			
ISO9001:2008 Certificate No. 31200	ISO14001:2004 Certificate No. 46260	OHSAS 18001 2007 Certificate No. 46259	API Spec Q1 & API Spec 6A License No. 6A-0357



INNOSILD®

INNOSILD® is the new brand name of Non-metallic sheet gasket series of KUKIL INNTOT CO., LTD.

INNOSILD® contains the meaning of 'INNOVATION', the motto of KUKIL INNTOT CO., LTD. and 'SHIELD' for leakage.



KUKIL INNTOT CO., LTD.
www.kukil.com



Management Philosophy is today's practice to attain the vision of KUKIL INNOT

Future oriented management

No enterprise lives like yesterday.

We, KUKIL INNOT. do our best on developing new technology for better future.

미래지향적 경영 | 어제와 같은 오늘을 사는 기업에게 내일은 없습니다.

저희 국일INNOT는 보다 나은 미래를 위하여 끊임없이 기술 개발에 최선을 다하고 있습니다.

Respecting human life and dignity management

Human is the main driving force for growth of an enterprise,

We, KUKIL INNOT. are an enterprise. producing talented people based on creative and self-control to accomplish self-actualization.

인간존중의 경영 | 사람이야말로 기업 발전에 가장 큰 원동력입니다.

저희 국일 INNOT는 창의와 자율을 바탕으로 인재를 육성, 자기실현을 이룰 수 있는 기업이 되고자 합니다.

Customer oriented management

We consider customer as the leader of our company.

We listen to customer's voice and behave ourselves in order to learn from the customer.

We will be the enterprise that provides the best satisfaction.

고객지향적 경영 | 고객은 기업에 주역이라는 것이 국일 INNOT의 생각입니다.

고객의 의견에 항상 귀를 기울이며, 고객을 배우는 자세로 행동하여 항상 고객에게 최고의 만족을 드리는 기업이 되겠습니다.



KUKIL INNTOT CO.,LTD.



**Technology innovaion to become the best.
21st century innovaion enterprise that has
autogenesis in the age of infinite competition.**

최고를 위한 기술의 혁신. 21세기 무한 경쟁시대에 자생력을 갖춘 혁신기업

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INNOSILD® KN1

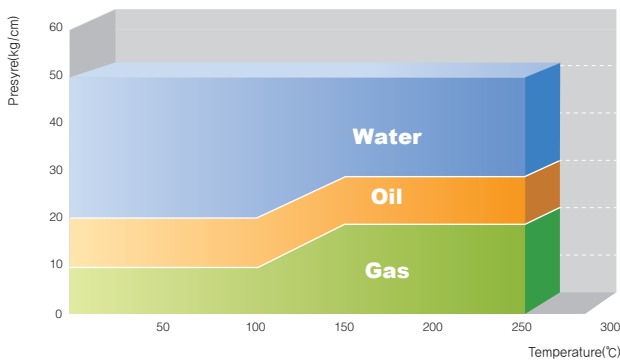
Description

INNOSILD® KN1 components are Aramid fibers with NBR binder to form Non-Asbestos joint sheet gasket. Good resistance to water and gases, oils & fuels.

INNOSILD® KN1은 아라미드 섬유와 NBR 바인더로 이루어진 비석면 조합 가스켓입니다. 이 제품은 물, 가스, 오일 그리고 연료 종류에 좋은 저항성을 가지고 있습니다.

Service

Max. Temperature	250°C
Max. Continuous Temperature	220°C(with steam)
Max. Pressure	100 bar



Typical Specifications

Test Method	Description	Specified Value
ASTM D792	Density	1.7~2.0g/cm ³
ASTM F152	Tensile Strength	>10Mpa
ASTM F36	Compressibility	5~15%
	Recovery	> 50%
ASTM F146	ASTM Oil No.3 150°C × 5h	
	-Tensile Strength Decrease	< 45%
	-Thickness Increase	< 10%
	-Weight Increase	< 10%
	ASTM Fuel B 23°C × 5h	
	-Thickness Increase	< 10%
ASTM F147	-Weight Increase	< 10%
	ASTM Fuel 22°C × 22h	
	-Thickness Increase	< 7%
ASTM F495	-Weight Increase	< 10%
	Flexibility	No Defects
BS 7531 Grade Y	Ignition Loss	< 30%
	Compressibility	8.0%
	Residual stress of the jointing	23.1Mpa
	Gas permeability Leak rate λ	3.03E-04 cm ³ /min 2.95E-05 mg/m/s

* ALL Data Are 1.5mm Thickness Typical value.



Design Data : Standard ASME Section VIII Div.1

Thickness	Gasket Factor 'm'	Min. Design Sealing Stress 'y'
1.5mm, 2.0mm	2.75	3,700 psi
3.0mm	2	1,600 psi

Availability

Gasket Size : 1,500mm × 1,000mm, 1,500mm × 2,000mm
1,500mm × 3,000mm, 2,000mm × 3,000mm
Thickness : 1.5mm, 2.0mm, 3.0mm

Remark

The specification of product is written by manufacturer, and it is changed frequently.

