

Tech-How Make the Difference!

**Next Generation
World Firstly Developed
Eco-Friendly
Flange Gasket Materials**



Environmentally Friendly Solvent Free Process
LEAKBLOK®



www.jeilens.co.kr

Environmentally Friendly Solvent Free Process LEAKBLOK®

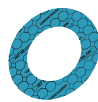
Since established 1969, JEIL E&S has been dedicated to manufacturing wide range of proven high quality sealing and ahead giant leap for strong enterprise of 'Hidden Champion' in soft gasket materials for next century. Specially invented LEAKBLOK®, came into the world with significant R&D investment and state-of-the-art facilities extension and proudly represent environmentally friendly compressed gasket materials.

Our new UMCS* & UMPS* have officially awarded NET* certifying from MKE*, Korean government. We set the target no use VOC* contents on all new LEAKBLOK® process by guarantee considerable improvement of superior sealability, strong durability and outstanding flexibility and other performances. Portable water application with WRAS* approval and suitable for steam, clean, contaminated fluid lines. Next generation flange gasket material, LEAKBLOK® especially represent superior sealability on gas line and excellent electrical isolation performance.

1969年に設立された以後、半世紀の間に最高の品質と性能を基で守りぬいたJEIL E&Sが、今後100年を準備する強小企業へ進むための新しい跳躍を準備しております。R&Dセンター拡張及び移転等、新規研究設備への投資と力を入れて開発した環境に優しい圧縮シート「LEAKBLOK®」を皆さんにご紹介させていただきます。

自社開発の UMCS* & UMPS* は新しい技術であることを証明するNET*認定書を取得し、VOC*を使用しない環境に優しい工法と既存圧縮シートと比べて優れた密封性、強い耐久性と卓越な柔軟性を見せております。更にWRAS*認定を取得し、飲用水ラインに適用可能であり、流体の汚染やスチーム及び清浄性を必要とするラインにも使用可能です。特に既存圧縮シートと比べてガスラインでも優れたSEAL性能を持ち、絶縁性能まで揃えた新しい概念の次世代ガスケットです。

*UMCS: Unique Mechanical Compounding System
*UMPS: Unique Machinery Process System
*NET: New Excellent Technology
*MKE: Ministry of Knowledge Economy
*VOC: Volatile Organic Compounds
*WRAS: Water Regulation Advisory Scheme
*MECS: Mill Edge Coiling System



Chapter 1
Global Leading Innovative Green Process
革新的な新環境工法



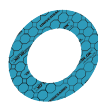
Chapter 2
Superior Gas Permeability
優れた気体機密性



Chapter 3
Exceptional Electrical Isolation Performance
卓越な絶縁性



Chapter 4
Excellent Sealability at Low Seating Stress
低い締め付け力でも安定的な密封性



Chapter 5
Less Deformation
低い変形性



Chapter 6
Easy Removability
向上されたガスケットの取り外し



Chapter 7
Sheet in Roll - by MECS* 1st in the world
世界最初 Roll 生産



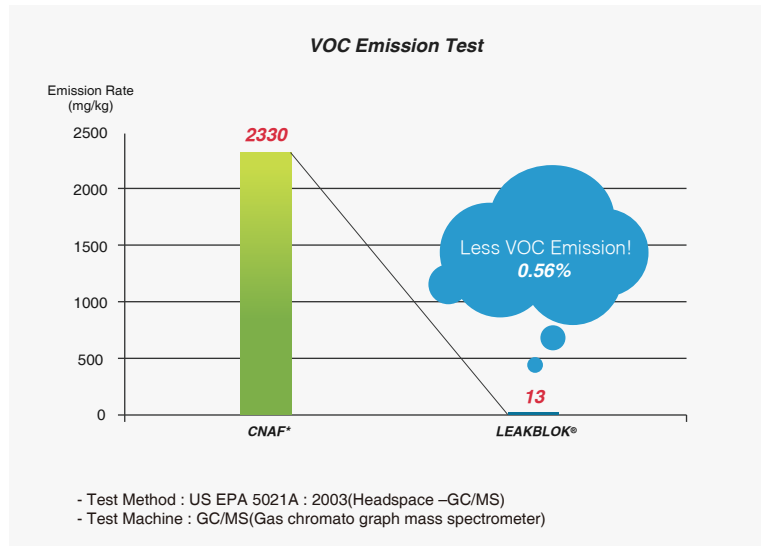
Chapter 8
Excellent Productivity
向上された加工性能

Chapter 1 Global Leading Innovative Green Process

NET* approved in 2013, specially invented unique method of UMCS* & UMPS* contribute to excellent reduction of VOC* emission because of no using solvent from compounding and manufacturing process. LEAKBLOK® is proven reliability from VOC* emission compare with existing conventional compressed sheet materials.

LEAKBLOK®は自社が独自開発した UMCS & UMPS 工法で2013年NET*から認定されて、VOCを製造工程から完成品まで排出しない最先端の環境に優しいシートである。

*NET: New Excellent Technology
 *UMCS: Unique Mechanical Compounding System
 *UMPS: Unique Machinery Process System
 *VOC: Volatile Organic Compounds
 *CNAF: Compressed Non-Asbestos Fiber Gasket

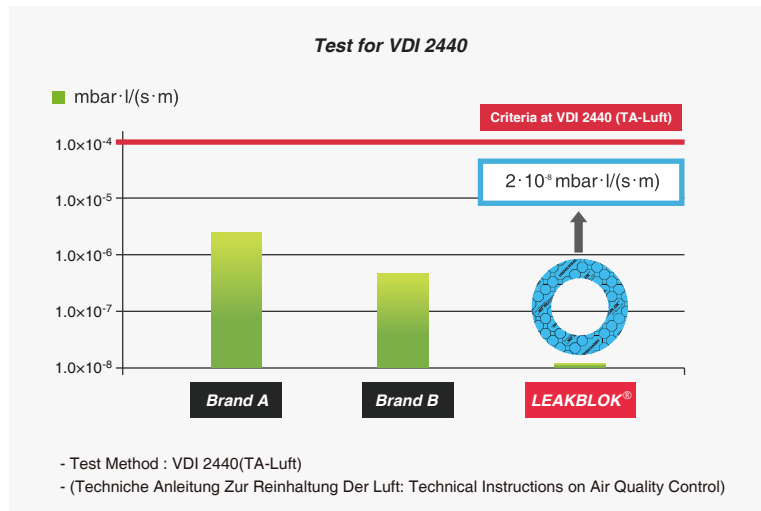


Chapter 2 Superior Gas Permeability

1. Excellent Gas Permeability

High grade of next generation gasket, LEAKBLOK® shows excellent gas permeability with dedicated protection from fugitive emission control which is considered the possible risk of fire & explosion etc. It provides distinguish level of TA-Luft acceptance criteria.

