novus
SEALING LIMITED

Sheet Materials

Manufacturers and distributors of sealing and jointing products

Novus Sealing manufactures and trades a variety of high quality products designed for fluid sealing applications in the industrial and manufacturing sectors. Our company ethos is to provide honesty, reliability and a high level of service and dependability through all aspects of our business, adding value to our products and ensuring we sustain a competitive edge.

Over the years we have enhanced our technical facilities to develop more new products and provide guidance and training programmes for some of the world's largest chemical and petrochemical plants. We have our own dedicated Research & Development team who ensure high quality technical support for all our products. We constantly look to provide a balanced mix of quality sealing products with a warmth of service.

Novus Sealing continues to invest in Quality and Environmental Systems such as ISO 9001, ISO 14001 and OHSAS 18001.

Contents

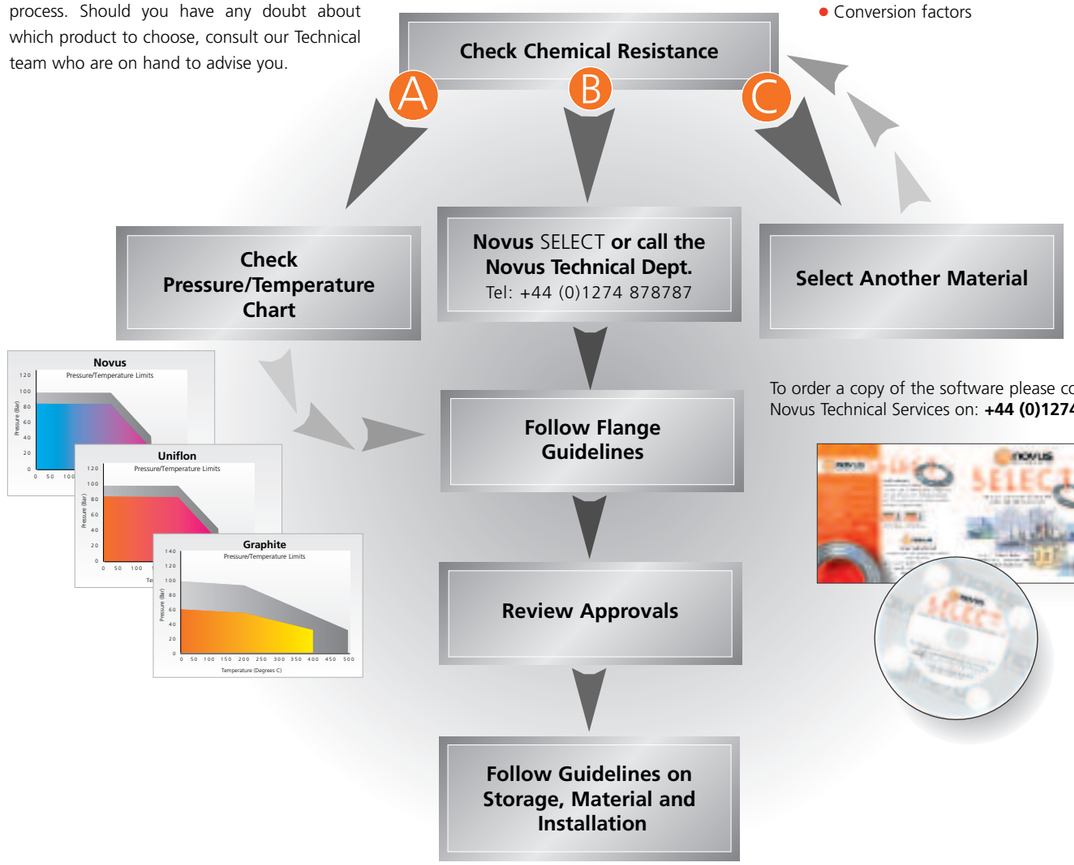
This brochure outlines our sheet material products and provides guidelines on their correct selection, storage and assembly. For more information on any of the areas covered please contact our sales or technical support teams who will be happy to assist.

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.

At Novus 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 Novus Technical Services on: **+44 (0)1274 878787**

Manufacturers and distributors of sealing and jointing materials.

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.

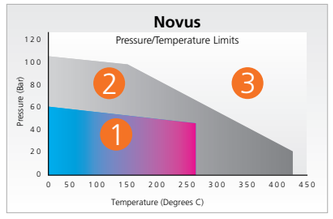
Availability

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.

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 Novus Technical Team
3. Contact the Novus 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.

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.

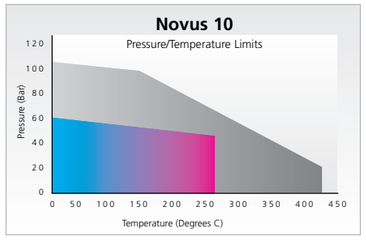
Approvals/Compliance

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.

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%



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

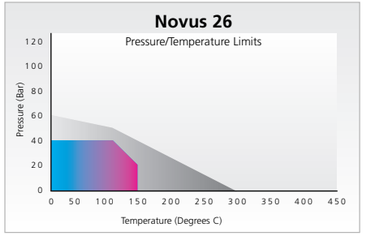
Service

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.

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

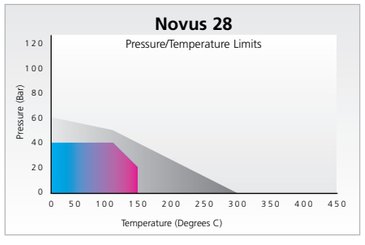
Service

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) DIN 52913	29MPa
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.

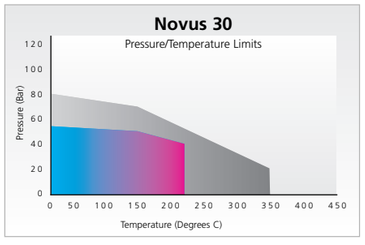
Approvals/Compliance

DIN-DVGW (Gas Industry)
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) DIN 52913	23MPa 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.

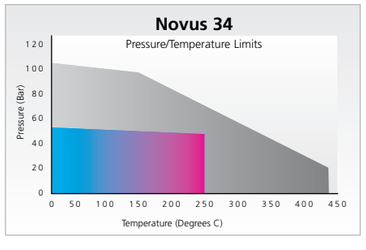
Approvals/Compliance

DIN-DVGW (Gas Industry)
WRAS Potable Water
BAM (Oxygen service) up to 90°C and 160 bar
Independently tested to Shell specification MF 94-0960
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) DIN 52913	26MPa 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%



Novus 45

Description
Novus 45 is a medium quality cost effective compressed sheet material manufactured from virgin fibres and recycled material, with a nitrile rubber binder system.

