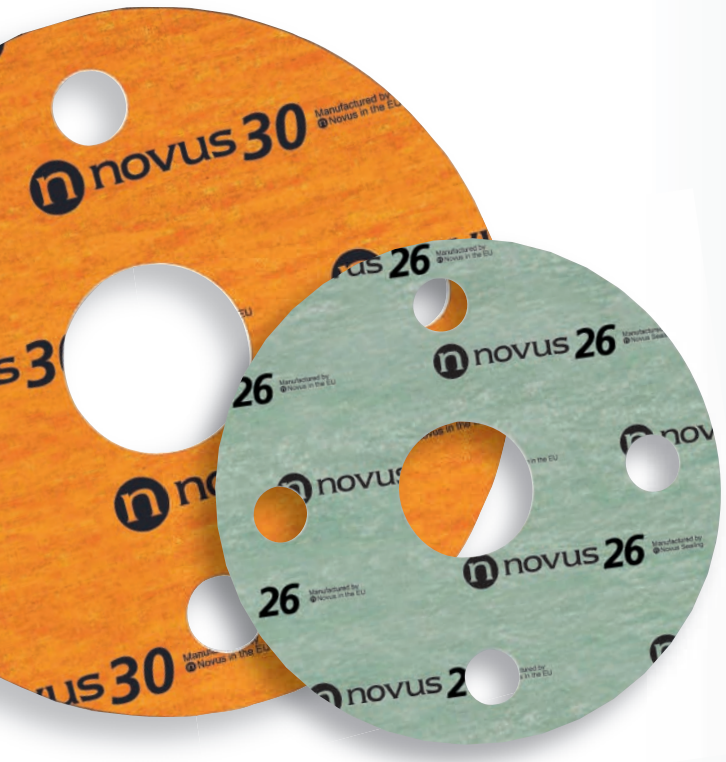
Flexitallic®

WILLIAM JOHNSTON
& COMPANY LIMITED

Glasgow Tel: +44 (0) 141 620 1666 | Inverness Tel: +44 (0) 1463 238 673
sales@williamjohnston.co.uk | www.williamjohnston.co.uk

Sheet Materials



novus™
a Flexitallic brand

Flexitallic

Contents

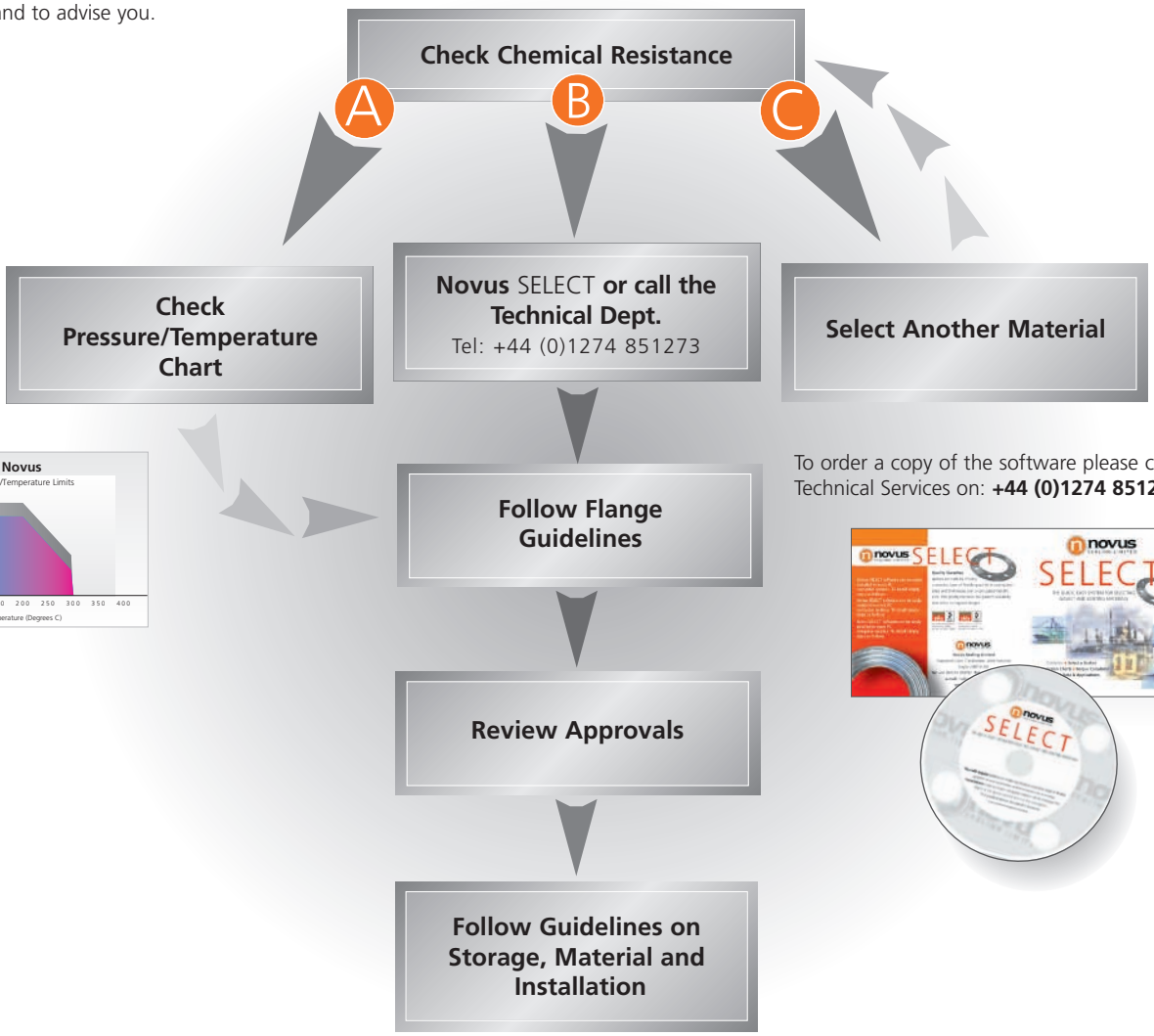
This brochure outlines our sheet material products and provides guidelines on their correct selection, storage and assembly. For more information on any of the areas covered please contact our sales or technical support teams who will be happy to assist.

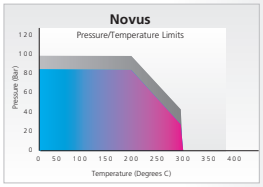
Product Selection

The suitability of a gasket material in a given application is dependent on a number of factors including chemical resistance, temperature, pressure capability, flange material, flange configuration and bolt load. Choosing the right material for the application can be a difficult and often confusing task.

We understand the importance of providing clear and concise data to aid in the selection and fitting of our products. We work closely with our customers in developing this data and in the production of helpful tools e.g. Novus SELECT software, to assist you in this process. Should you have any doubt about which product to choose, consult our Technical team who are on hand to advise you.

This flow chart is a useful guide to making the most of the information in this brochure.





Novus SELECT Software

Novus SELECT software has been developed as a user-friendly package to assist our customers in the selection and installation of Novus gasket products.

