASS / NPS ≤ 24			NF EN 1759-1 ASME B16.5	May-2005 Jan-2013	UNC bolting ISO bolting (With D3 calculated not standardized)	T2
503 (RW) 503R (RWI)	DN - PN	NF EN 1514-2	V.2014	NF EN 1092-1	Feb-2013	ISO bolting	T3
	CLASS / NPS ≤ 24	NF EN 12560-2 ASME B 16.20	V.2013 V.2012	NF EN 1759-1 ASME B16.5	May-2005 Jan-2013	UNC bolting ISO bolting (With D3 calculated not standardized)	T5 T4
	CLASS / NPS ≥ 26 - Series A	ASME B 16.20	V.2012	ASME 16.47	Oct-2011	UNC bolting ISO bolting (With D3 calculated not standardized)	T6 T7
	CLASS / NPS ≥ 26 - Series B	ASME B 16.20	V.2012	ASME 16.47	Oct-2011	UNC bolting ISO bolting (With D3 calculated not standardized)	T8 T9
	DN - PN10 to 40			NF E29-203	Jul-1989	Replacement gaskets dimensioned for NF E 29-203 flanges	T12-A
	DN - PN64 to 320			AFNOR-DIN-BS		Replacement gaskets dimensioned for NF or DIN flanges	T12-B
501 (SW) 501R (SWI)	DN - PN			NF EN 1092-1	Feb-2013		T11
	CLASS / NPS ≤ 24			ASME B16.5 NF EN 1759-1	Jan-2013 May-2005		T10

	DN-PN type standard
	NPS-Class type standard

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technetics.com



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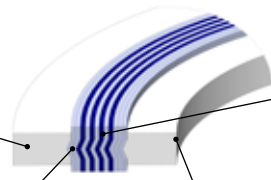
2) SPECIFIC SPIRAL-WOUND GASKETS

For our specific spiral-wound gaskets, manufacturing possibilities range from DN 20 to DN 1600. Custom dimensions can be created. To select the product best suited to your application and to optimize tightening torques, please contact our technical department.

2.1) VITAFLEX® BPA LOW-SEATING-PRESSURE GASKET

EXTERNAL CENTER FINDER

in zinc-plated ADX
stainless steel, etc.



METAL STRIP

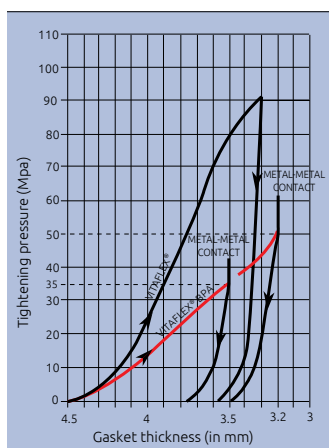
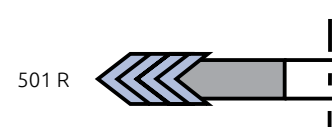
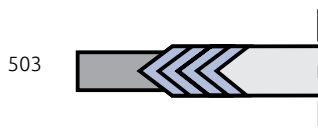
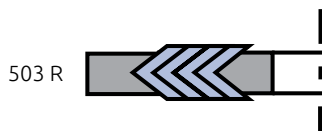
in 304L stainless steel, 316L stainless
steel, inconel 600, nickel, etc.

INTERNAL REINFORCEMENT (AVAILABLE)

Grade matching metal strip

FILLER

Graphite **CEFIGRAF® NP** with 99.8% carbon with
corrosion inhibitor Graphite **CEFIGRAF® NS 200***
PMUC graphite quality with 99.5% carbon
(* Special grade with sulfur and halogen content < 200 ppm.



Gasket with metal to metal tightening:

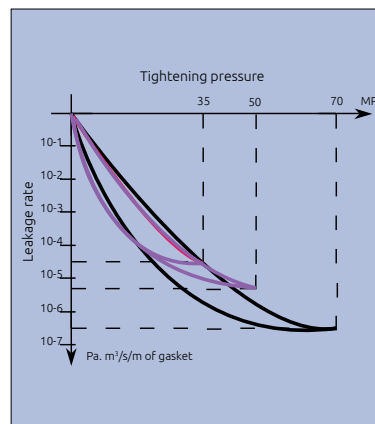
- Mechanical continuity of the
assembly, including under
thermal stresses.

Adaptable to all installation cases:

- Flat or raised faces, in groove,
single tongue and groove.

Can be produced in the following thicknesses:

- Standard: 3.2; 4.5 mm
- Others: contact us.



Economical:

- Without internal
rings for series
ISO PN 10-16-20 (150 lbs) - 25
- With optimized internal
rings for series
ISO PN 40 - 50 (300 lbs)

Works with any surface condition:

- from Ra = 0.8 to 12.5 μ
(turned surface)

Can be produced in all the normal dimensions.

APPLICATIONS

- Low PN pipe line for chemical, petrochemical, nuclear, etc.
- Replacement of flat-cut gaskets.
- Body/hat connection in groove for low PN taps.
- Exhaust for engine: e.g. marine diesel engine, etc.
- Device gaskets (exchangers), etc.

TYPES RECOMMENDED FOR ASSEMBLY WITH STANDARDIZED FLANGES

ISO ASSEMBLY	PN 10	PN 16	PN 20	PN 25	PN 40		PN 50
			Class 150		DN ≤ 150	DN ≥ 200	Class 300
503 BPA WITHOUT internal ring	GENERAL CASE						
503 R BPA WITH internal ring	POSSIBLE IF SPECIFIC APPLICATION				RECOMMENDED		

See dimensions on next page

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90, rue de la Roche du Geai
CS 52913

42029 Saint Etienne cedex 1 FRANCE

Phone: +33 (0) 4 77 43 51 00

Fax: +33 (0) 4 77 43 51 51

france@technetics.com

technetics.com

Technetics
GROUP

EnPro Industries companies

OUR STANDARD DIMENSIONS FOR VITAFLEX® BPA

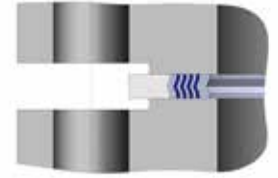
T1

DN		D0	D1	D2	D3	D3	D3	D3
mm	inch							
10	1/4	(15)	24	36	same as PN40			48
15	1/2	(19)	28	40				53
20	3/4	(24)	34	47				63
25	1	(30)	41	55				73
32	1 1/4	(40)	50	66				84
40	1 1/2	(46)	56	72				94
50	2	(58)	68	86				109
65	2 1/2	(72)	82	102				129
80	3	(87)	97	117				144
100	4	(110)	120	140				170
125	5	(138)	148	170	same PN16	164		196
150	6	(167)	177	200		194		226
200	8	215	225	251		220		293
250	10	273	283	310		275	286	355
300	12	322	332	360	330	343	420	
350	14	365	375	405	380	386	460	477
400	16	416	426	458	440	446	517	549
450	18	467	477	512	491	498	567	574
500	20	518	528	566	541	558	627	631
600	24	625	635	675	596	620	734	750