Equivalent Table

VALQUA	TOMBO	GARLOCK	JEIL	KLINGER	FLEXITALIC
6500(Blue) 6501(Gray)	6500(Blue) 6501(Gray)	3000	6000	4400	SF2401



INNOSILD® KN4

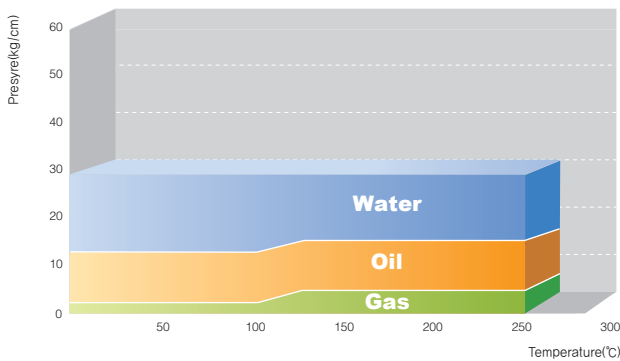
Description

INNOSILD® KN4 components are Cellulose fiber, Mineral fiber & Organic fiber with NBR binder to form Non-Asbestos joint sheet gasket. It is a gasket which has proper resistance to water and oils.

INNOSILD® KN4는 셀룰로오스 섬유, 무기섬유와 유기섬유를 NBR 바인더와 혼합한 비석면 조합 가스켓입니다. 이 제품은 물과 오일 종류에 좋은 저항성을 가지고 있습니다.

Service

Max. Temperature	180°C
Max. Continuous Temperature	120°C(with steam)
Max. Pressure	50 bar



Typical Specifications

Test Method	Description	Specified Value
ASTM D792	Density	1.7~2.0g/cm ³
ASTM F152	Tensile Strength	> 7Mpa
ASTM F36	Compressibility	5~15%
	Recovery	> 40%
ASTM F146	ASTM Oil No.3 150°C × 5h	
	-Tensile Strength Decrease	< 45%
	-Thickness Increase	< 10%
	-Weight Increase	< 15%
	ASTM Fuel B 23°C × 5h	
	-Thickness Increase	< 10%
ASTM F147	ASTM Warer 23°C × 22h	
	-Thickness Increase	< 15%
	-Weight Increase	< 15%
ASTM F147	Flexibility	No Defects
ASTM F495	Ignition Loss	< 40%

* ALL Data Are 1.5mm Thickness Typical value.



Design Data : Standard ASME Section VIII Div.1

Thickness	Gasket Factor 'm'	Min. Design Sealing Stress 'y'
1.5mm, 2.0mm	2.75	3,700 psi
3.0mm	2	1,600 psi

Availability

Gasket Size : 1,500mm × 1,000mm, 1,500mm × 2,000mm
 1,500mm × 3,000mm, 2,000mm × 3,000mm
 Thickness : 1.5mm, 2.0mm, 3.0mm

Remark

The specification of product is written by manufacturer, and it is changed frequently.

Equivalent Table

VALQUA	TOMBO	GARLOCK	JEIL	KLINGER	FLEXITALLIC
6500(Blue) 6501(Gray)	6500(Blue) 6501(Gray)	3000	6000	4400	SF2401

INNOSILD[®] 210FM(210FME)

Description

GRAFLEX used for KUKIL 210FM is obtained by refining the natural GRAFLEX and can be processed into sheet forms of high flexibility without using any binders or additives.

The metal core (SS316L) which is inserted into GRAFLEX by means of chemical bonding makes up for the weak points of soft GRAFLEX and provides a more stable and excellent sealing function.

210FME is a product whose sealing effectiveness has been greatly improved by applying an eyelet in the inner diameter.

GRAFLEX의 한 종류인 KUKIL 210FM은 천연 GRAFLEX를 추출하여 추가적인 바인더나 접착성분을 가미하지 않고 높은 유연성을 가지는 시트형태로 제작된 제품입니다. 화학적 접착료를 이용하여 GRAFLEX에 삽입된 금속코어(SS316L)는 연질GRAFLEX의 단점을 보완해 주며, 더욱 안정적이고 훌륭한 실링성능을 제공합니다. 210FME는 가스켓의 내경에 아이렛(eyelet)을 적용시켜 더욱 효과적인 실링성능을 제공하는 제품입니다.