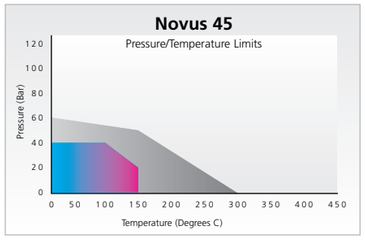
Colour - Blue

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 Approved

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%



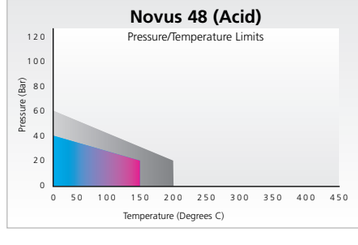
Novus 48 (Acid)

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%



Novus 49 (Graftec™)

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

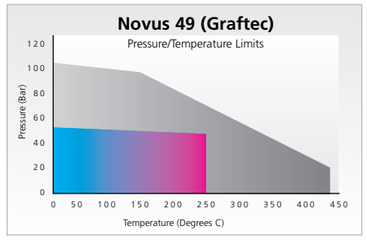
Colour - Black

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)
Germanischer Lloyd GL Approved

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 HDS-1

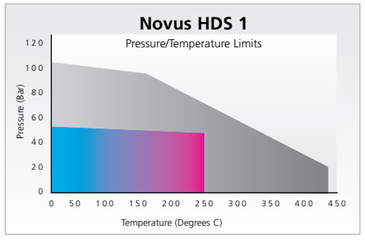
Description
Novus HDS-1 is a high performance compressed fibre sheet material with excellent dielectric properties. It is based on a blend of aramid/inorganic fibres and special additives with a high quality nitrile rubber binder system.

Colour - Face Yellow, Reverse Red

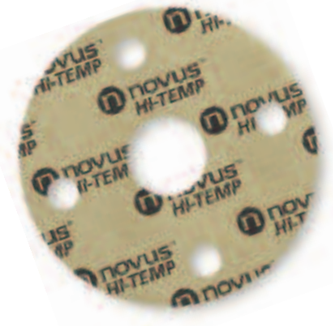
Service
A superior performance material with excellent mechanical properties, it is suitable for many applications including oils, solvents, high pressure steam and gases including oxygen. Novus HDS 1 has very high dielectric strength which makes it an ideal insulating material.

Approvals/Compliance
Complies with BS Specification 7531 Grade X
TA-LUFT (in accordance with VDI 2440)

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	32MPa
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%
Dielectric Strength	ASTM D149-95a	22-28 kw/mm



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

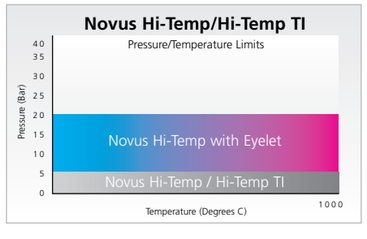
Service
Novus Hi-Temp is developed specially for high temperature applications (up to 1000°C) as a sheet material, filler for spiral wound gaskets or facing for camprofiles. The material offers outstanding resistance to elevated temperatures as well as good sealability at moderate pressures

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 SEALING

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 Novus Sealing 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 Novus Sealing 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.

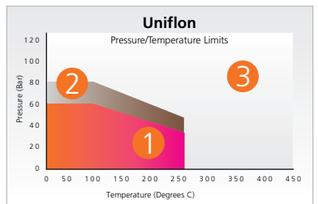
Standard thicknesses
Novus 10, Novus 30, Novus 49 (Graftec), Novus 45 = 0.4mm to 6.0mm
Novus 34 = 0.25mm to 6.0mm
Novus 26, Novus HDS 1 = 0.5mm to 6.0mm
Novus 48 (Acid), Novus 28 = 0.4mm to 3.0mm
Novus Hi-Temp = 0.1mm to 3.0mm

Uniflon™ Reinforced PTFE Gasket Material

Novus Uniflon is a comprehensive range of modified PTFE sealing products designed for applications where chemical resistance is paramount or where food safety is a requirement.

Our materials represent the latest generation of filled biaxially orientated PTFE sealing material combining outstanding chemical resistance with excellent sealing performance. The enhanced capabilities of our manufacturing facility means that one piece gaskets are available up to 2000 mm diameter.

Pressure vs Temperature Ratings for Uniflon Materials



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

   Applicable to 1.5mm and below

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

Uniflon™ 50

Description
Novus Uniflon 50 is a superior performance biaxially orientated PTFE sheet sealing material with highly conformable properties, ideally suited to both standard and irregular flanges.

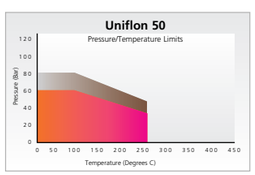
Colour - Blue

Service
Novus Uniflon 50 is specifically designed for use in low bolt loaded irregular flanges. Typical flanges include glass lined, ceramic plastic coated or uneven/badly distorted flanges. It is suitable for sealing all chemicals across the whole pH range, except molten alkali metals, fluorine or hydrogen fluoride,
(See chemical resistance chart for more details).

Approvals/Compliance
ABS Type Approved
Germanischer Lloyd GL Approved
TA-LUFT (in accordance with VDI Guideline 2440)

Features
Conforms with FDA21 CFR 177.1550 regulations.
Excellent chemical resistance.
Very low gas permeability.
Improved creep properties when compared with conventional PTFE gasket materials.
Excellent for handling and cutting.

TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density		1.4g/cc
Tensile Strength	ASTM F152	11MPa
Compression	ASTM F36	40%
Recovery	ASTM F36	30% min
Residual Stress	BS7531 (175°C)	25MPa
Creep Relaxation	ASTM F38	35%
Gas Permeability	DIN 3535	<0.02cc/min
Liquid Leakage	ASTM F37	0.23ml/hr



Uniflon™ 51

Description
Novus Uniflon 51 is a superior performance biaxially orientated PTFE sheet material with a silica filler.