Flange standards: for flanges **NF EN 1092-1 V.2013** ISO bolting, (flat faced or raised face flanges)

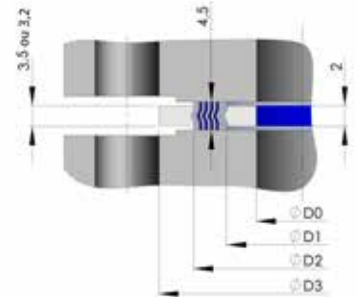
For PN 10-16-25 and PN 40 up to DN 150, we recommend the gasket:

VITAFLEX® 503 BPA



For PN 40 from DN 200 the internal ring is strongly recommended, we recommend the gasket:

VITAFLEX® 503R BPA



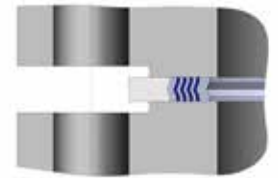
Thickness:
3.5mm for class 150
3.2mm for class 300

T2

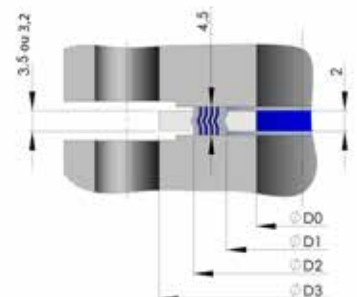
DN		SERIES						
		Class 150		Class 300				
		BOLTS						
mm	inch	D0 mm	D1 mm	D2 mm	UNC	ISO	UNC	ISO
					D3 mm	D3 mm	D3 mm	D3 mm
15	1/2	14.2	19.1	28.6	47.8	46.5	54.1	52.5
20	3/4	20.6	25.4	36.4	57.2	56	66.8	66.5
25	1	26.9	31.8	44.6	66.8	65.5	73.2	73
32	1 1/4	41.8	47.8	57.3	76.2	75	82.6	82.5
40	1 1/2	46.1	54.1	66.7	85.9	84.5	95.3	94.5
50	2	61.9	69.9	82.7	104.9	104.5	111.3	111
65	2 1/2	74.6	82.6	95.4	124	123.5	130.3	129
80	3	93.6	101.6	117.5	136.7	136.5	149.4	148.5
100	4	117	127	146.2	174.8	174.5	181.1	180
150	6	172.6	182.6	206.4	222.3	221.5	251	250
200	8	223.4	233.4	260.5	279.4	278.5	308.1	306
250	10	277.3	287.3	314.3	339.3	338	362	360.5
300	12	329.9	339.9	371.5	409.7	408	422.4	421
350	14	361.6	371.6	403.2	450.9	449	485.9	484.5
400	16	412.4	422.4	460.4	514.4	513	539.8	538.5
450	18	464.7	474.7	523.9	549.4	548	596.9	595.5
500	20	515.5	525.5	574.7	606.6	605	654.1	653
600	24	618.7	628.7	682.7	717.6	716.5	774.7	774

Flange standards: for flat faced or raised face flanges **NF EN 1759-1 V.2005** or **ASME B16.5 V.2013**

For the 150 lbs series (Pa = 35 MPa), we recommend the gasket: **VITAFLEX® 503 BPA**. Internal reinforcement possible for specific applications



For the 300 lbs series (Pa = 50 MPa), we recommend the gasket: **VITAFLEX® 503R BPA**. Internal reinforcement strongly recommended



Thickness:
3.5mm for class 150
3.2mm for class 300

A table of min/max tightening torques is available on request, by series of standardized flanges

TECHNETICS GROUP

EnPro Industries companies

90, rue de la Roche du Geai
CS 52913

42029 Saint Etienne cedex 1 FRANCE

Phone: +33 (0) 4 77 43 51 00

Fax: +33 (0) 4 77 43 51 51

france@technetics.com

technetics.com

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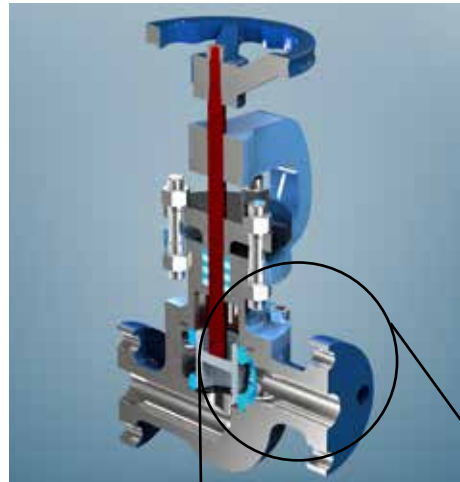
2.2) SPECIAL MANUFACTURE: "LOAD CERTIFIED" VITAFLEX GASKETS

PRESENTATION

Technetics Group produces spiral-wound gaskets with mechanical characteristics controlled by the creation of a compression curve. These gaskets are referred to as "load certified." As a leader in custom sealing solutions, we are able to design VITAFLEX® spiral-wound gaskets suited to the most extreme conditions. These gaskets are the result of unparalleled industry experience and are produced using our unique testing and manufacturing techniques.

TECHNICAL ADVANTAGES OF LOAD CERTIFIED GASKETS

- Elastic return greater than a standard spiral-wound gasket
- Seating effort specifically adapted to the application
- Metal-metal contact gasket
- Optimum crushing
- Ease of installation (no risk of over-tightening the gasket thanks to a mechanical stop)
- The gasket is no longer subject to the mechanical and thermal stresses of the assembly, due to better behavior in the presence of transitory P/T and a better life span



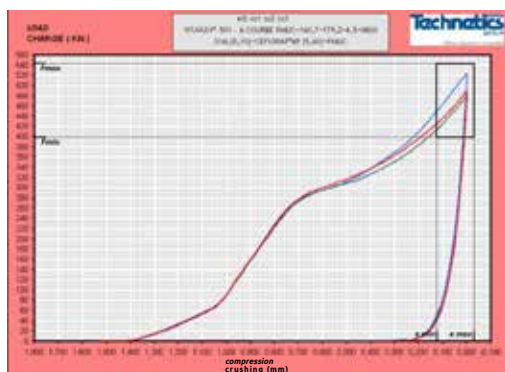
CONTROLLED-THICKNESS GASKET UNDER A PREDETERMINED LOAD

The control of essential parameters tied to the performance of the gasket enables Technetics Group to define and create VITAFLEX® spiral-wound gaskets with PTFE or CEFIGRAF® inserts, which ensure, for a given load, a thickness after tightening compatible with installation in a groove or a tightening limiter. This type of manufacture must be the subject of an appropriate technical study (see information sheet, page 19).

Examples of applications:

- body/hat connection in valves or taps,
- closing large devices (exchanger, pressure vessel, etc.),
- assembly with bolted flanges for specific industries such as nuclear, etc.

