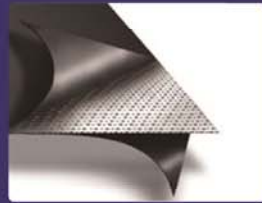




Compressed Non-asbestos Joint Sheet & gasket



Graphite(Tanged) Sheet & gasket



P.T.F.E Gasket



Rubber Gasket



Steel-rubber Gasket



Insulation Kit



Spiral Wound Gasket



Double Jacketed Gasket



Kamprofile Gasket



Ring Type Joint Gasket



U-bolt



Packing

[주] 태화칼파실
TaeHwa Kalpa Seal Co., Ltd.

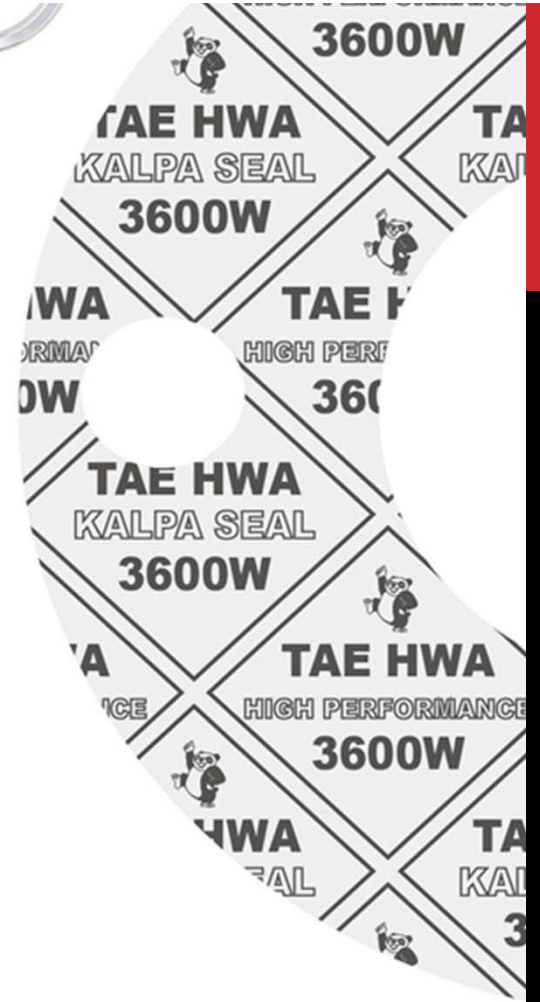
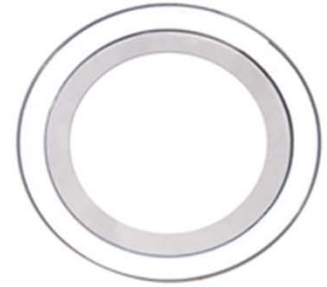
KOREA No.1
GASKET MANUFACTURER



CONTENTS

- **INTRODUCTION**
 1. COMPANY PROFILE
 2. BRIEF HISTORY
 3. ORGANIZATION CHART
 4. MAIN PRODUCT & MANUFACTURING RANGE
 5. MANUFACTURING FACILITIES
 6. INSPECTION & TEST MEASUREMENT FACILITIES
- **MANUFACTURING PROCESS**
- **CERTIFICATE**
 - CERTIFICATE
 - TEST REPORT
- **PERFONANCE RECORD**

INTRODUCTION



1. COMPANY PROFILE

Company Name	TAEHWA KALPA SEAL CO., LTD.
Annual Turnover	US\$ 9 million
Employees	40
Address	<ul style="list-style-type: none"> ▪ Head office & Factory #1: 11, Noksansandan290-ro, Gangseo-Gu, Busan, Korea ▪ Factory #2: 24, Noksansandan262-ro 49beon-gil, Gangseo-gu, Busan, Korea
Contract	<ul style="list-style-type: none"> ▪ Telephone : +82 51 831 9944 ▪ Email : taehwa1@taehwa1.com ▪ Website : www.taehwa1.com



2. BRIEF HISTORY

2018
~
2017

- 2018.12. Registered in SDC(Samsung Display) Vendor List
- 09. Registered in Hanwha E&C vendor list
- 03. Acquired PED by KIWA
- 03. Certified Type Approval(TH3000(W), TH3200(W), TH3600(W), TH4062, TH4063, TH4064, TH4029) by DNVGL
- 02. Acquired GOST-R by TC EMC
- 2017.12. Registered in S-oil vender list (approved vender# 16620)
- 11. Registered in DOOSAN Heavy Industries & Construction vender list
- 10. Registered in SC-Engineering vender list
- 04. Delivered to KOGAS

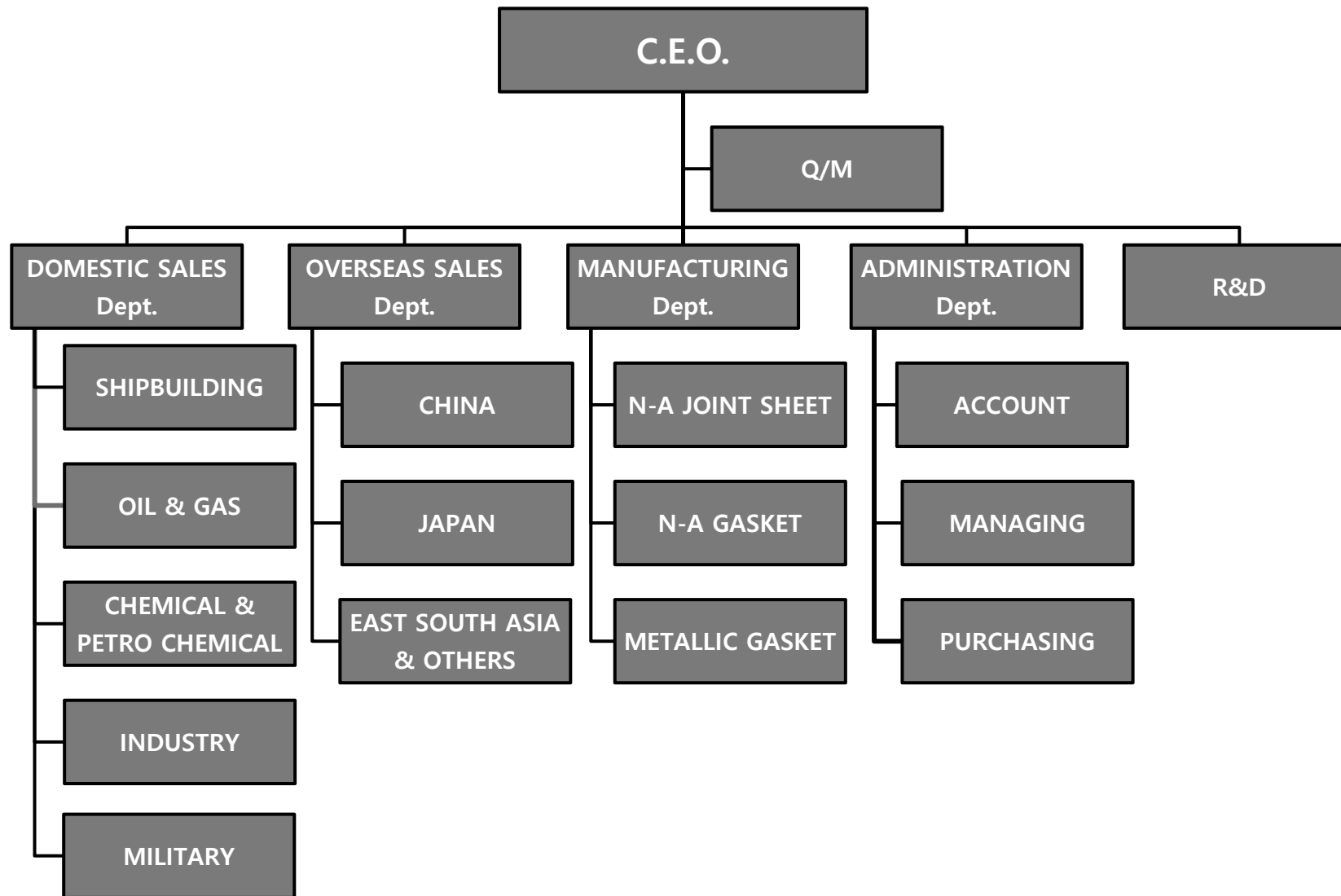
2016
~
2014

- 2016.12. Certified Type Approval(TH3000W, TH3200, TH3200W, TH3600W, TH4026-316L, TH4064, TH4029, TH4063- 316L- 316L) by ABS
- 12. Certified Type Approval(TH3000W, TH3200, TH3200W, TH3600, TH3600W, TH4062-316L, TH4064) by RS
- 11. Design approved by HHI for TH3000, TH3000W, SWG
- 07. Registered in Hyundai Mipo Dockyard vender list
- 05. Registered in HYUNDAI-STEEL vender list
- 03. Registered in SEBO MEC vender list
- 02. Registered in HHI(Hyundai Heavy Industries) vender list
- 02. Certified Qualification by Achilles JQS
- 2015.02. Registered in HYOSUNG vender list
- 01. Registered in LOTTE Chemical vender list
- 01. Registered in SAMSUNG FINE CHEMICAL vender list
- 01. Registered in GS E&TEC vender list
- 2014.12. Registered in POSCO Engineering vender list
- 12. Registered in SK Chemical vender list
- 11. Converted into a corporation
- 11. Completion of 2nd Factory

