ISO 14001:2015
ISO 45001:2018
ISO 9001:2015
Integrated Management System

SPIRA POWER FASTENERS

ENGINEERED PRODUCTS

www.spirapower.com

INTRODUCTION

Spira Power was formed as a Sealing Technology and manufacturing company within the UAE during 2009 as a Joint Venture between two well established ISO Approved UK companies J. A. HARRISON & Co. (Manchester) Limited and V-Seal Limited with a combined service to the Sealing Industry spanning over 130 years.

Spira Power Gasket Manufacturing LLC., was opened as Specialist Manufacturers of Industrial Gaskets & Sealing Products for the Oil, Gas, Marine and Power Generation Companies with the introduction of rapid gasket manufacture together with sealing design technology the venture has proven to be highly successful with both end-users and traders throughout the Middle East.

The Spira Power Group has comprehensively equipped workshops and have the appropriate machine tools and inspection facilities to supply excellent customer service with extensive support being provided across the Groups Network of production facilities.

Spira Power has manufacturing facilities in **Dubai** (**Spira Power Gasket Manufacturing LLC**), **Sohar, Sultanate of Oman** (**Spira Power Gasket Factory LLC**) and **Abu Dhabi** (**Spira Power Gasket Company LLC**) and It also has a **Manufacturing facility in KIZAD, Abu Dhabi for Stud bolts and Fasteners** and maintains key market in oil and gas production, power generation and water treatment, including all processed equipment for these industries.

Existing customers already recognized our commitment and dedication throughout the entire order lifecycle from enquiry stage, through supply and after-sales services of our products. Our culture has been developed to attract and retain business partnership by providing a service unchallenged by our competitors as we continue to strive to meet the highest standards of quality and service, gaining our customers the confidence to trust our abilities.


SPIRA POWER
Gasket Company LLC
Facility : ICAD-1, Abu Dhabi

SPIRA POWER
Fasteners Division
Facility : KEZAD, Abu Dhabi

SPIRA POWER
Gasket Manufacturing LLC
Facility : Al Quoz, Dubai

SPIRA POWER
Group of Companies

SPIRA POWER
Gasket Factory LLC
Facility : Sohar, Oman

Our Partner

SEAL | Gasket and Sealing Solutions

J.A Harrison
Complete Sealing Solutions

Distributors of

Lamons
MANUFACTURING AND SERVICE Co

DONIT®
A perfect fit

www.spirapower.com

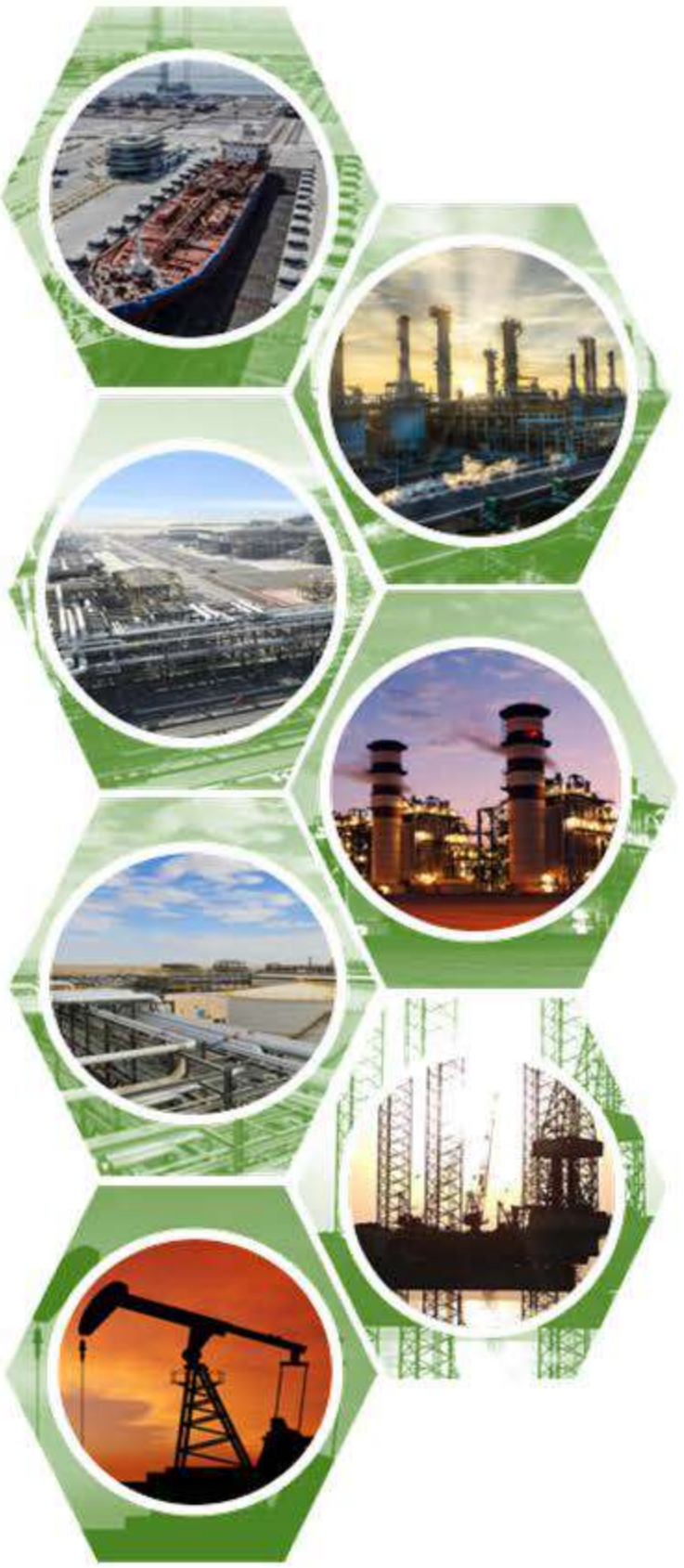
INDUSTRIES WE SERVE

Spira Power's market presence, vast experience & existing infrastructure in the related products have given us the confidence to manufacture and supply fasteners of various specifications.

Stringent, In-House Quality Control

As we know the quality is the key for any business success, products are thoroughly checked for dimensions, finishing and to meet all industry standards/clients specific requirements.

- **Refineries**
- **Water and Electricity**
- **Chemical and Petrochemical**
- **Marine Ship Building and Repair**
- **Pumps & Valves**
- **Power Generation**
- **On Shore & Off Shore**
- **Pulp & Paper Industries**
- **Chemical Processing**
- **HVAC**
- **Engine Cooling**
- **Oil Production**
- **Nuclear Industry**
- **Civil Construction**
- **Subsea Applications**
- **Turbines and Wind Energy**
- **Valves Industry**



STUD BOLTS & NUTS

Spira offers a wide range of **Stud bolts** in a variety of sizes and materials, including steel, stainless steel, and more .

Stud bolts are available in multiple diameters and lengths combinations, metric and imperial, and in a variety of materials from carbon steel to alloy, stainless and nickel alloys.

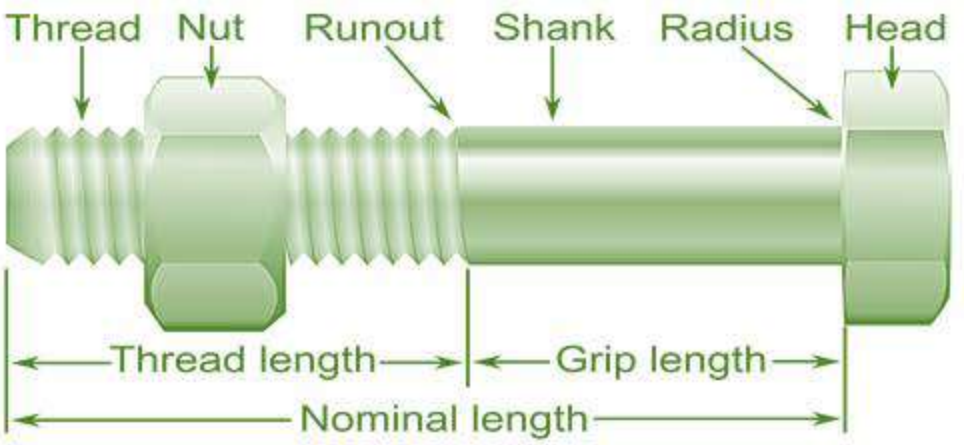
The **ASTM A193** specification covers alloy-steel and stainless steel stud bolts materials for high temperature or high-pressure service.

Stud bolts manufactured are suitable for several requirements, with all types of materials, from the smallest size (1/4" – M6) to the largest (7" – M180)

Spira can supply any type of nut (hexagonal, cylindrical, spherical, as per drawing) with all type of materials and from the smallest size (1/4" – M6) to the largest (4" – M100), in order to fit with relevant Stud bolt/screws.