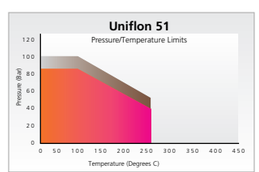
Colour - Pink and Fawn

Service
A general purpose grade for sealing applications across the whole pH range. It is particularly suitable for use with strong acids (except hydrofluoric acid) and alkalis. Other applications include solvents, fuels, water, steam, and chlorine.

Approvals/Compliance
BAM-Oxygen service for gaseous oxygen at temperatures up to 200°C and with liquid oxygen.
BAM- chemical resistance test against Ethylene Oxide Propylene oxide (100%) and a mixture of Ethylene oxide/Propylene oxide.
Germanischer Lloyd GL Approved.
ABS Type Approved

Features
Conforms with FDA21 CFR 177.1550 regulations.
Excellent chemical resistance.
Very low gas permeability.
Improved creep properties when compared with conventional PTFE gasket materials.

TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density		2.2g/cc
Tensile Strength	ASTM F152	15MPa
Compression	ASTM F36	7%
Recovery	ASTM F36	40%
Residual Stress	BS7531 (175°C)	32MPa
Creep Relaxation	ASTM F38	23%
Gas Permeability	DIN 3535	<0.01cc/min
Liquid Leakage	ASTM F37	0.21ml/hr



Uniflon™ 53

Description
Novus Uniflon 53 is a high performance biaxially orientated PTFE sheet material with barium sulphate filler.

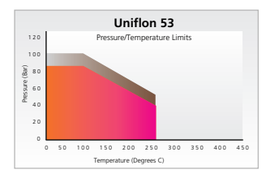
Colour - White

Service
A general purpose grade for sealing applications across the whole pH range. It is suitable for use with hydrofluoric acid, but not pure liquid hydrogen fluoride. It can also be used with alkalis, solvents, fuels, water, steam and chlorine.

Approvals/Compliance
BAM-Oxygen service for gaseous oxygen at temperatures up to 200°C and with liquid oxygen.
Germanischer Lloyd GL Approved.
ABS Type Approved

Features
Conforms with FDA21 CFR 177.1550 regulations.
Excellent chemical resistance.
Very low gas permeability.
Improved creep properties when compared with conventional PTFE gasket materials.

TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density		3.0g/cc
Tensile Strength	ASTM F152	14MPa
Compression	ASTM F36	5%
Recovery	ASTM F36	40% min
Residual Stress	BS7531 (175°C)	30MPa
Creep Relaxation	ASTM F38	21%
Gas Permeability	DIN 3535	<0.01cc/min
Liquid Leakage	ASTM F37	0.22ml/hr



Uniflon™ 58

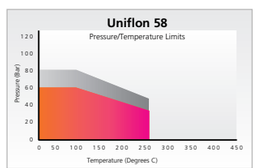
Description
Novus Uniflon 58 is a superior performance PTFE based material with highly conformable properties on the surface layers and a biaxially orientated pure PTFE core.

Colour - White

Service
Novus Uniflon 58 is ideally suited to damaged flange surfaces or irregular flanges with low bolt loadings. The layered structure provides the gasket with stability even at large diameters, aiding handling and installation. Uniflon 58 is suitable for chemicals across the whole PH range
with the exception of molten alkali metals and fluorine gas.

Approvals/Compliance
Conforms with FDA21 CFR 177.1550 regulations.

TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density		1.1g/cc
Tensile Strength	ASTM F152	9MPa
Compression	ASTM F36	55%
Recovery	ASTM F36	24% min
Residual Stress	DIN @ (175°C)	28MPa
Gas Permeability	DIN 3535	0.01ml/min
Liquid Leakage	ASTM F37	1.6ml/hr



Uniflon™ 60

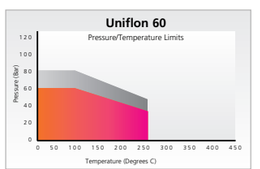
Description
Novus Uniflon 60 is a superior performance biaxially orientated PTFE sheet material with controlled porosity.

Colour - White

Service
Novus Uniflon 60 is a universal gasket designed for the full range of flange materials from low bolt loaded - plastic, ceramic or glass lined - to standard metallic flanges where the loading is higher. The material is manufactured from 100% PTFE and is therefore suitable across the full PH range. The only exceptions to its chemical resistance being molten alkali metals and fluorine gas.

Approvals/Compliance
Conforms with FDA21 CFR 177.1550 regulations.

TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density		0.8g/cc
Tensile Strength	ASTM F152	6MPa
Compression	ASTM F36	65%
Recovery	ASTM F36	5% min
Residual Stress	DIN @ (175°C)	34MPa
Gas Permeability	DIN 3535	0.01ml/min
Liquid Leakage	ASTM F37	2.0ml/hr



Applications

The Novus Uniflon range of materials show outstanding chemical resistance, which makes them ideally suitable for sealing aggressive media.

Due to our special manufacturing process the material is biaxially orientated, resulting in a superior performance material and more uniform properties.

Because of the exceptional sealing properties, emissions are kept to a minimum, resulting in a better environment.

The manufacturing process ensures uniform material construction giving enhanced performance reliability and consistency.

Features

- Outstanding chemical resistance
- Improved creep resistance properties
- Extremely low gas permeability
- Wide service temperature range
- Excellent sealing performance even at low seating stress.
- Conforms with FDA regulations
- Environmentally friendly
- Easy to cut, handle and remove from flanges
- Large one piece gaskets possible, up to 2000mm diameter

Standard Sheet Sizes

Novus Uniflon 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:-

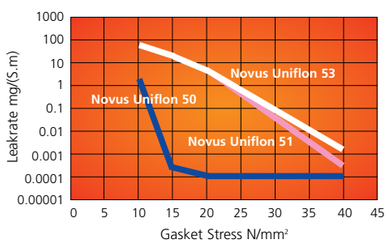
Standard sheet size =
1.0m x 1.0m, 1.5m x 1.0m,
2.0m x 1.0m, 1.5m x 1.5m,
2.0m x 1.5m, 2.0m x 2.0m

Standard thicknesses =
0.75mm to 3.0mm

Novatex

Additional to the Uniflon series is **Novatex** a range of expanded PTFE products designed for sealing applications of limited low bolt load. Available in both sheet and tape forms and in a range of thicknesses and sizes. Contact Novus Sealing for details.

Leakrate/Gasket Stress



Novus TI, FI, Hochdruck Exfoliated Graphite Sheet

Our range of exfoliated graphite products are designed for demanding, higher temperature applications typical of the petrochemical and refining industries. Manufactured from high purity exfoliated graphite, the product is available with a variety of metallic inserts.