2012 ~

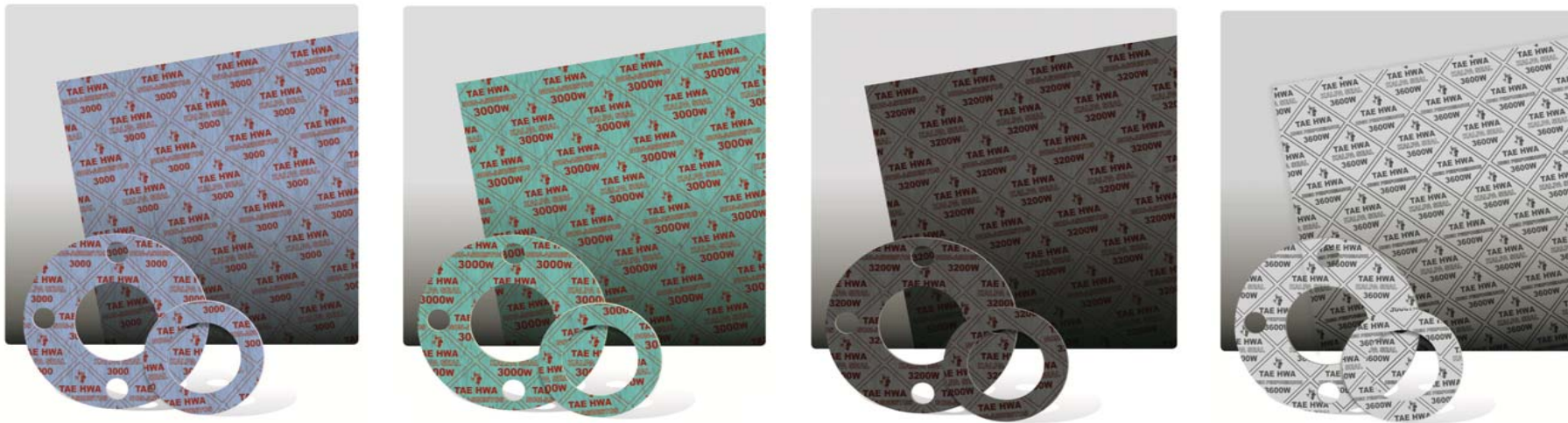
- 2012.11. Registered for Peru Public procurement Service
- 2011.10. Certified ISO 14001
- 05. Certified ISO 9001, ISO/TS 29001 & API 6A
- 01. Registered in POSCO Construction vender list
- 2010.08. Registered in LOTTE Construction vender list
- 01. Certified Type Approval(TH3000) by RS
- 2009.10. Opened sales office(TAEHWA E&P)
- 2008.05. Certified Type Approval(TH3000) by GL
- 10. Selected as a leading company by Busan Metropolitan city
- 2007.11. Certified Type Approval(TH3000) by ABS
- 08. Certified Type Approval(TH3000) by LR
- 2003.11. Vendor approved and deliver - DSME
- 05. Vendor approved and deliver - STX
- 2002.05. Vendor approved and deliver - POSCO
- 04. Exported Non-Asbestos Joint Sheet to Southeast Asia
- 2000.10. Acquired a K.R approval for Non-Asbestos Joint Sheet & Gasket
- 05. Acquired the ISO9001:2000 Certificate(ABS)
- 2001.10. Design approved by Samsung Heavy Industries for TH3000, TH3000W
- 09. Vendor approved and deliver - Hanjin Heavy Industries
- 02. Exported Non-Asbestos, Asbestos Joint Sheet to Japan
- 2000.10. Acquired a K.R approval for Non-Asbestos Joint Sheet & Gasket
- 05. Acquired the ISO9001:2000 Certificate(ABS)
- 1999.09. Developed and started manufacturing of Non-Asbestos Joint Sheet
- 08. Moved to Noksan National Industrial Complex
- 1979.02. Established TAEHWA KALPA SEAL

3. ORGANIZATION CHART



4. MAIN PRODUCT & MANUFACTURING RANGE

4.1 Main Product



Non-metallic Gasket & Non-asbestos Joint Sheet



- Non-asbestos
- Flexible Graphite
- PTFE
- Rubber

4. MAIN PRODUCT & MANUFACTURING RANGE

4.1 Main Product



Semi-metallic Gasket

- Spiral Wound Gasket
- Double-jacketed Gasket



Metallic Gasket

- Ring Type Joint Gasket
- Kammprofile Gasket



Insulation Kit

4. MAIN PRODUCT & MANUFACTURING RANGE

4.2 Production Capacity

ITEM	MONTHLY AVERAGE	ANNUAL AVERAGE
Compressed Non-asbestos Sheet	50 TON	600 TON
Compressed Non-asbestos Gasket	300,000 EA	3,600,000 EA
Rubber/ Plastic Gasket	80,000 EA	960,000 EA
Rubber-steel Gasket	60,000 EA	720,000 EA
Spiral Wound Gasket	70,000 EA	840,000 EA
Double-jacketed Gasket	1,000 EA	12,000 EA
Kammprofile Gasket	1,500 EA	18,000 EA
Ring Type Joint Gasket	5,000 EA	60,000 EA

4.3 Material Commonly Used

- Metals: Stainless Steel 316(L), Stainless Steel 304(L), Stainless Steel 410, Inconel 625, etc.
- Rubber/Plastic : Natural Rubber, NBR, EPDM, Neoprene-CR Rubber, Viton-FPM, SBR, PTFE, etc.
- Compressed Non-asbestos Sheet : Aramid Fiber+NBR, Carbon Fiber+NBR

4.4 Size Availability

(in accordance with flange standard)

- ASME B16.5 : Up to 24"
- ASME B16.47 : Up to 60"
- DIN EN 1514 : Up to DN4000
- JIS Standard : Up to 2500A

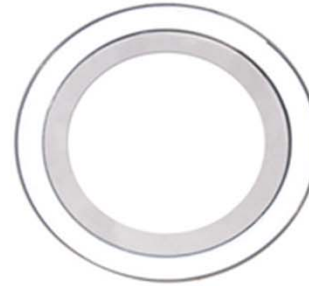
5. MANUFACTURING FACILITIES

NO	EQUIPMENT		Q TY	MAKER	NO	EQUIPMENT		Q TY	MAKER
1	108" Calender M/C	2540 * 3850	2	Bongshin	28		PUMA 280L	1	Doosan
2	60" Calender M/C	1500 * 4100	1	-	29		PUMA 240B	1	Doosan
3		1200 * 1500	1	Taehwa	30	CNC	PUMA 400	1	Doosan
4	Blending M/C	1200 * 1200	1	Daeruck	31		LYNX200A	1	Doosan
5		1200 * 1200	1	Taehwa	32		PUMA 240A	1	Doosan
6	Mixing, R/L	14" roll	1	-	33	POWER PRESS	5T, 3T	2	O-Sung
7	Cutting M/C	1500L	1	-	34	BENCH PRESS	TECH-32	1	Daekyung
8		1300L	1	-	35		DHP-32(hydromatic)	1	Donghyup
9	Print M/C	2000L	1	Daeruck	36	BANDING MACHINE	150A~650A	1	Daekyung
10	Hydraulic Press	400 * 1300	3	-	37		TR-30T (MEGA TR-30T)	1	Mega
11	Carbon Adsorption Eq.	2000 * 1700 (3set)	1	Taehwa	38	ROLLING MACHINE	1205-214(60T)	1	Dongil
12	Boiler	1ton	1	Daehan	39		TR-30T(20 1/4 HP)	1	Mega
13	Compressor	15HP	1	-	40	MARKING MACHINE		1	Techno Mark
14	Winding M/C	Vertical type	4	Samsung Precision	41	PRESS(MARKING)	1TON PRESS	1	Tongil
15		Horizontal type	2	Samsung Precision	42	SAWING MACHINE	H-330A(6.1HP)	2	Mega
16	Bending M/C	Horizontal type	1	Samsung Precision	43		TIPL-4(400×1060)	1	Tongil
17	Slitting M/C	Vertical type	1	Samsung Precision	44	LATHE	TIPL-4(400×1060)	1	Tongil
18	Lathe	600 * 1500	1	Tongil	45		TIPL-5(530×2050)	1	Tongil
19		600 * 1500	1	Kwangnam	46		MILLING MACHINE	TMYH-2	1
20	CNC Lathe	THN-5	1	Seil Heavy	47	POLYGON MACHINE	PG-250	1	Auto
21	Milling M/C	No. 2	1	Tongil	48	TAPPING MACHINE	P-208	2	Sungbo
22	Drilling M/C	13m/m	1	Woosung	49	MECHANICAL PRESS	OSE-45(3T, 540×890)	1	O-Sung
23	108" Calender M/C	2540 * 3850	1	Bongshin	50	CUTTING MACHINE	355X3X25.4	1	Keyang
24	High-speed Blending M/C #1	600L	1	Filtromix	51		2730RPM, 405×3×25.4	1	Daewon
25		WSD-32(32mm)	1	Woosung	52		3,450RPM, 200mm(8")	1	Wondeung
26	DRILLING MACHINE	WSD-19(19mm)	2	Samhung	53	BENCH GRINDER	1HP	1	BALHAE TOOLING
27		WSD-180	1	Woosung	54	HOIST CRANE	5T	2	Bando

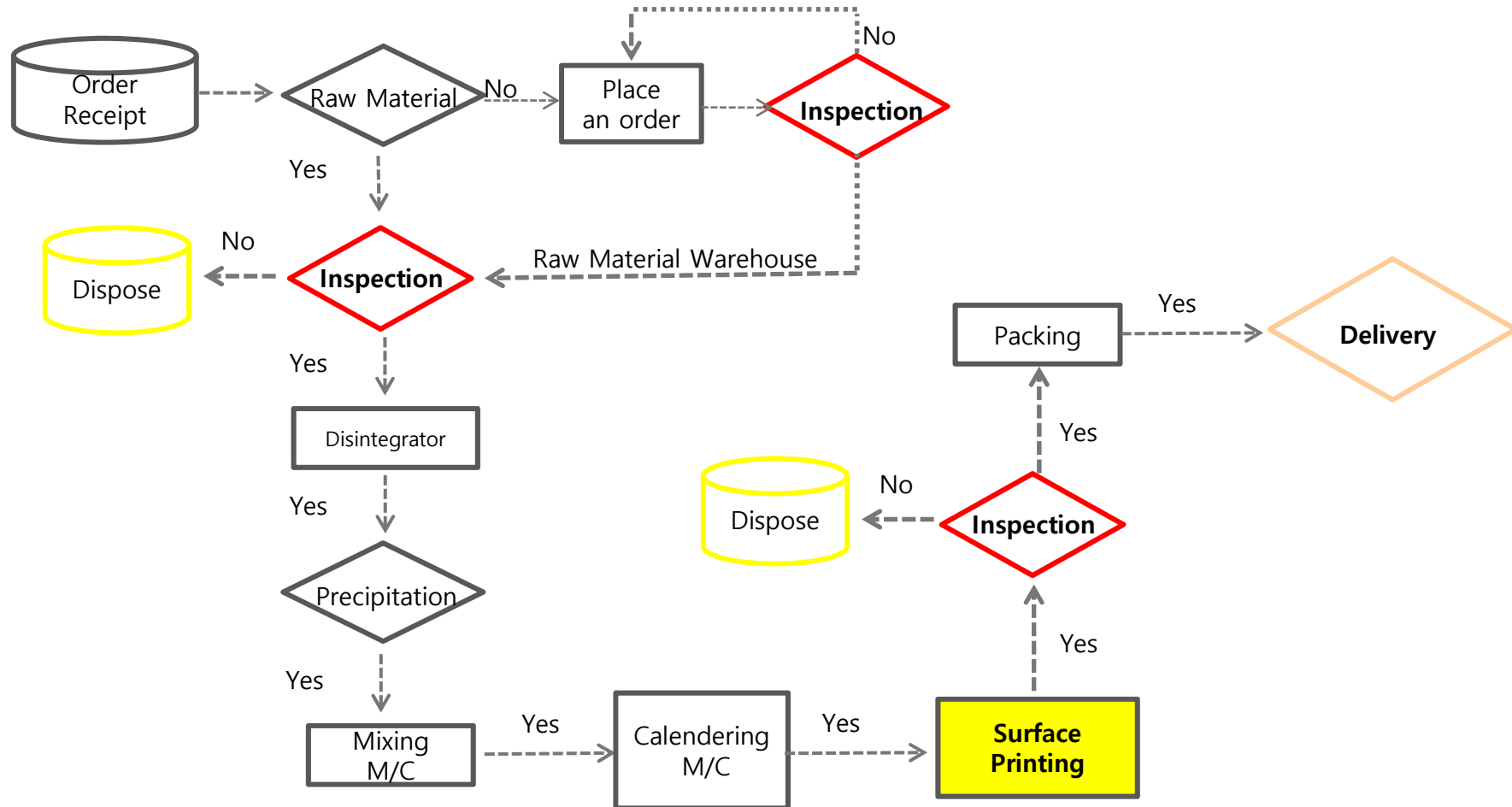
6. INSPECTION & TEST MEASUREMENT FACILITIES