Novus SELECT provides:

- Selection of gasket materials
- Suitability of gasket materials for given applications.
- Selection criteria including flange material, gasket properties and approvals.
- Bolt torque calculations
- Conversion factors

To order a copy of the software please contact Technical Services on: **+44 (0)1274 851273**

Novus Compressed Fibre Jointing

The **Novus** group of compressed fibre jointing is designed for a wide range of industrial and original equipment applications where sealing performance and reliability is essential.

Based on high performance reinforcing fibres blended with elastomeric binders, the Novus materials offer outstanding performance in the most demanding of applications.

Availability
The jointing can be supplied as sheet or as cut gaskets either to standard or non-standard dimensions to a maximum sheet size of 6m x 2m.

Properties
- Wide range of service applications
- Easy to handle and cut
- Excellent bolt torque retention
- Outstanding sealability
- Wide range of standard and non-standard dimensions.

Novus 10

Description
Novus 10 is a premium grade compressed sheet material based on carbon fibre with a high quality nitrile rubber binder.

Colour - Black

Service
A universal grade especially suitable for high temperatures and pressures. Ideal for use under alkaline conditions and in steam applications. It also possesses excellent creep resistance and is suitable for use with oils, fuels and refrigerants.

Approvals/Compliance
Complies with BS Specification 7531 Grade X
Firesafe API 607 Fourth Edition
TA-LUFT (in accordance with VDI Guideline 2440)
Germanischer Lloyd GL Approved

Availability
Available with fine mesh mild steel wire reinforcement: Novus 10 Metallic.
Supplied with anti-stick finish as standard.

Novus 26

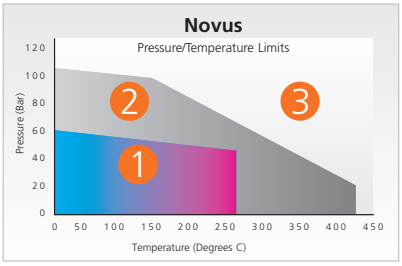
Description
Novus 26 is a premium quality compressed sheet material composed of aramid fibres with a SBR/Natural rubber binder system. It is specially formulated to exhibit controlled swell properties in oil combined with good resistance to water.

Colour - Green

Service
Novus 26 is particularly suitable for applications where controlled swell properties are required, such as in the automotive industry.

Availability
Available with fine mesh mild steel reinforcement: Novus 26 Metallic. Can also be supplied with anti-stick coating and graphite coating.

Pressure vs Temperature Ratings for Novus Materials

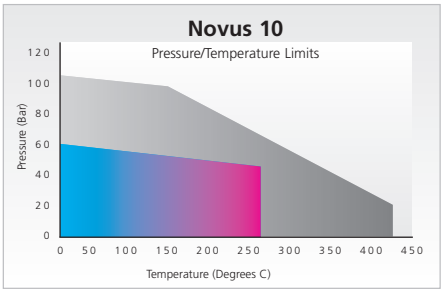


1. Suitable subject to chemical compatibility
2. Suitable in some cases but check your application requirements with the Technical Team
3. Contact the Technical Team for applications with higher temperatures and pressures.

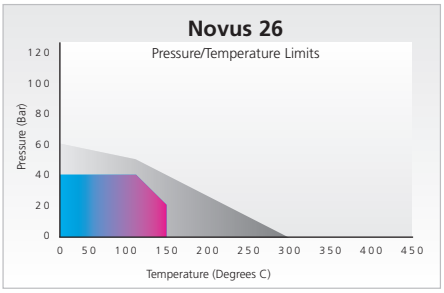
   Applicable to 1.5mm and below

The operating temperature of non-asbestos sheet material is related to the thickness of materials selected. Thinner materials give better temperature and pressure properties.

TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density		1.57g/cc
Tensile Strength	ASTM F152	13MPa
Compression	ASTM F36	11%
Recovery	ASTM F36	62%
Residual Stress	BS7531 (300°C)	25MPa
Gas Leakage	BS7531	<1cc/min
ASTM Oil 1	Thickness Increase	1.0%
IRM 903 Oil	Thickness Increase	2.5%
ASTM Fuel B	Thickness Increase	2.5%



TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density		1.96g/cc
Tensile Strength	ASTM F152	10.3MPa
Compression	ASTM F36	8%
Recovery	ASTM F36	>40%
Residual Stress	BS7531 (300°C) DIN 52913	19MPa
Gas Leakage	BS 7531	<0.5cc/min
ASTM Oil 1	Thickness Increase	0-20%
IRM 903 Oil	Thickness Increase	20-70%
ASTM Fuel B	Thickness Increase	10-40%



Novus 28

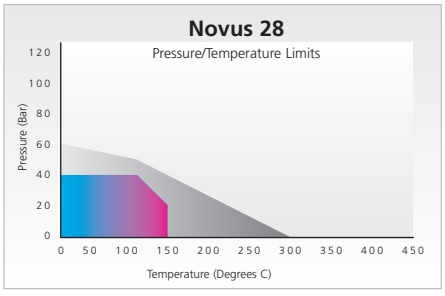
Description
Novus 28 is a good quality compressed sheet material based on aramid fibre with a quality nitrile binder system. It is characterised by its high compressibility and flexibility as well as outstanding gas sealability.

Colour - Red One side Black on Reverse

Service
Novus 28 is specifically designed for use in low bolt-loaded irregular flanges.

Availability
Available with fine mesh mild steel reinforcement: Novus 28 Metallic. Can also be supplied with anti-stick coating and graphite coating.

TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density		1.55g/cc
Tensile Strength	ASTM F152	6.2MPa
Compression	ASTM F36	16-25%
Recovery	ASTM F36	>60%
Residual Stress	BS7531 (175°C)	29MPa
	DIN 52913	
Gas Leakage	BS 7531	<0.01cc/min
ASTM Oil 1	Thickness Increase	1.0%
IRM 903 Oil	Thickness Increase	4.0%
ASTM Fuel B	Thickness Increase	4.0%



Novus 30

Description
Novus 30 is a good quality compressed sheet material based on a blend of aramid fibre and inorganic fibres with a nitrile rubber binder system.

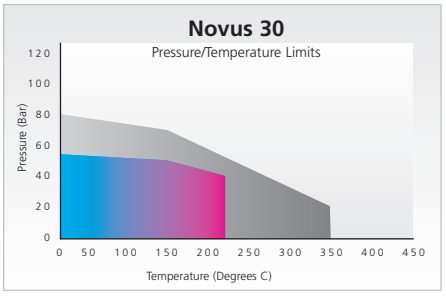
Colour - Orange

Service
Novus 30 is a general purpose material suitable for use in wide range of applications, including hot and cold water, steam, oils, fuels, gases and a wide range of general chemicals.

Approvals/Compliance
WRAS Potable Water
Complies with BS Specification 7531 Grade Y
TA-LUFT (in accordance with VDI Guideline 2440)
Germanischer Lloyd GL Approved

Availability
Available with fine mesh mild steel reinforcement: Novus 30 Metallic. Can also be supplied with anti-stick coating and graphite coating.

TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density		2.0g/cc
Tensile Strength	ASTM F152	12MPa
Compression	ASTM F36	9%
Recovery	ASTM F36	50%min
Residual Stress	BS7531 (300°C)	23MPa
	DIN 52913	29MPa
Gas Leakage	BS 7531	<1.0cc/min
ASTM Oil 1	Thickness Increase	2.0%
IRM 903 Oil	Thickness Increase	5.0%
ASTM Fuel B	Thickness Increase	4.0%



Novus 34

Description
Novus 34 is a high performance compressed sheet material based on a blend of aramid/inorganic fibres and special additives, with a high quality nitrile rubber binder system.

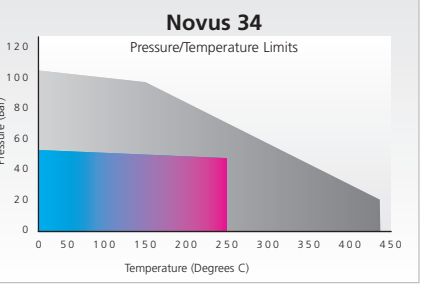
Colour - White

Service
A superior performance material with excellent mechanical properties, it is suitable for many applications including oils, solvents, high pressure steam and gases including oxygen.

Approvals/Compliance
WRAS Potable Water
BAM (Oxygen service) up to 90°C and 160 bar
Complies with BS Specification 7531 Grade X
TA-LUFT (in accordance with VDI Guideline 2440)
Germanischer Lloyd GL Approved

Availability
Available with fine mesh mild steel reinforcement: Novus 34 Metallic. Supplied with anti-stick coating as standard.

TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density		1.75g/cc
Tensile Strength	ASTM F152	15MPa
Compression	ASTM F36	9%
Recovery	ASTM F36	55%min
Residual Stress	BS7531 (300°C)	26MPa
	DIN 52913	32 MPa
Gas Leakage	BS 7531	<1.0cc/min
ASTM Oil 1	Thickness Increase	1.0%
IRM 903 Oil	Thickness Increase	2.5%
ASTM Fuel B	Thickness Increase	3.0%



Novus45

Description
Novus 45 is a quality compressed sheet material, manufactured from aramid fibres bound with a high quality nitrile rubber.

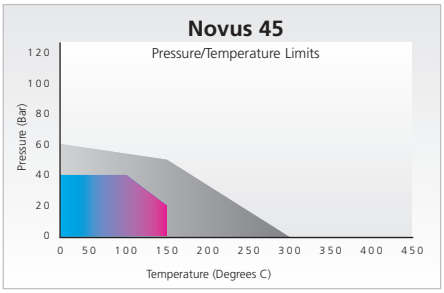
Colour - Blue

Service
Novus 45 is a general purpose material suitable for use with oils, solvents, gases, water, low pressure steam and most dilute acids and alkalis.

Approvals/Compliance
TA-LUFT (in accordance with VDI Guideline 2440)
Germanischer Lloyd GL Approval 37702 - 12HH

Availability
Available with fine mesh mild steel reinforcement: Novus 45 Metallic.
Can also be supplied with anti-stick coating and graphite coating.

TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density		1.9g/cc
Tensile Strength	ASTM F152	12MPa
Compression	ASTM F36	10%
Recovery	ASTM F36	50%min
Residual Stress	BS7531 (300°C)	18MPa
	DIN 52913	23MPa
Gas Leakage	BS 7531	<1.0cc/min
ASTM Oil 1	Thickness Increase	2.0%
IRM 903 Oil	Thickness Increase	5.0%
ASTM Fuel B	Thickness Increase	6.0%



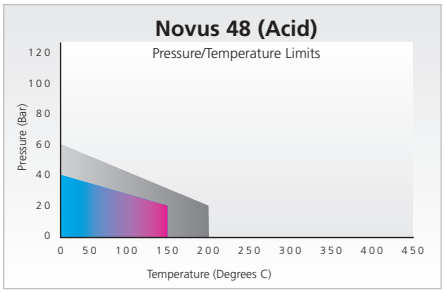
Novus48 (Acid)

Description
Novus Acid is a specially formulated compressed sheet material based on a blend of fibres with an acid resistant binder system.

Colour - Off White

Service
Novus Acid is designed to withstand aggressive chemical environments. A chemical grade material suitable for most acids, alkalis, oils, fuels and refrigerants.

TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density		1.75g/cc
Tensile Strength	ASTM F152	11MPa
Compression	ASTM F36	10%
Recovery	ASTM F36	50%
Gas Leakage	BS7531	<1.0cc/min
95% Sulphuric Acid	Thickness Increase	16.0%
36% Hydrochloric Acid	Thickness Increase	15.0%
50% Nitric Acid	Thickness Increase	7.0%



Novus49 (Graftec™)

Description
Novus Graftec is a compressed sheet material based on a blend of graphite, aramid fibres and a nitrile rubber binder.

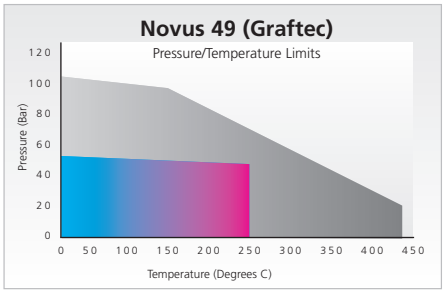
Colour - Black

Service
Novus Graftec is a high performance material with excellent mechanical properties. It is suitable for many applications including oils, solvents, high pressure steam and gases including oxygen.

Approvals/Compliance
WRAS Potable Water
BAM (Oxygen service) up to 90°C and 160 bar
Complies with BS Specification 7531 Grade X
TA-LUFT (in accordance with VDI 2440)

Availability
Available with fine mesh mild steel reinforcement: Novus 49 Metallic

TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density		1.65g/cc
Tensile Strength	ASTM F152	13MPa
Compression	ASTM F36	11%
Recovery	ASTM F36	55%
Residual Stress	BS7531 (300°C)	26MPa
	DIN 52913	31MPa
Gas Leakage	BS 7531	<1.0cc/min
ASTM Oil 1	Thickness Increase	1.0%
IRM 903 Oil	Thickness Increase	2.5%
ASTM Fuel B	Thickness Increase	2.5%



Novus Hi-Temp

Description
Novus Hi-Temp consists of phlogopite mica paper impregnated with a high quality silicone binder. Mica is a aluminosilicate of mineral origin, which has a lamellar and non fibrous structure representing an excellent alternative to asbestos at high temperatures. This material gives Novus Hi-Temp its thermal characteristics - weight loss at 800°C(1472°F) less than 5% - and its chemical resistance to solvents, acids, bases and mineral oils.

Colour - Gold

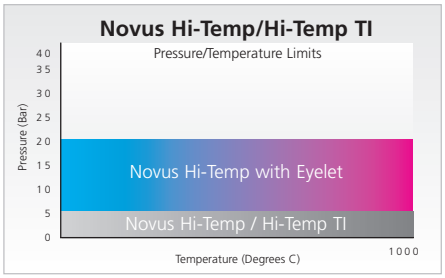
Service
Novus Hi-Temp is developed specially for high temperature applications (up to 1000°C) as a sheet material, filler for spiral wound gaskets or facing for camprofiles. The material offers outstanding resistance to elevated temperatures as well as good sealability at moderate pressures.