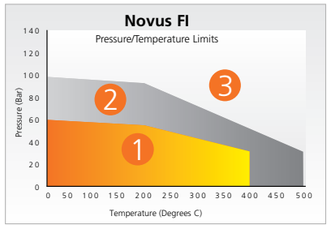
Ultra high purity grades for the nuclear industry are also available.

Novus TI, FI and Hochdruck have outstanding sealing properties making them ideal for use in a wide range of applications.

Theses qualities include:

- Suitability for high operating temperatures
- Temperature range between -196°C to +500°C
- Excellent chemical resistance
- Good compressibility
- Resistant to thermal shock
- Excellent stress retention
- Good storage properties

Pressure vs Temperature Ratings for Novus Exfoliated Graphite Sheet



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

   Applicable to 1.5mm and below

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

Novus FI (foil)

Description

Novus FI is a graphite laminate material with one or more thin, flat stainless steel 316 insertions. The thickness of the reinforcement is 0.05mm. The graphite sheet is fixed to the insertion by means of a super thin chloride-free adhesive layer. This reinforcement results in a sturdy gasket which is relatively easy to handle and simple to process into gaskets.

Service

Novus FI is used in a wide range of applications in the chemical and petrochemical and manufacturing industries including pumps, compressors and pipe joints. It is commonly used on-site as an alternative to Novus TI in sheet form, due to the ease of manual cutting.

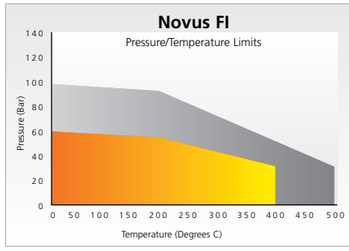
Approvals/Compliance

BAM for Oxygen
DVGW

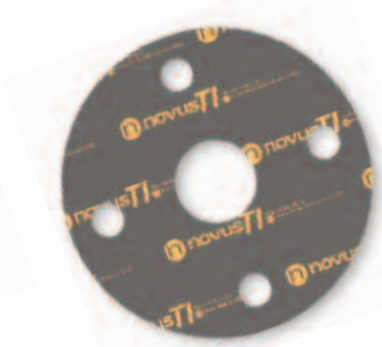
Availability

Thickness range = 1.0mm to 3.0mm
Standard sheet size = 1.0m x 1.0m
Other thicknesses available on request.

TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density		1.0g/cm³
Ash Content		Max 2
Chloride Content		Max 50
Number of Inserts		1
Compressibility	ASTM F36A-66	40-50%
Recovery	ASTM F36A-66	10-15%
Residual Stress	DIN 52913(300°C)	>45%



Novus TI (tanged)



Description

Novus TI is a graphite laminate product reinforced with an insertion of tanged 0.10mm thick 316 stainless steel. No adhesive is required to bond the graphite layers to the tanged insert resulting in a sturdy gasket material with excellent mechanical strength.

Service

Novus TI is used throughout industry in pipeline and vessel applications. Its wide temperature range and excellent stress retention make it ideal for steam systems and process duties in the petrochemical and manufacturing industries. The high mechanical strength of the material ensures it can seal higher internal pressures than standard sheet materials.

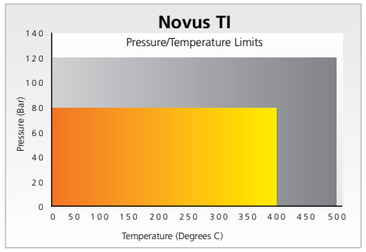
Approvals/Compliance

BAM for Oxygen
DVGW

Availability

Thickness range = 1.0mm to 3.0mm
Standard sheet size = 1.5m x 1.5m

TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density		1.0g/cm³
Ash Content		Max 2
Chloride Content		Max 50
Number of Inserts		1
Compressibility	ASTM F36A-66	30-35%
Recovery	ASTM F36A-66	15-20%
Residual Stress	DIN 52913(300°C)	>48%



Sigraflex Hochdruck

Description

Sigraflex Hochdruck is a multi-layer sheet material comprising 0.5mm thick layers of high quality graphite foil and 0.5mm thick stainless steel foil. Depending on the sheet thickness required, several layers of graphite and stainless steel foil are joined together in a special process without the use of an adhesive. The result is a sealing material with outstanding mechanical properties.

Service

The material is designed for highly loaded joints such as tongue and groove gaskets and for high internal pressures (see Pressure/Temperature chart for guidelines). Its high resistance to blow out makes the gasket a safe choice for hazardous applications.

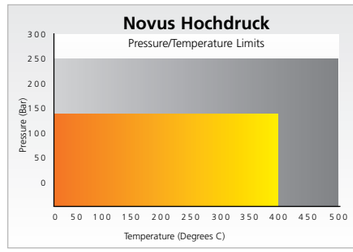
Approvals/Compliance

BAM for Oxygen
DVGW
Germanischer Lloyd
US Coastguard
Fire Safety, BS 6755
German Clean Air Act.

Availability

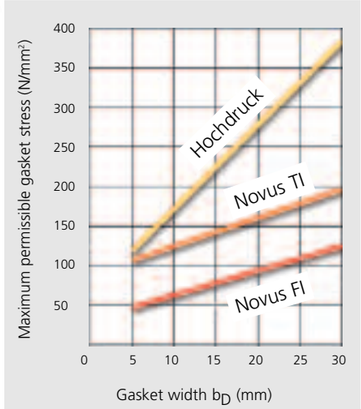
Thickness range = 1.0mm to 4.0mm
Standard sheet size = 1.0m x 1.0m and
1.5m x 15m (up to and including 2mm only)

TYPICAL PHYSICAL PROPERTIES		
Thickness		1.5mm
Density of Graphite		1.1g/cm³
Ash Content		<0.15
Chloride Content		<20ppm
Number of Inserts		2
Compression	DIN 28090-2	30-40%
Residual Stress	DIN 52913	48N/mm²
Gas Permeability	DIN 3535 DIN E 28090-2	<0.03cm³/min <0.05mg/(s-m)