No.	Photo	Equipment	Standard	No.	Photo	Equipment	Standard	No.	Photo	Equipment	Standard
1		Oil Resistance Tester	ASTM F146	5		Rock Hardness Testing Machine	KS B0806 ASTM E18	9		Steam Internal Pressure Tester	COMPANY SPEC
2		Hardness Tester	ASTM D2240 JIS K7215	6		Compress-Restore Test Machine Type-A	ASTM F36J	10		Dry Oven	ASTM F152 ASTM F36J
3		Digital Tensile Elongation Tester	ASTM F152	7		Compress-Restore Test Machine Type-B Gas Sealing Tester	DIN3535	11		Low Temp. Gasket Test Machine	COMPANY SPEC
4		Digital Illuminometer	JIS C1609	8		Digital Electric Furnace	ASTM F495	12		Water Pressure Tester 1 & 2	JPI-7S-81

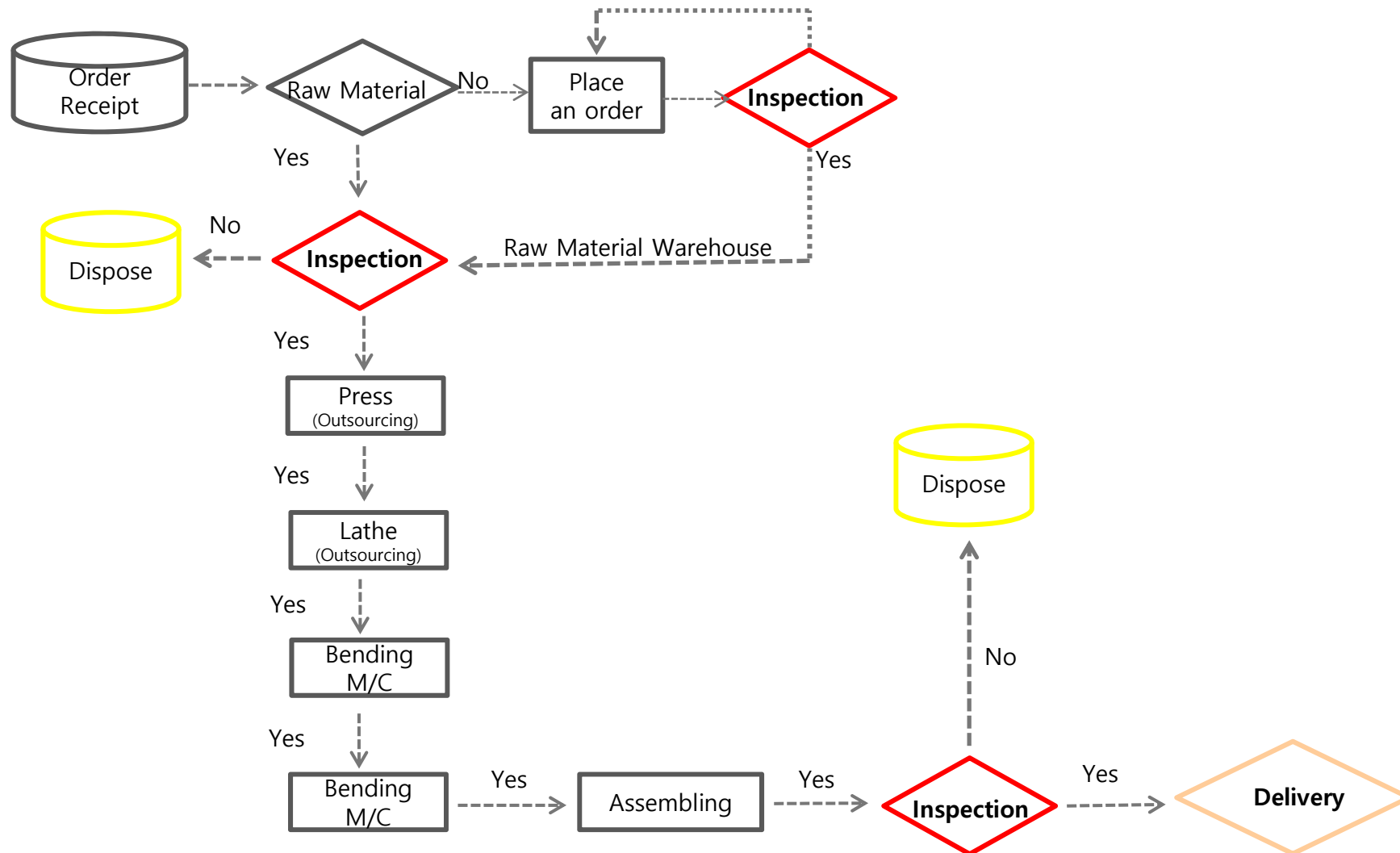
MANUFACTURING PROCESS



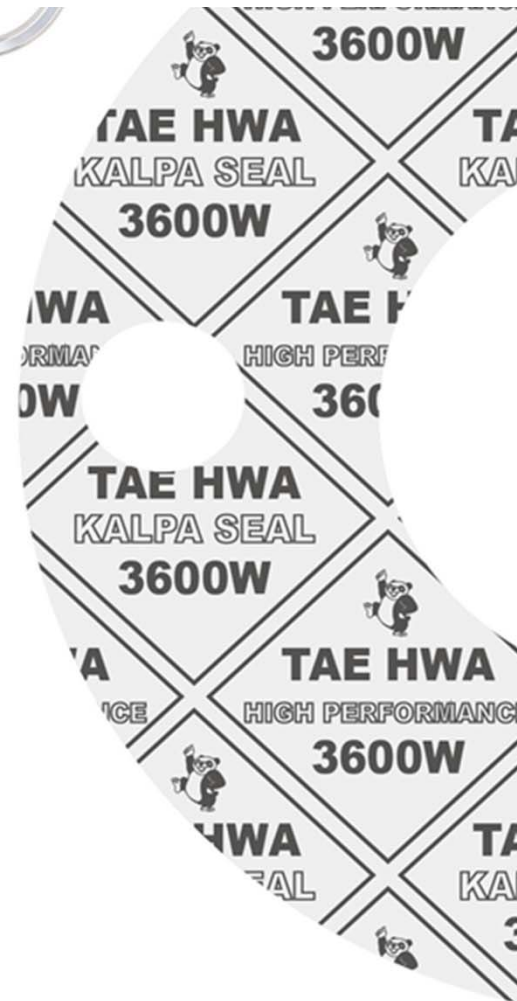
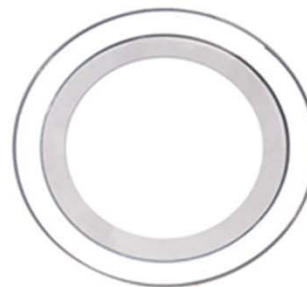
MANUFACTURING PROCESS **Compressed Joint Sheet**



MANUFACTURING PROCESS Semi-metallic Gasket



CERTIFICATE



CERTIFICATE

ABS Quality Evaluations
Certificate Of Conformance

This is to certify that the Quality Management System of
Tae Hwa Kalpa Seal Co., Ltd.
 11, Noksansandan 290-ro, Gangseo-gu
 Busan
 Korea

has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:
ISO 9001:2015
 The Quality Management System is applicable to:

MANUFACTURE OF INDUSTRIAL JOINT SHEETS AND GASKETS

This certificate may be found on the ABS QE Website (www.abs-qe.com). For certificates issued in the People's Republic of China information may also be verified on the CNCA website (www.cnca.gov.cn).

Certificate No: 55831	
Certification Date: 30 May 2017	Alex Weisselberg, President
Effective Date: 09 July 2018	
Expiration Date: 29 May 2019	
Issue Date: 09 July 2018	





Validity of this certificate is based on the successful completion of the periodic surveillance audits of the management system defined by the above scope and is contingent upon prompt-written notification to ABS Quality Evaluations, Inc. of significant changes to the management system or components thereof.
 ABS Quality Evaluations, Inc. 16855 Northchase Drive, Houston, TX 77060, U.S.A.
 Validity of this certificate may be confirmed at www.abs-qe.com/cert_validation.
 Copyright 2011-2018 ABS Quality Evaluations, Inc. All rights reserved.

ISO 9001:2015

ABS Quality Evaluations
Certificate Of Conformance

This is to certify that the Environment Management System of
Tae Hwa Kalpa Seal Co., Ltd.
 11, Noksansandan 290-ro, Gangseo-gu
 Busan
 Korea

has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:
ISO 14001:2015
 The Environment Management System is applicable to:

MANUFACTURE OF INDUSTRIAL JOINT SHEETS AND GASKETS

This certificate may be found on the ABS QE Website (www.abs-qe.com). For certificates issued in the People's Republic of China information may also be verified on the CNCA website (www.cnca.gov.cn).

Certificate No: 46514	
Certification Date: 30 October 2017	Alex Weisselberg, President
Effective Date: 30 August 2018	
Expiration Date: 29 October 2020	
Issue Date: 30 August 2018	





Validity of this certificate is based on the successful completion of the periodic surveillance audits of the management system defined by the above scope and is contingent upon prompt-written notification to ABS Quality Evaluations, Inc. of significant changes to the management system or components thereof.
 ABS Quality Evaluations, Inc. 1701 City Plaza Drive, Spring, TX 77389, U.S.A.
 Validity of this certificate may be confirmed at www.abs-qe.com/cert_validation.
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ISO 14001:2015

CERTIFICATE



CERTIFICATE NUMBER 18-BK1792976-PDA
EFFECTIVE DATE 16-Oct-2018
EXPIRATION DATE 15-Oct-2023
ABS TECHNICAL OFFICE ABS Busan

**CERTIFICATE OF
Product Design Assessment**

This is to certify that a representative of this Bureau did, at the request of
TAEHWA KALPA SEAL CO.
located at
2L 8BB, NOKSAN INDUSTRIAL, KANGSEO-KU, BUSAN KOREA

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product Gasket, Compressed Non-Asbestos Sheet

Model
TH1000, TH1100, TH3000, TH3000W, TH3200, TH3200W, TH3600W, TH4062-316L, TH4064, TH4000T, IGR

This Product Design Assessment (PDA) Certificate remains valid until 15-Oct-2023 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau of Shipping



Yun-Sung Kim,
Engineer / Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/3.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

Certificate of Product Design Assessment Rev.2 Page 1 of 1

ABS_Type Approval



CERTIFICATE NUMBER 16-BK1576859-PDA
DATE 02 Nov 2016
ABS TECHNICAL OFFICE
Busan Engineering Services

**CERTIFICATE OF
DESIGN ASSESSMENT**

This is to certify that a representative of this Bureau did, at the request of
TAEHWA KALPA SEAL CO.

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: Gasket
Model: TH4029, TH4063-316L-316L

This Product Design Assessment (PDA) Certificate 16-BK1576859-PDA, dated 02/Nov/2016 remains valid until 01/Nov/2021 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

AMERICAN BUREAU OF SHIPPING



Hyun-Dae Lee
Engineer/Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by the terms and conditions as contained in ABS Rules 1-1-A3/3.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010).