Service

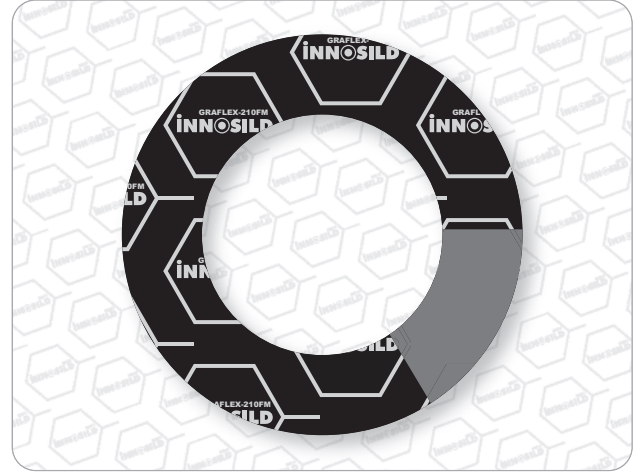
Max. Temperature	450°C(in Atmosphere)
	650°C(Not Oxidation)
Max. Pressure	140 bar

Typical Physical Properties

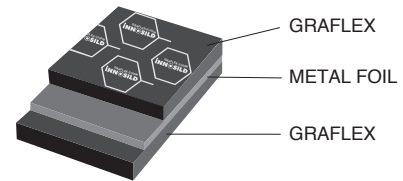
Description	Specified Value
Density	1.0~1.2 gm/cc
Leachable Chloride Content-Max	
- Industrial Grades	100ppm
- Premium(Nuclear) Grades	50ppm
Sulfur Content - Max	
- Industrial Grades	1000ppm
- Premium(Nuclear) Grades	700ppm
Carbon Content - Min	
- Industrial Grades	95.0%
- Premium(Nuclear) Grades	99.5%
Compressibility	40%
Recovery	20%
Creep Relaxation	<5%
Sealability	<0.5m ³ /hr

Design Data

Thick	Gasket Factor 'm'	Min. Design Sealing Stress 'y'
1.5mm	2	1,500 psi
3.0mm	2	1,500 psi



Construction



Availability

Gasket Size : up to 1,500mm(Non-shim)
up to 5,000mm(Shim)
Thickness : 1.5mm, 2.0mm, 3.0mm

Remark

- The specification of product is written by manufacturer, and it is changed frequently.
- Metal foil to be inserted is optional with the customer. (SS316L, SS304, Inconel etc.)

Equivalent Table

VALQUA	TOMBO	GARLOCK	KLINGER	FLEXITALLIC	LAMONS
VF35E(ss)	1215-A	3125SS	SLS	FLEXI-CARB SR	LG-TC, SS



INNOSILD® 220TM, 220TME, 220TMED

Description

Used for KUKIL 220TM is obtained by refining the natural and can be processed into sheet forms of high flexibility without using any binders or additives. The metal tang (SS316) which is inserted into by means of mechanical bonding makes up for the weak points of soft and provides a more stable and excellent sealing function.

220TME is a product whose sealing effectiveness has been greatly improved by applying an eyelet in the inner diameter.

220TMED is a product whose sealing effectiveness has been greatly improved by applying an eyelet in the inner & outer diameter.

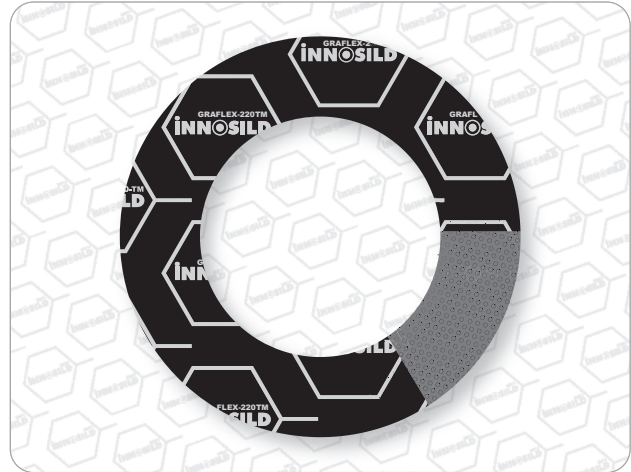
KUKIL 220TM은 천연 GRAFLEX를 추출하여 추가적인 바인더나 접착성분을 가미하지 않고 높은 유연성을 가지는 시트형태로 제작된 제품입니다. 화학적 접착료를 이용하여 GRAFLEX에 삽입된 금속 코어(SS316L)는 탕(Tanged)처리가 되어 있으며, 연질GRAFLEX의 단점을 보완해 더욱 안정적이고 훌륭한 실링성능을 제공합니다. 220TME는 가스켓의 내경에 아이렛(eyelet)을 적용시켜 더욱 효과적인 실링성능을 제공하는 제품입니다. 220TMED는 가스켓의 내/외경 양쪽 모두에 아이렛(eyelet)을 적용시켜 더욱 효과적인 실링성능을 제공하는 제품입니다.