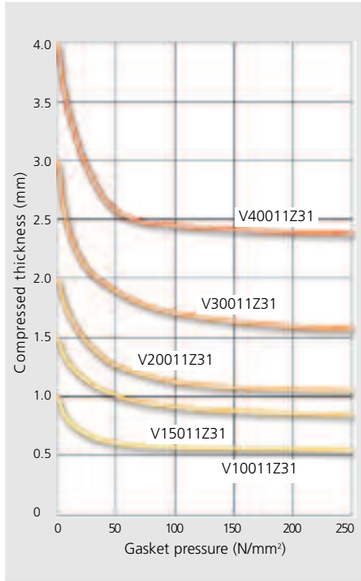
Gasket Stress

Maximum permissible gasket stress for gaskets made from reinforced graphite sheets of 2mm thickness, as determined at 300°C in accordance with DIN 28090-1



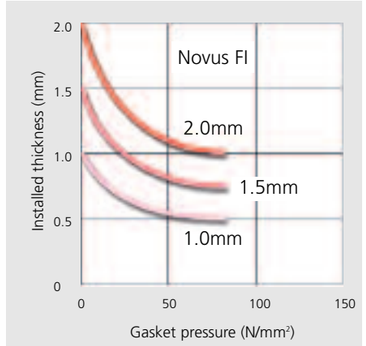
Sigraflex Hochdruck

Compressed thickness as a function of gasket pressure.



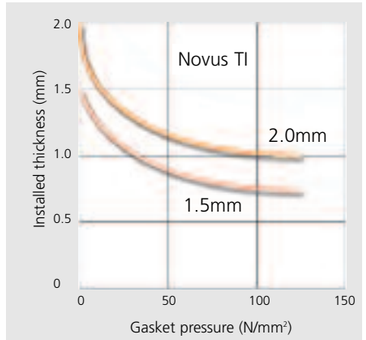
Novus FI Graphite Laminate

Compressed thickness as a function of stress for Novus FI.



Novus TI Graphite Laminate

Compressed thickness as a function of stress for Novus TI.



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.

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)			■	■				■		■
Novus HDS-1								■		
Uniflon 50						■		■	■	■
Uniflon 51			■			■			■	■
Uniflon 53						■			■	■
Uniflon 58/60						■				
Novus TI			■				■			
Novus FI			■				■			
Hochdruck	■	■	■				■			

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.

BAM = Bundesanstalt Materialprufung (Federal Institute for Materials Testing), Berlin. Tests on sealing materials designed to establish reactivity with gaseous and liquid oxygen.

DVGW = Deutscher Verien der Gas-und EWasserfachmanner (German Association of Gas and Water Operatives). Gaskets tested in accordance with DIN 3535 part 6 as a measure of suitability for gas supply.

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 Novus Sealing 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)	■	■				
Novus HDS-1	■	■	■			
Uniflon 50	■	■				
Uniflon 51	■	■	■			
Uniflon 53	■	■	■			
Uniflon 58/60	■	■				
Novus TI	■	■	■	■		
Novus FI	■	■	■	■		
Hochdruck	■	■	■	■		

Recommended
Suitable*

We recommend that you check your application with the Novus 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)	■			■	■	■
Novus HDS-1	■			■	■	■
Uniflon 50	■	■	■	■		■
Uniflon 51	■			■	■	■
Uniflon 53	■			■	■	■
Uniflon 58/60	■	■	■	■		
Novus TI	■			■	■	*
Novus FI	■			■		*
Hochdruck	■			■	■	*

Recommended
Suitable

* Can be segmented and joined

We recommend that you check your application with the Novus Technical Team

Application Guidelines

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. For this reason we suggest the use of our graphite sheet products Novus TI, Novus FI or Hochdruck for cyclic steam duties.
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**
Uniflon 50	**260°C**
Uniflon 51	**260°C**
Uniflon 53	**260°C**
Uniflon 58/60	**260°C**
Novus TI	**400°C**
Novus FI	**400°C**
Hochdruck	**400°C**

Applicable to thicknesses of 1.5mm and below. For thicknesses >1.5mm please contact our technical department.

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. For applications involving thermal cycling we recommend either graphite laminate materials (Novus TI, Novus FI or Hochdruck) or one of our Uniflon grades.

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**
Uniflon all grades	**-196°C**
Graphite Laminate all grades	**-196°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.

For graphite laminate and Uniflon grades there is no requirement to avoid Ultra-Violet light and the storage temperature is less important. All other conditions apply.

Chemical Resistance

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

A = Suitable for application
B = Suitability depends on conditions
C = Not Suitable

	N10	N26	N28	N30	N34	N45	N48 Acid	N49 Graftec	HDS-1	Uniflon 50	Uniflon 51	Uniflon 53	Uniflon 58/60	TI/FI Hochdruck
Acetaldehyde	B	B	A	B	B	A	B	B	B	A	A	A	A	A
Acetamide	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Acetic Acid	A	A	B	A	A	B	A	A	A	A	A	A	A	B
Acetic Acid Glacial	B	B	B	B	B	B	A	B	B	A	A	A	A	B
Acetic Anhydride	B	B	B	B	B	B	B	B	B	A	A	A	A	A
Acetone	B	B	B	B	B	B	A	B	B	A	A	A	A	A
Acetonitrile	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Acetyl Chloride	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Acetylene	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Acrylic Acid	B	C	B	B	B	B	B	B	B	A	A	A	A	A
Acrylonitrile	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Adipic Acid	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Air	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Allyl Chloride	B	C	B	B	B	B	B	B	B	A	A	A	A	B
Alum	A	A	A	A	A	A	A	A	A	A	A	A	A	B
Aluminium Acetate	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Aluminium Chloride	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Aluminium Hydroxide (Solid)	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Aluminium Sulphate	A	A	A	A	A	A	A	A	A	A	A	A	A	B
Ammonia Gas	B	B	B	B	B	B	B	B	B	A	A	A	A	A
Ammonium Carbonate	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Ammonium Chloride	A	A	A	A	A	A	A	A	A	A	A	A	A	C
Ammonium Hydroxide	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Ammonium Sulphate	A	A	A	A	A	A	A	A	A	A	A	A	A	B
Amyl Acetate	B	B	B	B	B	B	B	B	B	A	A	A	A	A
Amyl Alcohol	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Aniline	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Aqua Regia	C	C	C	C	C	C	C	C	C	A	A	A	A	C
Asphalt	A	B	A	A	A	A	C	A	A	A	A	A	A	A
Aviation Fuel	A	B	A	A	A	A	B	A	A	A	A	A	A	A
Barium Chloride	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Benzaldehyde	B	C	C	B	B	C	B	B	B	A	A	A	A	A
Benzene	A	C	A	A	A	A	A	A	A	A	A	A	A	A
Benzoic Acid	A	B	B	B	B	B	A	A	B	A	A	A	A	A
Benzonitrile	C	C	C	C	C	C	C	C	C	A	A	A	A	B
Benzyl Alcohol	B	C	C	B	B	C	B	B	B	A	A	A	A	A
Benzyl Chloride	B	C	B	B	B	B	A	B	B	A	A	A	A	B
Blast furnace gas	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Bleach (solution)	B	B	B	B	B	B	B	B	B	A	A	A	A	C
Boiler feed water	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Borax	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Boric Acid	A	A	A	A	A	A	A	A	A	A	A	A	A	A