Applications
Exhaust manifolds, gas turbines, gas and oil burners, heat exchangers

Availability
In rolls or sheets with or without tanged insert (1200 x 1000mm) as winding strip for spiral wound gaskets

TYPICAL PHYSICAL PROPERTIES		
Thickness	mm	0.1 - 3
Density (IEC371-2)	g/cm3	1.9 (1.75*)
Tensile Strength (DIN52910)	N/mm2	20
Compressibility (ASTM F36J)	%	25 (30*)
Recovery (ASTM F36-J)	%	35 (20*)
Dielectric Strength (IEC243 - 23°C)	kV/mm	± 20
Creep Strength (DIN 52913)		
50Mpa, 300°C*	N/mm²	± 40
7252 psi, 572°F*	psi	5.800
Binder		Silicon Resin
Resin Content	%	± 10

*The measurement was performed with a pegged steel insert.



Novus Compressed Fibre Jointing

Options

Anti -Stick
Novus materials are available with an anti-stick finish. The coating is specially formulated to be environmentally safe without compromising gasket removal from the flange. Anti-stick finish is available as standard on our premium grades Novus 10, Novus 34 and Novus 49 (Graftec).

Wire Reinforced
Novus materials are available with wire reinforcement for applications requiring high compressive strength or where thermal cycling is severe. Carbon Steel wire is the standard reinforcement.

Eyelets
Cut gaskets manufactured from Novus material are available with eyelets. The eyelet is fitted on the inner diameter of the gasket and prevents fluid contamination as well as aiding sealability. The standard material for the eyelet is 316L stainless steel but other materials are available on request.

PTFE Envelopes
Cut gaskets fitted with PTFE envelopes offer excellent chemical resistance under moderate service conditions, allowing the use of Novus materials in fluids which would normally be unsuitable.

Availability
For large volume one size gaskets we can also supply the materials in coils, increasing material yield and reducing production time. Contact our Technical Team for details.

Private Branding
Our materials can be supplied in private brand and colour formats to ensure your company or customer is accorded recognition. Contact our Technical Team for details.

Standard Sheet Sizes

Novus sheet materials are available in standard and non-standard sheet sizes. Standard sheet sizes are available as follows, for non-standard sheet sizes please contact our Technical Team:

Standard sheet size = 2.0m x 2.0m, 2.0m x 1.5m 2.0m x 1.0m, 1.5m x 1.5m, 1.5m x 1.0m

Standard roll sizes = up to a maximum size of 6.0m x 2.0m.

Standard thicknesses
Novus 10, Novus 30, Novus 49 (Graftec),
Novus 45 = 0.4mm to 6.0mm
Novus 34 = 0.25mm to 6.0mm
Novus 26, Novus HDS 1 = 0.5mm to 6.0mm
Novus 48 (Acid), Novus 28 = 0.4mm to 3.0mm
Novus Hi-Temp = 0.1mm to 3.0mm

Approvals and Flange Recommendations

Approvals

Our materials are subjected to a wide range of tests as specified by statutory regulations and customer requirements. The approvals enable our customers to make informed choices as to the suitability of a product for a particular application.

Listed below are just some of the approvals held by our materials with a brief description of the applicability of the test. Please contact our Technical Team for appropriate certification and product reports or for details of other approvals held by our materials.

	Fire Safety		Oxygen	Drinking Water		Food	Gas Supply	TA-LUFT	Maritime	
	API 607	BS6755	BAM*	WRc	KTW*	FDA	DVGW*		ABS	GL
Novus 10	■							■		■
Novus 26										
Novus 28										
Novus 30				■				■		■
Novus 34				■				■		■
Novus 45								■		■
Novus 48 (Acid)				■						■
Novus 49 (Graftec)				■				■		■

Approvals Listing

API607/BS 6755 = Assessment of the suitability of gasket materials in a fire incident. Leakage performance of gasket during burn and post burn conditions.

WRAS = Water Regulations Advisory Scheme. Suitability of gasket materials in hot and cold potable (drinking) water. A number of different tests are conducted including taste, colouring, toxicity levels and growth of bacteria.

KTW = Kunststoff-Trinkwasserempfehlung des Bundesgesundheitsministeriums (Federal German Ministry of Health recommendations for maximum levels of plastics in drinking water). Suitability of gasket materials in drinking water. Assessment of the degree of clouding, smell and foaming. Analysis of organic and metallic compounds.

TA Luft = In accordance with VDI Guideline 2440, the gasket tightness criteria of 1.0 x 10-4 mbar.l/(m.s). Compliance is required for the gasket to be regarded as a high grade sealing system for the purposes of TA Luft.

ABS = American Bureau of Shipping. Type approval for maritime applications. ABS certifies manufacturers around the world are capable of consistently producing a product in compliance with product specifications.

GL = Germanischer Lloyd AG. Type approval for maritime applications. GL certifies manufacturers around the world are capable of consistently producing a product in compliance with product specifications.

Other approvals available on request

Flanges

The gasket must be suitable for the flange in which it is fitted. Incorrect gasket selection may result in under or over loading of the gasket and subsequent joint failure.

The chart below provides a guideline for the selection of our sheet materials in standard ANSI B16.5 flanges. The guidelines apply to 1.5 mm thickness and below. For thicker materials consult the Technical Team.

Flange Class	150	300	600	900	1500	2500
Novus 10	■	■	■			
Novus 26	■					
Novus 28	■	■				
Novus 30	■	■				
Novus 34	■	■	■			
Novus 45	■	■				
Novus 48 (Acid)	■					
Novus 49 (Graftec)	■	■				

Recommended

Suitable*

We recommend that you check your application with the Technical Team

Flange Materials

The following guidelines apply to the selection of gasket materials for different flange materials and configurations.

	STEEL	GLASS PLASTIC ENAMEL	LINED	STD FLANGES	T&G	GASKETS UP TO 2000mm
Novus 10	■			■	■	■
Novus 26	■			■		■
Novus 28	■			■		■
Novus 30	■			■	■	■
Novus 34	■			■	■	■
Novus 45	■			■		■
Novus 48 (Acid)	■			■		■
Novus 49 (Graftec)	■			■	■	■

Recommended

Suitable

We recommend that you check your application with the Technical Team

Steam Applications

Steam is a powerful hydrolyser and is one of the most difficult mediums for a gasket material to seal. Careful consideration must therefore be exercised when selecting and installing an appropriate material for this fluid.

Of particular importance is the degree of thermal or pressure cycling that is likely to occur during the lifetime of the gasket. This can lead to failure of the gasket if it is prone to embrittlement in steam.

There are many factors in addition to the above which contribute to a leak free steam joint including:

- **Gasket Thickness**
- **Bolt Loading**
- **Method of Assembly**
- **Flange Design** - type, surface finish, flatness and general condition.

Due to the many factors involved, only approximate recommendations for maximum steam temperatures can be made and these are given below.