A report, provided with delivery, contains a load deflection curve, a material certificate, and an inspection report (dimensions/appearance).



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42029 Saint Etienne cedex 1 FRANCE

Phone: +33 (0) 4 77 43 51 00

Fax: +33 (0) 4 77 43 51 51

france@technetics.com
technetics.com

Technetics
GROUP

EnPro Industries companies

2.3) SPECIAL MANUFACTURE: ALKYLATION

AREAS OF USE

- Petrochemical
- Hydrofluoric acid content
- Design specific to the conditions of alkylation units

TECHNICAL CHARACTERISTICS

- Monel/PTFE gasket: monel ring with PTFE fillers on the reinforcement.
- Available for ASME flanges

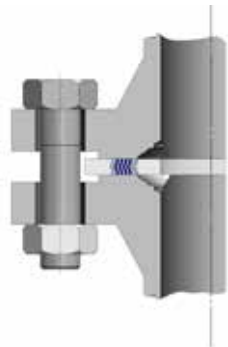
WINDING COMPOSITION

The VITAFLEX® gasket for alkylation units is a spiral-wound gasket with a monel/PTFE filler.

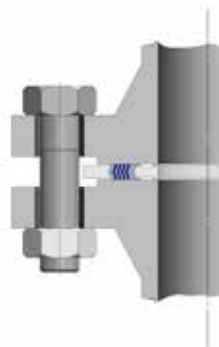
SPECIFIC PROPERTIES AND APPLICATIONS

- With the PTFE ring, the seal is as close as possible to the flange/pipe ID in order to prevent corrosion of the flange.
- Reduces flange maintenance costs.
- No more corrosive leaks damaging the bolts. Possibility of adapting to all designs. Ideal for corrosive and flammable fluids.

Spiral-wound gaskets without internal protection. Flanges corroded inside the sealing surface



Spiral-wound gaskets with internal rings and PTFE reinforcements that protect the flange from corrosion



2.4) SPECIAL MANUFACTURE: MICA/GRAPHITE/MICA

COMPOSITION

The VITAFLEX® MICA/GRAPHITE/MICA is a spiral-wound gasket with a graphite/mica filler: an internal and external mica filler and the internal part in graphite.

AREAS OF USE

Temperature: > 500°C
Pressure: < 10 bars

TECHNICAL CHARACTERISTICS

Chemical composition

The VITAFLEX® MICA/GRAPHITE/MICA gasket is available in standard dimensions and special dimensions

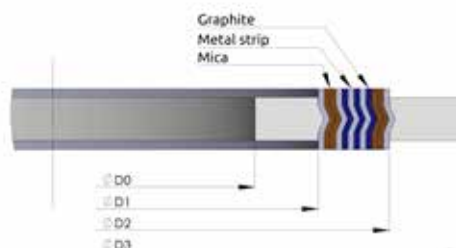
SPECIFIC PROPERTIES

The gasket combines both the characteristics of graphite in terms of sealing and the characteristics of mica in temperature resistance. This gasket maintains an excellent level of sealing due to the graphite. The mica protects the graphite from premature oxidation.

Possibility of adapting to all designs.

EXAMPLES OF APPLICATIONS

- High temperature
- Furnaces
- Exhaust gases for engines
- Petrochemical: high-temperature process, FCC



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CS 52913
42029 Saint Etienne cedex 1 FRANCE

Phone: +33 (0) 4 77 43 51 00

Fax: +33 (0) 4 77 43 51 51

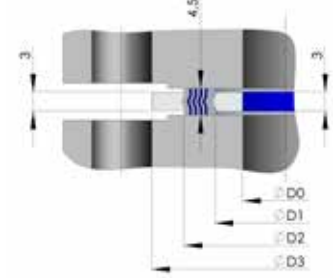
france@technetics.com
technetics.com

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3) COMMON SPIRAL-WOUND GASKETS: STANDARD DIMENSIONS

TYPE 503R



- **Flange standards:** for NF EN 1092-1 V.2013 flanges, ISO bolting.
- **Gasket standards:** NF EN 1514-2 V.2014 designated PN. DN 10 to DN 40 on type 11 flanges. Other types, contact us.

T3

DN		PN10			PN16			PN25			PN40			PN63			PN100			PN160																					
mm	inch	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3																
10	1/4	18	24	34	46	same as PN10			46	same as PN10			46	same as PN10			34	56	same as PN10			56	same as PN10			56															
15	1/2	23	29	39	51				51				51				51	51				39				61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61
20	3/4	28	34	46	61				61				61				61	61				-				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	1	35	41	53	71				71				71				71	71				53				82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82
32	1 1/4	43	49	61	82				82				82				82	82				-				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	1 1/2	50	56	68	92				92				92				92	92				68				103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103
50	2	61	70	86	107				107				107				107	107				86				113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113
65	2 1/2	77	86	102	127				127				127				127	127				106				137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137
80	3	90	99	115	142				142				142				142	142				119				148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148
100	4	115	127	143	162				162				162				162	162				147				174	174	174	174	174	174	174	174	174	174	174	174	174	174	174	174
125	5	140	152	172	192	192	192	192	192	176	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210															
150	6	167	179	199	218	218	218	218	218	203	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247															
200	8	216	228	248	273	273	273	273	273	252	309	309	309	309	309	309	309	309	309	309	309	309	309	309	309	309															
250	10	267	279	303	327	327	327	327	327	307	364	364	364	364	364	364	364	364	364	364	364	364	364	364	364	364															
300	12	318	330	354	377	377	377	377	377	358	424	424	424	424	424	424	424	424	424	424	424	424	424	424	424	424															
350	14	360	376	400	437	437	437	437	437	404	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486															
400	16	410	422	450	488	488	488	488	488	456	543	543	543	543	543	543	543	543	543	543	543	543	543	543	543	543															
500	20	510	522	550	593	593	593	593	593	556	657	657	657	657	657	657	657	657	657	657	657	657	657	657	657	657															
600	24	610	622	650	695	695	695	695	695	656	764	764	764	764	764	764	764	764	764	764	764	764	764	764	764	764															
700	28	710	722	756	810	810	810	810	810	762	879	879	879	879	879	879	879	879	879	879	879	879	879	879	879	879															
800	32	810	830	864	917	917	917	917	917	870	988	988	988	988	988	988	988	988	988	988	988	988	988	988	988	988															
900	36	910	930	964	1017	1017	1017	1017	1017	970	1108	1108	1108	1108	1108	1108	1108	1108	1108	1108	1108	1108	1108	1108	1108	1108															
1000	40	1010	1030	1074	1124	1124	1124	1124	1124	1080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-															

Sides in mm

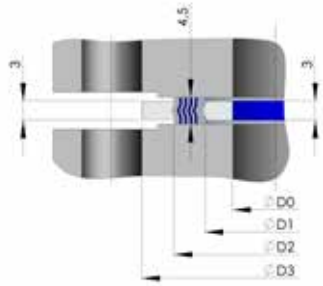
- **Flange standards:** for ASME/ANSI B16.5 V.2013 flanges or NF EN 1759-1 V.2005 flanges designated "class" with flat faces or raised faces (FF or RF) and ISO bolting. DN 1/4" to DN 1 1/2" for Welding-Neck flanges.
- **Gasket standards:** D0, D1, D2 according to standards: EN 12560-2 V.2013 and ASME B16.20 V.2012. D3 adapted for installation with ISO bolting. Other types, contact us.