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Chemical Resistance

	N10	N26	N28	N30	N34	N45	N48 Acid	N49 Graftec	HDS-1	Uniflon 50	Uniflon 51	Uniflon 53	Uniflon 58/60	TI/FI Hochdruck
Brine	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Bromine	C	C	C	C	C	C	C	C	C	A	A	A	A	C
Butadiene	B	C	B	B	B	B	C	B	B	A	A	A	A	A
Butane	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Butanol	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Butyl Acetate	A	B	B	B	B	B	B	A	B	A	A	A	A	A
Butyl Alcohol	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Butyl Methacrylate	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Butyric Acid	A	A	A	A	A	A	A	A	A	A	A	A	A	B
Calcium Chloride	A	A	A	A	A	A	B	A	A	A	A	A	A	A
Calcium Hydroxide	A	A	A	A	A	A	A	A	A	A	A	A	A	B
Calcium Hypochlorite	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Calcium Sulphate	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Carbolic Acid	C	C	C	C	C	C	B	C	C	A	A	A	A	A
Carbon Dioxide	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Carbon Disulphide	B	C	C	C	C	C	C	C	C	A	A	A	A	A
Carbon Monoxide	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Carbon Tetrachloride	B	C	B	B	B	B	C	B	B	A	A	A	A	A
Castor Oil	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Caustic Soda <25%	A	B	B	B	B	B	A	B	B	B	C	A	A	B
Caustic Soda <50%	B	B	B	B	B	B	B	B	B	B	C	A	A	B
Caustic Soda >50%	B	C	C	C	C	C	C	C	C	B	C	A	A	B
Chlorine Dioxide	C	C	C	C	C	C	C	C	C	A	A	A	A	C
Chlorine Wet	C	C	C	C	C	C	C	C	C	A	A	A	A	C
Chlorine Dry	B	B	C	B	B	C	B	B	B	A	A	A	A	A
Chlorine Liquid	B	B	C	B	B	C	B	B	B	A	A	A	A	A
Chloroacetic Acid	C	C	C	C	C	C	C	C	C	A	A	A	A	C
Chlorobezene	B	C	C	B	B	C	C	B	B	A	A	A	A	A
Chloroform	B	C	B	B	B	B	B	B	B	A	A	A	A	A
Chlortrifluoride	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Chromic Acid	C	C	C	C	C	C	B	C	C	A	A	A	A	C
Citric Acid	A	A	B	A	A	B	A	A	A	A	A	A	A	B
Condensation Water	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Copper Acetate	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Copper Sulphate	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Creosote	B	C	B	B	B	B	B	B	B	A	A	A	A	A
Cresol	B	B	B	B	B	B	C	B	B	A	A	A	A	A
Crude Oil	A	C	A	A	A	A	A	A	A	A	A	A	A	A
Cyclohexane	B	C	B	B	B	B	B	B	B	A	A	A	A	A
Cyclohexanol	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Cyclohexanone	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Dibenzyl Ether	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Dibutyl Phthalate	B	B	B	B	B	B	B	B	B	A	A	A	A	A

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Chemical Resistance

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

A = Suitable for application
B = Suitability depends on conditions
C = Not Suitable

	N10	N26	N28	N30	N34	N45	N48 Acid	N49 Graftec	HDS-1	Uniflon 50	Uniflon 51	Uniflon 53	Uniflon 58/60	TI/FI Hochdruck
Diesel Oil	A	C	A	A	A	A	A	A	A	A	A	A	A	A
Diethanolamine	B	B	B	B	B	B	B	B	B	A	A	A	A	A
Diethylamine	B	B	B	B	B	B	B	B	B	A	A	A	A	A
Di-iso Butyl Ketone	B	B	B	B	B	B	B	B	B	A	A	A	A	A
Dimethyl Formamide	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Dimethylamine	B	B	B	B	B	B	B	B	B	A	A	A	A	A
Dioxane	B	B	C	B	B	C	C	B	B	A	A	A	A	A
Diphyl (Dowtherm A)	A	A	A	A	A	A	B	A	A	A	A	A	A	A
Ethane	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Ethanol	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Ethyl Acetate	B	C	B	B	B	B	B	B	B	A	A	A	A	A
Ethyl Acrylate	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Ethyl Alcohol	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Ethyl Chloride (Dry)	B	C	C	B	B	C	C	B	B	A	A	A	A	A
Ethyl Ether	A	B	A	A	A	A	B	A	A	A	A	A	A	A
Ethylbenzene	B	C	B	B	B	B	B	B	B	A	A	A	A	A
Ethylene	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Ethylene Chloride	C	C	C	C	C	C	A	C	C	A	A	A	A	A
Ethylene Glycol	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Fluorine Dioxide	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Fluorine Gaseous	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Fluorine Liquid	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Formaldehyde	B	B	B	B	B	B	B	B	B	A	A	A	A	A
Formamide	B	B	B	B	B	B	B	B	B	A	A	A	A	A
Formic Acid 10%	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Formic Acid 85%	B	C	B	B	B	B	A	B	B	A	A	A	A	B
Freons (see refrigerants)														
Fuel Oil	A	C	A	A	A	A	A	A	A	A	A	A	A	A
Gas (LPG)	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Gas (Natural Gas)	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Gas Oil	A	C	A	A	A	A	A	A	A	A	A	A	A	A
Gasoline	A	C	A	A	A	A	A	A	A	A	A	A	A	A
Generator Gas	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Glucose	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Glycerine	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Glycol	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Heating Oil	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Heptane	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Hexane	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Hydraulic Oil	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Hydrochloric Acid (20%)	B	C	B	B	B	B	A	B	B	A	A	A	A	A
Hydrochloric Acid (37%)	C	C	C	C	C	C	A	C	C	A	A	A	A	A
Hydrofluoric Acid <65%	C	C	C	C	C	C	C	C	C	C	C	A	A	C