The material to use for stud bolts depends on multiple factors, the main ones are the material of the flanges and the pipeline design temperature:

STUD BOLT GRADE	HEAVY HEX STEEL NUTS
A320 Gr. B8 Class 2	A194 Gr. 8A
A 320 Gr. L7	A 194 Gr. 7
A 320 Gr. L7	A 194 Gr. 7
A 193 Gr. B7	A 194 Gr. 2H
A 193 Gr. B16	A 194 Gr. 2H
A 193 Gr. B8 Class 1	A 194 Gr. 8A
A 193 Gr. B8M Class 1	A 194 Gr. 8A
A 193 B7M	A 194 2HM
A 320 L7M	A 194 7ML



HEX BOLTS

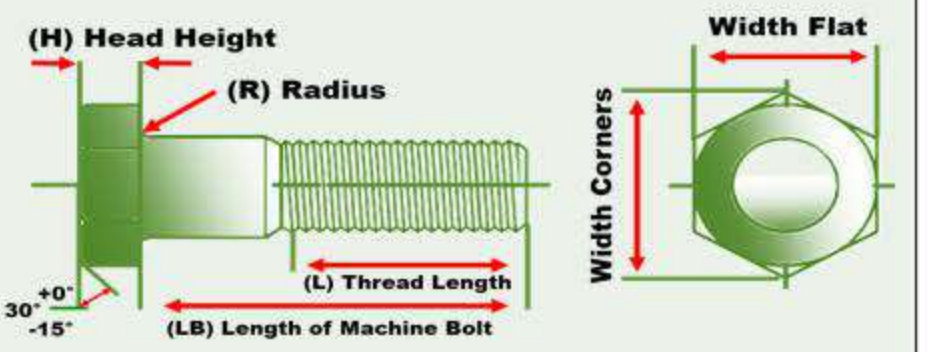
Spira Power offers Hex bolts that can be used for many different applications that include fastening wood, steel, and other construction materials for projects such as docks, bridges, highway structures, and buildings.

Finished hex nuts are the most common type. Heavy hex nuts are used in high temperature and high pressure applications. This is the most common type of nut for flanged joints. Heavy hex nuts are slightly larger and thicker than finished hex nuts.

Dimensional Standard	Diameter	Length	Material	Grade	Finish
DIN 588 /DIN 601 DIN 931 /DIN 933 DIN 7968 /DIN 7990 ISO 4014 /ISO 4017 ISO 4018	1/4"-4",M4-M100	≤800mm or 30"	Carbon Steel Alloy Steel Stainless Steel Brass	ASTM A325 ASTM A490 ASTM A354 Gr. BC ASTM A307 Gr. B	Galvanized Zinc Plated (Clear/Blue/Yellow/Black) H.D.G /Nickel Chrome /PTFE

Recommended Nuts and Washers		
Bolt Grade	Nuts	Washers
B7	A 194 Grade 2H	F436
B8 Class 1	A 194 Grade 8	SS304
B8M Class 1	A 194 Grade 8M	SS316
B8 Class 2	A 194 Grade 8	SS304
B8M Class 2	A 194 Grade 8M	SS316
B7M	A 194 Grade 2HM	F436
L7	A 194 Grade 7L	F436

HEX BOLTS DIMENSIONS



Marking of Stud Bolts Thread rods and nuts must be marked by the manufacturer with a unique identifier to identify the manufacturer or private label distributor, as appropriate. Below are a number of ASTM examples.

A 193 Grade B8M | A 193 Grade B7 | A 194 Grade 2H | A 194 Grade 8M

ENGINEERED PRODUCTS

Spira power manufactures wide range of engineered products. Threading of individual components as per customer required drawings with various material grades can be manufactured and supplied.

Engineered components provide additional capabilities like self-retention, vibration resistance, or installation.

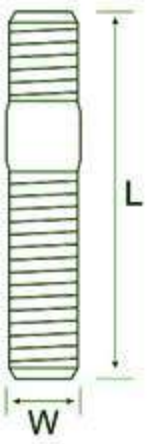
They range from simple panel clips to complex self-retaining threaded nuts, with many categories and variants in between.

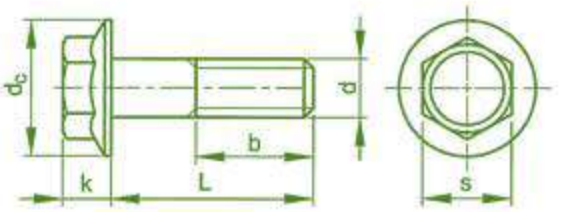
Engineering Stud

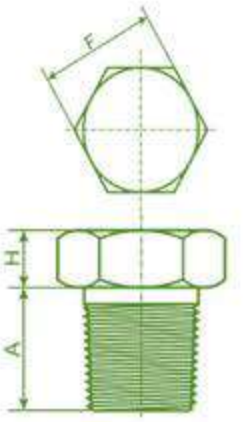
Collar Stud Bolt

Hex Plug

Dowel Pins







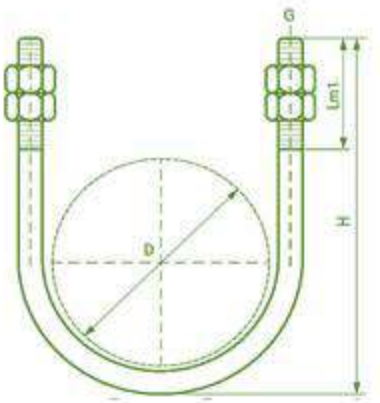
FABRICATED PRODUCTS

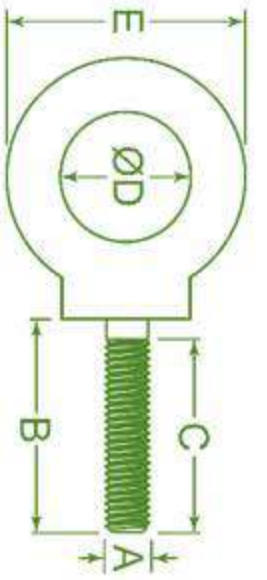
U-BOLTS

ANCHOR BOLTS

EYE BOLTS

	U-BOLT	ANCHOR BOLT	EYE BOLT
Material	Stainless Steel / Carbon Steel	Stainless Steel / Carbon Steel	Stainless Steel / Carbon Steel Aluminum /Brass/ Bronze /Titanium
Coating	✓ Electro Zinc Plated ✓ Hot Dip Galvanized ✓ Xylan PTFE ✓ Black Other Special Coating: Neoprene/PTFE/Rubber Moulding/Insulation Pad.	✓ Electro Zinc Plated ✓ Hot Dip Galvanized	✓ Electro Zinc Plated ✓ Hot Dip Galvanized
Features	✓ High load capacity due to one piece design. ✓ Supplied with two or four nuts ✓ U Bolt with Buna- N Rubber can be supplied upon request. ✓ U bolts with longer tangents and threads can be manufacture upon request. ✓ Alternate rod sizes for different pipe sizes also available.	✓ High Performance Stainless Steel ✓ Used in construction industry, power generation and other high tensile and high stress applications. ✓ Easy to use ✓ Rugged Construction ✓ Durable ✓ Ensure a secure fixing suitable for medium to heavy-duty loads	✓ Used to lift heavy off-axis loads. ✓ Used for a wide variety of material lifting applications and may either pivot or swivel. ✓ Exceptional levels of grip and can accommodate oversized holes. ✓ Heavy-duty applications including the movement of panels and gates.
Note	Different Sizes and Material Grades can be supplied with relevant nuts and washers upon request.		





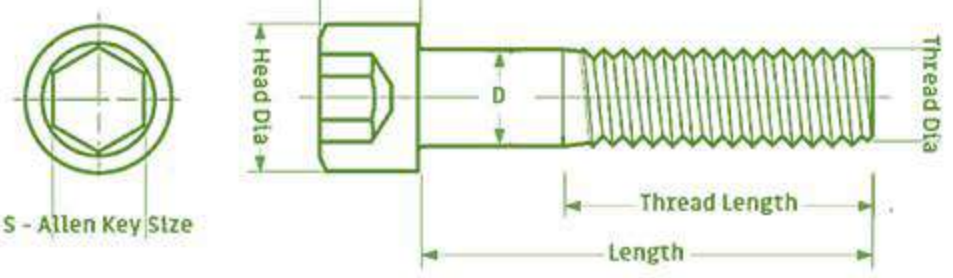
SOCKET HEAD CAP SCREW

Socket head cap screw used in the industrial sector and assembly lines. This makes them ideal for many applications where space is an issue.

They are mainly used in applications like the construction of plastic injection molds, power plant parts and transmission tools, hydraulic braking system and home furniture.

Stainless Steel bolts are mainly use to connect bridge, LNG ship, military industry, port, chemical industry, rail and other equipment.