高性能の次世代ガスケット LEAKBLOK®は優れた気体機密性を持っており、火災や爆発等の潜在的な流出危険までも慮るガスケットであり、TA-LUFT TESTからも他社製品より優れた Sealing性能を見せておる。

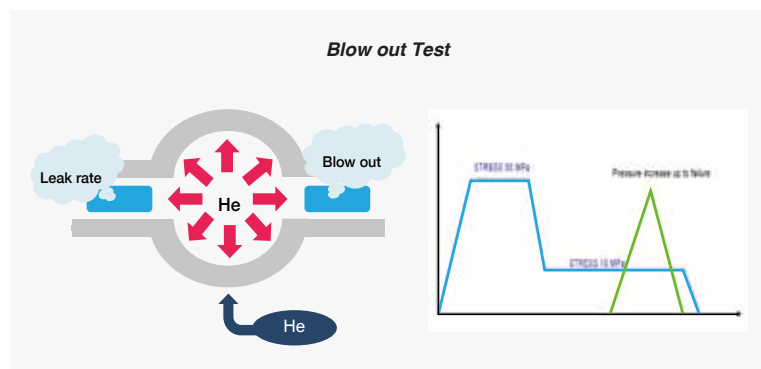


2. Peak Pressure & Blow out Test

- Test Result
- Leak rate on internal pressure applied

Internal Pressure(He)	Leak rate(atm.cm ³ /s)
60 bar	2.90 × 10 ⁻⁸
80 bar	2.65 × 10 ⁻⁴
100 bar	3.93 × 10 ⁻²

According to Global oil major's Type Acceptance Test, it verify stable sealing performance without leakage and breakage when internal pressure increasing over 60 bar with minimum gasket seating stress maintains. This test shall meet the qualification at variety applicable condition what related industries required.



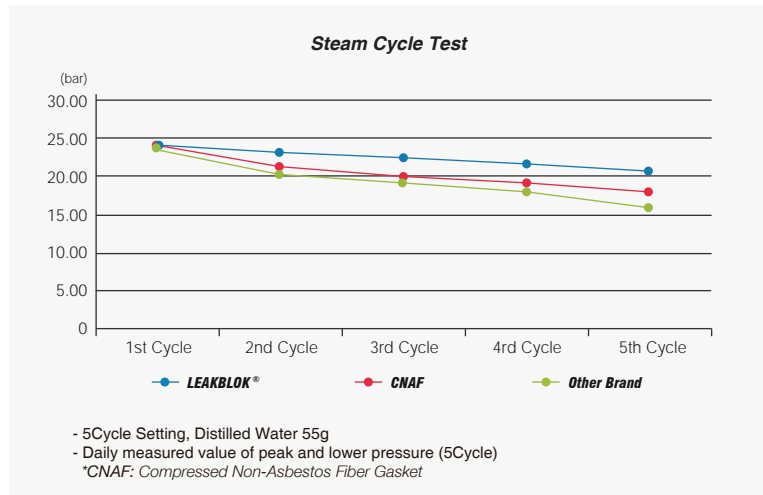
グローバルOIL Major CompanyのType Acceptance Test基準による試験結果、60Bar以上の内圧が適用されても優れた機密性と破損されない特性で、高圧の環境内でも使用可能であり、インダストリーから要求される様々な環境でも適用可能であることを見せておる。

3. Steam Cycle Test

Temperature	250 °C
Fluid	Steam, 24 bar
Seating Stress	30 MPa

Based on excellent gas permeability, it provides stable sealability at steam application compare with conventional CNAF*. Normally drastic change of thermal or pressure cycling is highly effected on sealability, but high dense inner structure of LEAKBLOK® enhance much longer and lower life cycle cost for customers.

優れた気体機密性を基に既存圧縮ガスケットと比べ、Steam Testでも安定的な機密性を見せている。温度及び圧力の変動は機密性に影響があるが、LEAKBLOK®の優秀な組織構造は機密性向上と耐久力増大によって顧客のガスケット交換費用節減に寄与する。

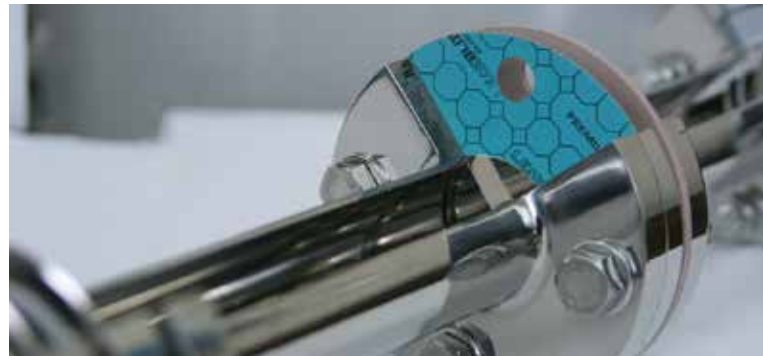


4. Durability Test

Temperature	160 °C
Fluid	Steam, 7 bar
Seating Stress	30 MPa

Actual field test performed at a chemical plant in Korea to confirm excellent durability above specified condition and leakage has not detected at steam line for 1,000days.