T4

DN		Class 150				Class 300				Class 600				
mm	inch	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3	
15	1/2	14.2	19.1	31.8	46.5	Same for class 150	Same for class 150	Same for class 150	52.5	14.2	Same for class 150	Same for class 150	52.5	
20	3/4	20.6	25.4	39.6	56.0				66.5	20.6			66.5	
25	1	26.9	31.8	47.8	65.5				73.0	26.9			73.0	
32	1 1/4	38.1	47.8	60.5	75.0				82.5	38.1			82.5	
40	1 1/2	44.5	54.1	69.9	84.5				94.5	44.5			94.5	
50	2	55.6	69.9	85.9	104.5				111.0	55.6			111.0	
65	2 1/2	66.5	82.6	98.6	123.5				129.0	66.5			129.0	
80	3	81.0	101.6	120.7	136.5				148.5	81.0			148.5	
100	4	106.4	127.0	149.4	174.5				180.0	102.6			120.7	192.0
125	5	131.8	155.7	177.8	196.0				215.0	128.3			147.6	240.0
150	6	157.2	182.6	209.6	221.5	250.0	154.9	174.8	265.0					
200	8	215.9	233.4	263.7	278.5	306.0	205.7	225.6	319.0					
250	10	268.2	287.3	317.5	338.0	360.5	255.3	274.6	399.5					
300	12	317.5	339.9	374.7	408.0	421.0	307.3	327.2	456.0					
350	14	349.3	371.6	406.4	449.0	484.5	342.9	362.0	491.0					
400	16	400.1	422.4	463.6	513.0	538.5	389.9	412.8	564.0					
450	18	449.3	474.7	527.1	548.0	595.5	438.2	469.9	612.0					
500	20	500.1	525.5	577.9	605.0	653.0	489.0	520.7	682.0					
600	24	603.3	628.7	685.8	716.5	774.0	590.6	628.7	790.0					

Sides in mm

TYPE 503R



- **Flange standards:** for **NF EN 1759-1 V.2005** flanges or **ASME B16.5 V.2013** flanges designated "CLASS" with flat faces or raised faces and UNC bolting.
- **Gasket standards:** **ASME B16.20 V.2012** or **NF EN 12560-2 V.2013**

T5

DN		Class 150				Class 300				Class 600				Class 900				Class 1500				Class 2500				
mm	inch	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3	
15	1/2	14.2	19.1	31.8	47.8				54.1				19.1	54.1	14.2	19.1	31.8	63.5	14.2	19.1	31.8	63.5	14.2	19.1	31.8	69.9
20	3/4	20.6	25.4	39.6	57.2				66.8				25.4	66.8	20.6	25.4	39.6	69.9	20.6	25.4	39.6	69.9	20.6	25.4	39.6	76.2
25	1	26.9	31.8	47.8	66.8				73.2				31.8	73.2	26.9	31.8	47.8	79.5	26.9	31.8	47.8	79.5	26.9	31.8	47.8	85.9
32	1 1/4	38.1	47.8	60.5	76.2				82.6				47.8	82.6	33.3	39.6	60.5	88.9	33.3	39.6	60.5	88.9	33.3	39.6	60.5	104.9
40	1 1/2	44.5	54.1	69.9	85.9				95.3				54.1	95.3	41.4	47.8	69.9	98.6	41.4	47.8	69.9	98.6	41.4	47.8	69.9	117.6
50	2	55.6	69.9	85.9	104.9				111.3				69.9	111.3	52.3	58.7	85.9	143.0	52.3	58.7	85.9	143.0	52.3	58.7	85.9	146.1
65	2 1/2	66.5	82.6	98.6	124.0				130.3				82.6	130.3	63.5	69.9	98.6	165.1	63.5	69.9	98.6	165.1	63.5	69.9	98.6	168.4
80	3	81.0	101.6	120.7	136.7				149.4				101.6	149.4	78.7	95.3	120.7	168.4	78.7	92.2	120.7	174.8	78.7	92.2	120.7	196.9
100	4	106.4	127.0	149.4	174.8				181.1	102.6			120.7	181.1	102.6	120.7	149.4	206.5	97.8	117.6	149.4	209.6	97.8	117.6	149.4	235.0
125	5	131.8	155.7	177.8	196.9				215.9	128.3	147.6			215.9	128.3	147.6	177.8	247.7	124.5	143.0	177.8	254.0	124.5	143.0	177.8	279.4
150	6	157.2	182.6	209.6	222.3				251.0	154.9	174.8			251.0	154.9	174.8	209.6	289.1	147.3	171.5	209.6	282.7	147.3	171.5	209.6	317.5
200	8	215.9	233.4	263.7	279.4				308.1	205.7	225.6			308.1	205.7	225.6	257.3	358.9	196.9	215.9	257.3	352.6	196.9	215.9	257.3	387.4
250	10	268.2	287.3	317.5	339.9				362.0	255.3	274.6			362.0	255.3	274.6	311.2	435.1	246.1	266.7	311.2	435.1	246.1	270.0	311.2	476.3
300	12	317.5	339.9	374.7	409.7				422.4	307.3	327.2			422.4	307.3	327.2	368.3	498.6	292.1	323.9	368.3	520.7	292.1	317.5	368.3	549.4
350	14	349.3	371.6	406.4	450.9				485.9	342.9	362.0			485.9	342.9	362.0	400.1	520.7	320.8	362.0	400.1	577.9	-	-	-	-
400	16	400.1	422.4	463.6	514.4				539.8	389.9	412.8			539.8	389.9	412.8	457.2	574.8	368.3	406.4	457.2	641.4	-	-	-	-
450	18	449.3	474.7	527.1	549.4				596.9	438.2	469.9			596.9	438.2	469.9	520.7	638.3	425.5	463.0	520.7	704.9	-	-	-	-
500	20	500.1	525.5	577.9	606.6				654.1	489.0	520.7			654.1	489.0	520.7	571.5	698.5	476.3	514.4	571.5	755.7	-	-	-	-
600	24	603.3	628.7	685.8	717.6				774.7	590.6	628.7			774.7	590.6	628.7	679.5	838.2	577.9	616.0	679.5	901.7	-	-	-	-

Sides in mm

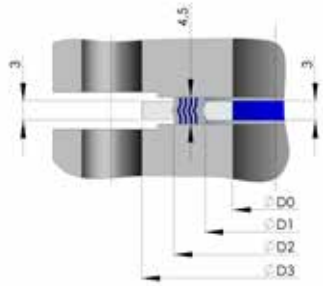
- **Flange standards:** for **ASME B16.47 series A V.2011** or **BS 3293** flanges and UNC bolting.
- **Gasket standards:** **ASME B16.20 V.2012**.