Material	MAX.Temperature
Novus 10	**220°C**
Novus 26	**150°C**
Novus 28	**150°C**
Novus 30	**200°C**
Novus 34	**220°C**
Novus 45	**150°C**
Novus 48 Acid	**150°C**
Novus 49 Graftec	**250°C**
Novus HDS-1	**220°C**

Applicable to thicknesses of 1.5mm and below. For thicknesses >1.5mm please contact our Technical Team.

Low-Temperature Range

Novus compressed fibre sheet materials contain an elastomeric binder which will harden at temperatures below approx -40°C. To ensure safe service of these materials at low temperatures we recommend the following guidelines.

- **Fit the gasket dry**
- **Fit the gasket at room temperature**
- **Do not retorque the gasket**

If the above guidelines are implemented then the following minimum temperatures apply.

Material	MIN.Temperature
Novus 10	**-196°C**
Novus 26	**-40°C**
Novus 28	**-40°C**
Novus 30	**-100°C**
Novus 34	**-120°C**
Novus 45	**-40°C**
Novus 48 (Acid)	**-40°C**
Novus 49 (Graftec)	**-196°C**
Novus HDS-1	**-120°C**

Monomer Service

Some Monomers e.g. Styrene can present a particular problem to sheet gasket materials.

During service, the monomer can polymerise on the inner edge of the gasket leading to gasket failure or in extreme cases process blockage.

For these duties we recommend that materials are fitted with a metal eyelet which prevents the polymerisation from taking place.

Thickness

The gasket thickness should be selected as thin as possible. This is because thinner gaskets require less load to achieve a tight seal, they can accommodate higher gasket loads and they have better torque retention properties which helps maintain a tight seal throughout the lifetime of the gasket. However, the gasket must be sufficiently thick to seal any imperfections or surface finish in the flange faces.

For most applications a thickness of 1.5 or 2mm is acceptable. 3mm is generally not recommended. For arduous duties e.g. high pressure steam, thinner gaskets should be used.

Width

The width of the gasket, along with its thickness, has a major effect on the maximum permissible gasket stress. For graphite laminate materials the maximum stress is directly proportional to the width - the wider the gasket the higher the stress - and particular care must be taken to ensure that the gasket is sufficiently wide to prevent over compression.

We recommend the following minimum thickness to width ratios:

- **Graphite Laminate 1/10**
- **Novus and Uniflon 1/5**

Installation Guidelines

Installation of Novus Sheet Products

In order to ensure the optimum service life of Novus gasket materials it is not only important to choose the correct material for the application but to install and maintain it correctly.

The following guidelines are designed to assist the end user in the assembly of Novus gasket materials.

Flange Condition

- Remove the old gasket and check that the flange faces are clean and free from indentations and scoring. Radial (cross face) scoring is a particular concern and can lead to joint leakage.
- For most applications a surface finish of between 3.2µm to 6.3µm Ra (125 to 250 micro inch) is recommended. For very thin gaskets (0.4mm or below) a surface finish as fine as 1.6µm Ra is acceptable. Use a surface finish comparator e.g. Novus Comparator to check flange finish.
- Check that the flange faces are parallel or that the pipework is sufficiently flexible to allow the flanges to be pulled parallel and concentric without excessive bolt loads.

Gasket

- Always use a new gasket
- The gasket material should be as thin as possible. Out of flat or pitted flanges may require thicker gaskets to accommodate the imperfections. To ensure optimum performance a minimum thickness/width ratio of 1/5 (ideally 1/10) is required.
- Check that the gasket is in good condition and that the dimensions are correct for the class and size of the flanges.
- Do not use jointing compounds, grease or lubricants with Novus gasket materials. These compounds can affect the contact friction between the gasket and the flange and can lead to creep and premature joint failure.
- If there is a requirement to fix the gasket to the flange prior to assembly (e.g. large vertical flanges) then a light dusting of spray adhesive e.g. 3M 77 spray may be used.

  The adhesive should be applied sparingly and in isolated areas, and must be compatible with the fluid medium.

Bolting

- Ensure the bolt and nut threads are clean. Apply bolt lubrication to the bolt and nut threads and to the face of the nut to be tightened. Do not apply grease or bolt lubricant to the joint face. After cleaning and lubrication it should be possible to run the nut along the full length of the bolt by hand. If this is not possible the bolts and nuts should be refurbished or replaced.
- Scrape, wire brush or file as necessary the back face of each flange where the bolt heads and nuts are to sit, ensuring that the surfaces are clean and flat.
- If possible use hardened flat washers to ensure even transfer of the load.

Installation

- Ensure that the gasket is installed centrally.
- It is recommended that the bolts are tightened using a controlled method such as torque or tension. If using a torque wrench, ensure that it is accurately calibrated.
- Tighten bolts in a star-like crossing pattern in the following sequence:
- Finger tighten nuts
- Tighten to 30% of the final load
- Tighten to 60% of the final load
- Tighten to full load
- Make a final tightening sequence, working around the flange, tightening each bolt in turn until the specified torque is achieved.

After Installation

Check that the flange faces are parallel using a suitable tool e.g. Novus Flange Gap Tool.

Gasket Storage

We recommend the following conditions for the storage of Novus sheet gasket materials:

- Room Temperature (Below 25°C)
- Away from sources of UV light (No natural light)
- Dry (Humidity levels <60%)
- Store Flat

Storing the gasket under the above conditions will ensure a shelf life of at least 5 years.

Chemical Resistance

If your chemical resistance requirement is not listed please contact the Technical Team.

A = Suitable for application
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C = Not Suitable

	N10	N26	N28	N30	N34	N45	N48 Acid	N49 Graftec	HDS-1
Acetaldehyde	B	B	A	B	B	A	B	B	B
Acetamide	A	A	A	A	A	A	A	A	A
Acetic Acid	A	A	B	A	A	B	A	A	A
Acetic Acid Glacial	B	B	B	B	B	B	A	B	B
Acetic Anhydride	B	B	B	B	B	B	B	B	B
Acetone	B	B	B	B	B	B	A	B	B
Acetonitrile	C	C	C	C	C	C	C	C	C
Acetyl Chloride	C	C	C	C	C	C	C	C	C
Acetylene	A	A	A	A	A	A	A	A	A
Acrylic Acid	B	C	B	B	B	B	B	B	B
Acrylonitrile	C	C	C	C	C	C	C	C	C
Adipic Acid	A	A	A	A	A	A	A	A	A
Air	A	A	A	A	A	A	A	A	A
Allyl Chloride	B	C	B	B	B	B	B	B	B
Alum	A	A	A	A	A	A	A	A	A
Aluminium Acetate	A	A	A	A	A	A	A	A	A
Aluminium Chloride	A	A	A	A	A	A	A	A	A
Aluminium Hydroxide (Solid)	A	A	A	A	A	A	A	A	A
Aluminium Sulphate	A	A	A	A	A	A	A	A	A
Ammonia Gas	B	B	B	B	B	B	B	B	B
Ammonium Carbonate	A	A	A	A	A	A	A	A	A
Ammonium Chloride	A	A	A	A	A	A	A	A	A
Ammonium Hydroxide	A	A	A	A	A	A	A	A	A
Ammonium Sulphate	A	A	A	A	A	A	A	A	A
Amyl Acetate	B	B	B	B	B	B	B	B	B
Amyl Alcohol	A	A	A	A	A	A	A	A	A
Aniline	C	C	C	C	C	C	C	C	C
Aqua Regia	C	C	C	C	C	C	C	C	C
Asphalt	A	B	A	A	A	A	C	A	A
Aviation Fuel	A	B	A	A	A	A	B	A	A
Barium Chloride	A	A	A	A	A	A	A	A	A
Benzaldehyde	B	C	C	B	B	C	B	B	B
Benzene	A	C	A	A	A	A	A	A	A
Benzoic Acid	A	B	B	B	B	B	A	A	B
Benzonitrile	C	C	C	C	C	C	C	C	C
Benzyl Alcohol	B	C	C	B	B	C	B	B	B
Benzyl Chloride	B	C	B	B	B	B	A	B	B
Blast furnace gas	A	A	A	A	A	A	A	A	A
Bleach (solution)	B	B	B	B	B	B	B	B	B
Boiler feed water	A	A	A	A	A	A	A	A	A
Borax	A	A	A	A	A	A	A	A	A
Boric Acid	A	A	A	A	A	A	A	A	A