耐久力検証のため、韓国のある化学工場の現場Steam Lineに装着した後、1000日以上漏れが発生しない性能を確認して、優れた耐久性で顧客の満足に寄与させる。



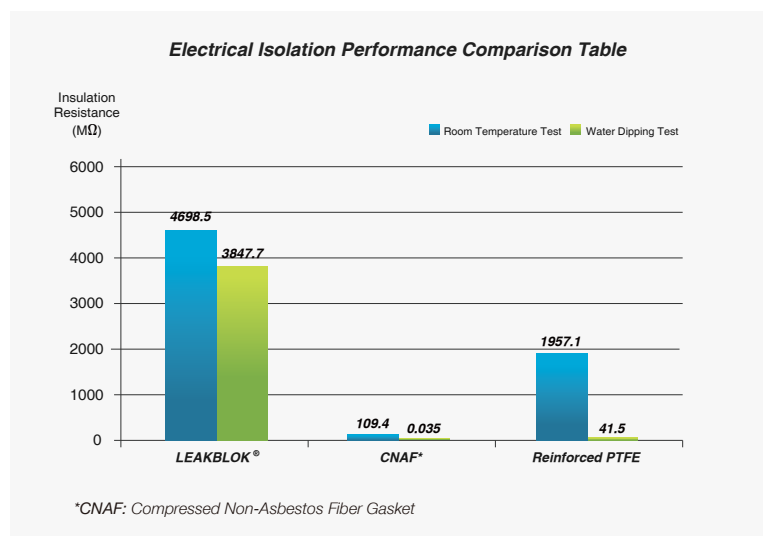
Chapter 3

Exceptional Electrical Isolation Performance

1. Electrical Isolation Performance Test

Test Method	Test Material	Insulation Resistance(MΩ)
Room Temperature Temperature : 21.0±3 °C Humidity : 42.0±10 %	LEAKBLOK®	4698.5
	CNAF	109.4
Water Dipping Dipping Time : 1 hour	Reinforced PTFE	1957.1
	LEAKBLOK®	3847.7
	CNAF	0.035
	Reinforced PTFE	41.5

Test	Unit	Ref. STD	LEAKBLOK®
Insulation Resistance	Ω	ASTM D257	3.02×10 ¹²
Volume Resistance	Ω.cm	ASTM D257	4.65×10 ¹⁴
Dielectric Strength	kV/mm	ASTM D149	13.39
Tangent δ (ε')	-	ASTM D150	0.004
Dielectric Constant (ε'')	-	ASTM D150	13.39



In accordance with authorized institute, LEAKBLOK® represents outstanding application of electrical isolation performance. Compare to testing result with conventional CNAF* and reinforced PTFE materials, LEAKBLOK® has the highest level of electrical isolation performance at ambient and water dipping conditions.

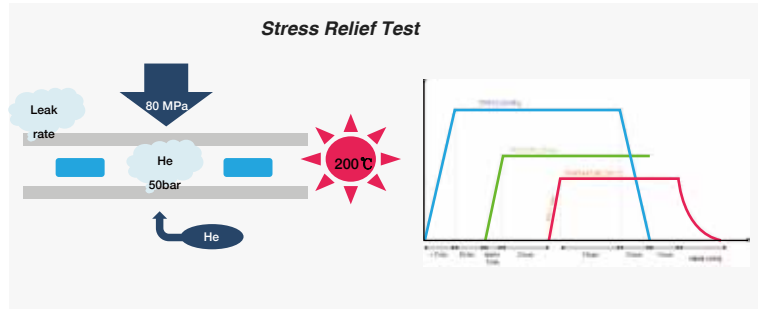
LEAKBLOK®は公認TEST機関の検証を通じて、既存圧縮ガスケットとReinforced PTFE 材質より卓越した電気的特性を見せて、常温の浸水条件からもハイレベルの絶縁性能を発揮している。

Chapter 4 Excellent Sealability at Low Seating Stress

1. Stress Relief Test

Tightness	Reading Leak rate on 10 MPa stress point
A leak = 5×10^3 stress applied on the gasket <= (MPa)	5×10^5 atm.cm ³ /s (Stress 10 MPa applied)
Stress applied on the gaskets up to tightness failure <= (MPa)	

With superior heat resistance of LEAKBLOK®, above test result demonstrates excellent sealability on against critical applicable conditions (High temperature & pressure but decreasing seating stress). This strength has shown stable sealing advantage on relief bolting stress at high temperature condition.



LEAKBLOK®の優れた耐熱・機密性能は急変する運転条件(高温、高圧、締め付け力減少)でも Sealing 性能が維持されることを確認可能であり、このような特性のため高温環境で締め付け力の弛緩による漏れ問題にも安定的に使用可能な長所を持つ。

2. Low Seating Stress Test

With special UMCS*, LEAKBLOK® shows outstanding stability at low seating stress and suitable where difficulty to applying standard torque in actually assembling construction fields.

LEAKBLOK®の特殊UMCS* 工法を通じて、圧縮ガスケットで適用が難しく、低い締め付け力でも優秀なSealing性能を見せながら、現場作業時に十分な締結が難しい劣悪な状況でも適用可能である。

*UMCS: Unique Mechanical Compounding System

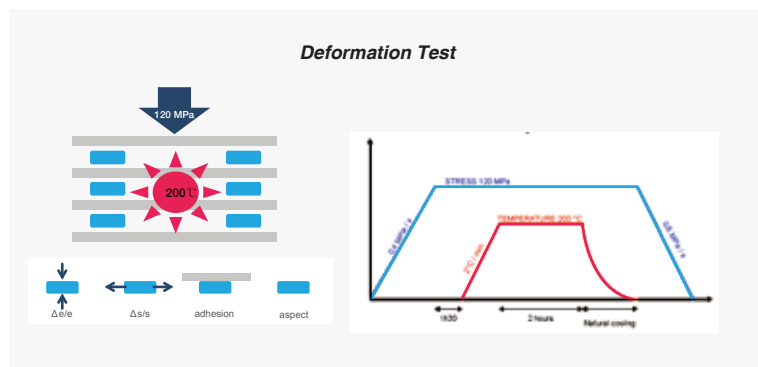
Specimen	Test Result		
	LEAKBLOK®	CNAF	
Seating Stress(MPa)	20	20	40
N2 Leakage Test (10 bar)	No Leak	Leak(Permeation)	No Leak
Hydraulic Test (31 bar)	No Leak	No Leak	No Leak

Chapter 5 Less Deformation

Deformation Test (Preselection Test)

Simultaneously applied condition of high seating stress 120MPa and 200°C, LEAKBLOK® has strong physical properties and less deformation while testing verification of gasket thickness, surface change and breakage.