T6

DN		Class 150				Class 300				Class 600				Class 900			
mm	inch	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3
650	26	654.1	673.1	704.9	774.7	654.1	685.8	736.6	835.2	647.7	685.8	736.6	866.9	660.4	685.8	736.6	882.7
700	28	704.9	723.9	755.7	831.9	704.9	736.6	787.4	898.7	698.5	736.6	787.4	914.4	711.2	736.6	787.4	946.2
750	30	755.7	774.7	806.5	882.7	755.7	793.8	844.6	952.5	755.7	793.8	844.6	971.6	768.4	793.8	844.6	1009.7
800	32	806.5	825.5	860.6	939.8	806.5	850.9	901.7	1006.6	812.8	850.9	901.7	1022.4	812.8	850.9	901.7	1073.2
850	34	857.3	876.3	911.4	990.6	857.3	901.7	952.5	1057.4	863.6	901.7	952.5	1073.2	863.6	901.7	952.5	1136.7
900	36	908.1	927.1	968.5	1047.8	908.1	955.8	1006.6	1117.6	917.7	955.8	1006.6	1130.3	920.8	958.9	1009.7	1200.2
950	38	958.9	977.9	1019.3	1111.3	952.5	977.9	1016.0	1054.1	952.5	990.6	1041.4	1104.9	1009.7	1035.1	1085.9	1200.2
1000	40	1009.7	1028.7	1070.1	1162.1	1003.3	1022.4	1070.1	1114.6	1009.7	1047.8	1098.6	1155.7	1060.5	1098.6	1149.4	1251.0
1050	42	1060.5	1079.5	1124.0	1219.2	1054.1	1073.2	1120.9	1165.4	1066.8	1104.9	1155.7	1219.2	1111.3	1149.4	1200.2	1301.8
1100	44	1111.3	1130.3	1178.1	1276.4	1104.9	1130.3	1181.1	1219.2	1111.3	1162.1	1212.9	1270.0	1155.7	1206.5	1257.3	1368.6
1150	46	1162.1	1181.1	1228.9	1327.2	1152.7	1178.1	1228.9	1273.3	1162.1	1212.9	1263.7	1327.2	1219.2	1270.0	1320.8	1435.1
1200	48	1212.9	1231.9	1279.7	1384.3	1209.8	1235.2	1286.0	1324.1	1219.2	1270.0	1320.8	1390.7	1270.0	1320.8	1371.6	1485.9
1250	50	1263.7	1282.7	1333.5	1435.1	1244.6	1295.4	1346.2	1378.0	1270.0	1320.8	1371.6	1447.8				
1300	52	1314.5	1333.5	1384.3	1492.3	1320.8	1346.2	1397.0	1428.8	1320.8	1371.6	1422.4	1498.6				
1350	54	1358.9	1384.3	1435.1	1549.4	1352.6	1403.4	1454.2	1492.3	1378.0	1428.8	1479.6	1555.8				
1400	56	1409.7	1435.1	1485.9	1606.6	1403.4	1454.2	1505.0	1543.1	1428.8	1479.6	1530.4	1612.9				
1450	58	1460.5	1485.9	1536.7	1663.7	1447.8	1511.3	1562.1	1593.9	1473.2	1536.7	1587.5	1663.7				
1500	60	1511.3	1536.7	1587.5	1714.5	1524.0	1562.1	1612.9	1644.7	1530.4	1593.9	1644.7	1733.6				

Sides in mm

TYPE 503R



- **Flange standards:** for **MSS-SP-44** flanges or **ASME B16.47 series A V.2011** flanges and ISO bolting.
- **Gasket standard:** **ASME B16.20 V.2012**. D3 adapted for installation with ISO bolting.

T7

DN		Class 150				Class 300				Class 600				Class 900							
mm	inch	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3				
650	26		673.1	704.9	773.0		685.8	736.6	834.0		685.8	736.6	866.0		685.8	736.6	880.0				
700	28		723.9	755.7	830.0		736.6	787.4	898.0		736.6	787.4	913.0		736.6	787.4	946.0				
750	30		774.7	806.5	881.0		793.8	844.6	952.0		793.8	844.6	970.0		793.8	844.6	1009.0				
800	32		825.5	860.6	939.0		850.9	901.7	1006.0		850.9	901.7	1024.0		850.9	901.7	1076.0				
850	34		876.3	911.4	990.0		901.7	952.5	1057.0		901.7	952.5	1074.0		901.7	952.5	1136.0				
900	36		927.1	968.5	1047.0		955.8	1006.6	1116.0		955.8	1006.6	1130.0		955.8	1009.7	1199.0				
950	38		977.9	1019.3	1111.0		977.9	1016.0	1053.0		990.6	1041.4	1106.0		1035.1	1085.9	1199.0				
1000	40	standard reinforcement width: 10mm, to be verified based on interior Ø of the tube	1028.7	1070.1	1161.0	standard reinforcement width: 10mm, to be verified based on interior Ø of the tube	1022.4	1070.1	1114.0	standard reinforcement width: 10mm, to be verified based on interior Ø of the tube	1047.8	1098.6	1157.0	standard reinforcement width: 10mm, to be verified based on interior Ø of the tube	1098.6	1149.4	1250.0				
1050	42		1079.5	1124.0	1218.0		1073.2	1120.9	1164.0		1104.9	1155.7	1219.0		1149.4	1200.2	1301.0				
1100	44		1130.3	1178.1	1275.0		1130.3	1181.1	1219.0		1162.1	1212.9	1270.0		1206.5	1257.3	1369.0				
1150	46		1181.1	1228.9	1326.0		1178.1	1228.9	1273.0		1212.9	1263.7	1327.0		1270.0	1320.8	1437.0				
1200	48		1231.9	1279.7	1383.0		1235.2	1286.0	1324.0		1270.0	1320.8	1390.0		1320.8	1371.6	1480.0				
1250	50		1282.7	1333.5	1435.0		1295.4	1346.2	1377.0		1320.8	1371.6	1448.0								
1300	52		1333.5	1384.3	1491.0		1346.2	1397.0	1427.0		1371.6	1422.4	1499.0								
1350	54		1384.3	1435.1	1548.0		1403.4	1454.2	1493.0		1428.8	1479.6	1556.0								
1400	56		1435.1	1485.9	1606.0		1454.2	1505.0	1544.0		1479.6	1530.4	1615.0								
1450	58		1485.9	1536.7	1663.0		1511.3	1562.1	1595.0		1536.7	1587.5	1666.0								
1500	60	1536.7	1587.5	1714.0	1562.1	1612.9	1646.0	1593.9	1644.7	1732.0											

Sides in mm

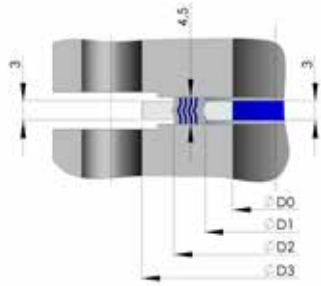
- **Flange standards:** for **API STANDARD 605 V.1988** or **ASME B16.47 series B V.2011** flanges and UNC bolting.
- **Gasket standards:** **ASME B16.20 V.2012**.