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	N10	N26	N28	N30	N34	N45	N48 Acid	N49 Graftec	HDS-1	Uniflon 50	Uniflon 51	Uniflon 53	Uniflon 58/60	TI/FI Hochdruck
Hydrofluoric Acid >65%	C	C	C	C	C	C	C	C	C	C	C	B	A	C
Hydrofluorosillic Acid	C	C	C	C	C	C	C	C	C	C	C	B	A	C
Hydrogen	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Hydrogen Chloride (Dry)	B	B	B	B	B	B	B	B	B	A	A	A	A	A
Hydrogen Fluoride	C	C	C	C	C	C	C	C	C	C	C	C	A	C
Hydrogen Peroxide 6%	B	B	B	B	B	B	B	B	B	A	A	A	A	A
Hydrogen Sulphide	B	B	B	B	B	B	B	B	B	A	A	A	A	A
Isoctane	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Isopropyl Acetate	B	B	B	B	B	B	B	B	B	A	A	A	A	A
Isopropyl Alcohol	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Isopropyl Ether	B	B	B	B	B	B	B	B	B	A	A	A	A	A
Kerosene	A	C	A	A	A	A	A	A	A	A	A	A	A	A
Lactic Acid	B	B	B	B	B	B	A	B	B	A	A	A	A	B
Linseed Oil	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Liquid Petroleum Gas	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Lubricating Oil	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Machine Oil	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Magnesium Sulphate	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Maleic Acid	B	B	B	B	B	B	A	B	B	A	A	A	A	A
Maleic Anhydride	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Methane	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Methanol	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Methyl Alcohol	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Methyl Chloride	B	C	B	B	B	B	B	B	B	A	A	A	A	A
Methyl Ethyl Ketone	B	B	B	B	B	B	A	B	B	A	A	A	A	A
Methyl Methacrylate	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Methylated Spirits	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Methylene Chloride	C	C	C	C	C	C	C	C	C	A	A	A	A	B
Mineral Oil	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Mobiltherm 600	A	B	A	A	A	A	B	A	A	A	A	A	A	A
Mobiltherm 603/605	A	B	A	A	A	A	B	A	A	A	A	A	A	A
Molten Alkali Metals	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Motor Oil	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Naphtha	A	B	A	A	A	A	A	A	A	A	A	A	A	B
Naphthalene	B	C	B	B	B	B	B	B	B	A	A	A	A	B
Natural Gas	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Nickel Chloride	A	A	A	A	A	A	A	A	A	A	A	A	A	B
Nickel Sulphate	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Nitric Acid <30%	B	C	C	C	C	C	B	B	C	A	A	A	A	B
Nitric Acid >30%	C	C	C	C	C	C	B	C	C	A	A	A	A	C
Nitric Acid Red Fuming	C	C	C	C	C	C	C	C	C	A	A	A	A	C
Nitrogen	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Octane	A	B	A	A	A	A	A	A	A	A	A	A	A	A

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	N10	N26	N28	N30	N34	N45	N48 Acid	N49 Graftec	HDS-1	Uniflon 50	Uniflon 51	Uniflon 53	Uniflon 58/60	TI/FI Hochdruck
Oleic Acid	A	B	A	A	A	A	A	A	A	A	A	A	A	C
Oleum	C	C	C	C	C	C	C	C	C	A	A	C	A	C
Oxalic Acid	B	C	B	B	B	B	B	B	B	A	A	A	A	A
Oxygen (BAM Approval)	C	C	C	C	A	C	C	A	A	C	A	A	A	A
Palmitic Acid	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Paraffin	A	C	A	A	A	A	A	A	A	A	A	A	A	A
Pentane	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Perchlorethylene	B	C	C	B	B	C	B	B	B	A	A	A	A	A
Perchloric Acid	C	C	C	C	C	C	B	C	C	A	A	A	A	C
Petroleum	A	C	A	A	A	A	A	A	A	A	A	A	A	A
Phenol	C	C	C	C	C	C	B	C	C	A	A	A	A	A
Phosgene	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Phosphoric Acid <45%	B	C	B	B	B	B	A	B	B	A	A	A	A	A
Phosphoric Acid >45%	B	C	C	C	C	C	A	B	C	B	B	A	A	B
Phthalic Acid	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Phthalic Anyhydride	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Potassium Acetate	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Potassium Carbonate	A	C	A	A	A	A	A	A	A	A	A	A	A	A
Potassium Chlorate	A	A	A	A	A	A	C	A	A	A	A	A	A	A
Potassium Chloride	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Potassium Cyanide	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Potassium Dichromate <20%	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Potassium Hydroxide <50%	B	B	B	B	B	B	B	B	B	C	C	A	A	A
Potassium Hydroxide >50%	B	C	C	C	C	C	C	C	C	C	C	A	A	A
Potassium Hypochlorite	B	B	C	B	B	C	B	B	B	A	A	A	A	C
Potassium Nitrate	A	A	A	A	A	A	A	A	A	A	A	A	A	B
Potassium Pemanganate	A	A	A	A	A	A	B	A	A	A	A	A	A	A
Producer Gas	A	A	A	A	A	A	B	A	A	A	A	A	A	A
Propane	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Pyridine	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Rape Seed Oil	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Refrigerant R11	A	C	A	A	A	A	C	A	A	A	A	A	A	A
Refrigerant R112	A	C	A	A	A	A	B	A	A	A	A	A	A	A
Refrigerant R113	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Refrigerant R114	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Refrigerant R114B2	A	C	A	A	A	A	A	A	A	A	A	A	A	A
Refrigerant R115	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Refrigerant R12	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Refrigerant R123	B	C	B	B	B	B	C	B	B	A	A	A	A	A
Refrigerant R125	B	A	B	B	B	B	C	B	B	A	A	A	A	A
Refrigerant R13	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Refrigerant R13B1	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Refrigerant R134A	A	B	A	A	A	A	C	A	A	A	A	A	A	A

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novus SEALING™ Chemical Resistance