120MPaの高い締め付け面圧と200°Cの高温条件からも LEAKBLOK®の優れた物理的強度を通して、ガスケットの厚み及び体的変化が最小化されることを確認出来る。



$$\Delta e / e = \frac{\text{reference thickness} - \text{final thickness}}{\text{reference thickness}} \times 100$$

$$\Delta s / s = \frac{\text{final Surface} - \text{Initial Surface}}{\text{Initial Surface}} \times 100$$

Test Result					
Test Name	Criteria	Gasket 1	Gasket 2	Gasket 3	Acceptance
$\Delta e / e$	Max 20 %	17.38	16.4	17.52	Yes
$\Delta s / s$	Max 25 %	21.57	22.6	21.43	Yes

Chapter 6 Easy Removability

1. Removability Test

LEAKBLOK® has designed to consider maintenance cost reduction in industrial fields. Performed testing under the condition of 120MPa and 200°C, LEAKBLOK® has shown excellent and easy removability with no adhesive on the flange which dedicated to cost saving and flange protection.

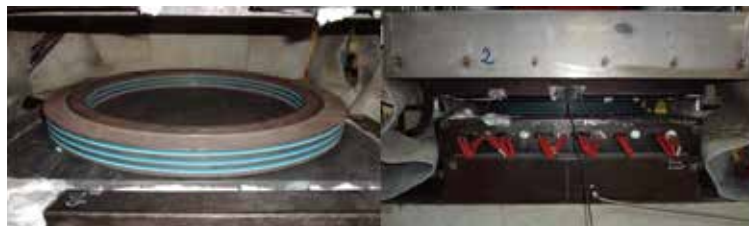
120MPaの高い締め付け面圧と200℃の高温条件でもLEAKBLOK®だけの優れた取り外し性能で維持補修時にGASKETの交換が容易であり、FLANGE表面の損傷を最小化して交換が出来る。

2. Removability for Heating Cycle Test

- High Temperature and Pressure test
- 200°C × 96 hours : 1 Cycle × 4 Days
(10 hours Heating + 14 hours Cooling)

ITEM	Removability (Surface check)
LEAKBLOK®	Seating & Removability : ★★★★★ Easy removal and no creep and deformation.
Brand "A"	Seating & Removability : ★★★☆☆ Easy removal and no creep and deformation.
Brand "B"	Seating & Removability : ★★★☆☆ Stick at surface and need to force to remove.

*CNAF: Compressed Non-Asbestos Fiber Gasket



Condition: Seating Stress 120MPa and 200°C
Test Result : No Adhesion

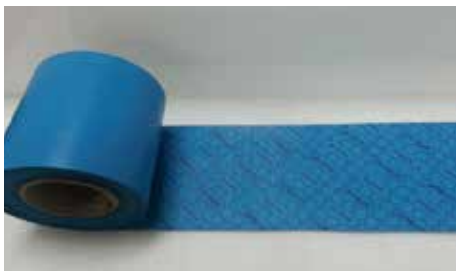


Outstanding surface quality of LEAKBLOK® has an exceptional removability without anti-stick surface treatment. Unique surface roughness fulfill less deformation, good adaptability for flange irregularities.

LEAKBLOK®の優れたAnti-Stic性能で別途の後処理をしなくても既存圧縮シートより優秀な取り外し性を見せる。

Chapter 7 Sheet in Roll - by MECS 1st in the world

1. Mill Edge Coiling System(MECS) as Various Customers Requirments



Thickness	Width	Length
0.8mm~3.2mm	50"(1270mm) 60"(1500mm)	50"(1270mm) 60"(1500mm) 3M ~ 20M & etc

*SECS: Slit Edge Coiling System
*MECS: Mill Edge Coiling System



Focus on cost minimization, LEAKBLOK® is independently supplying MECS*/SECS* considerably efficient to cost reduction, benefits from unnecessary loss, productivity enhancement etc. It provides unique 'TAILOR MADE' solution from SECS* with various width of roll base international industrial standard by fulfill customer's automation facilities, customized process characteristics.

LEAKBLOK®だけの独自のMECS*&SECS*工法で"顧客のお好み"大量生産システムに最適化された幅と長さで供給可能であり、LOSS率節減及び生産性の向上を通して革新的な原価節減効果を持つ。

Chapter 8 Excellent Productivity

Specially designed by UMCS* process contribute to remarkable improvement on high productivity and excellent die-cutting ability caused from conventional CNAF*.

LEAKBLOK®だけの独自のUMCS*工法で既存CNAF*から発生される低い加工性による生産性低下問題を画期的で改善することが出来て、LEAKBLOK の手軽い打抜き性、加工性で顧客生産性に寄与する。

*UMCS: Unique Mechanical Compounding System
*CNAF: Compressed Non-Asbestos Fiber Gasket



Why

Environmentally Friendly Solvent Free Process
LEAKBLOK® ?

for customers
around the World

- L**ower Costs for Client (Time/Process/Handle etc)
- E**co-Friendly for Client's Purpose
- A**ggressive Sales with LEAKBLOK®
- K**eeping Workshop Clean & Tiny
- B**esides, Make your Plants SAFE
- L**eading the Market with LEAKBLOK®
- O**vious way to get good Productivities
- K**orean Origin from JEIL's TECH Support