#ABS0110

ABS_Type Approval(Cryogenic)

CERTIFICATE



Certificate No:
TAP00001BC

TYPE APPROVAL CERTIFICATE

This is to certify:
That the Gaskets and Sealings

with type designation(s)
TH3000, TH3000W, TH3200, TH3200W, TH3600, TH3600W, TH4062-316L, TH4064, TH4029, TH4063-316L-316L

Issued to
TAEHWA KALPA SEAL
Busan, Korea

is found to comply with
ASME B16.20-2017, Metallic Gaskets for Pipe Flanges
ASME B16.21-2016, Nonmetallic Flat Gaskets for Pipe Flanges

Application :
Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Temperature range: See Certificate
Max. working press.: See Certificate
Design: See Certificate
Sizes: See Certificate

Issued at **Høvik** on 2018-03-15

This Certificate is valid until 2023-03-14.
DNV GL local station: **Gimhae Station**
Approval Engineer: **Mehdi Rowshan**



for **DNV GL**
Digitally Signed By: **Marveng, Marianne Sørensen**
Location: DNV GL Høvik, Norway
Marianne Sørensen Marveng
Head of Section



Form code: TA 251 Revision: 2016-12 www.dnvgl.com Page 1 of 3
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DNVGL_ Type Approval



Type Approval Certificate

This is to certify that the undernoted product has been tested with satisfactory results in accordance with the relevant requirements of the LR Type Approval System.

This certificate is issued to:

PRODUCER	Taehwa Kalpa Seal Co.,Ltd
PLACE OF PRODUCTION	24, Noksansandan 262-ro, 49beon-gil, Gangseo-gu, Busan, 46757, Korea, Republic of.
DESCRIPTION	Gasket, Compressed Non-Asbestos Sheet
TYPE	TH3000, TH3000W, TH3200, TH3200W, TH3600, TH3600W, TH4062-316L, TH4064, TH4029, TH4063-316L-316L, TH4000T
APPLICATION	Marine Piping Systems- Hot oil, Fuels, Water, Sea water, Organic, Oil gas, Organic solvent, LNG, LPG
DESIGN CODE STANDARD	LR Rules and Regulations for the Classification of Ships, Part 5, Chapter 12, July 2017
	ASTM F152-95 "Standard Test Methods for Tension Testing of Nonmetallic Gasket Materials"
	ASTM F36-99 "Standard Test Method for Compressibility and Recovery of Gasket Materials"
	ASTM F147-87 "Standard Test Method for Flexibility of Non-Metallic Gasket Materials"

Certificate No. 18/40016
Issue Date 05 April 2018
Expiry Date 04 April 2023
Sheet 1 of 4

Digitally signed by **YDKong**
Yong-Dae Kong
Date: 2018.04.05 14:31:40 +0900



Busan Technical Support Office
Lloyd's Register Asia

Y. D. Kong
Busan Technical Support Office
Lloyd's Register Marine & Offshore

*Lloyd's Register Asia,
119, Daegyoo-ro, Jung-gu, Busan, Republic of Korea*

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LR_ Type Approval

18

CERTIFICATE

РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА
RUSSIAN MARITIME REGISTER OF SHIPPING

Стр. 1 / 3
Page. 1 / 3
6.8.3



СВИДЕТЕЛЬСТВО О ТИПОВОМ ОДОБРЕНИИ
TYPE APPROVAL CERTIFICATE

Изготовитель
Manufacturer **ТАЕHWA KALPA SEAL CO., LTD. (BRN 606-86-60038)**

Адрес
Address **11, NOKSANSANDAN 290-RO, GANGSEO-GU, BUSAN, KOREA**

Изделие*
Product*
Безасбестовый прокладочный материал типа TH3000, TH3000W, TH3200, TH3200W, TH3600, TH3600W. Спиральная прокладка TH4062-316L, TH4064.
Compressed Non-Asbestos Joint Sheet type TH3000, TH3000W, TH3200, TH3200W, TH3600, TH3600W. Spiral Wound Gasket TH4062-316L, TH4064.

Код номенклатуры
Code of nomenclature **08120000MK**

На основании освидетельствования и проведенных испытаний удостоверяется, что вышеупомянутое(ые) изделие(а) удовлетворяет(ют) требованиям Российского морского регистра судоходства.
This is to certify that on the basis of the survey and tests carried out the above mentioned item(s) complies(ly) with the requirements of Russian Maritime Register of Shipping.

Удовлетворяет требованиям п. 2.4.3.1, 4.3.2.11 Части VIII, Правил классификации и постройки морских судов, изд. 2016 и Раздел 8.5.4 Части IV, Правила технического наблюдения за постройкой судов и изготовлением материалов и изделий для судов, изд. 2016 и Правила 13.2.3 главы II-1 МК СОЛАС-74/2000.
Complies with the requirement of Section 2.4.3.1, 4.3.2.11 of Part VIII, Rules for the Classification and Construction of Sea-Going Ships (RS, edition 2016) and Section 8.5.4 of Part IV, Rules for the Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships (RS, edition 2016) and Regulation 13.2.3 of Chapter II-1 of SOLAS 74/2000.

Настоящее Свидетельство о типовом одобрении действительно до **15.12.2021**
This Type Approval Certificate is valid until **15.12.2021**

Настоящее Свидетельство о типовом одобрении теряет силу в случаях, установленных в Правилах технического наблюдения за постройкой судов и изготовлением материалов и изделий для судов.
This Type Approval Certificate becomes invalid in cases stipulated in Rules for the Technical Supervision during Construction of Ships and Manufacture of Shipboard Materials and Products.

Дата выдачи
Date of issue **15.12.2016** № **16.10488.296**

Российский морской регистр судоходства
Russian Maritime Register of Shipping


 **Дубейковский С.В. / S. Dubeykovskiy**
(подпись, инициалы) (фамилия, инициалы)
папе

*Дополнительную информацию см. на обороте.
Additional information see overleaf.

RS_Type Approval

РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА
RUSSIAN MARITIME REGISTER OF SHIPPING

Стр. 1 / 3
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6.8.3



СВИДЕТЕЛЬСТВО О ТИПОВОМ ОДОБРЕНИИ
TYPE APPROVAL CERTIFICATE

Изготовитель
Manufacturer **ТАЕHWA KALPA SEAL CO., LTD. (BRN 606-86-60038)**

Адрес
Address **11, NOKSANSANDAN 290-RO, GANGSEO-GU, BUSAN, KOREA**

Изделие*
Product*
Расширенный PTFE лист и прокладка типа TH4029. Спиральная прокладка TH4063-316L-316L.
Expanded PTFE Sheet & Gasket type TH4029. Spiral Wound Gasket TH4063-316L-316L.

Код номенклатуры
Code of nomenclature **08120000MK**

На основании освидетельствования и проведенных испытаний удостоверяется, что вышеупомянутое(ые) изделие(а) удовлетворяет(ют) требованиям Российского морского регистра судоходства.
This is to certify that on the basis of the survey and tests carried out the above mentioned item(s) complies(ly) with the requirements of Russian Maritime Register of Shipping.

Удовлетворяет требованиям п. 2.4.3.1, 4.3.2.11 Части VIII, Правил классификации и постройки морских судов, изд. 2017 и Раздел 8.5.4 Части IV, Правила технического наблюдения за постройкой судов и изготовлением материалов и изделий для судов, изд. 2016 и Правила 13.2.3 главы II-1 МК СОЛАС-74/2000.
Complies with the requirement of Section 2.4.3.1, 4.3.2.11 of Part VIII, Rules for the Classification and Construction of Sea-Going Ships (RS, edition 2017) and Section 8.5.4 of Part IV, Rules for the Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships (RS, edition 2016) and Regulation 13.2.3 of Chapter II-1 of SOLAS 74/2000.

Настоящее Свидетельство о типовом одобрении действительно до **22.03.2022**
This Type Approval Certificate is valid until **22.03.2022**

Настоящее Свидетельство о типовом одобрении теряет силу в случаях, установленных в Правилах технического наблюдения за постройкой судов и изготовлением материалов и изделий для судов.
This Type Approval Certificate becomes invalid in cases stipulated in Rules for the Technical Supervision during Construction of Ships and Manufacture of Shipboard Materials and Products.

Дата выдачи
Date of issue **22.03.2017** № **17.10104.296**

Российский морской регистр судоходства
Russian Maritime Register of Shipping

 **Дубейковский С.В. / S. Dubeykovskiy**
(подпись, инициалы) (фамилия, инициалы)
папе

*Дополнительную информацию см. на обороте.
Additional information see overleaf.

RS_Type Approval(Cryogenic)

CERTIFICATE



TYPE APPROVAL CERTIFICATE

Certificate No. : GCH25560-GT001 **Initial Approval** : 25th September, 2000.

Product : Gasket

Manufacturer : Tae Hwa Kalpa Seal Co.
11, Noksansandan 290-ro, Gangseo-gu, Busan

Product Description : Compressed Non-Asbestos Sheet and Gasket

- Type : TH3000
- Size (mm) : 2540 x 3850
- Thickness (mm) : 0.4 ~ 3.2
- Pressure : Max. 30 kgf/cm²
- Temperature : Max. 350 °C
- Intended for : F.O, L.O, Compressed Air, Water

Approval Condition : 1. This approval is granted on the basis of the Test report no. TAP-009759 by Korea Testing and Research Institute for Chemical Industry, 930041-03144 by FTI Testing & Research Institute.
2. Individual Product Certification is not required.

THIS IS TO CERTIFY that the above-mentioned product has been approved in accordance with the relevant requirement of this Society's Rules and / or of the recognized standards as follows and entered in the "List of Approved Manufacturers and Type Approved Equipment".

Pt. 5, Ch. 6, Art. 107 of the Rules for Classification, Steel Ships and KSL 5406.

This Certificate is valid until 24th September, 2020.
Issued at Gamcheon, Korea on 29th October, 2015.



KOREAN REGISTER OF SHIPPING



General Manager of
Gamcheon Branch Office

Note : 1 : The approval will be automatically suspended and the Certificate become invalid from the expiry date of the Certificate in the event that the extension has not been granted or the renewal of the Certificate is not underway.
2 : The manufacturer should notify this Society of any modification or changes that may affect the validity of this Certificate.

AC-2A(2011.06)

KR_Type Approval



WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)
MATERIAL APPROVAL

Approval Number: 1708515
Test Report: MAS940/O

21st August 2017

Teahwa Kalpa Seal Co. Ltd.
11 Noksansandan 262-ro,
Gangseo-gu,
Busan,
Korea

Water Regulations Advisory Scheme Ltd.
Unit 13,
Willow Road,
Pen y Fan Industrial Estate,
Crumlin,
Gwent,
NP11 4EG

WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)
MATERIAL APPROVAL

The material referred to in this letter is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6920-1:2000 and/or 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'.

The reference relates solely to its effect on the quality of the water with which it may come into contact and does not signify the approval of its mechanical or physical properties for any use.

FIBRE 5075

Non-Asbestos TH3000[®]. Blue coloured, natural rubber/fibre gasket material. For use with water up to 23°C. For use only as a jointing/gasket material having been tested at a reduced surface area to volume ratio.