SOCKET HEAD CAP SCREW	
Material	Stainless Steel / Carbon Steel / Copper
Coating	Electro galvanized / Hot Dip Galvanized / Xylan PTFE / Black
Features	✓ As compared to ordinary fasteners, less socket screws of the same size can achieve the same clamping force in a joint. ✓ As fewer screws are required for a given job, fewer holes are required to be drilled and tapped. ✓ There is weight reduction as fewer screws are used. ✓ There will be weight reduction on account of smaller size of the component parts since the cylindrical heads of socket screws need less space than hex heads and require no additional wrench space ✓ Useful in situations where clearance is limited.
Dimensional Standard	ANSI - ASTM A574, B 18.3, B 18.3.1M IS - 2269 ISO - 4762 DIN - 912 BS - 2470, BS-EN ISO 4762 JIS - B1176
Note	Different Sizes and Material Grades can be supplied with relevant nuts and washers upon request.

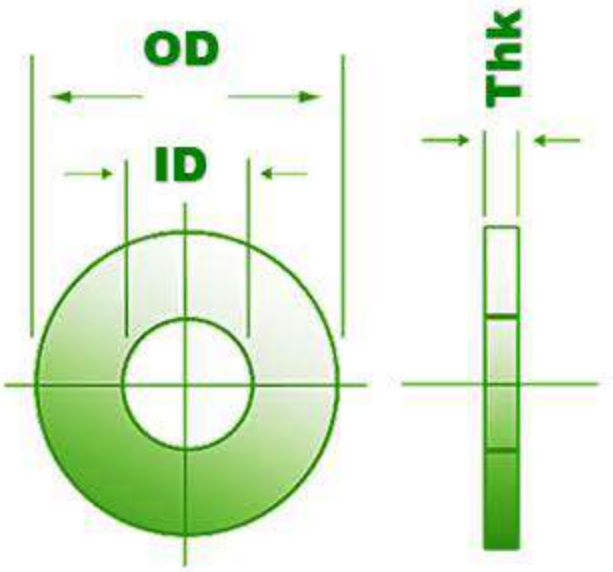


WASHERS

Washers is an essential part of any fastener assembly and are used in conjunction with screws, nuts and bolts. They may also be used in rotating applications, as a bearing. The term washer is often applied to various gasket types such as those used to seal the control valve in taps

Spira Power can supply from different materials, including brass, stainless steel, carbon steel, and non-metallic materials like ceramic, phenolics, plastic, etc.

WASHERS	
Material	Brass / Stainless Steel /Carbon Steel / Non-metallic materials / Ceramic / Phenolics /Plastic
Coating	PTFE Coated Washers / Phosphate Coating / Teflon Coating / Zinc Coating Xylon Coating /Cadmium Coating /Hot Dipped Galvanizing Coating
Features	✓ Damage prevention ✓ Vibration Absorption ✓ Corrosion Prevention ✓ Seal/Liquid Protection ✓ Assist in spreading the Load distribution more equally
Dimensional Standard	DIN 125A, DIN 125B, DIN 127B, DIN 137B, DIN 6797A, DIN 6797J, ISO 7089, DIN 7980, DIN 127 B, IS 2016, ASTM F436M, ASME B18.13, ASME B18.21.1, ASME B18.22.1, ASME B18.23.1
Form of Washers	Hex, Threading, Square, Round
Type of Washer	Plain washers / Spring washers / Locking washers



SERVICE COATING

Coating Process	Features
Electro Zinc Plating	✓ Chemical resistance ✓ Corrosion resistance ✓ Low friction and galling resistance ✓ Improved conductivity ✓ High hardness ✓ Oxidation resistance ✓ Extreme heat resistance
PTFE Coating	✓ Non-stick ✓ Electrical resistance ✓ Low friction ✓ Abrasion resistance
Zinc-Nickel Coating	✓ Great Corrosion resistance ✓ Thermal Stress ✓ Wear resistance ✓ Eco-friendly ✓ Cost-effective
Xylan	✓ High corrosion resistance. ✓ Predictable friction properties ✓ Reduced torque requirements ✓ Wide colour range ✓ Outperforms conventional coatings
Xylar 1 / Xylar 2	✓ Controlled torque ✓ Corrosion resistance ✓ Chemical resistance ✓ Heat resistance ✓ Abrasion resistance
Take coat 1000	✓ Corrosion resistance ✓ Heat resistance ✓ Insulation ✓ Durability ✓ Stable in fastening of bolts
Cadmium Plating	✓ Corrosion resistance ✓ Lubricity ✓ Chemical resistance ✓ Ductility ✓ Ease of solderability
Hot-Dip Galvanizing	✓ Lower Costs ✓ Extremely Long Life ✓ Reliability ✓ Tougher Coating ✓ Automatic Protection for any Damaged Areas ✓ Complete Protection ✓ Ease of Inspection

Spira Power ensures that the life of fasteners will be extended having metal coatings

- **Electro Zinc Plating**
- **PTFE Coating**
- **Zinc-Nickel Coating**
- **Xylan**
- **Xylar 1 / Xylar 2**
- **Take coat 1000**
- **Cadmium Plating**
- **Hot-Dip Galvanizing**

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SPIRA POWER

Vol 1/2024

ISO 14001-2015
Integrated Management System
ISO 9001-2015

SPIRA POWER

MANUFACTURER OF INDUSTRIAL GASKETS & SEALING PRODUCTS

www.spirapower.com

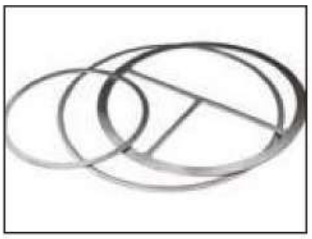
OTHER PRODUCTS


Non-Asbestos Gaskets


Spiral Wound Gaskets


Ring Joint Gaskets


Studbolt & Nuts


Heat Exchanger Gaskets


Corrugated Metal Gaskets


Grooved /Camprofile Gaskets


Pipe Fittings


PTFE Envelope Gaskets


Metal Eyeleted Gaskets

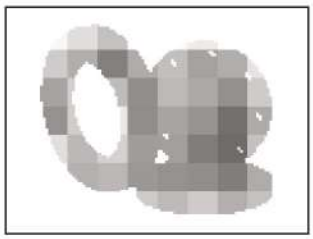

PTFE Joint Sealant


O-Rings & Seals


Flexible Graphite Tape


Ceramic Ropes & Tapes


Expansion Joints


Flanges


Gland Packings


Insulation Kits


Die-Moulded Rings


Lid Seal Packings


Cork Sheets


Machining &
Fabrication Works


Rubber Moulding
& Extrusions


Valves

CONTENT

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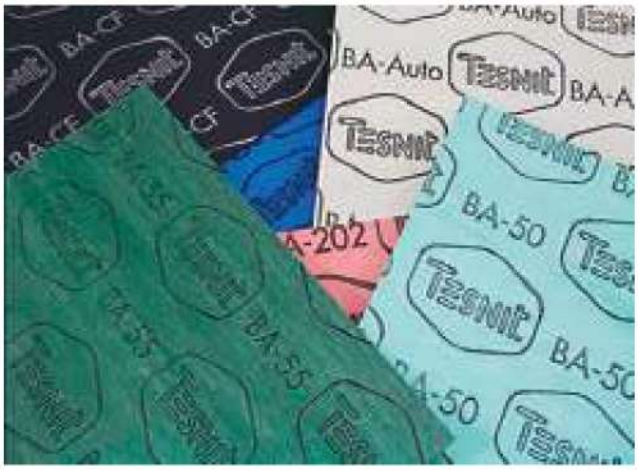
Each of the **Spira Power facilities** are engaged in sealing design, manufacturing and marketing of a complete range of Gaskets and Fluid sealing products, to serve all kind of Industrial sectors in Middle East. Spira Power delivers on its promises with real results every time, working in partnership with our customers. Whether it is integrated manufacturing or customized designing, and ensures a level of certainty of results that no other compared companies can match.

Existing customers already recognized our commitment and dedication throughout the entire order lifecycle from enquiry stage, through supply and after-sales services of our products. Our culture has been developed to attract and retain business partnership by providing a service unchallenged by our competitors as we continue to strive to meet the highest standards of quality and service, gaining our customers the confidence to trust our abilities.

All our Compressed Non Asbestos Fiber (CNAF) based materials are designed to meet the highest standards of performance for a wide range of industrial applications, they are easy to handle and install. These materials also offer excellent bolt stress retention properties with an excellent sealing performance. They are easy to remove from the flange assembly after use due to the anti-stick coating properties, are very economical and will withstand a temperature range from -196°C up to 450°C (grade may vary dependent upon the application) and suitable for pressures up to 140 bar (again depending upon the grade).