T8

DN		Class 150				Class 300				Class 600				Class 900			
mm	inch	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3
650	26	654.1	673.1	698.5	725.4	654.1	673.1	711.2	711.7	644.7	663.7	714.5	765.3	666.8	692.2	749.3	838.2
700	28	704.9	723.9	749.3	776.2	704.9	723.9	762.0	825.5	685.8	704.9	755.7	819.2	717.6	743.0	800.1	901.7
750	30	755.7	774.7	800.1	827.0	755.7	774.7	812.8	886.0	752.6	778.0	828.8	879.6	781.1	806.5	857.3	958.9
800	32	806.5	825.5	850.9	881.1	806.5	825.5	863.6	939.8	793.8	831.9	882.7	933.5	838.2	863.6	914.4	1016.0
850	34	857.3	876.3	908.1	935.0	857.3	876.3	914.4	993.9	850.9	889.0	939.8	997.0	895.4	920.8	971.6	1073.2
900	36	908.1	927.1	958.9	987.6	908.1	927.1	965.2	1047.8	901.7	939.8	990.6	1047.8	920.8	946.2	997.0	1124.0
950	38	958.9	974.9	1009.7	1044.7	971.6	1009.7	1047.8	1098.6	952.5	990.6	1041.4	1104.9	1009.7	1035.1	1085.9	1200.2
1000	40	1009.7	1022.4	1063.8	1095.5	1022.4	1060.5	1098.6	1149.4	1009.7	1047.8	1098.6	1155.7	1060.5	1098.6	1149.4	1251.0
1050	42	1060.5	1079.5	1114.6	1146.3	1085.9	1111.3	1149.4	1200.2	1066.8	1104.9	1155.7	1219.2	1111.3	1149.4	1200.2	1301.8
1100	44	1111.3	1124.0	1165.4	1197.1	1124.0	1162.1	1200.2	1251.0	1111.3	1162.1	1212.9	1270.0	1155.7	1206.5	1257.3	1368.6
1150	46	1162.1	1181.1	1224.0	1255.8	1178.1	1216.2	1254.3	1317.8	1162.1	1212.9	1263.7	1327.2	1219.2	1270.0	1320.8	1435.1
1200	48	1212.9	1231.9	1270.0	1306.6	1231.9	1263.7	1311.4	1368.6	1219.2	1270.0	1320.8	1390.7	1270.0	1320.8	1371.6	1485.9
1250	50	1263.7	1282.7	1325.6	1357.4	1267.0	1317.8	1355.9	1419.4	1270.0	1320.8	1371.6	1447.8				
1300	52	1314.5	1333.5	1376.4	1408.2	1317.8	1368.6	1406.7	1470.2	1320.8	1371.6	1422.4	1498.6				
1350	54	1365.3	1384.3	1422.4	1463.8	1365.3	1403.4	1454.2	1530.4	1378.0	1428.8	1479.6	1555.8				
1400	56	1422.4	1444.8	1478.0	1514.6	1428.8	1479.6	1524.0	1593.9	1428.8	1479.6	1530.4	1612.9				
1450	58	1478.0	1500.1	1528.8	1579.6	1484.4	1535.2	1573.3	1655.8	1473.2	1536.7	1587.5	1663.7				
1500	60	1535.2	1557.3	1586.0	1630.4	1557.3	1589.0	1630.4	1706.6	1530.4	1593.9	1644.7	1733.6				

Sides in mm

TYPE 503R



- **Flange standards:** for **API STANDARD 605 V.1988** or **ASME B16.47 series B V.2011** flanges and ISO bolting.
- **Gasket standard:** **ASME B16.20 V.2012**. D3 adapted for installation with ISO bolting.

T9

DN		Class 150				Class 300				Class 600				Class 900						
mm	inch	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3	D0	D1	D2	D3			
650	26		673.1	698.5	724.7		673.1	711.2	769.5		663.7	714.5	764.0		692.2	749.3	836.4			
700	28		723.9	749.3	775.5		723.9	762.0	823.7		704.9	755.7	818.2		743.0	800.1	900.6			
750	30		774.7	800.1	826.3		774.7	812.8	883.9		778.0	828.8	878.9		806.5	857.3	958.5			
800	32		825.5	850.9	880.4		825.5	863.6	938.2		831.9	882.7	930.3		863.6	914.4	1015.6			
850	34		876.3	908.1	932.7		876.3	914.4	992.0		889.0	939.8	997.0		920.8	971.6	1073.2			
900	36		927.1	958.9	985.1		927.1	965.2	1046.7		939.8	990.6	1047.8		946.2	997.0	1123.6			
950	38	standard reinforcement width: 10mm, to be verified based on interior Ø of the tube	974.9	1009.7	1041.9	standard reinforcement width: 10mm, to be verified based on interior Ø of the tube	1009.7	1047.8	1097.5	standard reinforcement width: 10mm, to be verified based on interior Ø of the tube	990.6	1041.4	1106.0	standard reinforcement width: 10mm, to be verified based on interior Ø of the tube	1035.1	1085.9	1199.0			
1000	40		1022.4	1063.8	1092.7		1060.5	1098.6	1148.3		1047.8	1098.6	1157.0		1098.6	1149.4	1250.0			
1050	42		1079.5	1114.6	1143.5		1111.3	1149.4	1199.2		1104.9	1155.7	1219.0		1149.4	1200.2	1301.0			
1100	44		1124.0	1165.4	1194.3		1162.1	1200.2	1250.0		1162.1	1212.9	1270.0		1206.5	1257.3	1369.0			
1150	46		1181.1	1224.0	1253.5		1216.2	1254.3	1317.1		1212.9	1263.7	1327.0		1270.0	1320.8	1437.0			
1200	48		1231.9	1270.0	1304.3		1263.7	1311.4	1367.9		1270.0	1320.8	1390.0		1320.8	1371.6	1480.0			
1250	50		1282.7	1325.6	1355.1		1317.8	1355.9	1418.7		1320.8	1371.6	1448.0							
1300	52		1333.5	1376.4	1405.9		1368.6	1406.7	1469.5		1371.6	1422.4	1499.0							
1350	54		1384.3	1422.4	1461.6		1403.4	1454.2	1529.6		1428.8	1479.6	1556.0							
1400	56		1444.8	1478.0	1512.4		1479.6	1524.0	1593.9		1479.6	1530.4	1615.0							
1450	58		1500.1	1528.8	1577.8		1535.2	1573.3	1655.8		1536.7	1587.5	1666.0							
1500	60		1557.3	1586.0	1628.6		1589.0	1630.4	1706.6		1593.9	1644.7	1732.0							