Service

Max. Temperature	450°C(in Atmosphere)
	650°C(Not Oxidation)
Max. Pressure	140 bar

Typical Physical Properties

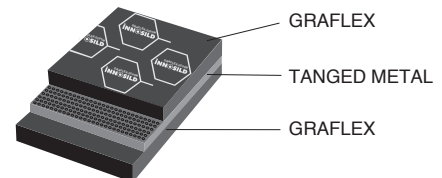
Description	Specified Value
Density	1.0~1.2 gm/cc
Leachable Chloride Content-Max	
- Industrial Grades	100ppm
- Premium(Nuclear) Grades	50ppm
Sulfur Content - Max	
- Industrial Grades	1000ppm
- Premium(Nuclear) Grades	700ppm
Carbon Content - Min	
- Industrial Grades	95.0%
- Premium(Nuclear) Grades	99.5%
Compressibility	40%
Recovery	20%
Creep Relaxation	< 5%
Sealability	< 0.5mQ/hr



Design Data

Thick.	Gasket Factor 'm'	Min. Design Sealing Stress 'y'
1.5mm	2.5	2,000 psi
3.0mm	2.5	2,000 psi

Construction



Availability

Gasket Size : up to 1,500mm(Non-shim)
up to 1,500mm(Shim)

Thickness : 1.5mm, 2.0mm, 3.0mm

Remark

- The specification of product is written by manufacturer, and it is changed frequently.
- Metal tang to be inserted is optional with the customer. (SS316L, SS304, Inconel etc.)

Equivalent Table

GARLOCK	KLINGER	FLEXITALLIC
3125TC	PSM/AS	FLEXICARB ST

INNOSILD® KP1

Description

These gaskets are stamped out from a pure P.T.F.E sheet. As they are susceptible to cold-flow should generally be used on flanges.

INNOSILD® KP1 gasket are used for fine chemicals, petrochemical, pharmaceuticals, foodstuffs, etc.

이 제품은 순수 테프론 시트에서 제품을 찍어내어 제작됩니다. 상온에서의 변형에 민감하며 주로 플랜지에 사용되어 집니다.

INNOSILD® KP1은 화학, 정유, 제약, 식품가공 등에 사용하기 적합합니다.

Service

Max. Temperature	-100 ~ 100°C
Max. Pressure	10bar
pH Pange	0 ~ 14

Typical Physical Properties

Test Method	Description	Specified Value
ASTM D 4894-98a	Bulk Density	380g/l
	Specific Gravity	2.155g/cc
	Shrinkage	4.3%
ASTM D 4894	Tensile Strength	4,800psi
	Elongation at Break	450%
ASTM D 621	Deformation Under Load, 2175psi	
	- 24 hours	15%
	- 100 hours	17%
	- permanent	11%
ASTM D 3985	Permeability	
	- SO ₂ (@23°C)	310cm ³ /m ² ×d×bar
	- HCl(@54°C)	640cm ³ /m ² ×d×bar
	- Cl ₂ (@54°C)	320cm ³ /m ² ×d×bar
ASTM D 638	Tensile Modulus	87,000psi
ASTM D 149-95a	Dielectric Strength	3.5kV/mil

* ALL Data Are 1.5mm Thickness Typical value.

Applications

Strong acids and strong alkalis etc. Various corrosive fluids, organic solutions. Fluid where no contamination is allowed. Where electrical insulation is required.



Design Data : Standard ASME SectionVIII Div.1

Thickness	Gasket Factor 'm'	Min. Design Sealing Stress 'y'
1.5mm	3.2	3,271 psi
3.0mm	2.5	2,845 psi

Availability

Gasket Size : up to 2,000mm(Non-shim)
Thickness : 1.5mm / 2.0mm / 3.0mm

Remark

The specification of product is written by manufacturer, and it is changed frequently.

Equivalent Table

VALQUA	TOMBO	FLEXITALLIC
7010	9007	SIGMA600





INNOSILD® KSP1

Description

INNOSILD® KSP1 components are PTFE with Silica to form PTFE sheet gasket.

Good resistance to Strong acids (except hydrofluoric), steam, solvents, hydrocarbons, chlorine and cryogenics.

INNOSILD® KSP1은 PTFE와 실리카를 조합하여 만든 테프론 시트 가스켓입니다. 강한 산(플루오르화 수소 제외), 증기, 솔벤트, 탄화수소, 염소 및 극저온에 좋은 저항성을 보이며, 사용하기 적합합니다.

Service

Max. Temperature	Cryogenic ~ 260°C
Max. Pressure	83 bar

Typical Physical Properties

Test Method	Description	Specified Value
ASTM F37	Sealability	0.22 ml/hr
ASTM F38	Creep Relaxation	18%
ASTM F36	Compressibility	7-12%
	Recovery	40%
ASTM D1708	Tensile Strength	2,000 psi
	Modulus @100% Elongation	1,600 psi
ASTM D792	Specific Gravity	2.10
ASTM D149	Dielectric Strength	500 volts/mil
ASTM F433	Thermal Conductivity	2.88 Btu.°ft./hr.°ft.°°F

* ALL Data Are 1.5mm Thickness Typical value.