GASKET MATERIALS & APPLICATIONS

Standard line	Basic	Max. T[C7F°]		Max. P[bar/psi]	Application and properties
BA-202	Organic fibres,NBR	• Peak • Continuous	180/356 140/284	40/580	For lower loadings, good resistance to water , gases, oils , fuels
BA-203	Aramind Fibres, NBR	• Peak • Continuous	250/482 200/392	50/725	For medium loading, good resistance to water, gases, oil, fuels
BA-50	Aramind Fibres, NBR	• Peak • Continuous	280/536 220/428	80/1160	Good dynamic resistance for higher loading, gas, food industry
BA-55	Syntetic fibres,NBR	• Peak • Continuous	350/662 270/518	100/1450	Excellent thermal properties and good steam resistance, economical quality for wide field of application
BA-U	Aramind Fibres, NBR	• Peak • Continuous	350/662 250/482	100/1450	General use
BA-GL	Glass Fibres, NBR	• Peak • Continuous	440/824 300/662	100/1450	Very good thermal properties and excellent torque retention
BA-CF	Carbon Fibres,NBR	• Peak • Continuous	400/752 300/572	100/1450	Resistance to steam and alkaline media, chemical and petrochemical industry
BA-Auto	Aramind Fibres, SBR	• Peak • Continuous	280/536 220/518	80/1160	Controlled swell properties in oil, automotive industry
BA-N	Aramind Fibres, CR	• Peak • Continuous	350/662 270/518	100/1450	Resistance to refrigerant, general use
BA-C	Aramind Fibres, CSM	• Peak • Continuous	200/392 150/302	60/870	Excellent resistance to acids and alkaline media
BA-R	Aramind Fibres, NBR/SBR	• Peak • Continuous	400/752 350/662	140/2030	Great strength , for dynamic loadings, automotive and petrochemical
BA-R300	Inorganic Fibres, NBR, special reinforced	• Peak • Continuous	550/1022 450/842		Excellent dynamic and thermal resistance, automotive and petrochemical industry
BA-R302	Inorganic Fibres, NBR, special reinforced	• Peak • Continuous	650/1202 600/1112		Excellent dynamic and thermal resistance, automotive and petrochemical industry
BA-U R200	Aramid fibres, NBR, Expanded Metal	• Continuous	75/143	140/2030	Improved strength, for dynamic loadings, high pressure applications, district heating ,ship's piping systems

NON ASBESTOS FIBRE SHEETS & GASKETS – (CNAF)

SIZE AND CONSTRUCTION

The non-metallic gaskets are produced in several sizes and shapes to meet the most demanding applications. They are available in standard and non-standard gasket design. For non-standard gaskets we can provide any shape and size according to customer design or sample.

AVAILABILITY

The dimensions of our standard gaskets meet the requirements of the EN 1514-1,ANSI B16.21 or other standards.Gaskets of up to 2000 mm x 2000 mm are made from one piece, while larger ones are assembled from segments. Two kinds of splicing are used: dove-tail and bevelled (practically there are no limitation regarding gasket dimension). According to the gasket shapes and sizes all other dimensions can be manufactured upon request.

CUTTING CAPABILITIES

With our cutting technology, experience and knowledge we are able to cut almost any material. A wide range of cutting euipment provides competitive pricing and high quality regardless of the gasket size or quality. A large range of presses, special cutting tools, CAD-CAM CNC,Water jet cutting and also a skilled team for the swift production of small quantities are available. The Custom-cut gaskets according to the customers drawing and specification, samples and templates. Cutter manufacture-cutting tools are made in-house as an integral part of production unit.

DIMENSION STANDARD

SIZE : 1.5 Mtr X 1.5 Mtr (Std) 2.0 Mtr X 2.0 Mtr,
3 Mtr x 3 Mtr upon request
THICKNESS : 1.0 / 2.0 / 3.0 / 4.0 / 5.0 mm
NOTE : Other sizes are available on request.

Rubber is the most cost-effective material to use where temperatures and pressures are low and the chemical environment is mild. Different elastomers offer different mechanical and chemical properties. Cloth inserted materials are better able to handle movement and high compression loads.

MATERIAL AND APPLICATIONS

Material	Temp.(F)	P.Max(psi	Thick. (in).	Application/Features
Butyl	-40 - 225	150	1/16 - 1/4	Gases inorganic acids & alkalis. Excellent weather abrasion resistance.
EPDM	-40 - 212	150	1/16 - 1/4	Water, steam, animal/vegetable. Oils, oxygenates solvents, Excellent weather resistance.
Natural (Pure Gum)	-20 - 140	150	1/32 - 1	Acids, organic salts & alkalis. Non-toxic. Abrasion resistant soft.
Neoprene	-20 - 170	150	1/32 - 2	Oil/gasoline. Excellent weather resistance
Neoprene Cloth inserted	-20 - 170	150	1/32 - 1/4	Oil/gasoline. Excellent weather resistance Handles movement. High tensile strength.
Nitrile (NBR, Buna-N)	-20 - 170	150	1/32 - 1/2	Oil/Aromatic fuels, mineral, animal and vegetable oils, solvents and hydraulic fluid. Available in commercial, premium and FDA grades.
SBR (Red Rubber)	-20 - 170	150	1/ 32 - 1/4	Air, hot /cold water.
SBR Cloth inserted	400	150	1/16 - 1/4	Air, hot /cold water, saturated/low pressure steam. Excellent for high compression loads. Handles movement.
Silicone	20 - 160	150	1/ 32 -1/4	High temperature air or water (not oil or steam). Soft. Available in FDA grade.
Vinyl	20 - 160	150	1/ 16 -1/4	Water oxidizing agents, Excellent weather/abrasion resistance.
Viton	400	150	1/ 32 -1/4	Oil/Aromatic fuels, mineral, animal and vegetable oils, solvent and hydraulic fluid.

AVAILABILITY

- Available in Rolls
- Available as Gaskets
- Available as sheets
- Can be supplied in cut-to-width strips
- Can be vulcanized to infinity

DIMENSION STANDARD

SIZE : 1.2 Mtr X 10 Mtr (Std)
1.5 Mtr X 10 Mtr (Std)
2.0 Mtr X 10 Mtr (Std)
THICKNESS :1.0 / 2.0 / 3.0 / 5.0 / 6.0 / 8.0 /10.0 mm
NOTE : Other sizes are available upon request.




PTFE PRODUCTS

PTFE is the material choice for a very large variety of applications. The chemical inertness of PTFE is unique makes it suitable for almost all chemicals with the exception of fluorine, some flour chemicals and molten alkali metals.

ADVANTAGES:

- Wide temperature use range: -200°C + 250°C
- Very low coefficient of friction
- Anti-stick properties
- Non-flammable
- Excellent dielectric properties
- Good mechanical properties
- Excellent tensile strength even at low temperature
- Non-ageing properties
- Moisture and U.V. resistance
- Non-toxic
- Resistance to all corrosive chemicals.

PTFE FILLED COMPOUNDS

Inspite of its remarkable properties pure or "unfilled" PTFE is inadequate for some engineering uses. Mechanical applications especially require better physical characteristics.
A proper combination of inorganic and metallic fillers will enhance the following factors:

- Creep resistance,
- Wear resistance,
- Thermal conductivity,
- Arc resistance,
- Dimensional stability,
- Hardness

PRODUCT RANGE:

- Virgin PTFE Sheets
- Expanded PTFE Sheets
- Modified PTFE Sheets (Barium silicate, Silica fillers)
- Glass ,Bronze & Graphite filled sheets
- PTFE Rods
- Skived Tape
- Expanded PTFE Tape
- IBC & Full Face Gaskets
- PTFE Envelope Gaskets
- Thread Seal Tapes

The sealing inserts is made of corrugated stainless steel, soft non-asbestos material, or rubber and different combinations. This insert is coated with PTFE and open on one side, usually on the outside. Thanks to the high chemical stability, good mechanical properties and permanent resistance in the atmosphere (humidity, gasses, temperature changes) they are suitable for all types of gaskets and different media, mostly for aggressive chemicals.

ADVANTAGES

Benefits from the high stability of C-F bond virgin PTFE, which is used for the envelope and exhibits extraordinary chemical resistance. Combinations of two or more insert materials allow a large number of different applications.

SHAPE AND CONSTRUCTION

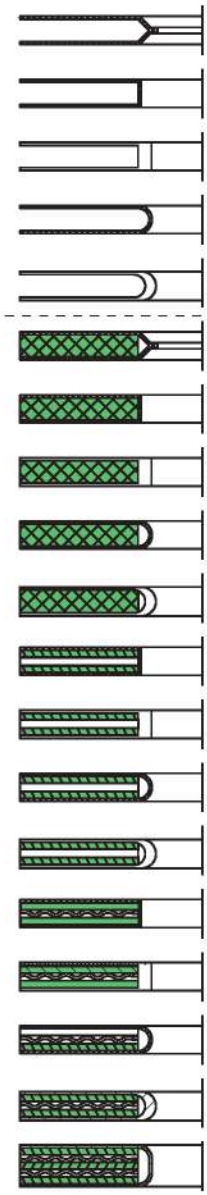
The PTFE enveloped gaskets are produced in several types to meet the most demanding applications. Standard shapes are round or oval. Enveloped material: Virgin PTFE, Base materials: Stainless steel, non-asbestos material, rubber.