APPROVAL NUMBER: 1708515
APPROVAL HOLDER: TEAHWA KALPA SEAL CO. LTD.

The Scheme reserves the right to review approval.
Approval 1708515 is valid between August 2017 and August 2022

An entry, as above, will accordingly be included in the Water Fittings Directory on-line under the section headed, "Materials which have passed full tests of effect on water quality".

The Directory may be found at: www.wras.co.uk/directory

Yours faithfully



Jason Furnival
Approvals & Enquiries Manager
Water Regulations Advisory Scheme

The Water Regulations Advisory Scheme Ltd. Registered in England No. 09663030 Registered office: 6D Lowick Close, Hazel Grove, Stockport, SK7 5ED
Tel: +44(0)333 207 9030 Fax: +44(0)1495 248 540 E-mail: info@wras.co.uk website: www.wras.co.uk

WRAS_Material Approval

CERTIFICATE

CERTIFICATE



Accredited Body: AB-0006-YS

TaeHwa Kalpa Seal Co., Ltd.

11, Noksansandan 290-ro, Gangseo-gu, Busan, Korea

has implemented, operates and maintains a

QUALITY ASSURANCE SYSTEM IN ACCORDANCE WITH THE PRESSURE EQUIPMENT DIRECTIVE 2014/68/EU (PED) ANNEX I PARAGRAPH 4.3

As Material Manufacturer for the Scope of

Metallic gaskets and non-metallic gaskets

Report Reference : R-PED -17-533

The Manufacturer is, therefore, authorized to issue certificates of specific product control within the scope of the assessed quality system and in accordance with the Pressure Equipment Directive 2014/68/EU requirements and applied technical specifications. Possible additional requirements – specific to applied technical specifications to meet PED Annex I – are not affected

This certificate is valid through 29 March 2019

The validity of this certificate is connected to a valid certification in accordance with ISO 9001:2008

Certificate No: BK-MIKS-18-15
Issue Date: 30.03.2018



Head of Accredited Body

Kiwa Certification Services Inc.
ITOSB 9, Cad. No:15 Tepeören-Tuzla / İstanbul-Türkiye
Tel.: +90 216 593 25 75, Fax: +90 216 593 25 74
Web: www.kiwa.com.tr, e-mail: posta@kiwa.com.tr
Certificates without seal are invalid

Page 1 of 1

PED



Joint Qualification System
for suppliers to the Oil Industry in Norway and Denmark

Certificate of Qualification

Awarded to

TAEHWA KALPA SEAL CO., LTD.

Company Registration number: 606 86 60038
Achilles Id: 60856

Achilles Information AS hereby confirms that
TAEHWA KALPA SEAL CO., LTD.
is Qualified in the Achilles Joint Qualification System for suppliers to the Oil Industry in Norway and Denmark. The Qualification concerns the product and service codes listed in the appendix.



Atle Gjertsen
Achilles Information AS
Sector Manager, Oil & Gas



Anja Thorsdalen
Achilles Information AS
Operation Manager

The participating Oil Companies and Main Contractors may use Achilles JQS as the basis for preparation of bidder lists directly or together with additional qualification criteria established by the individual Company. Other qualification stages may be added by the individual Company if more information is found necessary to complete preparation of bidder lists.

08.02.2018
Issued date

14.09.2018
Expiry date

Achilles JQS_Certificate of Qualification

CERTIFICATE

Quality Certificate

DSME

DAEWOO SHIPBUILDING & MARINE ENGINEERING CO.,LTD. certifies that the company and items below have been assessed and found to comply with the requirements of Quality Certificate of DSME.

*Company Name : TAEHWA KALPA SEAL CO.,Ltd
Address : 11,Noksansandan 290-ro,Gangseo-gu,Busan
Items : Gasket*

*Certificate No. : DSME-QM-18-432
Valid Date : Feb. 28th,2020*

U. H. Baek

Un-Hyon Baek / Director
Quality Management
Daewoo Shipbuilding & Marine Engineering Co., LTD.

DSME_ Quality Certificate

Certificate No. : 2017 - 002



Certificate of Partnership

Name of Company : TAEHWA KALPA SEAL

President : C. H. PARK

Address : 24, NOKSANSANDAN 262-RO
49 BEON-GIL, GANGSEO-GU,
BUSAN, KOREA

Product : COMPRESSED SHEET, GASKET

We hereby certify the above mentioned company is a partner of Hyundai Mipo Dockyard Co.,Ltd.

June. 13th. 2017

Y. S. Han
Young-Seuk Han
President & C.E.O.



Hyundai Mipo Dockyard_ Cert. of Partnership

CERTIFICATE

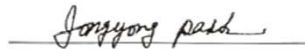
No. 2011310075

CERTIFICATE OF AUTHORIZATION

The Korea Industrial Technology Association,
the certifying agency authorized by
the Ministry of Education, Science and Technology
of the Republic of Korea, hereby certifies the

Taehwa Kalpa Seal R&D center
of
Taehwa Kalpa Seal
located at
88B/2L, 1727-2, Songjeong-dong,
Gangseo-gu, Busan, KOREA

as an
Industrial R&D Center
as of 17th February 2011,
pursuant to the Technology Development Promotion Act
of the Republic of Korea.





Jong-yong PARK, Ph.D.
Executive Deputy Chairman
Korea Industrial Technology Association(KOITA)

Certificate of Authorization_R&D Center

TEST REPORTS

TEST REPORT

 Dong-A University Technical Center for High-Performance Valves 88 Hadae-dong, Saha-gu, Busan, Korea Tel: +82-51-200-6260 Fax: +82-51-200-6286	Certificate No.: TCHPV-16-06-111	 한국기술개발사업 기술개발사업 기술개발사업
	Page : 1 OF 12	

1. Client
 * Name : TaeHwa Kalpa Seal Co., Ltd.
 * Address : 31, Naksan-ro 209-2n, Gangseo-gu, Busan, Korea
 * Date of Receipt : 2016. 05. 04

2. Use of Report : Submission for Classification society

3. Test Sample : Non-Asbestos Gasket (TH 3000 / ISO CLASS -4 INCH RP TTYPE.)

4. Date of Test : 2016. 05. 27

5. Test method used : Reference to the
 API STANDARD 607-30th SIXTH EDITION, SEPTEMBER 2007

6. Testing Environment & Locations
 * Temperature : (23.6 ± 0.3) °C
 * Relative Humidity : (62 ± 5) % RH
 * Locations : Laboratory of TCHPV (Room No. SM1R, S14, DONG-A UNIV.)

7. Test Result : Page 3 & 4.

Affirmation	Tested by Researcher Name : J.Y. KWON (Signature)	Approved by Technical Manager Name : S.J. OH (Signature)
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* The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full.

2016. 06. 23.

Director of Dong-A University
 Technical Center for High Performance Valves

QIP-24-02 Revision No: 00 28 May 2009

TEST REPORT

 Dong-A University Technical Center for High-Performance Valves 88 Hadae-dong, Saha-gu, Busan, Korea Tel: +82-51-200-6260 Fax: +82-51-200-6286	Certificate No.: TCHPV-16-06-106	 한국기술개발사업 기술개발사업 기술개발사업
	Page : 1 OF 11	

1. Client
 * Name : TaeHwa Kalpa Seal Co., Ltd.
 * Address : 31, Naksan-ro 209-2n, Gangseo-gu, Busan, Korea
 * Date of Receipt : 2016. 05. 04

2. Use of Report : Submission for Classification society

3. Test Sample : Spiral Wound Gasket (TH 4064-FSG / ISO CLASS -4 INCH RP TTYPE.)

4. Date of Test : 2016. 05. 23

5. Test Standard : API SPECIFICATION 6FD THIRD EDITION, MAY 1988

6. Testing Environment & Locations
 * Temperature : (20.9 ± 0.3) °C
 * Relative Humidity : (49 ± 5) % RH
 * Locations : Laboratory of TCHPV (Room No. SM1R, S14, DONG-A UNIV.)

7. Test Result : Page 3 & 4.



Affirmation	Tested by Researcher Name : J.Y. KWON (Signature)	Approved by Technical Manager Name : S.J. OH (Signature)
-------------	--	---

* The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full.







2016. 06. 23.

Director of Dong-A University
 Technical Center for High Performance Valves



QIP-24-02 Revision No: 00 28 May 2009

 Dong-A University Technical Center for High-Performance Valves 88 Hadae-dong, Saha-gu, Busan, Korea Tel: +82-51-200-6260 Fax: +82-51-200-6286	Certificate No.: TCHPV-16-06-111	 한국기술개발사업 기술개발사업 기술개발사업
	Page : 11 OF 12	

Attach:05 Test Pictures

	
Weight Sample	The Sample Mounting
	
Installed Sample	During burn
	
Cool Down	After Test

QIP-24-02 Revision No: 00 28 May 2009

 Dong-A University Technical Center for High-Performance Valves 88 Hadae-dong, Saha-gu, Busan, Korea Tel: +82-51-200-6260 Fax: +82-51-200-6286	Certificate No.: TCHPV-16-06-201	 한국기술개발사업 기술개발사업 기술개발사업
	Page : 4 OF 4	

③ Dimension check

■ Before cryogenic test

Check No.	1	2	3	4	5	AVG.
LD (mm)	105.9	105.3	105.6	105.9	106.1	105.56
OD (mm)	174.7	174.2	174.8	174.1	173.9	174.34

■ After cryogenic test

Check No.	1	2	3	4	5	AVG.
LD (mm)	106.2	106.5	105.9	105.8	105.9	105.66
OD (mm)	174.9	174.7	174.3	174.8	174.9	174.72

- END -

QIP-24-02 Revision No: 00 28 May 2009

List of Fire Test

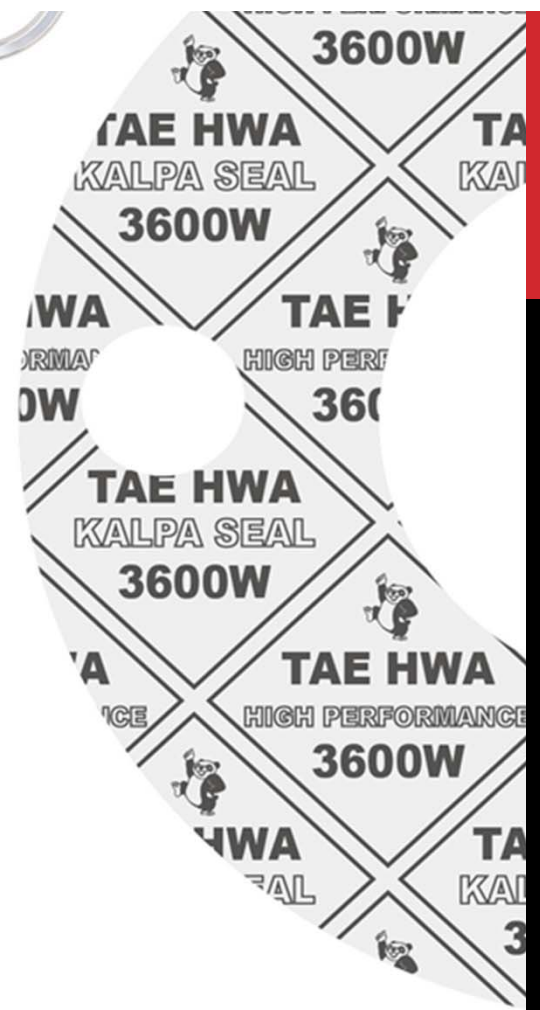
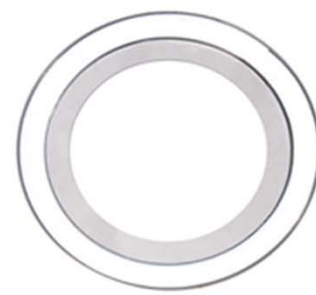
- * Compressed Non-Asbestos Joint Sheet Gasket
 TH3000,
 TH3000W
 TH3200
 TH3600W
- * Graphite Tanged Sheet Gasket
 TH400T