Design Data

Thickness	Gasket Factor 'm'	Min. Design Sealing Stress 'y'
1.5mm	5	2,750 psi
3.0mm	5	3,500 psi

Availability

Gasket Size : up to 1,700mm(Non-shim)
up to 5,000mm(Shim)

Thickness : 1.5mm, 3.0mm

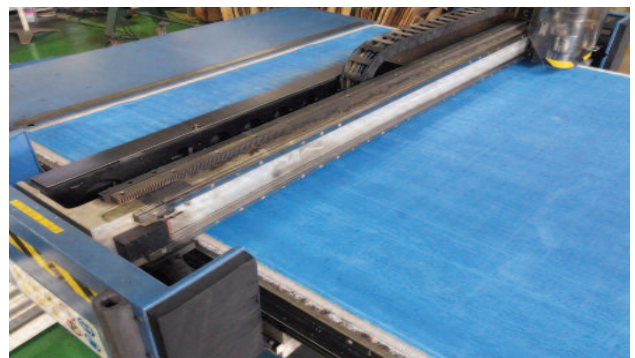


Remark

- The specification of product is written by manufacturer, and it is changed frequently.

Equivalent Table

GARLOCK	FLEXITALLIC
3500	SIGMA511



INNOSILD® KSP2

Description

INNOSILD® KSP2 components are PTFE with glass microspheres to form PTFE sheet gasket.

Good resistance to Strong acids (except hydrofluoric), steam, solvents, hydrocarbons, chlorine and cryogenics.

INNOSILD® KSP2는 PTFE와 마이크로스피어를 조합하여 만든 테프론 시트 가스켓입니다. 강한 산(플루오르화 수소 제외), 증기, 솔벤트, 탄화수소, 염소 및 극저온에 좋은 저항성을 보이며, 사용하기 적합합니다.

Service

Max. Temperature	Cryogenic ~ 260°C
Max. Pressure	55 bar

Typical Physical Properties

Test Method	Description	Specified Value
ASTM F37	Sealability	0.12 ml/hr
ASTM F38	Creep Relaxation	40%
ASTM F36	Compressibility	25-45%
	Recovery	30%
ASTM D1708	Tensile Strength	2,000 psi
	Modulus @ 100% Elongation	1,650 psi
ASTM D792	Specific Gravity	1.70
ASTM D149	Dielectric Strength	305 volts/mil
ASTM F433	Thermal Conductivity	1.44 Btu.°ft./hr.°ft.°°F

※ ALL Data Are 3.0mm Thickness Typical value.

Design Data

Thickness	Gasket Factor 'm'	Min. Design Sealing Stress 'y'
1.5mm	3	1,650 psi
3.0mm	2.5	3,000 psi



Availability

Gasket Size : up to 1,700mm(Non-shim)
Thickness : 1.5mm / 3.0mm

Remark

- The specification of product is written by manufacturer, and it is changed frequently.

Equivalent Table

GARLOCK	FLEXITALLIC
3504	SIGMA500



INNOSILD® KSP3

Description

INNOSILD® KSP3 components are PTFE with barium sulfate to form PTFE sheet gasket.

Good resistance to Strong caustics, chlorine, gases, water, steam, cryogenics, hydrocarbons and aluminum fluoride.

INNOSILD® KSP3는 PTFE와 황산바륨을 조합하여 만든 테프론 시트 가스켓입니다. 강한 초산, 염소, 가스, 물, 증기, 극저온, 탄화수소와 불화 알루미늄에 좋은 저항성을 보이며, 사용하기 적합합니다.

Service

Max. Temperature	Cryogenic ~ 260°C
Max. Pressure	83 bar

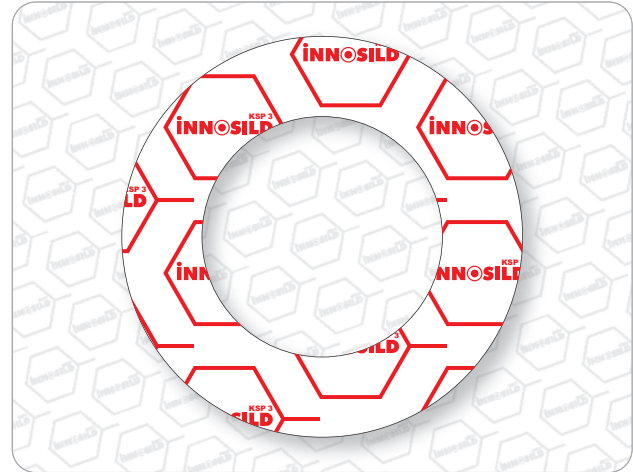
Typical Physical Properties

Test Method	Description	Specified Value
ASTM F37	Sealability	0.04 ml/hr
ASTM F38	Creep Relaxation	11%
ASTM F36	Compressibility	4-10%
	Recovery	40%
ASTM D1708	Tensile Strength	2,000 psi
	Modulus @100% Elongation	1,400 psi
ASTM D792	Specific Gravity	2.80
ASTM D149	Dielectric Strength	577 volts/mil
ASTM F433	Thermal Conductivity	2.40 Btu.°ft./hr.°ft.°°F

* ALL Data Are 3.0mm Thickness Typical value.