SIZE

The PTFE envelope for gaskets with maximum external diameter of up to 500 mm are made in one piece, for gaskets with greater diameters they are welded. Oval shapes of PTFE envelopes are welded. There are no limitations regarding sizes for gaskets with welded envelopes.

EN 1514-3 gaskets

DN (mm)	Gasket inside diameter (mm)	Envelope outside diameter (mm)	Gasket outside diameter (mm)					
	PN Class		PN6	PN 10	PN 16	PN25	PN40	PN63
10	18	36	39	46	46	46	46	56
15	22	40	44	51	51	51	51	61
20	17	50	54	61	61	61	61	72
25	34	60	64	71	71	71	71	82
32	43	70	76	82	82	82	82	88
40	49	80	86	92	92	92	92	103
50	61	92	96	107	107	107	107	113
65	77	110	116	127	127	127	127	138
80	89	126	132	142	142	142	142	148
100	115	151	152	162	162	168	168	174
125	141	178	182	192	192	194	194	210
150	169	206	207	218	218	224	224	247
200	220	260	262	273	273	284	290	309
250	273	314	317	328	329	340	352	364
300	324	365	373	378	384	400	417	424
350	356	412	423	438	444	457	474	486
400	407	469	473	489	495	514	546	543
450	458	528	528	539	555	564	571	
500	508	578	578	594	617	624	628	
600	610	679	679	695	734	731	747	



(and combinations)

GASKET ORDERING EXAMPLE

EN 1514-3, Type C, DN 65, PN 16, 2 mm, virgin PTFE

GRAPHITE SHEETS & GASKETS

Spira Power is one of the leading suppliers of Graphite sheets & Gaskets in Middle East. These products are well suited to a wide range of industrial processes that demand high-performance at increased temperatures.

ADVANTAGES

- Graphite can handle both high and low temperatures, making it very durable in processes that operate across a wide temperature range.
- Graphite is corrosion resistant at most temperature and pressures, and is not affected by pH changes.
- Graphite has exceptional mechanical strength when used in Gaskets and excellent resiliency.
- Graphite is highly compressible
- Graphite has low creep under pressure or temperature
- Graphite has unlimited storage life and are not effected by direct sunlight

APPLICATIONS

- High & low temperatures
- Aggressive media
- Low bolt loads
- Hot oil equipment
- Heat exchangers

Graphite gaskets are used in processes that include corrosive media like ammonia, hot water, high pressure vapours, ultra cool liquids and hydrocarbons. This can withstand a temperature -200°C to 650°C This makes them the top choice for heat exchangers, cooling towers and high pressure pipes.
Spira Power provides gaskets fully customized to your dimensional and mechanical requirements.

PRODUCT RANGE:

- Pure Graphite sheet, plain, no insert
- Graphite laminate, 316 stainless steel foil insert, adhesive bond
- Graphite laminate, 316 stainless steel tang insert, mechanically bond

DIMENSION STANDARD

SIZE : 1.0 Mtr X 1.0 Mtr (Std)
1.5 Mtr X 1.5 Mtr (Std)
THICKNESS :1.0 / 2.0 / 3.0 / 5.0 mm
NOTE : Other sizes are available upon request.

OTHER STYLES:

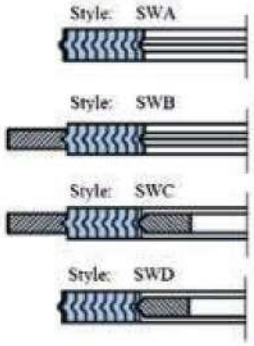
As per customer's request, we can also supply inserts in Nickel Alloy, Monel and other exotic materials.

Spiral Wound Gaskets are special semi-metallic gaskets of great resilience; therefore they are suitable for applications featuring heavy operating conditions. SWG manufactured by spirally winding a V-shaped metal strip and a strip of non-metallic filler material. The metal strip holds the filler, providing the gasket with mechanical resistance and resilience. SWG can be reinforced by an outer centering ring and/or inner retaining ring. The outer centering ring controls the compression and holds the gasket centrally within the bolt circle. The inner retaining ring increases the axial rigidity and resilience of the gasket and acts as a Heat and Corrosion barrier eliminating turbulence between the gasket Inner diameter and the flange bore so avoiding erosion of the flange faces.

ADVANTAGES

- Sealing under heavy operating conditions.
- Strong stress compensation,
- Stable and Reliable sealing performance even under frequent pressure fluctuation conditions.
- Solid construction provides stability
- Seal ability even when the sealing surfaces are slightly corroded or bent.
- Easy installation meters

SWG STANDARD STYLES



without Outer Ring and Inner Ring

with Outer Ring (No inner Ring)

with Outer Ring and Inner Ring

with Inner Ring (No outer Ring)

DIMENSIONS:

Standard Sizes: Acc. To ASME/ANSI, DIN, BS, JIS & Non-Standard sizes upon request.
Manufacturing Thicknesses: 3.2 mm; 4.5 mm; 6.5 mm and 7.2 mm

MATERIALS:

Standard Filler: Flexible Graphite, PTFE, Non-Asbestos, Ceramic etc..
Standard Metals: SS316L, SS316, SS304, SS304L, SS321, SS347, Monel, Inconel, Incoloy, Titanium, Duplex, Super Duplex etc...

SPIRAL WOUND GASKETS

Spiral wound gaskets have proven to be the most reliable sealing element for use in difficult, critical and arduous duties. Spiral wound gaskets are used in refinery, Petrochemical, Chemical, steam lines and process industries, where they have many advantages over older types of gaskets.

These gaskets are manufactured to international specifications such as BS, API, ASME, JIS and DIN standards. We also manufacture to as per customer's specifications.

FLANGE STANDARDS

ASME/ANSIB16.5	MSS SP44 (ASME B16.47 SERIES A) (AWWA)
BS 1560, BS10, BS4504	DIN FLANGES, JIS FLANGES
API 605 (ASME B16.47 SERIES B)	FRENCH NF STANDARD

COMMON FILLERS USED

FILLERS MATERIALS	MAX. WORKING TEMPERTURE
Graphite Mica	350 F (Temperature)
Graphite 99.8 % purity	1200 C
Non asbestos	550 C
PTFE	250 C
Ceramic	1000 C

INNER AND OUTER RINGS

Carbon steel, stainless steel 304,304L,316, 316L, 316Ti,321,347,MONEL 400 ,Inconel 600,625,800,Incoloy 800,825,Nickel 200,Titanium, Hastelloy, Copper, Duplex, Super Duplex etc...

SPIRAL WOUND GASKET SIZES

Size and shape as per prevailing international standards or Custumoer needs can be produced

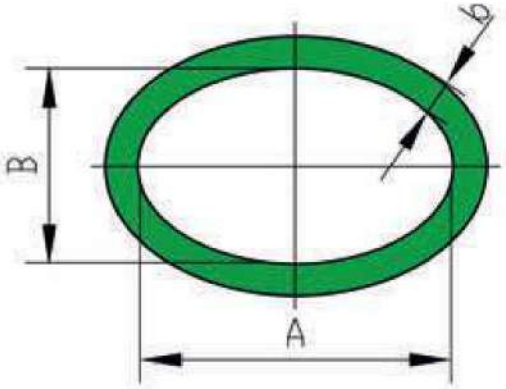
GASKET COMPRESSION & CHOICE OF THICKNESS

Nom. Thickness	Compressed Thickness
2.5mm(.098 in)	1.9/2.1mm(.075/.085 in)
3.2mm(.125 in)	2.4/2.6mm(.95/.105 in)
4.5 mm(.175 in)	3.2/3.45mm(.125/.135 in)
6.4 mm(.250 in)	4.6/4.8mm (.180/.190 in)
7.3 mm(.285 in)	4.7/4.9mm(.185/.195 in)

GASKETS FOR BOILERS HANDHOLES AND MANHOLES

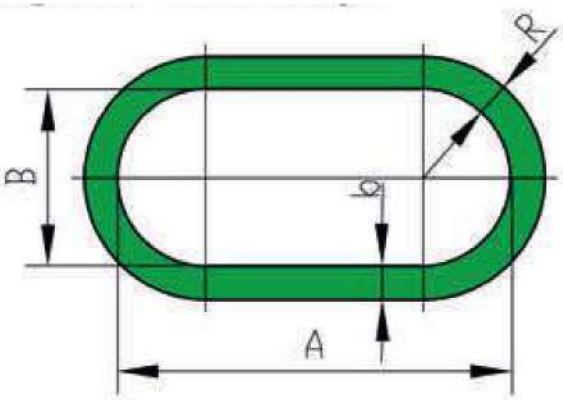
Gaskets Type SWA can be manufactured in other shapes like oval and oblong (stadium). There is no specific standard for this type of gasket. When ordering, complete specifications must be provided inside dimensions (A x B), width (b) and thickness (s) or a drawing