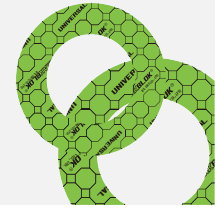
LEAKBLOK[®] Properties

Grade		LEAKBLOK [®] Premium			
Composition		Aramid Fiber Glass Fiber NBR Binder	Aramid Fiber Glass Fiber NBR Binder	Aramid Fiber Glass Fiber SBR Binder	Aramid Fiber Glass Fiber NBR Binder
Model No		P100	P200	P300	P400
Basic Color		Green	Blue	Silver	Brown
Temp (°C)	Continuous Operating	180	220	220	260
	Maximum	260	350	350	430
	Low	-50	-50	-50	-50
	Peak Pressure(bar)	60	80	80	100
Test Method	Physical Properties	P100	P200	P300	P400
ASTM D792	Density[g/cm ³]	1.9	1.9	1.9	1.9
ASTM F152	Tensile strength Across grain MPa[kg/cm ²]	10.0 (102)	15.0 (153)	15.0 (153)	16.7 (170)
ASTM F36J	Compressibility[%]	10	9	9	8
ASTM F36J	Recovery[%]	75	71	73	63
ASTM F146	Fluid Resistance after 5hrs immersions ASTM # 3 oil(150°C) Thickness Increase[%]	4	3	10	4
	ASTM Fuel B(20~30°C) Thickness Increase[%] Weight Increase[%]	7 10	6 9	10 17	4 12
	DIN 52913	Relaxation Stress[MPa] - 50MPa 16hrs / 175°C - 50MPa 16hrs / 300°C	20 -	38.2 -	37.6 -
BS 7531	Relaxation Stress[MPa] - 40MPa 16hrs / 300°C	-	23.7	23.8	25.1
VDI 2440 (TA-Luft)	Leak rate [mbar.l/(s.m)]	2x10 ⁻⁸	2x10 ⁻⁸	2x10 ⁻⁸	2x10 ⁻⁸
DIN 3535/6	Gas Permeability[ml/min]	≤ 0.01	≤ 0.01	≤ 0.01	≤ 0.01
Type Approval & Test Certificate		ISO 9001/14001, OHSAS 18001, PED, NET Lloyd's & ABS Type Approval, TA - Luft, WRAS, Fire Endurance Test(ISO 19921 & 19922)			
pH Range		4-11 Above is general range and has no guarantee for every case. Please contact us for further details.			
Thickness		0.8mm ~ 3.2mm			
Width		1270mm(50"), 1500mm(60")			
Length		1270mm(50"), 1500mm(60"), 3M~10M, 15M~20M & etc.			
Applicable Fluids		Portable Water, Oils, Fuels Salt Solution, gas line, Mild acids and alkalis & etc.			

* All data are 1.5mm thickness typical value.

* 上記物性値は1.5T製品の実測値で、全体物性を代表することではない。

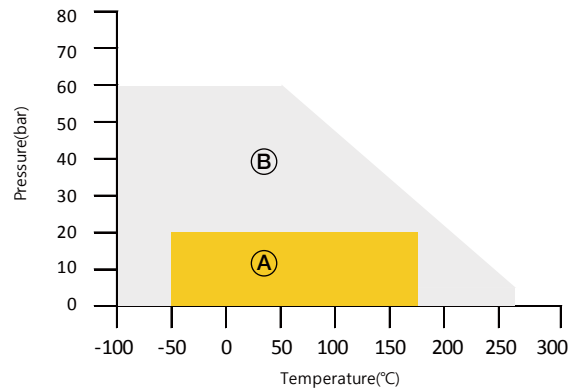
Compressed Asbestos-Free Gasket **LEAKBLOK® Premium P100**



MATERIAL PROPERTIES

Product Name	LEAKBLOK® Premium P100
Color	Green(Black Printed)
Composition	Aramid Fiber + NBR Binder
Fluids Service	Portable Water, Oils, Fuels, Salt Solution, Mild acids and alkalis, gas line
Pressure	Short-term peak 60bar(870 psi)
Temperature	Continuous -50℃(-58°F) ~ 180℃(356°F) Short-term peak Max 260℃(500°F)
pH range	4-11
Thickness(mm)	0.8 ~ 3.2
Size(mm)	1270(W)×1270(L), 3M-10M, 15M-20M(L) 1500(W)×1500(L), 3M-10M, 15M-20M(L)
Certificates	Lloyd's & ABS Type Approval , TA-Luft(VDI 2440), WRAS, Fire Endurance Test(ISO 19921 & 19922)

SERVICE RANGE



Area (A) Satisfactory area subject to chemical compatibility
Area (B) Usually suitable but required technical recommend by JEIL Technical team
P×T(Max) $\text{psi} \times \text{°F} (\text{bar} \times \text{°C}) / 309,720 (10,800)$

PHYSICAL PROPERTIES

Test Method	Description	LEAKBLOK® P100
ASTM D792	Density (g/cm³)	1.9
ASTM F152	Tensile Strength Across grain. MPa (kgf/mm²)	10.0(1.02)
ASTM F36 Procedure J	Compressibility (%) Recovery (%)	10 75
DIN 3535 - 6	Gas permeability (ml/min)	≤ 0.01
DIN 52913	Relaxation Stress(MPa) -50MPa 16 hours @ 175℃	20
VDI 2440 (TA - Luft)	Leak rate (mbar·l / (s·m)) -at 150℃ 48 hours	2·10 ⁻⁸

IMMERSION PROPERTIES

Test Method	Description	LEAKBLOK® P100
ASTM F146		
at 150 °C x5hrs		
ASTM Oil no 3	Thickness Increase (%)	4
at 20~30 °C x5hrs		
ASTM Fuel B	Thickness Increase (%)	7
	Weight Increase (%)	10

GASKET DESIGN DATA

Thickness (mm)	Gasket Factor(m)	Min. Design Seating Stress(y) Kg/cm² (psi)
3.2	2.00	112(1600)
1.6	2.75	260(3700)
0.8	3.50	457(6500)

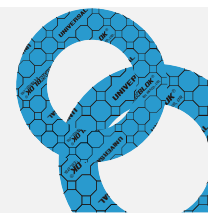
* All data are 1.5mm thickness typical value.

Innovative technology, LEAKBLOK®, absolutely distinguished from the traditional way of calendar roll production, It specially invented with environmentally friendly solvent free process. Compare with previous product, it shows strong durability and superior at low seating stress. Suitable for use Low pressure steam and clean line, excellent protection of fluid contamination.

WARNING

- Not available with max. temperature & pressure at the same time
- Guide line only, if outside this range contact us.
- Do not re-use gaskets unless this is specifically indicated.
- Do not use gasket compounds with gasket as this will adversely affect performance.
- Please consult with JEIL's Technical team for application of steam & explosive gas line especially.