Design Data

Thickness	Gasket Factor 'm'	Min. Design Sealing Stress 'y'
1.5mm	2	2,350 psi
3.0mm	2	2,500 psi



Availability

Gasket Size : up to 1,700mm(Non-shim)
Thickness : 1.5mm / 3.0mm

Remark

- The specification of product is written by manufacturer, and it is changed frequently.

Equivalent Table

GARLOCK	FLEXITALLIC
3510	SIGMA533



INNOSILD® KP11

Description

INNOSILD® KP11 is one of high-quality Teflon sheet gasket which is combined with sulfur barium & multi-directionally expanded PTFE.

INNOSILD® KP11는 다방면으로 확장가능한 PTFE 합성수지와 와 황산바륨을 조합하여 만든 테프론 시트 가스켓입니다.

Service

Max. Temperature	Cryogenic ~ 270°C
Max. Pressure	40 bar
pH Pange	: 0 ~ 14

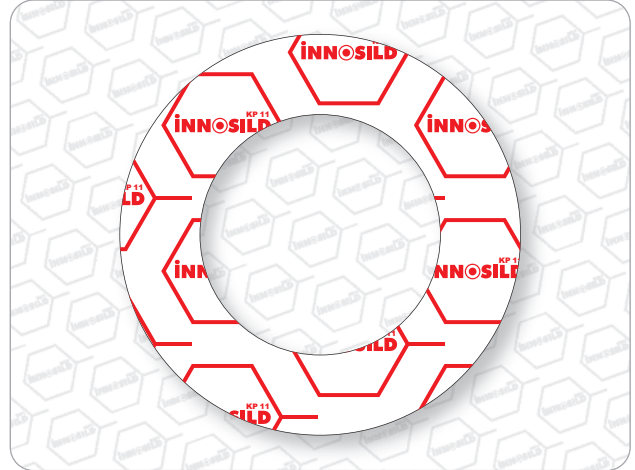
Typical Physical Properties

Test Method	Description	Specified Value
ASTM F36	Compressibility	45%
	Recovery	14%
ASTM F38	Creep Relaxation	11%
ASTM F152	Tensile	2,000 psi
ASTM D792	Specific Gravity	2.80
ASTM D1708	Modulus @100% Elongation	1,400 psi
ASTM F433	Thermal Conductivity	0.29-0.38 W/m²K
ASTM D149	Dielectric	
	- 3hours at 250°F	466
	- 96hours at 100% Relative Humidity	59
ASTM F37B Fuel A	Gasket Load	1,000 psi
	Internal Pressure	9.8 psig
	Leakage	0.04 ml/hr
DIN 3535-4 Gas Permeability	Gasket Load	4,640 psi
	Internal Pressure	580 psig
	Leakage	<0.015 cc/min

※ ALL Data Are 1.5mm Thickness Typical value.

Design Data

Thickness	Gasket Factor 'm'	Min. Design Sealing Stress 'y'
1.5mm	2.5	2,800
3.0mm	2.5	2,800



Availability

Gasket Size : up to 1,500mm(Non-shim)
 Thickness : 1.5mm / 2.0mm / 3.0mm

Remark

- The specification of product is written by manufacturer, and it is changed frequently.

Equivalent Table

TEADIT
24SH



INNOSILD® KM1



Description

Good resistance to Strong caustics, chlorine, gases, water, steam, cryogenics, hydrocarbons and aluminum fluoride.

이 제품은 강한 초산, 염소, 가스, 물, 증기, 극저온, 탄화수소와 불화 알루미늄에 좋은 저항성을 보이며, 사용하기 적합합니다.

Service

Max. Temperature	300°C ~ 900°C
Max. Pressure	5 bar

Typical Physical Properties

Typical Material Properties	
Density	1.2~3.2 gr/cm ³
Mositure Hygroscopic	Max 3%
Ignition Loss	Max 10%
Tensile Strength	Min 50 kgf/cm ²

※ ALL Data Are 1.5mm Thickness Typical value.