Oval Shape



Dim.: AxBxbxs (mm)

Oblong (stadium) shape



Dim.: AxBxbxs (mm)

GASKET ORDERING EXAMPLE

Spiral Wound Gasket Style: SWA

Size : A x B x b x s

Winding : AISI / SS316

Filler : Graphite 98%

Certification / Approval

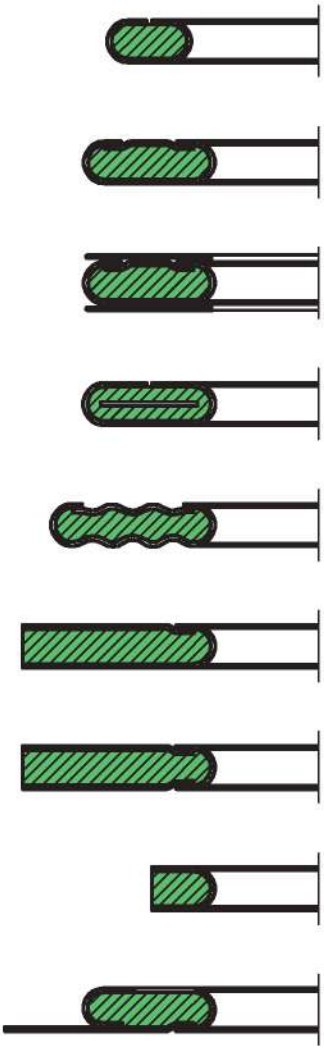
TAT- SHELL Approved product

METAL JACKETED GASKETS

Metal-jacketed gaskets are particularly suitable for sealing flat surfaces of heat exchangers, gas pipes, cast iron flanges, and autoclaves and similar. By their sealing efficiency, provided by exerting strong pressure on circular rims of the flanges, metal-jacketed gaskets can stand up to 30% deviation from the initial thickness, which is very useful in case of irregular or faulty flange rims. The chemical compatibility of the metal and the medium being sealed should be considered. The metallic jacket is normally 0.4 mm thick. Other materials are available on customer request. The metal jacketed gaskets come in sizes according to EN 1514-4 ASME B 16.21 standards. Metal-jacketed gaskets are produced in several types to meet the requirements of the most demanding applications.

APPLICATION

- Refineries
- Chemical and petrochemical industry
- Gas production and distribution
- Petrochemical industry
- Pumps and valves
- Boilers and flues



GASKET PROFILES

Metal jacketed gaskets can be manufactured in the given profiles to profile shapes.

MATERIALS FOR COATING

Material	AISI/ASTM	DIN EN 10 027–2 Material No.
Low carbon steel	Soft iron (CS)	1.0333
Stainless steel	AISI 304	1.4301
Stainless steel	AISI 316, 316 L	1.4401,1.4404
Stainless steel	AISI 321	1.4541
Stainless steel	AISI 316 Ti	1.4571
Monel (NiCu30Fe)	Alloy 400	2.4360
Copper	Copper	2.0090
Brass	Brass Ms 63	2.0321
Titanuim	B348 Gr.1	3.7025

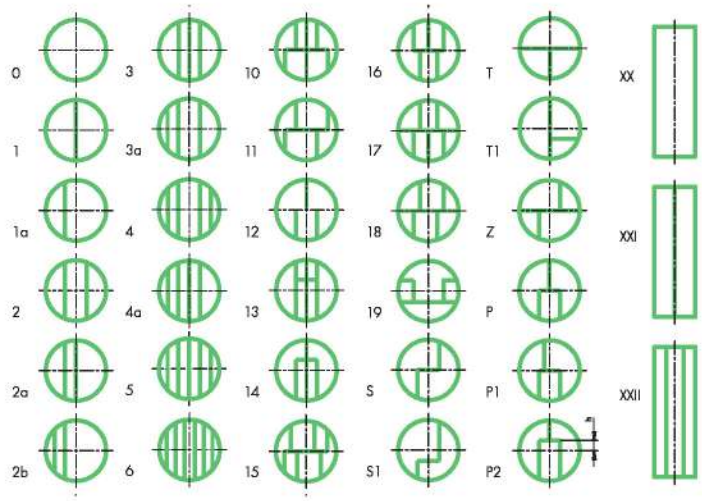
FILLER

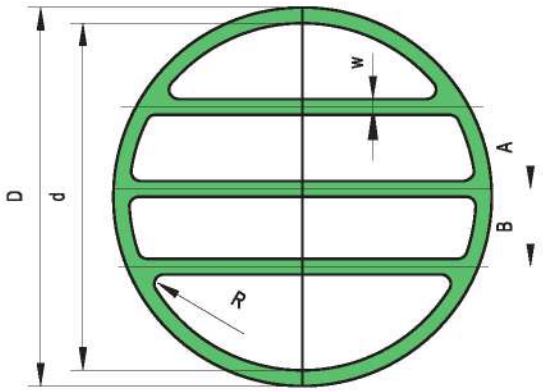
The most common filler in metal jacketed gaskets is expanded graphite. Other fillers like ceramic, CSF or other can be used.

STANDARD SEALING FILLER – TEMPERATURE RANGE		
Graphite	-200 °C	+550 °C
CSF	- 40 °C	+250 °C
Ceramic	-200°C	+1100°C

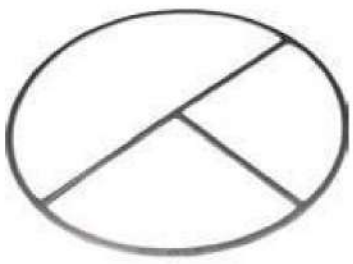
SHAPES

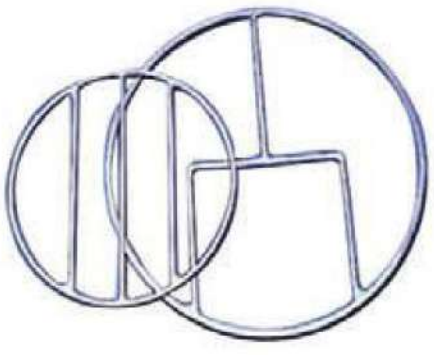
Metal jacketed gaskets can be produced in different shapes with or without bars as shown in the drawing.





OT1, Type 3

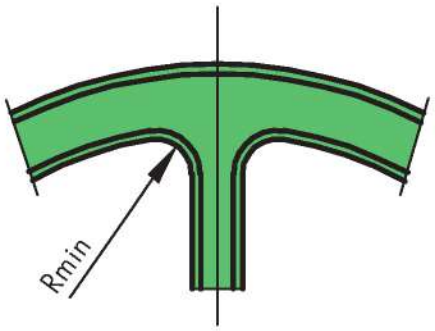




GASKETS WITH INTEGRATED BARS

Usually, double-jacketed gaskets for heat exchangers are manufactured with integrated bars. There is a radius between the bars and an internal diameter of the gaskets.
The values of the corresponding radius for the most commonly used metals and alloys are shown in the following table. If a radius is less than R min, the material can crack, reducing the sealing properties of the gaskets.

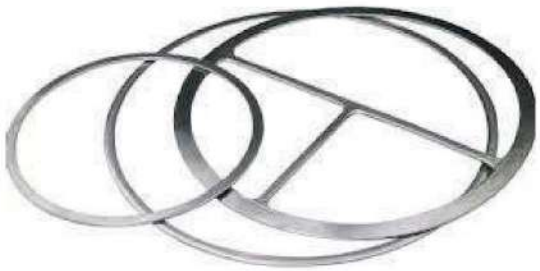
GASKET MATERIAL and R min	
Copper	8 mm
Soft iron (CS)	8 mm
Brass, Monel	10 mm
Stanless steel	10 mm

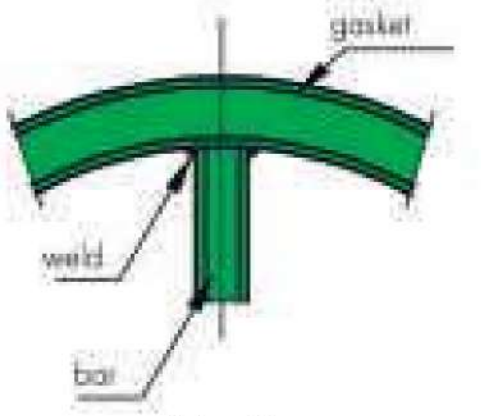


Integrated bars

GASKETS WITH WELDED BARS

Gaskets with welded bars have eliminated one of the greatest problems of conventional gaskets, which are cracks in the radius area.
The primary and secondary seals are continuous all around the gasket. The gasket has an excellent sealability, reducing leaks to the environment. The bars which seal between the heat exchanger passages are plasma or TIG welded with spot welds at each end.