Sides in mm

- **Flange standards:** for **ASME/ANSI B16.5 V.2013** and **NF E 29-203 V.1989** flanges

T10

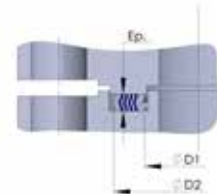
DN		Double insertions					Large series single tongue and groove						
		Small series Class 150 to 2500		Large series Class 150 to 2500			Class 150 to 1500				Class 2500		
mm	inch	D1	D2	D1	D2	Thickness	D0(*)	D1	D2	D0(*)	D1	D2	Thickness
10	1/4			12.5	25.5	3.2		12.5	25.5				3.2
15	1/2	25.5	35	25.5	35	3.2	14.2	25.5	35	14.2	20.5	35	3.2
20	3/4	33.5	43	33.5	43	3.2	20.6	33.5	43	20.6	27	43	3.2
25	1	38	48	38	51	3.2	26.9	38	51	26.9	32	51	3.2
32	1 1/4	47.5	57	47.5	63.5	3.2	38.1	47.5	63.5	33.3	41	63	3.2
40	1 1/2	54	63.5	54	73	3.2	44.5	54	73	41.4	48	73	3.2
50	2	73	82.5	73	92	3.2	55.6	73	92	52.3	61	92	3.2
65	2 1/2	86	95	86	105	3.2	66.5	86	105	63.5	76	105	3.2
80	3	108	117.5	108	127	3.2	81	108	127	81	95	127	3.2
90	3 1/2	120.5	130	120.5	140	3.2	104.8	120.5	140				3.2
100	4	131.5	144.5	132	157	3.2	106.4	132	157	106.4	121	157	3.2
125	5	160.5	173	160.5	186	3.2	140.5	160.5	186	131.8	146	186	3.2
150	6	190.5	203	191	216	3.2	171	191	216	157.2	172	216	3.2
200	8	238	254	238	270	3.2	218	238	270	203	223	270	3.2
250	10	286	305	286	324	3.2	266	286	324	253	273	324	3.2
300	12	343	362	343	381	3.2	323	343	381	310	330	381	3.2
350	14	375	394	35	413	3.2	355	375	413				3.2
400	16	425.5	447.5	426	470	3.2	406	426	470				3.2
450	18	489	511	489	533	3.2	469	489	533				3.2
500	20	533.5	559	533	584	3.2	513	533	584				3.2
600	24	641.5	666.5	642	692	3.2	622	642	692				3.2

Sides in mm

(*) Measurements given for informational purposes.

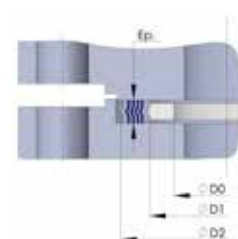
TYPE 501

Double tongue and groove



TYPE 501 R

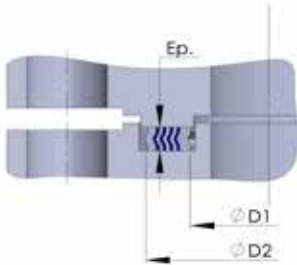
Single tongue and groove



TYPE 501

Double tongue and groove

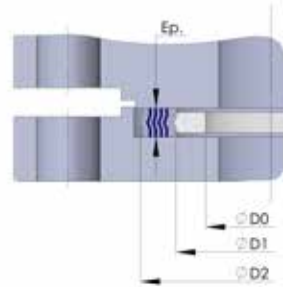
For DN 15 up to DN 150, we recommend the VITAFLEX® 501 gasket



TYPE 501 R

Single tongue and groove

For DN 250 up to DN 1000, we recommend the VITAFLEX® 501 R gasket



- **Flange standards:** for NF EN 1092-1 V.2013 and AFNOR-DIN-BS flanges.

T11

TONGUE & GROOVE		ISO PN 10-16-25-40 (PN 10-16-25-40-100 ex NF-DIN-BS)			
DOUBLE			D1	D2	Thickness
SINGLE		DO(*)	D1	D2	Thickness
DN mm	DN inch				
15	1/2	22	29	39	2.5
20	3/4	28	36	50	2.5
25	1	35	43	57	2.5
32	1 1/4	43	51	65	2.5
40	1 1/2	49	61	75	2.5
50	2	61	73	87	2.5
65	2 1/2	77	95	109	2.5
80	3	90	106	120	2.5
100	4	115	129	149	3.2
125	5	141	155	175	3.2
150	6	169	183	203	3.2
250	10	272	292	312	3.2
300	12	323	343	363	3.2
350	14	375	395	421	3.2
400	16	427	447	473	3.2
450	18	477	497	523	3.2
500	20	529	549	575	3.2
600	24	629	649	675	3.2
700	28	731	751	777	3.2
800	32	836	856	882	3.2
900	36	941	961	987	3.2
1000	40	1042	1062	1092	4.5

Sides in mm

(*) Measurements given for informational purposes.

TECHNETICS GROUP

EnPro Industries companies

90, rue de la Roche du Geai
CS 52913
42029 Saint Etienne cedex 1 FRANCE

Phone: +33 (0) 4 77 43 51 00

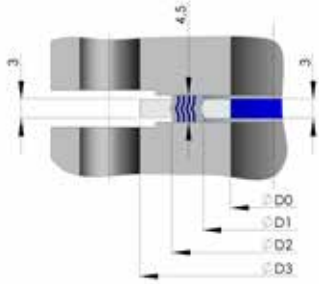
Fax: +33 (0) 4 77 43 51 51

france@technetics.com
technetics.com

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GROUP

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TYPE 503R



- **Flange standards:** for NF E 29-203 V.1989 flanges and ISO bolting.

T12-A

For DIN flange					2632	2633	2634	2635
DN		D0	D1	D2	D3	D3	D3	D3
mm	inch				PN10	PN16	ISO PN25	ISO PN40
10	1/4	15	24	36	same as PN40			048
15	1/2	19	28	40				053
20	3/4	24	34	47				063
25	1	30	41	55				073
32	1 1/4	39	50	66				084
40	1 1/2	45	56	72				094
50	2	56	68	86				0109
65	2 1/2	72	82	102				0129
80	3	84	97	117				0144
100	4	108	120	140				0170
125	5	133	148	170	same PN16	164		0196
150	6	157	177	200		194		0226
200	8	205	225	251		220		
250	10	263	283	310		275	286	0293
300	12	312	332	360	330	343	0355	
350	14	355	375	405	380	386	403	0420
400	16	406	426	458	440	446	460	0477
450	18	457	477	512	491	498	517	0549
500	20	508	528	566	541	558	567	0574
600	24	615	635	675	596	620	627	0631
700	28	715	735	777	698	737	734	0750
800	32	816	836	878	813	807	836	0855
900	36	914	934	979	920	914	945	0978
					1020	1014	1045	1088

Sides in mm

- **Flange standards:** for AFNOR-DIN-BS standard flanges and ISO bolting. The gaskets used for PN64-100-160-250-320 must be used solely for replacement.