	N10	N26	N28	N30	N34	N45	N48 Acid	N49 Graftec	HDS-1	Uniflon 50	Uniflon 51	Uniflon 53	Uniflon 58/60	TI/FI Hochdruck
Refrigerant R141A	A	C	A	A	A	A	C	A	A	A	A	A	A	A
Refrigerant R141B	A	C	A	A	A	A	C	A	A	A	A	A	A	A
Refrigerant R152A	A	A	A	A	A	A	C	A	A	A	A	A	A	A
Refrigerant R22	B	B	B	B	B	B	C	B	B	A	A	A	A	A
Refrigerant R402A	A	B	A	A	A	A	C	A	A	A	A	A	A	A
Refrigerant R402B	A	B	A	A	A	A	C	A	A	A	A	A	A	A
Refrigerant R404A	A	B	A	A	A	A	C	A	A	A	A	A	A	A
Refrigerant R502	A	B	A	A	A	A	C	A	A	A	A	A	A	A
Refrigerant R507	A	B	A	A	A	A	C	A	A	A	A	A	A	A
Salicylic Acid	B	B	B	B	B	B	A	B	B	A	A	A	A	B
Santotherm 66	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sea Water	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Silicone Oil	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Silver Nitrate	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Soap	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Aluminate	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Bicarbonate	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Bisulphite	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Chloride	A	A	A	A	A	A	A	A	A	A	A	A	A	B
Sodium Hydroxide <25%	A	B	B	B	B	B	A	B	B	B	C	A	A	B
Sodium Hydroxide <50%	B	B	B	B	B	B	B	B	B	B	C	A	A	B
Sodium Hydroxide >50%	B	C	C	C	C	C	C	C	C	B	C	A	A	B
Sodium Silicate	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Sulphide	A	A	A	A	A	A	A	A	A	A	A	A	A	B
Sodium Sulphate	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Starch	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Steam	A	B	B	B	A	B	B	A	A	A	A	A	A	A
Stearic Acid	A	B	B	A	A	B	B	A	A	A	A	A	A	A
Styrene	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Sugar	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sulphur	B	B	C	B	B	C	B	B	B	A	A	A	A	A
Sulpher Dioxide Dry	B	C	B	B	B	B	A	B	B	A	A	A	A	A
Sulphur Trioxide	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Sulphuric Acid (Fuming)	C	C	C	C	C	C	C	C	C	A	A	C	A	C
Sulphuric Acid 30%	C	C	C	C	C	C	A	C	C	A	A	A	A	C
Sulphuric Acid 50%	C	C	C	C	C	C	B	C	C	A	A	A	A	C
Sulphuric Acid 96%	C	C	C	C	C	C	B	C	C	A	A	A	A	C
Sulphurous Acid	B	C	C	B	B	C	A	B	B	A	A	A	A	B
Tannic Acid	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Tar	A	B	A	A	A	A	C	A	A	A	A	A	A	A
Tartaric Acid	A	A	A	A	A	A	A	A	A	A	A	A	A	B
Tetrachloroethylene	B	C	C	B	B	C	A	B	B	A	A	A	A	A
Thermal Oil	A	B	A	A	A	A	A	A	A	A	A	A	A	A

The information on compatibility should only be used as a general guide to the selection of the most suitable material. If in doubt contact the Novus Technical Team.

novus SEALING™ Chemical Resistance

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

A = Suitable for application
B = Suitability depends on conditions
C = Not Suitable

	N10	N26	N28	N30	N34	N45	N48 Acid	N49 Graftec	HDS-1	Uniflon 50	Uniflon 51	Uniflon 53	Uniflon 58/60	TI/FI Hochdruck
Toluene	B	C	B	B	B	B	B	B	B	A	A	A	A	A
Transformer Oil	A	B	A	A	A	A	B	A	A	A	A	A	A	A
Transmission Oil	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Trichloroethylene	B	C	C	B	B	C	B	B	B	A	A	A	A	A
Triethanolamine	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Turpentine	A	C	A	A	A	A	A	A	A	A	A	A	A	A
Urea	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Vegetable Oil	A	C	A	A	A	A	A	A	A	A	A	A	A	A
Vinyl Acetate	B	C	C	B	B	C	B	B	B	A	A	A	A	A
Vinyl Chloride	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Vinyl Bromide	C	C	C	C	C	C	C	C	C	A	A	A	A	A
Water	A	A	A	A	A	A	A	A	A	A	A	A	A	A
White Spirit	A	B	A	A	A	A	A	A	A	A	A	A	A	A
Xylene	A	B	A	A	A	A	B	A	A	A	A	A	A	A
Zinc Chloride	A	A	A	A	A	A	A	A	A	A	A	A	A	B
Zinc Sulphate	A	A	A	A	A	A	A	A	A	A	A	A	A	A

The information on compatibility should only be used as a general guide to the selection of the most suitable material. If in doubt contact the Novus Technical Team.

Product Range

Sheet Jointing Materials

- Compressed Fibre
- Uniflon
- PTFE
- Exfoliated Graphite
- Hi-Temperature
- Novatex

Gaskets

- Spiral Wound
- Elastagraph
- Ring Type Joints
- Camprofile
- Metal Jacketed
- Corrugated
- Solid Metal

Other Products

- Laser Cutting
- Flange Insulation Kits
- Compression Packings
- Gasket Tape
- Joint Sealant
- Stem Packing
- Bolting
- Bolt-Lube

Product Brochures

The following are available to download from our website or to request a hard copy, telephone: +44 (0)1274 878787

www.novussealing.com

Best Available Techniques in Sealing Technology
How Novus Sealing can help reduce your environmental impact.

Bolting
Stud-Bolts, threaded bar and nuts - materials and size information.
Bolt-Lube - assembly lubrication product specification. Training aids.

Products and Services
An overview of the products and services available from Novus Sealing.

Metallic Gaskets
Camprofile, Spiral Wound, Corrugated, Metal Jacketed, Control of Flange Joints.
Technical information and installation guide.

HDS-1
Dielectric Gasket Material for Flange Insulation Kits.
Technical information and installation procedures.

Flange Insulation Kits
Technical information, dimensions and service recommendations.

Ring Type Joints / Metallic Gaskets
Product overview, catalogue and technical information.

Novatex PTFE Products
Gasket sheets, Joint sealant, Tape and Stem packing.
Product overview, technical information and installation guide.

Uni-Pac Compression Packings
High performance compression packings.
Technical information and fitting instructions.

Hi-Temp Gaskets
For high temperature applications.
Product overview, catalogue and technical information.

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