Welded bars

DIMENSIONS AND SIZES

Standard sizes are made according to EN 1514-4 or ASME B 16.21 standards. Non standard sizes are available on request. Outside diameter of metal jacketed gaskets can be up to 4000 mm, thickness of the gasket can be from 2 to 12 mm.

STANDARD DIMENSIONS	
Gasket thickness	3,2 mm
Gasket width	10, 13 and 16 mm
Bar width	8,10 and 13 mm

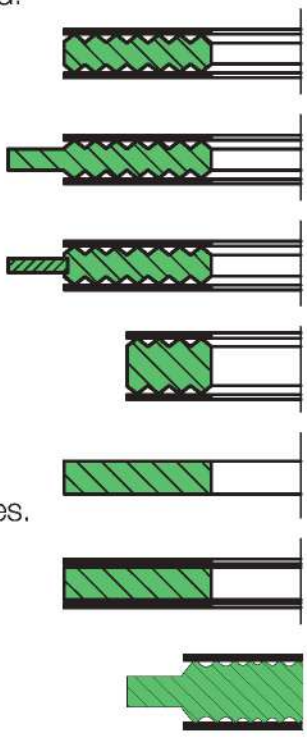
Spira Power grooved or Kammprofile gaskets consist of a metal core with concentric grooves and a soft layer of sealing material bonded to both grooved faces. Grooved gaskets are an excellent solution for extreme operating conditions. Non-metal layers ensure that flanges remains undamaged while a metal core ensures the gasket's stability. Grooved gaskets provide the highest level of sealing integrity and have the ability to seal at low seating stress. Very low diffusion level and very high density ensure very low leakage rates. Grooved gaskets are proven to be very effective where temperatures and pressures are constantly fluctuating. They can be used as an alternative for applications associated with metal jacketed gaskets and are ideal choice for heat exchanger services

GENERAL CHARACTERISTICS

- Camprofiles resist pressures up to 400 bar, and depending on the sealing layer gaskets can resist temperatures up to approx. +1000°C.
- Gaskets are suitable for applications according to various specifications for flanges (DIN, ASTM, EN, JIS, etc.) and a very wide seating stress range (highly suitable for varying temperatures and pressures, less sensitive to assembly faults, suitable for light and heavy designed flanges).
- Grooved gaskets does not damage the flange surfaces and can be easily removed.

APPLICATION

- Chemical and petrochemical industry
- Nuclear power stations
- Steam generation
- Power plants
- Heat exchangers



STANDARD GASKET PROFILES

At Spira Power Grooved gaskets are made in several different profiles to profile shapes.

CERTIFICATION / APPROVAL

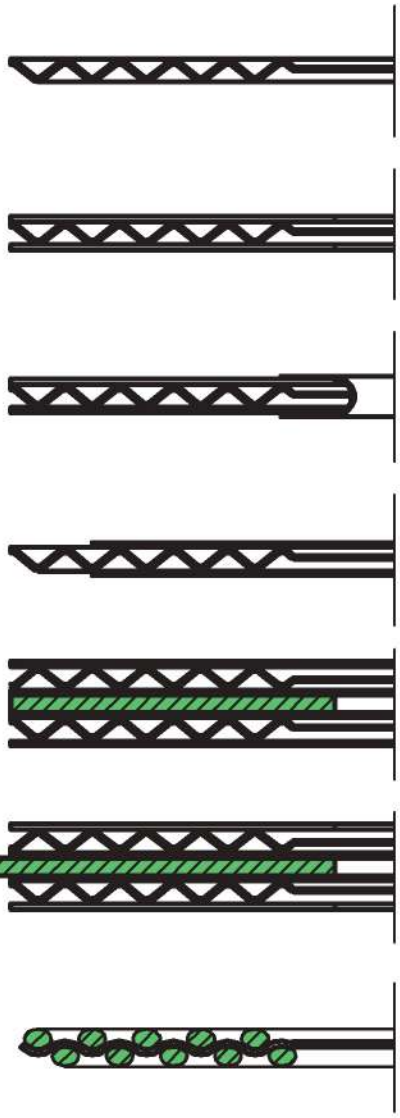
TAT- SHELL Approved product

CORRUGATED GASKETS

Spira Power corrugates gaskets are universally usable sealing elements. Due to the different possibilities of manufacturing in the form of rings, ovals, long ovals or frames, which can be with or without ribs, holes, and fixing loops, the field of application for these gaskets is expanding continuously. The gaskets can be completely or partly covered with a soft layer. Even in cases of uneven flanges a satisfactory tightness could be achieved with adequate flexible soft layers.Corrugated gaskets are used in applications where mechanical strength , thermal conductivity , temperature and corrosion resistance are requested. The field of application for these gaskets is growing.

APPLICATION

- Pipes and values
- Chemical industry
- Vacuum applications
- Low pressure and high temperature applications



GASKET PROFILES

At Spira Power corrugated gaskets are produced in different profiles and dimensions.

MATERIALS

Standard materials for the core are carbon steel, SS 316L, SS 304, SS 321. Other materials are available on request. Standard thickness of the metal part is 1.3 mm while the thickness of the layer on each side is 0.8 mm, However other thickness also available on customer's request.

STANDARD MATERIALS

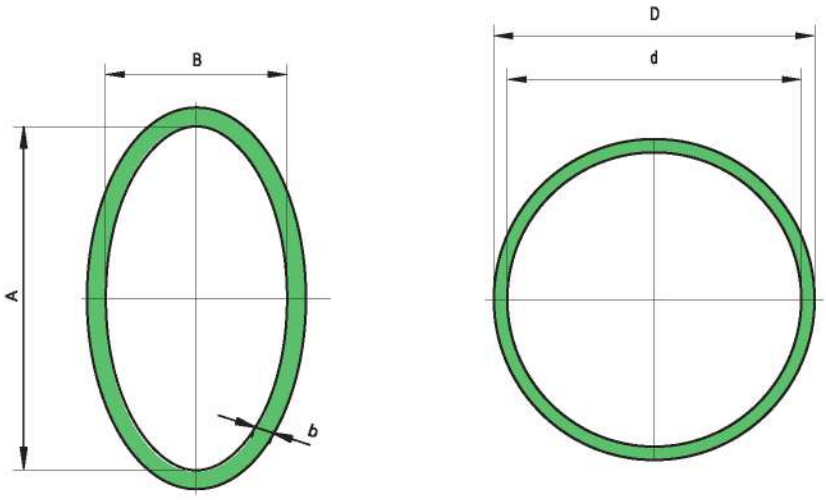
Material	ASTM	DIN 10 027-2 Material No.
Low carbon steel	Soft iron (CS)	1.0333
Stainless steel	AISI 304	1.4301
Stainless steel	AISI 316, 316 L	1.4401, 1.4404
Stainless steel	AISI 321	1.4541
Stainless steel	AISI 316 Ti	1.4571

LAYER

Standard material of layers: expanded graphite, CSF, PTFE, mica.

SHAPE AND DIMENSION

Shapes of corrugated gaskets can be circular, oval, rectangular, etc. Dimensions of the gaskets are available from 50 mm to 4000 mm according EN or ASME standard or in non-standard dimensions, according to custumer 's request.



Type: A x B x b (oval)

GASKET ORDERING EXAMPLE

Standard dimension
Corrugated gasket NT 1A
EN 1514-4 DN 100, PN 40
Material : AISI 316/Graphite

Non-standard dimension
Corrugated gasket NT 1A
D = 730 mm, d = 700 mm, s = 3,5 mm
Material : AISI 316/Graphite

RING JOINT GASKETS(RTJ)

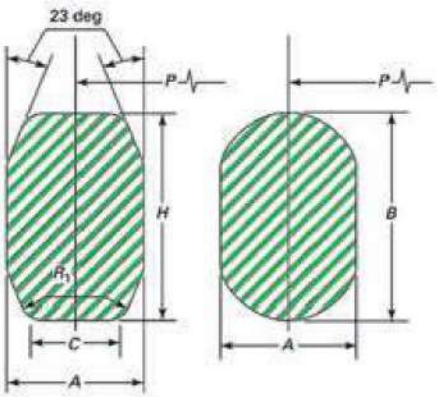
RING JOINT GASKETS(RTJ) are designed for high pressure applications. They are available in a variety of forms to suit different flanges formats. RTJs can be used for very high and/or fluctuating pressures up to 1500 bar, depending on the profile selected. Material selection determines use for high temperatures up to 1000°C and in aggressive media. To ensure proper sealing the surfaces of contact between the gaskets and flange have to be carefully processed. The small sealing area and high contact pressure results in excellent seal ability.