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Chemical Resistance

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A = Suitable for application
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	N10	N26	N28	N30	N34	N45	N48 Acid	N49 Graftec	HDS-1
Brine	A	A	A	A	A	A	A	A	A
Bromine	C	C	C	C	C	C	C	C	C
Butadiene	B	C	B	B	B	B	C	B	B
Butane	A	B	A	A	A	A	A	A	A
Butanol	A	A	A	A	A	A	A	A	A
Butyl Acetate	A	B	B	B	B	B	B	A	B
Butyl Alcohol	A	A	A	A	A	A	A	A	A
Butyl Methacrylate	C	C	C	C	C	C	C	C	C
Butyric Acid	A	A	A	A	A	A	A	A	A
Calcium Chloride	A	A	A	A	A	A	B	A	A
Calcium Hydroxide	A	A	A	A	A	A	A	A	A
Calcium Hypochlorite	A	A	A	A	A	A	A	A	A
Calcium Sulphate	A	A	A	A	A	A	A	A	A
Carbolic Acid	C	C	C	C	C	C	B	C	C
Carbon Dioxide	A	A	A	A	A	A	A	A	A
Carbon Disulphide	B	C	C	C	C	C	C	C	C
Carbon Monoxide	A	A	A	A	A	A	A	A	A
Carbon Tetrachloride	B	C	B	B	B	B	C	B	B
Castor Oil	A	A	A	A	A	A	A	A	A
Caustic Soda <25%	A	B	B	B	B	B	A	B	B
Caustic Soda <50%	B	B	B	B	B	B	B	B	B
Caustic Soda >50%	B	C	C	C	C	C	C	C	C
Chlorine Dioxide	C	C	C	C	C	C	C	C	C
Chlorine Wet	C	C	C	C	C	C	C	C	C
Chlorine Dry	B	B	C	B	B	C	B	B	B
Chlorine Liquid	B	B	C	B	B	C	B	B	B
Chloroacetic Acid	C	C	C	C	C	C	C	C	C
Chlorobezene	B	C	C	B	B	C	C	B	B
Chloroform	B	C	B	B	B	B	B	B	B
Chlortrifluoride	C	C	C	C	C	C	C	C	C
Chromic Acid	C	C	C	C	C	C	B	C	C
Citric Acid	A	A	B	A	A	B	A	A	A
Condensation Water	A	A	A	A	A	A	A	A	A
Copper Acetate	A	A	A	A	A	A	A	A	A
Copper Sulphate	A	A	A	A	A	A	A	A	A
Creosote	B	C	B	B	B	B	B	B	B
Cresol	B	B	B	B	B	B	C	B	B
Crude Oil	A	C	A	A	A	A	A	A	A
Cyclohexane	B	C	B	B	B	B	B	B	B
Cyclohexanol	A	A	A	A	A	A	A	A	A
Cyclohexanone	C	C	C	C	C	C	C	C	C
Dibenzyl Ether	C	C	C	C	C	C	C	C	C
Dibutyl Phthalate	B	B	B	B	B	B	B	B	B

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	N10	N26	N28	N30	N34	N45	N48 Acid	N49 Graftec	HDS-1
Diesel Oil	A	C	A	A	A	A	A	A	A
Diethanolamine	B	B	B	B	B	B	B	B	B
Diethylamine	B	B	B	B	B	B	B	B	B
Di-iso Butyl Ketone	B	B	B	B	B	B	B	B	B
Dimethyl Formamide	C	C	C	C	C	C	C	C	C
Dimethylamine	B	B	B	B	B	B	B	B	B
Dioxane	B	B	C	B	B	C	C	B	B
Diphyl (Dowtherm A)	A	A	A	A	A	A	B	A	A
Ethane	A	A	A	A	A	A	A	A	A
Ethanol	A	A	A	A	A	A	A	A	A
Ethyl Acetate	B	C	B	B	B	B	B	B	B
Ethyl Acrylate	C	C	C	C	C	C	C	C	C
Ethyl Alcohol	A	A	A	A	A	A	A	A	A
Ethyl Chloride (Dry)	B	C	C	B	B	C	C	B	B
Ethyl Ether	A	B	A	A	A	A	B	A	A
Ethylbenzene	B	C	B	B	B	B	B	B	B
Ethylene	A	A	A	A	A	A	A	A	A
Ethylene Chloride	C	C	C	C	C	C	A	C	C
Ethylene Glycol	A	A	A	A	A	A	A	A	A
Fluorine Dioxide	C	C	C	C	C	C	C	C	C
Fluorine Gaseous	C	C	C	C	C	C	C	C	C
Fluorine Liquid	C	C	C	C	C	C	C	C	C
Formaldehyde	B	B	B	B	B	B	B	B	B
Formamide	B	B	B	B	B	B	B	B	B
Formic Acid 10%	A	A	A	A	A	A	A	A	A
Formic Acid 85%	B	C	B	B	B	B	A	B	B
Freons (see refrigerants)									
Fuel Oil	A	C	A	A	A	A	A	A	A
Gas (LPG)	A	A	A	A	A	A	A	A	A
Gas (Natural Gas)	A	A	A	A	A	A	A	A	A
Gas Oil	A	C	A	A	A	A	A	A	A
Gasoline	A	C	A	A	A	A	A	A	A
Generator Gas	A	A	A	A	A	A	A	A	A
Glucose	A	A	A	A	A	A	A	A	A
Glycerine	A	A	A	A	A	A	A	A	A
Glycol	A	B	A	A	A	A	A	A	A
Heating Oil	A	B	A	A	A	A	A	A	A
Heptane	A	B	A	A	A	A	A	A	A
Hexane	A	A	A	A	A	A	A	A	A
Hydraulic Oil	A	B	A	A	A	A	A	A	A
Hydrochloric Acid (20%)	B	C	B	B	B	B	A	B	B
Hydrochloric Acid (37%)	C	C	C	C	C	C	A	C	C
Hydrofluoric Acid <65%	C	C	C	C	C	C	C	C	C