- * Spiral Wound Gasket
 TH4062
 TH4063

List of Cryogenic Test

- * Soft PTFE Gasket
 TH4029
- * Spiral Wound Gasket
 TH4064

PERFORMANCE RECORD



PERFORMANCE RECORD FOR OVERSEAS

No	Buyer	Buyer's location	Project info	Project Site	End user	Products	Delivered (yyyy-mm)
1	Dalian Shipbuilding Import Export Co., Ltd	China	G85K-01	China	Dalian Shipbuilding	SWG, RTJ	2020.01
2	Dong Tay Investment	Vietnam	(Local supplier)	Vietnam		Graphite Tape	2020.01
3	Dalian Shipbuilding Import Export Co., Ltd	China	Shanghai Area Shipyards	China	-	Non-Asbestos Joint Sheet(T H1100)	2019.12
4	Dalian Shipbuilding Import Export Co., Ltd	China	Shanghai Area Shipyards	China	-	Non-Asbestos Joint Sheet(T H1100)	2019.11
5	Dalian Shipbuilding Import Export Co., Ltd	China		China	Dalain Shipbuilding Industry Offshore	Duct Fireproof Gasket, S.W.G	2019.11
6	Dalian Shipbuilding Import Export Co., Ltd	China	Shanghai Area Shipyards	China	-	Non-Asbestos Joint Sheet	2019.10~11
7	Qingdao Xinyu Pipeline Equipment	China	Local Supplier	China	-	Non-Asbestos Joint Sheet	2019.10
8	CIMC Raffles Offshore Ltd.	China	H1277	China	CIMC Raffles Offshore Ltd.	Non-Asbestos Gasket	2019.06
9	HTM Industrial Seal Co., Ltd.	Vietnam	(Local supplier)	Vietnam	-	E-Flon Gasket	2019.10
10	BJC Heavy Industries Ltd.	Thailand	UPGN COMPERJ PROJECT - 66 SKID	Thailand	KM	N-A Gasket, SWG	2019.09
11	Sechang Philippines Corp.	Philippines	Local Supplier	Philippines	-	Steel Rubber Gasket	2019.09
12	Dalian Shipbuilding Import Export Co., Ltd	China	Shanghai Area Shipyards	China	-	Non-Asbestos Joint Sheet	2019.09
13	Phu Song Long Material Equipment	Vietnam	(Local supplier)	Vietnam	-	S.W.G.	2019.09
14	Dalian Shipbuilding Import Export Co., Ltd	China	Shanghai Area Shipyards	China	-	Non-Asbestos Joint Sheet	2019.08
15	VIFUTECH CO., LTD.	Vietnam	(Local supplier)	Vietnam	-	Kammprofile Gasketm S.W.G.	2019.09
16	Dalian Shipbuilding Import Export Co., Ltd	China	H1810A/H1811A/H1812A/H1813A	China	Hudong-Zhounghua Shipbuilding (Group) Co., Ltd.	S.W.G.	2019.08
17	Dalian Shipbuilding Import Export Co., Ltd	China		China	Dalain Shipbuilding Industry Offshore	Duct Fireproof Gasket	2019.07
18	Sechang Philippines Corp.	Philippines	Local Supplier	Philippines	-	Steel Rubber Gasket	2019.07
19	Dalian Shipbuilding Import Export Co., Ltd	China	Shanghai Area Shipyards	China	-	Non-Asbestos Joint Sheet	2019.07
20	CIMC Raffles Offshore Ltd.	China	H1278	China	CIMC Raffles Offshore Ltd.	Non-Asbestos Gasket	2019.06

PERFORMANCE RECORD FOR OVERSEAS

No	Buyer	Buyer's location	Project info	Project Site	End user	Products	Delivered (yyyy-mm)
21	Dalian Shipbuilding Import Export Co., Ltd	China		China	Dalain Shipbuilding Industry Offshore	Duct Fireproof Gasket	2019.06
22	Dalian Shipbuilding Import Export Co., Ltd	China	H1811A/H1812A/H1813A	China	Hudong-Zhounghua Shipbuilding (Group) Co., Ltd.	Dome Cover Gasket, Molykote	2019.05
23	Dalian Shipbuilding Import Export Co., Ltd	China	Shanghai Area Shipyards	China	-	Non-Asbestos Joint Sheet	2019.06
24	Qingdao Xinyu Pipeline Equipment	China	Local Supplier	China	-	Non-Asbestos Joint Sheet	2019.05
25	HTM Industrial Seal Co., Ltd.	Vietnam	(Local supplier)	Vietnam	-	EPDM Gasket	2019.05
26	Dalian Shipbuilding Import Export Co., Ltd	China	H1810A	China	Hudong-Zhounghua Shipbuilding (Group) Co., Ltd.	Dome Cover Gasket, Molykote	2019.05
27	RAON M&E co., ltd	Korea	SHI_75,000m3 LNG carrier/ SPARE PART	Korea	k-Line	Graphite gasket	2019.05
28	Dong Tay Investment	Vietnam	(Local supplier)	Vietnam		Kammprofile Gasket	2019.05
29	Dalian Shipbuilding Import Export Co., Ltd	China	Shanghai Area Shipyards	China	-	Non-Asbestos Joint Sheet	2019.05
30	Himile Mechanical Manufacturing(Shandong) Co., Ltd.	China	Local Supplier	China	-	E-Flon Gasket	2019.05
31	CIMC Raffles Offshore Ltd.	China	H473	China	CIMC Raffles Offshore Ltd.	Non-Asbestos Gasket-Additional	2019.02
32	Kantaya Engineering Co., Ltd.	Thailand	Local Supplier	Thailand	-	RTJ, E-Flon Gasket	2019.03
33	Dalian Shipbuilding Import Export Co., Ltd	China	G85K-01	China	Dalain Shipbuilding Industry Offshore	S.W.G.	2019.04
34	Himile Mechanical Manufacturing(Shandong) Co., Ltd.	China	Local Supplier	China	-	E-Flon Gasket	2019.04
35	Kantaya Engineering Co., Ltd.	Thailand	Local Supplier	Thailand	-	RTJ, E-Flon Gasket	2019.03
36	Qingdao Haiying Valve	China	Local Supplier	China	-	Non-Asbestos Joint Sheet	2019.03
37	Dalian Shipbuilding Import Export Co., Ltd	China	Shanghai Area Shipyards	China	-	Non-Asbestos Joint Sheet	2019.03~05
38	HTM Industrial Seal Co., Ltd.	Vietnam	(Local supplier)	Vietnam	-	Gland Packing	2019.02
39	HTM Industrial Seal Co., Ltd.	Vietnam	(Local supplier)	Vietnam	-	EPDM Gasket	2019.02
40	CIMC Raffles Offshore Ltd.	China	H473	China	CIMC Raffles Offshore Ltd.	Non-Asbestos Gasket	2019.02

PERFORMANCE RECORD FOR OVERSEAS

No	Buyer	Buyer's location	Project info	Project Site	End user	Products	Delivered (yyyy-mm)
41	Dalian Shipbuilding Import Export Co., Ltd	China	H1811A/H1812A/H1813A	China	Hudong-Zhounghua Shipbuilding(Group) Co., Ltd.	S.W.G.	2019.02
42	BK GLOBAL	Thailand	LG VINA Chemical Maintenance	Vietnam	LG VINA Chemical	PTFE PACKING	2019.01
43	CONG TY TNHH MTV PIRIOU VIETNAM	Vietnam	(Local supplier)	Vietnam	-	PTFE PACKING	2019.01
44	PT ZAKY PERSADA	Indonesia	(Local supplier)	Indonesia	-	Non-Asbestos Joint Sheet	2019.01
45	CONG TY TNHH MTV PIRIOU VIETNAM	Vietnam	(Local supplier)	Vietnam	-	PTFE PACKING	2019.01
46	KOGAS	Korea	Mozambique Coral FLNG project	Mozambique	-	S.W.G, SOFT PTFE	(Expected)2022
47	KOGAS	Korea	Australia Prelude FLNG project	Australia	-	S.W.G, SOFT PTFE	2018.12
48	KOGAS	Korea	KOGAS, Maintenance	Korea	KOGAS	Non-Asbestos Sheet	2018.11.27
49	HTM	Vietnam	Duong River Surface Water Plant	Vietnam	VOI / national project	Rubber Gasket	2018.05
50	Dalian Shipbuilding Import Export Co., Ltd	China	G85K-1	China	Dalian Shipbuilding Industry Offshore Co., Ltd.	S.W.G	2018.03
51	Dalian Shipbuilding Import Export Co., Ltd	China	H1810A	China	Hudong-Zhounghua Shipbuilding(Group) Co., Ltd.	S.W.G	2018.03
52	Samsung Heavy Ind(ningbo)co.ltd	China	50,000 DWT OIL /Chemical Tanker	China	Maersk	Non-Asbestos(sus wire reinforced) Gasket	2015~2018
53	Dalian Shipbuilding Import Export Co., Ltd	China	Shipbuilding Project	China	Hudong-Zhounghua Shipbuilding(Group) Co., Ltd.	Non-Asbestos Gasket	2017.12
54	YENTEC / PHA RUNG SHIPYARD	Korea	6.5K Chemical Oil Tanker	Vietnam	YENTEC	Non-Asbestos Gasket, Graphite, PTFE Gasket	2017.11
55	DSEC	Korea	3,500 TEU containership	USA	Matson / (NASSCO)	Non-Asbestos Gasket, Graphite, PTFE, Rubber gasket, S.W.G	2017.11 ~
56	KOGAS	Korea	KOGAS, Maintenance	Korea	KOGAS	Soft PTFE	2017.11~12
57	Lotte Chemical	Korea	Maintenance for Factory#1 pia	Korea	Lotte Chemical	SWG/ Non-Asbestos Gasket	2017, 10
58	Daewoo Shipbuilding & Marine Engineering (DSME)	Korea	YAMAL 172,410 m3 ARC7 LNG CARRIER	Korea	YAMAL	Non-Asbestos Gasket	2017, 07
59	YENTEC / PHA RUNG SHIPYARD	Korea	6.5K Chemical Oil Tanker	Vietnam	YENTEC	Non-Asbestos Gasket, Graphite, PTFE Gasket	2017, 07
60	BS-TANKER / PHA RUNG SHIPYARD	Korea	6.5K Chemical Oil Tanker	Vietnam	BS-TANKER	Non-Asbestos Gasket, Graphite, PTFE Gasket	2017, 07