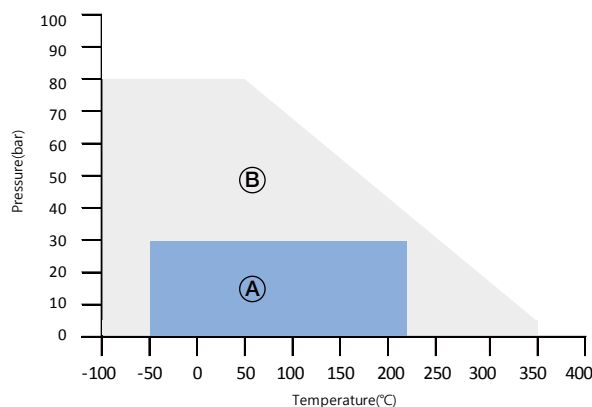
Compressed Asbestos-Free Gasket **LEAKBLOK® Premium P200**



MATERIAL PROPERTIES

Product Name	LEAKBLOK® Premium P200
Color	Blue(Black Printed)
Composition	Aramid Fiber + NBR Binder
Fluids Service	Portable Water, Oils, Fuels, Salt Solution, Mild acids and alkalis, gas line
Pressure	Short-term peak 80bar (1160 psi)
Temperature	Continuous -50℃ (-58°F) ~ 220℃ (428°F) Short-term peak Max 350℃ (660°F)
pH range	4-11
Thickness	0.8 ~ 3.2(mm)
Size	1270(W)×1270(L), 3M~10M, 15M~20M(L) 1500(W)×1500(L), 3M~10M, 15M~20M(L)
Certificates	Lloyd's & ABS Type Approval , TA-Luft(VDI 2440), WRAS, BS 7531 Grade Y Fire Endurance Test(ISO 19921 & 19922)

SERVICE RANGE



Area (A) Satisfactory area subject to chemical compatibility
Area (B) Usually suitable but required technical recommend by JEIL Technical team
P×T(Max) psi × °F (bar × °C) / 496,480 (17,600)

PHYSICAL PROPERTIES

Test Method	Description	LEAKBLOK® P200
ASTM D792	Density (g/cm³)	1.9
ASTM F152	Tensile Strength Across grain.MPa (kgf/mm²)	15.0(1.53)
ASTM F36 Procedure J	Compressibility (%) Recovery (%)	9 71
DIN 3535 -6	Gas permeability (ml/min)	≤ 0.01
DIN 52913	Relaxation Stress(MPa) - 50MPa 16 hours @ 175℃	38.2
BS 7531	Relaxation Stress(MPa) - 40MPa 16 hours @ 300℃	23.7
VDI 2440 (TA - Luft)	Leak rate (mbar·l / (s·m)) -at 150℃ 48 hours	2·10 ⁻⁸

IMMERSION PROPERTIES

Test Method	Description	LEAKBLOK® P200
ASTM F146 at 150℃ x5hrs		
ASTM Oil no 3	Thickness Increase (%)	3
at 20~30℃ x5hrs		
ASTM Fuel B	Thickness Increase (%)	6
	Weight Increase (%)	9

GASKET DESIGN DATA

Thickness (mm)	Gasket Factor(m)	Min. Design Seating Stress(y) Kg/cm² (psi)
3.2	2.00	112(1600)
1.6	2.75	260(3700)
0.8	3.50	457(6500)

* All data are 1.5mm thickness typical value.

Innovative technology, LEAKBLOK®, absolutely distinguished from the traditional way of calendar roll production, It specially invented with environmentally friendly solvent free process.

Compare with previous product, it shows strong durability and superior at low seating stress. Suitable for use steam and clean line, excellent protection of fluid contamination.

WARNING

- Not available with max. temperature & pressure at the same time
- Guide line only, if outside this range contact us.
- Do not re-use gaskets unless this is specifically indicated.
- Do not use gasket compounds with gasket as this will adversely affect performance.
- Please consult with JEIL's Technical team for application of steam & explosive gas line especially.

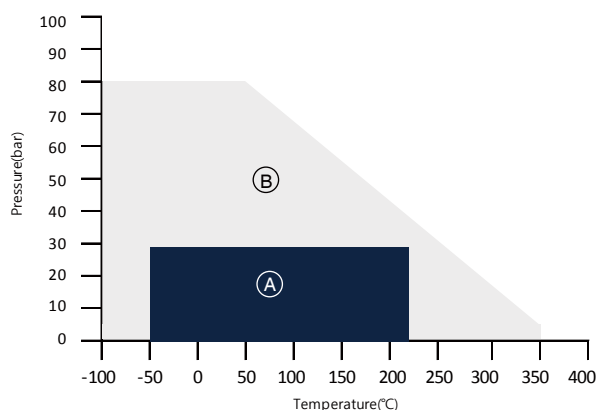
Compressed Asbestos-Free Gasket **LEAKBLOK® Premium P300**



MATERIAL PROPERTIES

Product Name	LEAKBLOK® Premium P300
Color	Silver(Black Printed)
Composition	Aramid Fiber + SBR Binder
Fluids Service	Portable Water, Oils, Fuels, Salt Solution, Mild acids and alkalis, gas line
Pressure	Short-term peak 80bar (1160 psi)
Temperature	Continuous -50℃(-58°F) ~ 220℃(428°F) Short-term peak Max 350℃(660°F)
pH range	4-11
Thickness	0.8 ~ 3.2(mm)
Size	1270(W)×1270(L), 3M~10M, 15M~20M(L) 1500(W)×1500(L), 3M~10M, 15M~20M(L)
Certificates	Lloyd's & ABS Type Approval , TA-Luft(VDI 2440), WRAS, BS 7531 Grade Y Fire Endurance Test(ISO 19921 & 19922)

SERVICE RANGE



Area (A) Satisfactory area subject to chemical compatibility
 Area (B) Usually suitable but required technical recommend by JEIL Technical team
 P×T(Max) psi × °F (bar × °C) / 496,480(17,600)

PHYSICAL PROPERTIES

Test Method	Description	LEAKBLOK® P300
ASTM D792	Density (g/cm³)	1.9
ASTM F152	Tensile Strength Across grain.MPa (kgf/mm²)	15.0(1.53)
ASTM F36 Procedure J	Compressibility (%)	9
	Recovery (%)	73
DIN 3535-6	Gas permeability (ml/min)	≤ 0.01
DIN 52913	Relaxation Stress(MPa) - 50MPa 16 hours @175℃	37.6
BS 7531	Relaxation Stress(MPa) - 40MPa 16 hours @300℃	23.8
VDI 2440 (TA - Luft)	Leak rate (mbar·l / (s·m)) -at 150℃ 48 hours	2·10 ⁻⁸

IMMERSION PROPERTIES

Test Method	Description	LEAKBLOK® P300
ASTM F146		
at 150 °C×5hrs		
ASTM Oil no 3	Thickness Increase (%)	10
at 20~30℃×5hrs		
ASTM Fuel B	Thickness Increase (%)	10
	Weight Increase (%)	17

GASKET DESIGN DATA

Thickness (mm)	Gasket Factor(m)	Min. Design Seating Stress(y) Kg/cm ²(psi)
3.2	2.00	112(1600)
1.6	2.75	260(3700)
0.8	3.50	457(6500)

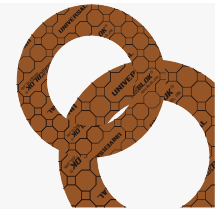
* All data are 1.5mm thickness typical value.