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A = Suitable for application
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	N10	N26	N28	N30	N34	N45	N48 Acid	N49 Graftec	HDS-1
Hydrofluoric Acid >65%	C	C	C	C	C	C	C	C	C
Hydrofluorosillic Acid	C	C	C	C	C	C	C	C	C
Hydrogen	A	B	A	A	A	A	A	A	A
Hydrogen Chloride (Dry)	B	B	B	B	B	B	B	B	B
Hydrogen Fluoride	C	C	C	C	C	C	C	C	C
Hydrogen Peroxide 6%	B	B	B	B	B	B	B	B	B
Hydrogen Sulphide	B	B	B	B	B	B	B	B	B
Isoctane	A	B	A	A	A	A	A	A	A
Isopropyl Acetate	B	B	B	B	B	B	B	B	B
Isopropyl Alcohol	A	A	A	A	A	A	A	A	A
Isopropyl Ether	B	B	B	B	B	B	B	B	B
Kerosene	A	C	A	A	A	A	A	A	A
Lactic Acid	B	B	B	B	B	B	A	B	B
Linseed Oil	A	B	A	A	A	A	A	A	A
Liquid Petroleum Gas	A	A	A	A	A	A	A	A	A
Lubricating Oil	A	B	A	A	A	A	A	A	A
Machine Oil	A	B	A	A	A	A	A	A	A
Magnesium Sulphate	A	B	A	A	A	A	A	A	A
Maleic Acid	B	B	B	B	B	B	A	B	B
Maleic Anhydride	C	C	C	C	C	C	C	C	C
Methane	A	A	A	A	A	A	A	A	A
Methanol	A	A	A	A	A	A	A	A	A
Methyl Alcohol	A	A	A	A	A	A	A	A	A
Methyl Chloride	B	C	B	B	B	B	B	B	B
Methyl Ethyl Ketone	B	B	B	B	B	B	A	B	B
Methyl Methacrylate	C	C	C	C	C	C	C	C	C
Methylated Spirits	A	B	A	A	A	A	A	A	A
Methylene Chloride	C	C	C	C	C	C	C	C	C
Mineral Oil	A	B	A	A	A	A	A	A	A
Mobiltherm 600	A	B	A	A	A	A	B	A	A
Mobiltherm 603/605	A	B	A	A	A	A	B	A	A
Molten Alkali Metals	C	C	C	C	C	C	C	C	C
Motor Oil	A	B	A	A	A	A	A	A	A
Naphtha	A	B	A	A	A	A	A	A	A
Naphthalene	B	C	B	B	B	B	B	B	B
Natural Gas	A	A	A	A	A	A	A	A	A
Nickel Chloride	A	A	A	A	A	A	A	A	A
Nickel Sulphate	A	A	A	A	A	A	A	A	A
Nitric Acid <30%	B	C	C	C	C	C	B	B	C
Nitric Acid >30%	C	C	C	C	C	C	B	C	C
Nitric Acid Red Fuming	C	C	C	C	C	C	C	C	C
Nitrogen	A	A	A	A	A	A	A	A	A
Octane	A	B	A	A	A	A	A	A	A

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	N10	N26	N28	N30	N34	N45	N48 Acid	N49 Graftec	HDS-1
Oleic Acid	A	B	A	A	A	A	A	A	A
Oleum	C	C	C	C	C	C	C	C	C
Oxalic Acid	B	C	B	B	B	B	B	B	B
Oxygen (BAM Approval)	C	C	C	C	A	C	C	A	A
Palmitic Acid	A	A	A	A	A	A	A	A	A
Paraffin	A	C	A	A	A	A	A	A	A
Pentane	A	B	A	A	A	A	A	A	A
Perchlorethylene	B	C	C	B	B	C	B	B	B
Perchloric Acid	C	C	C	C	C	C	B	C	C
Petroleum	A	C	A	A	A	A	A	A	A
Phenol	C	C	C	C	C	C	B	C	C
Phosgene	C	C	C	C	C	C	C	C	C
Phosphoric Acid <45%	B	C	B	B	B	B	A	B	B
Phosphoric Acid >45%	B	C	C	C	C	C	A	B	C
Phthalic Acid	A	A	A	A	A	A	A	A	A
Phthalic Anyhydride	C	C	C	C	C	C	C	C	C
Potassium Acetate	A	A	A	A	A	A	A	A	A
Potassium Carbonate	A	C	A	A	A	A	A	A	A
Potassium Chlorate	A	A	A	A	A	A	C	A	A
Potassium Chloride	A	A	A	A	A	A	A	A	A
Potassium Cyanide	A	A	A	A	A	A	A	A	A
Potassium Dichromate <20%	A	A	A	A	A	A	A	A	A
Potassium Hydroxide <50%	B	B	B	B	B	B	B	B	B
Potassium Hydroxide >50%	B	C	C	C	C	C	C	C	C
Potassium Hypochlorite	B	B	C	B	B	C	B	B	B
Potassium Nitrate	A	A	A	A	A	A	A	A	A
Potassium Pemanganate	A	A	A	A	A	A	B	A	A
Producer Gas	A	A	A	A	A	A	B	A	A
Propane	A	A	A	A	A	A	A	A	A
Pyridine	C	C	C	C	C	C	C	C	C
Rape Seed Oil	A	A	A	A	A	A	A	A	A
Refrigerant R11	A	C	A	A	A	A	C	A	A
Refrigerant R112	A	C	A	A	A	A	B	A	A
Refrigerant R113	A	A	A	A	A	A	A	A	A
Refrigerant R114	A	A	A	A	A	A	A	A	A
Refrigerant R114B2	A	C	A	A	A	A	A	A	A
Refrigerant R115	A	A	A	A	A	A	A	A	A
Refrigerant R12	A	A	A	A	A	A	A	A	A
Refrigerant R123	B	C	B	B	B	B	C	B	B
Refrigerant R125	B	A	B	B	B	B	C	B	B
Refrigerant R13	A	A	A	A	A	A	A	A	A
Refrigerant R13B1	A	A	A	A	A	A	A	A	A
Refrigerant R134A	A	B	A	A	A	A	C	A	A