PERFORMANCE RECORD FOR OVERSEAS

No	Buyer	Buyer's location	Project info	Project Site	End user	Products	Delivered (yyyy-mm)
61	Daewoo Shipbuilding & Marine Engineering (DSME)	Korea	BP SHIPPING 173,400 CBM LNG CARRIER	Korea	BP SHIPPING	Non-Asbestos Gasket	2017, 06~07
62	Viet Thuong Industrial Company	Vietnam	Maintenance	Vietnam	PMS Refinery Oil & Gas Plant	Kammprofile Gasket, Gland Packing	2017, 06
63	BJC Heavy Industries Ltd.	Thailand	FPSO PROJECT (P70) TUPI	Brazil	PETROBRAS	Gasket & Insulation Kit Package	2017, 01~08
64	Samsung Heavy Industries	Korea	160K LNG CARRIER	Korea	CHEVRON	Non-Asbestos Gasket, PTFE, Rubber Gasket	2016, 12
65	Samsung Heavy Industries	Korea	20,100 TEU CONTAINER VESSEL	Korea	MOL	Non-Asbestos Gasket, PTFE, Rubber Gasket	2016, 12
66	BJC Heavy Industries Ltd.	Thailand	FPSO PROJECT (P66/69) TUPI	Brazil	PETROBRAS	Gasket & Insulation Kit Package	2016, 06~12
67	GOGS Co.,Ltd.	Korea	FLNG (SN-2030)	U.K	SHELL	S.W.G	2016, 08~12
68	Kim Sang PTE	Vietnam	(Local supplier)	Vietnam	-	Non-Asbestos Sheet	2016, 09
69	TRIYARDS (Saigon Offshore)	Vietnam	H1031/32/33	Vietnam	Great Lakes Maritime Ltd	Non-Asbestos Gasket, PTFE Gasket	2016, 09
70	Hyundai Samho Heavy Industries	Panama	Panama Canal Expansion Project	Panama	Panama Canal Expansion Project	Rubber Gasket	2016, 01~08
71	BJC Heavy Industries Ltd.	Thailand	FPSO PROJECT (P75/77) QGI	Brazil	PETROBRAS	Gasket & Stud Bolt Package	2016, 01~05
72	BJC Heavy Industries Ltd.	Thailand	FPSO PROJECT (P66/69) TUPI	Brazil	PETROBRAS	Gasket & Stud Bolt Package	2016, 01~05
73	KOGAS	Korea	Kuwait Al-Zour LNG terminal project	Kuwait	Kuwait National Petroleum Company	S.W.G, SOFT PTFE	2016.05~2021
74	Zen Wang Co., Ltd.	Taiwan	(Local supplier)	Taiwan	-	Non-Asbestos Sheet	2016, 03
75	DSEC	Korea	NAVANTIA project	Spain	Ibaizabal	Non-Asbestos Gasket, Graphite, PTFE, Rubber Gasket, S.W.G	2016.02 ~
76	Hyundai Steel	Korea	Maintenance	Korea	Hyundai Steel	PTFE, S.W.G, Non-Asbestos Gasket	2016 ~
77	GS GLOBAL	Korea	Karaha Project	Indonesia	HAWKINS	S.W.G, RTJ Package	2016, 04
78	BJC Heavy Industries Ltd.	Thailand	FPSO PROJECT (P66/69)	Brazil	PETROBRAS	IX-SEAL	2015, 12
79	Hyundai Samho Heavy Industries	Panama	Panama Canal Expansion Project	Panama	Panama Canal Expansion Project	Rubber Gasket	2015, 12
80	Kim Sang PTE	Vietnam	(Local supplier)	Vietnam	-	Non-Asbestos Sheet	2015, 12

PERFORMANCE RECORD FOR OVERSEAS

No	Buyer	Buyer's location	Project info	Project Site	End user	Products	Delivered (yyyy-mm)
81	BJC Heavy Industries Ltd.	Thailand	FPSO PROJECT (P66/69)	Brazil	PETROBRAS	RTJ, Insulation Kit	2015, 11
82	Hyundai Samho Heavy Industries	Panama	Panama Canal Expansion Project	Panama	Panama Canal Expansion Project	Rubber Gasket	2015, 10
83	BJC Heavy Industries Ltd.	Thailand	FPSO PROJECT (P66/69)	Brazil	PETROBRAS	Non-Asbestos Gasket, S.W.G, RTJ, Insulation Kit	2015, 10
84	Samho IND Shipyard	Korea	H1033/34	Thailand	VL Enterprise	PTFE Gasket, Bolt Package	2014 to 2015
85	Samho IND Shipyard	Korea	H1035	Philippines	Animo Marine	PTFE Gasket, Bolt Package	2014 to 2015
86	Hyundai Samho Heavy Industries	Panama	Panama Canal Expansion Project	Panama	Panama Canal Expansion Project	Rubber Gasket	2015, 09
87	Kim Sang PTE	Vietnam	(Local supplier)	Vietnam	-	Non-Asbestos Sheet	2015, 08
88	Zen Wang Co., Ltd.	Taiwan	(Local supplier)	Taiwan	-	Non-Asbestos Sheet	2015, 07
89	AST Technical Service Trading	Vietnam	(Local supplier)	Vietnam	-	Rubber Gasket	2015, 07
90	KOGAS	Korea	Indonesia DSLNG project	Indonesia	-	S.W.G, SOFT PTFE	2015.06
91	South East Asia Shipyard	Vietnam	Shipbuilding project	Vietnam	South East Asia Shipyard	Non-Asbestos Sheet, Gland Packing	2015, 03
92	BJC Heavy Industries Ltd.	Thailand	FPSO PROJECT (P75/77)	Brazil	PETROBRAS	Non-Asbestos Gasket, S.W.G, RTJ, Insulation Kit	2015, 02
93	South East Asia Shipyard	Vietnam	Shipbuilding project	Vietnam	South East Asia Shipyard	Non-Asbestos Sheet	2015, 01
94	Qingdao WangYuan Piping System Machinery Co.,Ltd.	China	-	Singapore	Singapore Project	Non-Asbestos Sheet	2015, 01
95	Zen Wang Co., Ltd.	Taiwan	(Local supplier)	Taiwan	-	Non-Asbestos Sheet	2015, 01
96	BJC Heavy Industries Ltd.	Thailand	FPSO PROJECT (P75/77)	Brazil	PETROBRAS	Non-Asbestos Sheet	2014, 12
97	BJC Heavy Industries Ltd.	Thailand	AP LNG Talinga project	Australia	Australia Pacific LNG (APLNG)	RTJ Gasket	2014, 08
98	BJC Heavy Industries Ltd.	Thailand	AP LNG Talinga project	Australia	Australia Pacific LNG (APLNG)	Hammer Union	2014, 07
99	Royal Marine Equipments	Myanmar	(Local supplier)	Myanmar	-	S.W.G	2014. 07
100	Royal Marine Equipments	Myanmar	(Local supplier)	Myanmar	-	S.W.G	2014. 05

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No	Buyer	Buyer's location	Project info	Project Site	End user	Products	Delivered (yyyy-mm)
101	Daelim Saudi Arabia	Saudi Arabia	Sadara MFC project	Saudi Arabia	Sadara Chemical Co.	Non-Asbestos Sheet	2014, 02
102	Kim Sang PTE	Vietnam	(Local supplier)	Vietnam	-	Non-Asbestos Sheet	2014. 01
103	Zen Wang Co., Ltd.	Taiwan	(Local supplier)	Taiwan	-	Non-Asbestos Sheet	2013. 12
104	Nam Phat	Vietnam	Air Separation Unit	Vietnam	PSSV	Insulation Kit, S.W.G	2013. 09
105	BJC Heavy Industries Ltd.	Thailand	AP LNG Talinga project	Australia	Australia Pacific LNG (APLNG)	S.W.G, RTJ, Non-Asbestos Gasket	2013, 08
106	Baku Shipyard LLC	Azerbaijan	Shipbuilding(H102)	Azerbaijan	Baku Shipyard LLC	Non-Asbestos Sheet	2013. 08
107	BJC Heavy Industries Ltd.	Thailand	AP LNG Talinga project	Australia	Australia Pacific LNG (APLNG)	S.W.G, RTJ, Graphite / EPDM Gasket	2013, 05
108	Mohammad Taha Yahya Bureau	Iraq	Daura Refinery maintenance job	Iraq	Daura Refinery	S.W.G, RTJ, Graphite Gasket	2012~2013
109	ST&H	Korea	(Overseas project)	Dubai	-	S.W.G	2013, 03
110	Qingdao WangYuan Piping System Machinery Co.,Ltd.	China	Shipbuilding project	China	STX (Dalian) Shipbuilding Co., Ltd.	Non-Asbestos Sheet	2013, 02
111	Steel World	Korea	(Overseas project)	-	-	PTFE Gasket	2013, 02
112	BJC Heavy Industries Ltd.	Thailand	AP LNG Talinga project	Australia	Australia Pacific LNG (APLNG)	S.W.G, EPDM Gasket	2013, 01
113	POUYA ANDISHANE DANESH MEHVAR CO.	Iran	SPGC Refinery maintenance job	Iran	SPGC (South pars gas complex)	S.W.G, RTJ Gasket	2013, 01
114	Petroleum Service Company	Kuwait	DOHA WEST POWER STATION	Kuwait	Kuwait Ministry of Electricity & Water (MEW)	S.W.G	2012, 11
115	Qingdao WangYuan Piping System Machinery Co.,Ltd.	China	Shipbuilding project	China	STX (Dalian) Shipbuilding Co., Ltd.	Non-Asbestos Sheet	2012, 03~11
116	BJC Heavy Industries Ltd.	Thailand	AP LNG Talinga project	Australia	Australia Pacific LNG (APLNG)	S.W.G, RTJ Gasket	2012, 10
117	BJC Heavy Industries Ltd.	Thailand	AP LNG Talinga project	Australia	Australia Pacific LNG (APLNG)	RTJ Gasket	2012, 09
118	TRIYARD SOFEL	Vietnam	Offshore facility building	Vietnam	-	Non-Asbestos Gasket	2012, 08
119	BJC Heavy Industries Ltd.	Thailand	AP LNG Talinga project	Australia	Australia Pacific LNG (APLNG)	RTJ Gasket	2012, 07
120	Sun Korea	Korea	Offshore facility building	Vietnam	TRIYARD SOFEL	Non-Asbestos Sheet	2012, 07