Innovative technology, LEAKBLOK®, absolutely distinguished from the traditional way of calendar roll production, It specially invented with environmentally friendly solvent free process.
 Compare with previous product, it shows strong durability and superior at low seating stress.
 Suitable for use steam and clean line, excellent protection of fluid contamination.

WARNING

- Not available with max. temperature & pressure at the same time
- Guide line only, if outside this range contact us.
- Do not re-use gaskets unless this is specifically indicated.
- Do not use gasket compounds with gasket as this will adversely affect performance.
- Please consult with JEIL's Technical team for application of steam & explosive gas line especially.

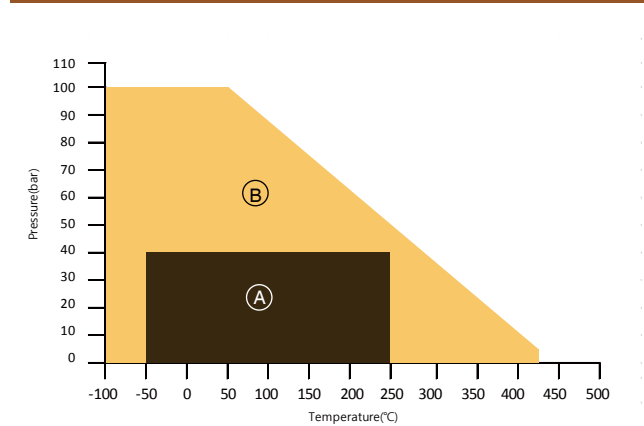
Compressed Asbestos-Free Gasket **LEAKBLOK® Premium P400**



MATERIAL PROPERTIES

Product Name	LEAKBLOK® Premium P400
Color	Brown(Black Printed))
Composition	Aramid Fiber + NBR Binder
Fluids Service	Portable Water, Oils, Fuels, Salt Solution, Mild acids and alkalis, gas line
Pressure	Short-term peak 100bar (1450 psi)
Temperature	Continuous -50℃(-58°F) ~ 260℃(500°F) Short-term peak Max 430℃(806°F)
pH range	4-11
Thickness	0.8 ~ 3.2(mm)
Size	1270×1270, 1500×1500 (mm)
Certificates	Lloyd's & ABS Type Approval , TA-Luft(VDI 2440), WRAS, BS 7531 Grade X Fire Endurance Test(ISO 19921 & 19922)

SERVICE RANGE



Area (A) Satisfactory area subject to chemical compatibility
 Area (B) Usually suitable but required technical recommend by JEIL Technical team
 P×T(Max) psi × °F (bar × °C) / 725,000(26,000)

PHYSICAL PROPERTIES

Test Method	Description	LEAKBLOK® P400
ASTM D792	Density (g/cm³)	1.9
ASTM F152	Tensile Strength Across grain. MPa (kgf/mm²)	16.7(1.70)
ASTM F36 Procedure J	Compressibility (%) Recovery (%)	8 63
DIN 52913	Relaxation Stress(MPa) - 50MPa 16 hours @300℃	38.2
BS 7531	Relaxation Stress(MPa) - 40MPa 16 hours @300℃	25.1
DIN 3535 -6	Gas permeability (ml/min)	≤ 0.01
VDI 2440 (TA - Luft)	Leak rate (mbar.l / (s.m)) - at 150℃ 48 hours	2·10 ⁻⁸

IMMERSION PROPERTIES

Test Method	Description	LEAKBLOK® P400
ASTM F146		
at 150℃ x5hrs		
ASTM Oil no 3	Thickness Increase (%)	4
at 20~30℃ x5hrs		
ASTM Fuel B	Thickness Increase (%)	1
	Thickness Increase (%)	4

GASKET DESIGN DATA

Thickness (mm)	Gasket Factor(m)	Min. Design Seating Stress(y) Kgf/cm² (psi)
3.2	2.00	112(1600)
1.6	2.75	260(3700)
0.8	3.50	457(6500)

* All data are 1.5mm thickness typical value.

Innovative technology, LEAKBLOK®, absolutely distinguished from the traditional way of calendar roll production, It specially invented with environmentally friendly solvent free process. Compare with previous product, it shows strong durability and superior at low seating stress. Suitable for use steam and clean line, excellent protection of fluid contamination.

WARNING

- Not available with max. temperature & pressure at the same time
- Guide line only, if outside this range contact us.
- Do not re-use gaskets unless this is specifically indicated.
- Do not use gasket compounds with gasket as this will adversely affect performance.
- Please consult with JEIL's Technical team for application of steam & explosive gas line especially.

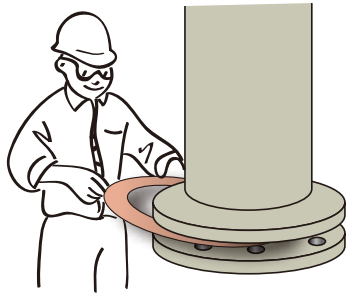
Gasket Handling, Storage & Installation Procedures

1. Install Gasket

- Make sure that gasket is correctly chosen for specific size and material.
- Examine the gasket to assure free of defects.
- Carefully install the gasket between the flange.
- The gasket has to be centralized in the flange.
- Ensure the gasket has not pinched or damaged when install the gasket.

1. 가스켓装着

- 가스켓が指定されたサイズと材料で製作されたのが確認する。
- 가스켓の欠陥可否を確認する。
- フランジの間にガスケットを気をつけて差し込む。
- 가스켓がフランジセンター部分に位置したのが確認する。
- 가스켓が間違っって差し込んだり、損傷されないように確認しながらフランジを装着する。

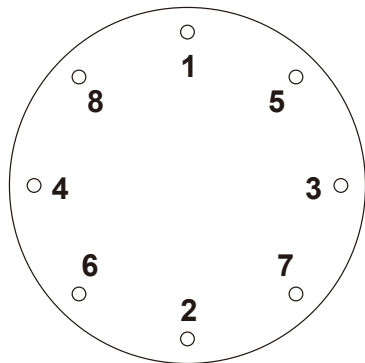


2. Bolt Tightening Instruction

- Required to use proper tools, calibrated torque wrench or other controlled tensioning device.
- For guidance of torque, consult with gasket manufacture.
- Bolt tightening should be in a cross-wise with correct torque.