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	N10	N26	N28	N30	N34	N45	N48 Acid	N49 Graftec	HDS-1
Refrigerant R141A	A	C	A	A	A	A	C	A	A
Refrigerant R141B	A	C	A	A	A	A	C	A	A
Refrigerant R152A	A	A	A	A	A	A	C	A	A
Refrigerant R22	B	B	B	B	B	B	C	B	B
Refrigerant R402A	A	B	A	A	A	A	C	A	A
Refrigerant R402B	A	B	A	A	A	A	C	A	A
Refrigerant R404A	A	B	A	A	A	A	C	A	A
Refrigerant R502	A	B	A	A	A	A	C	A	A
Refrigerant R507	A	B	A	A	A	A	C	A	A
Salicylic Acid	B	B	B	B	B	B	A	B	B
Santotherm 66	A	A	A	A	A	A	A	A	A
Sea Water	A	A	A	A	A	A	A	A	A
Silicone Oil	A	A	A	A	A	A	A	A	A
Silver Nitrate	A	A	A	A	A	A	A	A	A
Soap	A	A	A	A	A	A	A	A	A
Sodium Aluminate	A	A	A	A	A	A	A	A	A
Sodium Bicarbonate	A	A	A	A	A	A	A	A	A
Sodium Bisulphite	A	A	A	A	A	A	A	A	A
Sodium Chloride	A	A	A	A	A	A	A	A	A
Sodium Hydroxide <25%	A	B	B	B	B	B	A	B	B
Sodium Hydroxide <50%	B	B	B	B	B	B	B	B	B
Sodium Hydroxide >50%	B	C	C	C	C	C	C	C	C
Sodium Silicate	A	A	A	A	A	A	A	A	A
Sodium Sulphide	A	A	A	A	A	A	A	A	A
Sodium Sulphate	A	A	A	A	A	A	A	A	A
Starch	A	A	A	A	A	A	A	A	A
Steam	A	B	B	B	A	B	B	A	A
Stearic Acid	A	B	B	A	A	B	B	A	A
Styrene	C	C	C	C	C	C	C	C	C
Sugar	A	A	A	A	A	A	A	A	A
Sulphur	B	B	C	B	B	C	B	B	B
Sulpher Dioxide Dry	B	C	B	B	B	B	A	B	B
Sulphur Trioxide	C	C	C	C	C	C	C	C	C
Sulphuric Acid (Fuming)	C	C	C	C	C	C	C	C	C
Sulphuric Acid 30%	C	C	C	C	C	C	A	C	C
Sulphuric Acid 50%	C	C	C	C	C	C	B	C	C
Sulphuric Acid 96%	C	C	C	C	C	C	B	C	C
Sulphurous Acid	B	C	C	B	B	C	A	B	B
Tannic Acid	A	A	A	A	A	A	A	A	A
Tar	A	B	A	A	A	A	C	A	A
Tartaric Acid	A	A	A	A	A	A	A	A	A
Tetrachloroethylene	B	C	C	B	B	C	A	B	B
Thermal Oil	A	B	A	A	A	A	A	A	A

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	N10	N26	N28	N30	N34	N45	N48 Acid	N49 Graftec	HDS-1
Toluene	B	C	B	B	B	B	B	B	B
Transformer Oil	A	B	A	A	A	A	B	A	A
Transmission Oil	A	B	A	A	A	A	A	A	A
Trichloroethylene	B	C	C	B	B	C	B	B	B
Triethanolamine	A	A	A	A	A	A	A	A	A
Turpentine	A	C	A	A	A	A	A	A	A
Urea	A	A	A	A	A	A	A	A	A
Vegetable Oil	A	C	A	A	A	A	A	A	A
Vinyl Acetate	B	C	C	B	B	C	B	B	B
Vinyl Chloride	C	C	C	C	C	C	C	C	C
Vinyl Bromide	C	C	C	C	C	C	C	C	C
Water	A	A	A	A	A	A	A	A	A
White Spirit	A	B	A	A	A	A	A	A	A
Xylene	A	B	A	A	A	A	B	A	A
Zinc Chloride	A	A	A	A	A	A	A	A	A
Zinc Sulphate	A	A	A	A	A	A	A	A	A

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Novus 'SELECT' software

Novus SELECT software has been developed as a user-friendly package to assist our customers in the selection and installation of Novus gasket products.

Novus SELECT provides:

- Selection of gasket materials
- Suitability of gasket materials for given applications.
- Selection criteria including flange material, gasket properties and approvals.
- Bolt torque calculations
- Conversion factors

SELECT

THE QUICK, EASY SYSTEM FOR SELECTING GASKET AND JOINTING MATERIALS

Contents: • **Select a Gasket** • **Conversion Charts** • **Torque Calculator** • **Product Data & Applications**

To learn more about Novus SELECT please contact our Technical Team on +44 (0)1274 851273 who will be happy to discuss the many benefits of the software.

Flexitallic

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& COMPANY LIMITED

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Please note, failure to select the correct materials or products we supply ("the Products") may result in damage to plant, equipment or property. In some instances, it may cause death or personal injury. We are not designers and do not give advice about design related matters concerning the Products. We can help and assist with the technical specifications for the Products. In specific applications, particularly where critical conditions exist, we will try to assist you within the limitations of the services that we offer. All information supplied by us is intended as technical co-operation outlining the specifications of the different Products which we supply. To the extent permitted in law, no warranty is given in respect of any information supplied by us. The customer must satisfy themselves as to the suitability of the Products for their intended application and use. The correct fitting of Products is the responsibility of the customer. Your statutory rights remain unaffected. Save in respect of death, personal injury or fraud, our entire liability to you, however arising from the supply of Products shall be limited to the £10M indemnity amount provided by our insurers.

UNITED KINGDOM
Flexitallic Ltd
Scandinavia Mill
Hunsworth Lane
Cleckheaton
West Yorkshire
BD19 4LN
England, UK
T: + 44 (0)1274 851273
F: + 44 (0)1274 300303
www.flexitallic.eu

UNITED STATES
Flexitallic L.P.
6915 Highway 225
Deer Park
Texas 77536
USA
Tel. +1 281 604 2400
Fax. +1 281 604 2415
www.flexitallic.com

CANADA
AGS Flexitallic
4340 - 78 Avenue
Edmonton
Alberta
T6B 3J5
CANADA
Tel. +780 466 5050
Fax. +780 465 1177
www.agsflexitallic.com

CHINA
Flexitallic Sealing Technology Co. Ltd
Building 3 South
Wujiang Export
Processing Zone
688 Pangjin Road
Wujiang, Jiangsu 215200
P.R. CHINA
Tel. +86 512 6303 2839
Fax. +86 512 6303 2879
www.china.flexitallic.com

UNITED ARAB EMIRATES
Flexitallic LLC
P.O. Box 6591
Amenity Centre
Tower Number 2
10th Floor, Office 4
Al Hamra Industrial Area
Ras Al Khaimah
UNITED ARAB EMIRATES
Tel. +971 (0)7 243 4305
Fax. +971 (0)7 243 4306
www.flexitallic.ae

SAUDI ARABIA
Flexitallic Middle East LLC
Al-Aujam Industrial City
6790-Al Badia
Unit No. 1
Al Qatif 32656-2462
KINGDOM OF SAUDI ARABIA
Tel. +966 13 8089635
Fax. +966 13 8089634
www.flexitallic.sa

About The Flexitallic Group

The Flexitallic Group (www.TheFlexitallicGroup.com) is a global leader in specialised sealing solutions and products serving the oil and gas, power generation, chemical and petrochemical industries in emerging and developed markets. Focused on the upstream, downstream and power generation sectors, it has operations in France, the United States, Canada, Mexico, the United Kingdom, Germany, the United Arab Emirates, Saudi Arabia, Kazakhstan and China plus a network of worldwide licensing partners and distributors.

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