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No	Buyer	Buyer's location	Project info	Project Site	End user	Products	Delivered (yyyy-mm)
121	Zen Wang Co., Ltd.	Taiwan	(Local supplier)	Taiwan	-	Non-Asbestos Sheet	2012, 07
122	BJC Heavy Industries Ltd.	Thailand	AP LNG Talinga project	Australia	Australia Pacific LNG (APLNG)	RTJ Gasket	2012, 05
123	NN Marine	Vietnam	Shipbuilding project	Vietnam	-	Non-Asbestos Sheet	2012, 05
124	Zen Wang Co., Ltd.	Taiwan	(Local supplier)	Taiwan	-	Non-Asbestos Sheet	2012, 05
125	NN Marine	Vietnam	Shipbuilding project	Vietnam	-	Non-Asbestos Sheet	2012, 04
126	BJC Heavy Industries Ltd.	Thailand	AP LNG Talinga project	Australia	Australia Pacific LNG (APLNG)	RTJ Gasket	2012, 03
127	CVIT Co., Ltd.	Vietnam	Shipbuilding project	Vietnam	-	Non-Asbestos Sheet	2012, 03
128	NN Marine	Vietnam	Shipbuilding project	Vietnam	-	Non-Asbestos Sheet	2012, 02
129	WINTECO	Vietnam	PV GAS project	Vietnam	PetroVietnam Gas	S.W.G, Rubber Gasket	2012, 02
130	Zen Wang Co., Ltd.	Taiwan	(Local supplier)	Taiwan	-	Non-Asbestos Sheet	2012, 02
131	CVIT Co., Ltd.	Vietnam	Shipbuilding project	Vietnam	-	Non-Asbestos Sheet	2011. 07
132	NN Marine	Vietnam	Shipbuilding project	Vietnam	-	Non-Asbestos Sheet	2011, 12
133	Petroleum Service Company	Kuwait	DOHA WEST POWER STATION	Kuwait	Kuwait Ministry of Electricity & Water (MEW)	Non-Asbestos Sheet	2011, 12
134	Gateway Ventures	Kazakhstan	(Local supplier)	Kazakhstan		Non-Asbestos Sheet	2011, 09
135	Qingdao WangYuan Piping System Machinery Co.,Ltd.	China	Shipbuilding project	China	STX (Dalian) Shipbuilding Co., Ltd.	Non-Asbestos Sheet	2011, 01~09
136	Zen Wang Co., Ltd.	Taiwan	(Local supplier)	Taiwan	-	Non-Asbestos Sheet	2011, 06
137	NN Marine	Vietnam	Shipbuilding project	Vietnam	-	Non-Asbestos Sheet	2011, 02
138	KOGAS	Korea	Iraq Kirkuk~Baiji Pipeline EPC project	Iraq	Oil Pipelines Company	S.W.G, SOFT PTFE	2012.10 ~ 2015.06
139	KOGAS	Korea	Mozambique Maputo gas supply project	Mozambique	ENH-KOGAS, SA	S.W.G	2012.04 ~ 2014.07
140	KOGAS	Korea	Singapore LNG terminal project	Singapore	Singapore LNG Pte. Ltd.	Soft PTFE	2010.03 ~ 2013.08

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No	Buyer	Buyer's location	Project info	Project Site	End user	Products	Delivered (yyyy-mm)
121	Zen Wang Co., Ltd.	Taiwan	(Local supplier)	Taiwan	-	Non-Asbestos Sheet	2012, 07
122	BJC Heavy Industries Ltd.	Thailand	AP LNG Talinga project	Australia	Australia Pacific LNG (APLNG)	RTJ Gasket	2012, 05
123	NN Marine	Vietnam	Shipbuilding project	Vietnam	-	Non-Asbestos Sheet	2012, 05
124	Zen Wang Co., Ltd.	Taiwan	(Local supplier)	Taiwan	-	Non-Asbestos Sheet	2012, 05
125	NN Marine	Vietnam	Shipbuilding project	Vietnam	-	Non-Asbestos Sheet	2012, 04
126	BJC Heavy Industries Ltd.	Thailand	AP LNG Talinga project	Australia	Australia Pacific LNG (APLNG)	RTJ Gasket	2012, 03
127	CVIT Co., Ltd.	Vietnam	Shipbuilding project	Vietnam	-	Non-Asbestos Sheet	2012, 03
128	NN Marine	Vietnam	Shipbuilding project	Vietnam	-	Non-Asbestos Sheet	2012, 02
129	WINTECO	Vietnam	PV GAS project	Vietnam	PetroVietnam Gas	S.W.G, Rubber Gasket	2012, 02
130	Zen Wang Co., Ltd.	Taiwan	(Local supplier)	Taiwan	-	Non-Asbestos Sheet	2012, 02
131	CVIT Co., Ltd.	Vietnam	Shipbuilding project	Vietnam	-	Non-Asbestos Sheet	2011. 07
132	NN Marine	Vietnam	Shipbuilding project	Vietnam	-	Non-Asbestos Sheet	2011, 12
133	Petroleum Service Company	Kuwait	DOHA WEST POWER STATION	Kuwait	Kuwait Ministry of Electricity & Water (MEW)	Non-Asbestos Sheet	2011, 12
134	Gateway Ventures	Kazakhstan	(Local supplier)	Kazakhstan	-	Non-Asbestos Sheet	2011, 09
135	Qingdao WangYuan Piping System Machinery Co.,Ltd.	China	Shipbuilding project	China	STX (Dalian) Shipbuilding Co., Ltd.	Non-Asbestos Sheet	2011, 01~09
136	Zen Wang Co., Ltd.	Taiwan	(Local supplier)	Taiwan	-	Non-Asbestos Sheet	2011, 06
137	NN Marine	Vietnam	Shipbuilding project	Vietnam	-	Non-Asbestos Sheet	2011, 02
138	KOGAS	Korea	Iraq Kirkuk~Baiji Pipeline EPC project	Iraq	Oil Pipelines Company	S.W.G, SOFT PTFE	2012.10 ~ 2015.06
139	KOGAS	Korea	Mozambique Maputo gas supply project	Mozambique	ENH-KOGAS, SA	S.W.G	2012.04 ~ 2014.07
140	KOGAS	Korea	Singapore LNG terminal project	Singapore	Singapore LNG Pte. Ltd.	Soft PTFE	2010.03 ~ 2013.08

PERFORMANCE RECORD FOR OVERSEAS

No	Buyer	Buyer's location	Project info	Project Site	End user	Products	Delivered (yyyy-mm)
141	Qingdao WangYuan Piping System Machinery Co.,Ltd.	China	Shipbuilding project	China	STX (Dalian) Shipbuilding Co., Ltd.	Non-Asbestos Sheet	2010, 03
142	KOGAS	Korea	Yemen YLNG project	Yemen	-	S.W.G, SOFT PTFE	2009
143	KOGAS	Korea	Mexico Manzanillo LNG terminal project	Mexico	Mexico CFE.	Soft PTFE	2008.04 ~ 2011.08
144	KOGAS	Korea	Thailand PTT LNG terminal projet	Thailand	PTTLNG Company Limited	S.W.G, SOFT PTFE	2008.02 ~ 2012.11
145	SPP shipbuilding	Korea	lots of Shipbuilding projects	Korea	SPP shipbuilding	Non-Asbestos Gasket, PTFE / Rubber Gasket	2007 to 2013
146	STX Offshore & Shipbuilding	Korea	lots of Shipbuilding projects	Korea	STX offshore & shipbuilding		2003 to 2016
147	Hanjin Heavy Industries	Korea	lots of Shipbuilding projects	Korea	Hanjin Heavy Industries	Non-Asbestos Gasket	2003 to 2016
148	DAEHAN shipbuilding	Korea	lots of Shipbuilding projects	Korea	DAEHAN shipbuilding	Non-Asbestos Gasket, PTFE / Rubber Gasket	2001 ~
149	Daewoo Shipbuilding & Marine Engineering (DSME)	Korea	lots of Shipbuilding projects	Korea	Daewoo Shipbuilding & Marine Engineering (DSME)	Non-Asbestos Gasket, Rubber Gasket	2001 ~
150	Hyundai Mippo Docyard	Korea	lots of Shipbuilding projects	Korea	Hyundai Mippo Docyard	Non-Asbestos Gasket, PTFE / Rubber Gasket	2001 ~
151	Samsung Heavy Industries	Korea	lots of Shipbuilding projects	Korea	Samsung Heavy Industries	Non-Asbestos Gasket, PTFE / Rubber Gasket	2001 ~



PERFORMANCE RECORD FOR JAPANESE MARKET

No	Buyer	Buyer's location	Project info	Project Site	End user	Products	Delivered (yyyy-mm)
1	Japan Matex	Japan	(Local supplier)	Japan	-	Non-Asbestos Sheet, S WG, Kammprofile, Corrugated Gasket, RTJ and etc.	2012.01~2020
2	HANIL FUJI(KOREA)	Korea	SAKHALIN ISLAND(BRODOSPLIT BRODOGRADILISTE DOO, 439)	Japan	-	NBR Rubber, Non-Asbestos Gasket	2019.03
3	AMS	Korea	Hull no. S3186	Japan	Shitanoe Shipbuilding	S.W.G, PTFE Gasket	2019.02
4	AMS	Korea	Hull no. S3185, S3181/82 additional	Japan	Shitanoe Shipbuilding	S.W.G, PTFE Gasket	2018.09
6	AMS	Korea	Hull no. S3181 & S3182	Japan	Shitanoe Shipbuilding	S.W.G, PTFE Gasket	2018.04
7	HANIL FUJI(KOREA)	Korea	NORDPENGUIN, 1391	Japan	SUMITOMO HEAVY MARINE YOKOSUKA	Non-Asbestos Gasket, VITON Rubber Gasket	2017.12
8	HANIL FUJI(KOREA)	Korea	BW MERCURY, 1320	Japan	FUKUOKA SHIPBUILDING	Non-Asbestos Gasket	2017.12
9	HANIL FUJI(KOREA)	Korea	BW IRIDIUM, 7066	Japan	SHITANOE SHIPBUILDING	Non-Asbestos Gasket	2017.11
10	HANIL FUJI(KOREA)	Korea	BW LITHIUM, 1315	Japan	FUKUOKA SHIPBUILDING	Non-Asbestos Gasket	2017.09
11	HANIL FUJI(KOREA)	Korea	NAVIG8 SOL, 2076	Japan	FUKUOKA SHIPBUILDING	PTFE Gasket	2017.08
12	HANIL FUJI(KOREA)	Korea	NAVIG8 SPICA, 2075	Japan	FUKUOKA SHIPBUILDING	PTFE Gasket	2017.04
13	HANIL FUJI(KOREA)	Korea	NAVIG8 SCEPTUM, 625	Japan	KITANIHON SHIPBUILDING	PTFE Gasket	2017.04
15	Samhwa Trading Co., Ltd.	Korea	LNG (S2324/25)	Japan	Mitsubishi Heavy Industries	Non-Asbestos Sheet	2016, 09~12
20	Isshin Shoji	Japan	(Local supplier)	Japan	-	Non-Asbestos Sheet	2014. 02
22	Withus Trading	Korea	(Trading company)	Japan	Daido Machines	Non-Asbestos Gasket, S.W.G, Rubber Gasket	2012, 09
24	Isshin Shoji	Japan	(Local supplier)	Japan	-	Non-Asbestos Sheet	2012, 04
25	BOGO TRADING	Korea	(Trading company)	Japan	Kawasaki Heavy Ind.	Non-Asbestos Gasket, S.W.G, Rubber Gasket	2012, 03
26	三福商社 (Sanpuku)	Japan	Namura shipbuilding project	Japan	Namura Shipbuilding Company	PTFE Gasket	2011, 09
27	Withus Trading	Korea	(Trading company)	Japan	Daido Machines	Non-Asbestos Gasket, S.W.G, Rubber Gasket	2011, 09

CUSTOMERS