2. 볼트締結方法及び順番

- いつも適切な器具を使用する。
- トルク指針案内に関してはガスケットメーカーと相談する。
- ボルトを締める時にいつも対角線方向順番でする。

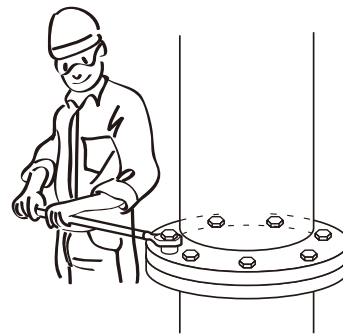


3. Tighten the nuts in multiple steps

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

3. 볼트・ナット締める段階

- すべてのナットを最初には手で締める。
- 30%まで各ナットを締める。
- 60%まで各ナットを締める。
- 対角線順番で完全にナットを締める。(大口径フランジは追加で締める)
- すべてのトルクが均一になるまで時計回りにボルトを最終的に締める。



4. Re-Tightening

- Caution - Consult yours gasket manufacture for guidance and recommendations re-tightening.
- Do Not Re-torque elastomer-based, non-asbestos gaskets after they have been exposed to elevated temperature unless otherwise specified.
- Re-torque fasteners exposed to aggressive thermal cycling.
- All re-torquing should be performed at ambient temperature and atmospheric pressure.

4. 再締める

- 注意-再締めるに関する案内及び有意事項に関してはガスケットメーカーと相談する。
- 別に規定されていないなら、上昇された温度に露出された以後にはゴムが含有された非石棉ガスケットは再締めるをしない。
- 深刻な熱変化に露出された締める部分は再締めるをする。
- すべての再締めるは大気温度及び大気圧から成らなければならない。

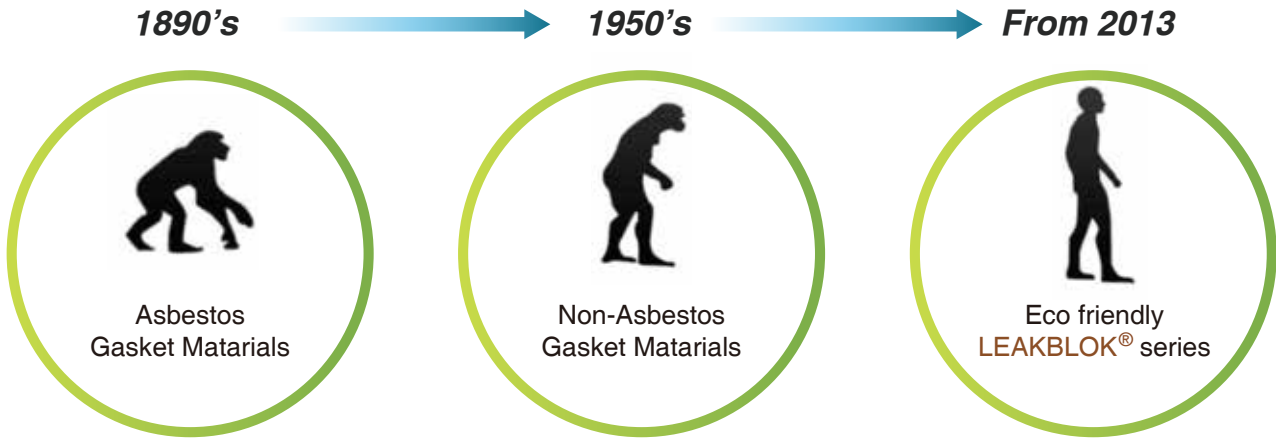
5. Storage

- Avoid expose to direct sunlight, storage in cool, dark and clean place.
- Recommended temperature (below 25°C)
- Recommended humidity level (under 60%)
- First-in & First-Out, storage in flat condition without folding.

5. 保管

- 直射光線避けて、涼しくて、暗くて、きれいな場所で保管する。
- 保管推奨温度は25℃以下。
- 保管推奨湿度は60%。
- 先入先出使用推奨して水平で保管する。

The Theory of Evolution at Soft Gasket Materials!!



Head Office & Plant(본사)

309, Chungnyeol-ro, Yangsan-si,
Gyeongsangnam-do, Korea
경남 양산시 충렬로 309 (유산동)

Tel 82.55.383.1301
Fax 82.55.383.0853

SEOUL Office(서울사무소)

4-27, Yangjae-daero 71-gil,
Songpa-gu, Seoul, Korea
서울특별시 송파구 양재대로
71길 4-27 (방이동)

Tel 82. 2. 413. 6090
Fax 82. 2. 413. 6493

YEOSOO Office(여수사무소)

21, Saeteo-ro, Yeosu-si,
Jeollanam-do, Korea
전남 여수시 새터로 21(신기동)

Tel 82. 61. 685. 1150
Fax 82. 61. 685. 1151

HWASEONG Office & Plant(화성공장)

11, Madogongdan-ro 4-gil,
Mado-myeon, Hwaseong-si,
Gyeonggi-do, Korea
경기도 화성시 마도면 마도공단로
4길 11 (쌍송리, 제일이엔에스(주))

Tel 82. 31. 357. 6751
Fax 82. 31. 357. 6754

JEIL Precision Industry(제일정공)

73, Jwasam-gil, Sangbuk-myeon,
Yangsan-si, Gyeongsangnam-do, Korea
경상남도 양산시 상북면 좌삼길 73

Tel 82. 55. 375-2361
Fax 82. 55. 375-2371

QINGDAO Office & Plant(청도공장)

Haibin Factory Complex,
Jiaonan-City, Qingdao, China
青岛市 黄岛区 胶南 海滨工业园,
海滨八路与琅琊台路 交界处

Tel 86. 532. 8513. 6021
Fax 86. 532. 8513. 6020