Availability

Gasket Size : up to 1,200mm(Non-shim)
Thickness : 1.5mm / 3.0mm

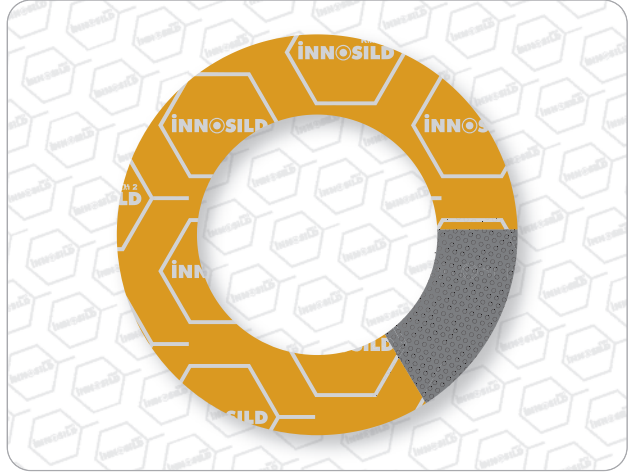
Remark

- The specification of product is written by manufacturer, and it is changed frequently.

Equivalent Table

LAMONS
MICA

INNOSILD® KM2



Description

Good resistance to Strong caustics, chlorine, gases, water, steam, hydrocarbons and aluminum flouride.

INNOSILD® KM1, the sheet gasket which contains pure MICA. This gasket has good flexibility and also good performance with low stress circumstances.

INNOSILD® KM2, the sheet gasket with tanged metal core inside of pure MICA. This gasket has good hardness & has better stable sealing ability.

이 제품은 강한 초산, 염소, 가스, 물, 증기, 탄화수소와 불화 알루미늄에 좋은 저항성을 보이며, 사용하기 적합합니다.

순수 Mica로 구성되어 있는 **INNOSILD® KM1**은 좋은 유연성을 가지며, 낮은 체결압에도 사용이 가능한 시트 가스켓입니다.

INNOSILD® KM2는 순수 Mica 내부에 Tanged Metal을 삽입함으로써 좋은 강성을 보유하고 있고 더욱 안정적이고 좋은 실링성능을 가지고 있습니다.

Service

Max. Temperature	300°C ~ 900°C
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Typical Physical Properties

Typical Material Properties	
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Equivalent Table

KLINGER
MILAM PSS

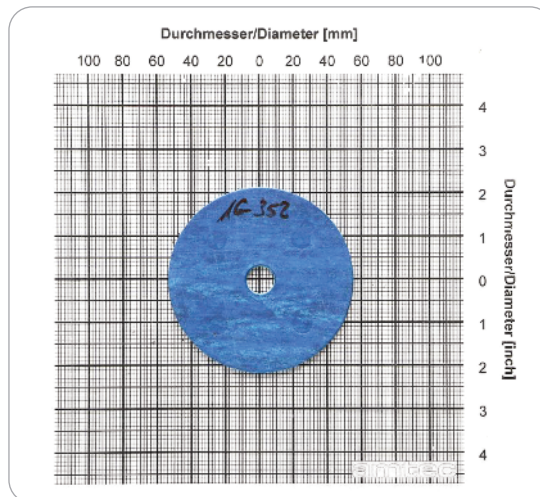
BS 7531 Grade Y Test

Compressibility test

Kukil Innosild KN1 13,3×0×1,92mm

Test number : 16~352

Thickness under pre-load	1.890mm
Thickness under load	1.738mm
Impression	0.152mm
Compressibility	8.0%

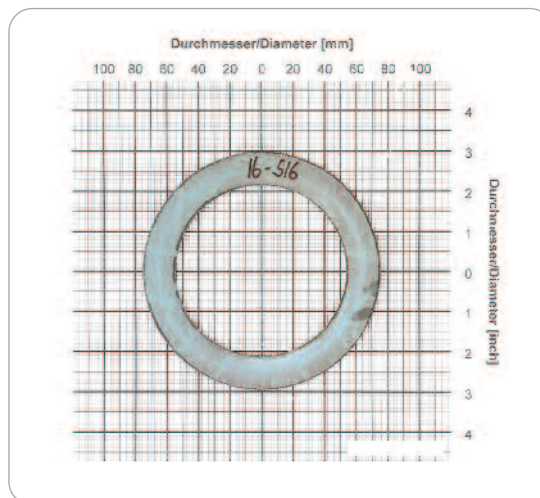


Residual stress test

Innosild KN1 74,66×54,65×1,64mm

Test number : 16~516

Initial gasket stress	40MPa
Time at RT	00:05 hh:mm
Test temperature T _p :	300°C
Time at T _p :	16:00 hh:mm
Stiffness C	313 kN:mm
Residual stress of the jointing	23.1Mpa