T12-B

For DIN flange					2636	2637	2638	2628	2629	
DN		D0	D1	D2	D3	D3	D3	D3		
mm	inch				PN64	PN100	ISO PN160	ISO PN250	PN320	
10	1/4	15	24	36	same as PN160		58	69	69	
15	1/2	19	28	40			63	74	74	
20	3/4	24	34	48			74	79	-	
25	1	30	41	56			84	85	95	
32	1 1/4	39	50	67			90	100	-	
40	1 1/2	45	56	74			105	111	121	
50	2	56	68	88		115		121	126	136
65	2 1/2	72	82	102		140		146	156	173
80	3	84	97	120		150		156	173	193
100	4	108	120	144		176		183	205	232
125	5	133	148	174	213		220	245	277	
150	6	157	177	205	250		260	287	314	
200	8	205	225	257	312		327	361	401	
250	10	263	283	319	367	394	391	445	492	
300	12	312	332	369	427	461	461	542		
350	14	355	375	413	489	515				
400	16	406	426	466	546	575				
500	20	508	528	572	660	708				
600	24	615	635	683	768	819				
700	28	715	735	785	883	956				
800	32	816	836	886	994					
900	36	914	934	984	1114					

Sides in mm

TECHNETICS GROUP

EnPro Industries companies

90, rue de la Roche du Geai
CS 52913

42029 Saint Etienne cedex 1 FRANCE

Phone: +33 (0) 4 77 43 51 00

Fax: +33 (0) 4 77 43 51 51

france@technetics.com

technetics.com



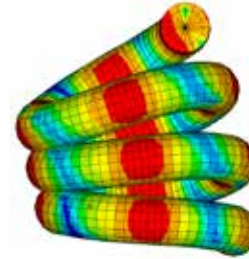
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MAESTRAL: THE LABORATORY THAT USES SCIENCE TO SERVE SEALING

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Maestral offers a multi-scale scientific approach combining tests, characterization and simulation in order to develop sealing solutions that meet present and future needs. **Maestral** technicians are experienced and certified in COFREND (French Confederation for Non-destructive Testing) II, Leak Testing.



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Simulation does not replace tests on mock-ups but it allows the latter, and experimental artifacts, to be reduced. Simulation is an efficient tool for conceiving and optimizing a sealing system by checking its performance in all circumstances, in order to best respond to clients' issues. Today, prediction abilities of models are advanced enough to extrapolate life-size results when the size of the mock-ups or the duration of the tests makes them impossible in real conditions. Our modelers are particularly experienced in the mechanics of largely non-linear behaviors, such as deformations, creep, complex contacts with flanges and friction.

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TECHNETICS GROUP

EnPro Industries companies

90, rue de la Roche du Geai
CS 52913
42029 Saint Etienne cedex 1 FRANCE

Phone: +33 (0) 4 77 43 51 00

Fax: +33 (0) 4 77 43 51 51

france@technetics.com

technetics.com



EnPro Industries companies

COMPANY:		TEL:	
CONTACT:		FAX:	
ADDRESS:		EMAIL:	
		DATE:	
END USER:		PLACE OF INSTALLATION:	
BUSINESS REFERENCE:		No.:	
Activity sector:		Unit:	
Type of device:		Association:	

USER CONDITIONS

Fluids: Gas <input type="checkbox"/>	Liquid <input type="checkbox"/>	Vacuum <input type="checkbox"/>	SKETCH:	Gasket plan:
Nature:				
Service:	Pressure	Temperature		
	Test:			
Temperature shock:	max.			
	min.			
Desired seal criteria:				
Lifespan:				

ASSEMBLY

Existing <input type="checkbox"/>	Adjustable <input type="checkbox"/>	To be defined <input type="checkbox"/>	
Dimensions: Normalized:	Standard:	DN:	
(for non-normalized assembly, attach a plan or a sketch)			
PN:	Materials:		
BOLTING:	NB:	M:	
Perforation diameter:	Material:	Size:	
PLACEMENT:	Existing: <input type="checkbox"/>	Adjustable: <input type="checkbox"/>	To be defined: <input type="checkbox"/>
	Flat surfaces: <input type="checkbox"/>	Raised faces: <input type="checkbox"/>	(Ext. diam. of raised face)
	Double insertion: <input type="checkbox"/>	Single insertion: <input type="checkbox"/>	
	Groove: <input type="checkbox"/>	Other:	
Dimensions:	(attach a plan or a sketch)		
Groove:	From:	Depth:	
Male (for insertion):	From:	Height:	
State of opening surfaces:	Ra=	µm/	
GASKETS:	Previously used: <input type="checkbox"/>	Desired: <input type="checkbox"/>	To be defined: <input type="checkbox"/>
Type:			
Material:			
Additional information:			

OTHER

Other technical info: (For exchangers, provide a plan or a sketch of the bar)	
Other commercial information:	Transmitter:
Estimated quantity:	Yearly requirements: Date:

For more information on how Technetics Group affects your critical markets, visit technetics.com.

ASIA

Blk 203, #05-52
Woodlands Avenue 9
Woodlands Spectrum 2,
738956 SINGAPORE
Phone: +65 6759 2335
Fax: +65 6759 7319

FRANCE

90, rue de la Roche du Geai
CS 52913
42029 Saint Etienne cedex 1 FRANCE
Phone: +33 (0) 4 77 43 51 00
Fax: +33 (0) 4 77 43 51 51

49 Avenue Charles de Gaulle
Z.I. Survaure
42607 Montbrison cedex FRANCE
Phone: +33 (0) 4 77 96 79 80

GERMANY

Falkenweg 1
41468 Neuss
GERMANY
Phone: 0800-627-0151

UK

Acan Way, Coventry Road
Narborough, Leicester LE19 2FT
UK
Phone: +44 (0) 1162 727411
Fax: +44 (0) 1162 727412

USA

2791 The Boulevard
Columbia, SC 29209 USA
Phone: +1-803-783-1880
Fax: +1-803-783-4279

305 Fentress Boulevard
Daytona Beach, FL 32114 USA
Phone: +1-386-253-0628
Fax: +1-386-257-0122

1700 E. International Speedway Blvd
DeLand, FL 32724 USA
Phone: +1-386-736-7373
Fax: +1-386-738-4533

1600 Industry Road
Hatfield, PA 19440 USA
Phone: +1-800-618-4701
Fax: +1-215-855-3570

10633 W Little York, Bldg 3, Suite 300
Hatfield, PA 77041 USA
Phone: +1-713-983-4201
Fax: +1-713-466-3721

10 Old Webster Road
Oxford, MA 01540 USA
Phone: +1-508-987-5900

990 Richard Avenue, Suite 117
Santa Clara, CA 95050 USA
Phone: +1-669-242-8804
Fax: +1-669-242-8492