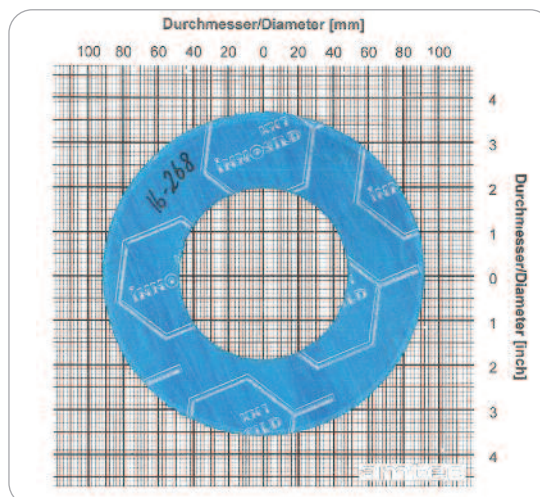


Gas permeability test

Innosild KN1 91,42×48,62×1,9mm

Test number : 16~268

Initial gasket stress σ :	32MPa
Internal pressure p :	40bar
Test temperature T _p :	23°C
Dwell time	2:00hh:mm
Measuring time	1:00hh:mm
Leak rate λ	3.03E-04cm ³ /min
	2.95E-05mg/m/s





Gasket Installation Procedure

Tools Required

Specific tools are required for cleaning and tensioning the fasteners.

Additionally, always use standard safety equipment and follow good safety practices. Acquire the following equipment prior to installation:

- Calibrated torque wrench, hydraulic or other tensioner
- Wire brush (brass if possible)
- Helmet
- Safety goggles
- Lubricant
- Other plant-specified equipment

1. Clean and examine

- Remove all foreign material and debris from the seating surfaces, fasteners (bolts or studs), nuts, and washers. Use plant-specified dust control procedures.
- Examine fasteners (bolts or studs), nuts, and washers for defects such as burrs or cracks.
- Examine flange surfaces for warping, radial scores, heavy tool marks, or anything prohibiting proper gasket seating.
- Replace components if found to be defective. If in doubt, seek advice.

2. Align Flanges

- Align flange faces and bolt holes without using excessive force.
- Report any misalignment.

3. Install gasket

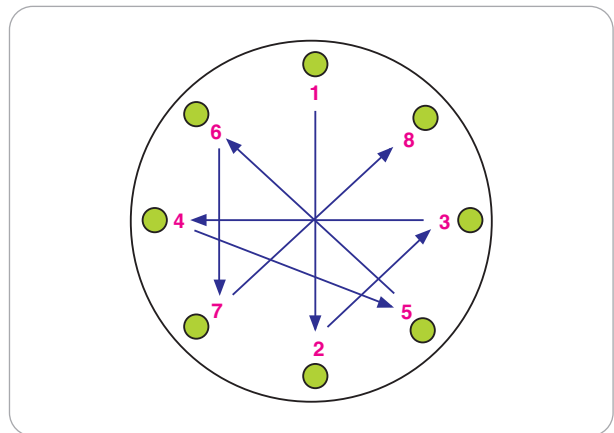
- Assure gasket is the specified size and material.
- Examine the gasket to ensure it is free of defects.
- Carefully insert gasket between flanges.
- Make sure the gasket is centered between the flanges.
- Do not use jointing compounds or release agents on the gasket or seating surfaces unless specified by the gasket manufacturer.
- Bring flanges together, ensuring the gasket isn't pinched or damaged.

4. Lubricate load-bearing surfaces

- Use only specified or approved lubricants.
- Liberally apply lubricant uniformly to all thread, nut and washer load-bearing surfaces.
- Ensure lubricant doesn't contaminate either flange or gasket face.

5. Install and tighten bolts

- Always use proper tools: calibrated torque wrench or other controlled tensioning device.
- Consult KUKIL for guidance on torque specifications.
- Always torque nuts in a cross bolt tightening pattern:



6. Tighten the nuts in multiple steps:

- Step 1. Tighten all nuts initially by hand. (larger bolts may require a small hand wrench.)
- Step 2. Torque each nut to approximately 30% of full torque.
- Step 3. Torque the nuts to approximately 60% of full torque.
- Step 4. Torque each nut to full torque, again using the cross bolt tightening pattern. (Large-diameter flanges may require additional tightening passes.)
- Step 5. Apply at least one final full torque to all nuts in a clockwise direction until all torque is uniform. (Large-diameter flanges may require additional tightening passes.)

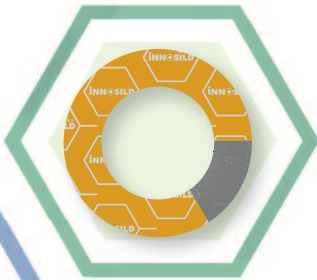
7. Retightening

- Caution: Consult KUKIL for guidance and recommendation on retightening.
- Do not retorque elastomer-based, asbestos-free gaskets after they have been exposed to elevated temperatures unless otherwise specified.
- Retorque fasteners exposed to aggressive thermal cycling.
- All retorquing should be performed at ambient temperature and atmospheric pressure.

KUKIL INNTOT is a professional manufacturer of gasket, packing and coupling with the latest technology not only for the plant but also the plant maintenance and emergency repair.



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