Typical Ring Joint Gaskets Materials

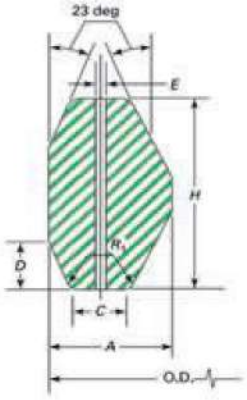
Material	Designation	Max. Hardness Rockwell B	Max. Hardness Brinell
Soft Iron	D	56	90
Low Carbon Steel	S	68	120
4-6 Chrome	F-5 Identification designates ASTM Specification	72	130
Stainless Steel 304	SS -304	83	160
Stainless Steel 316	SS -316		
Stainless Steel 321	SS -321		
Stainle ss Steel 347	SS -347		
Stainless Steel 410	SS -410	86	170
Alloy 625	INC 625	89	180
Ally 825	INC 825	92	195

STANDARDS FOR RING JOINT GASKETS USED WITH FLANGES		
RTJ Style	RTJ Standards	Flange Standard
R	ASME B 16.20 API 6A	ASME B16.5, ASME B1647 Series
RX	ASME B16.20 API 6A	A API 6B
BX	API 6A	API 6BX

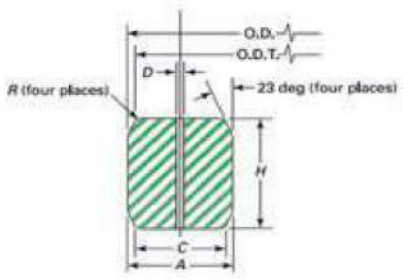
Type R Ring Gasket Dimensions and Tolerances



Type RX Ring Gasket Dimensions and Tolerances



Type BX Ring Gasket Dimensions and Tolerances



Nominal Pipe Size (NPS)	SIZE DESIGNATIONS FOR OVAL OR OCTAGONAL RINGS							
	FLANGE PRESSURE CLASS							
	150	300-600	900	1500	2500	API 6A (psi)		
½"		R-11	R-12	R-12	R-13	2000	3000	5000
¾"		R-13	R-14	R-14	R-16			
1.0"	R-15	R-16	R-16	R-16	R-18			
1 ¼"	R-17	R-18	R-18	R-18	R-21			
1 ½"	R-19	R-20	R-20	R-20	R-23			
2.0"	R-22	R-23	R-24	R-24	R-26			
2 1/16"						R-23	R-24	
2 ½"	R-25	R-26	R-27	R-27	R-28			
2 9/16"						R-26	R-27	
3.0"	R-29	R-31	R-31	R-35	R-32			
3 1/8"						R-31		R-35
3 ½"	R-33	R-34	R-34					
4.0"	R-36	R-37	R-37	R-39	R-38			
4 1/16"						R-37		R-39
5.0"	R-40	R-41	R-41	R-44	R-42			
5 1/8"						R-41		R-44
6.0"	R-43	R-45	R-45	R-46	R-47			
7 1/16"						R-45		R-46
8.0"	R-48	R-49	R-49	R-50	R-51			
9.0"						R-49		R-50
10.0"	R-52	R-53	R-53	R-54	R-55			
11.0"						R-53		R-54
12.0"	R-56	R-57	R-57	R-58	R-60			
13 5/8"						R-57		
14.0"	R-59	R-61	R-62	R-63				
16.0"	R-64	R-65	R-66	R-67				
16 ¾"						R-65		
18.0"	R-68	R-69	R-70	R-71				
20.0"	R-72	R-73	R-74	R-75				
20 ¾"							R-74	
21 ¼"						R-73		
22.0"	R-80	R-81						
24.0"	R-76	R-77	R-78	R-79				
26.0"		R-93	R-100					
28.0"		R-94	R-101					
30.0"		R-95	R-102					
32.0"		R-96	R-103					
34.0"		R-97	R-104					
36.0"		R-98	R-105					

RING JOINT GASKETS(RTJ)

RX RING DESIGNATIONS FOR API 6B FLANGES				
API Ring Number	SIZE OF CHART FLANGE			
	2000 psi	2900 psi	3000 psi	5000 psi
RX-20	1 ½"		1 ½"	1 ½"
RX-23	2 1/16"			
RX-24			2.0"	2.0"
RX-26	2 ½"			
RX-27			2 ½"	2 ½"
RX-31	3.0"		3.0"	
RX-35				3.0"
RX-37	4.0"		4.0"	
RX-39				4.0"
RX-41	5.0"		5.0"	
RX-44				5.0"
RX-45	6.0"		6.0"	
RX-46				6.0"
RX-47				8.0"*
RX-49	8.0"		8.0"	
RX-50				8.0"
RX-53	10.0"		10.0"	
RX-54				
RX-57	12.0"		12.0"	
RX-63				14.0"
RX-65	16.0"			
RX-66			16.0"	
RX-69	18.0"			
RX-70			18.0"	
RX-73	20.0"			
RX-74			20.0"	
RX-82		1.0"		
RX-84		1 ½"		
RX-85		2.0"		
RX-86		2 ½"		
RX-87		3.0"		
RX-88		4.0"		
RX-89		3 ½"		
RX-90		5.0"		
RX-91		10.0"		
RX-99	8.0"*		8.0" *	
*Crossover flange Connections				

BX RING DESIGNATIONS FOR API 6BX FLANGES						
API Ring Number	SIZE OF CHART FLANGE (Inches)					
	2000 psi	3000 psi	5000 psi	10000 psi	15000 psi	20000 psi
BX-150				1 11/16"	1 11/16"	
BX-151				1 13/16"	1 13/16"	1 13/16"
BX-152				2 1/16"	2 1/16"	2 1/16"
BX-153				2 9/16"	2 9/16"	2 9/16"
BX-154				3 1/16"	3 1/16"	3 1/16"
BX-155				4 1/16"	4 1/16"	4 1/16"
BX-156				7 1/16"	7 1/16"	7 1/16"
BX-157				9.0"	9.0"	9.0"
BX-158				11.0"	11.0"	11.0"
BX-159				13 5/8"	13 5/8"	13 5/8"
BX-160			13 5/8"			
BX-161						
BX-162			16 ¾"	16 ¾"		
BX-163			18 ¾"			
BX-164				18 ¾"	18 ¾"	
BX-165			21 ¼"			
BX-166				21 ¼"		
BX-167	26 ¾"					
BX-168		26 ¾"				
BX-169				5 1/8"	5 1/8"	
BX-170				6 5/8"	6 5/8"	
BX-171				8 9/16"	8 9/16"	
BX-172				11 5/32"	11 5/32"	
BX-303	30.0"	30.0"				

Ring joint gaskets come in two basic types, an Oval cross section and an Octagonal cross section. The octagonal cross section has a higher sealing efficiency than the oval and would be the preferred gasket. However, only the oval cross section can be used in the old type round bottom groove. The newer flat bottom groove design will accept either the oval or the octagonal cross section. RTJ assemblies seal by an initial line contact or an edging action as the compressive forces are applied. Dimensions for standard ring joint gaskets and grooves are covered in ASME B16.20 and API 6A, API 17D and ASME B16.5/B16.20.

RX Ring Gaskets are similar in shape to the standard octagonal ring joint gasket but their cross section is designed to take advantage of the contained fluid pressure in effecting a seal. They are made to API 6A and interchangeable with standard Octagonal rings for oil field drilling and production applications in API 6B flanges. RX is used at pressures up to 15,000 psi (103MPa). Standard sizes are stocked in low carbon steel, 304 and 316.

BX Ring Gaskets differs from the standard oval or octagonal shape since it is square in cross section and tapers in each corner. They can only be used in API 6BX flanges. BX is used at pressures up to 15,000 psi. Standard sizes are stocked in low carbon steel, 304 and 316.

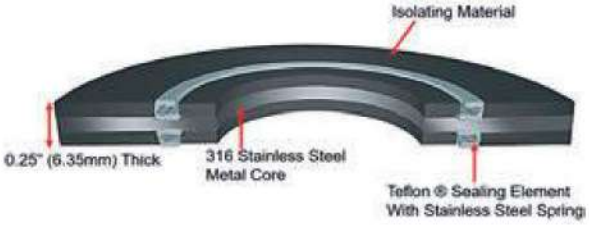
Flange Isolation Kits are designed to restrict the electrical conductivity between joint connections and to combat the effects of galvanic corrosion often found in flanged pipe systems, by eliminating metal to metal contact, as the static electrical current is halted to aid in the cathodic protection of the piping system. These kits can be used to control stray electric currents in piping at oil, gas, water, refineries and chemical plants in order to increase the safety of the production system.

Below are the design and selection of materials used in Flange Insulation Kit Gasket.

DEFENDER™
Sealing/Isolating Gaskets and Flange Isolation Kits

The **Defender™** sealing and isolating gasket is designed for critical applications. Manufactured with a 316 stainless steel core retainer and laminated on both sides with high strength G10 laminate, the Defender™ gasket is resistant to deformation under load and is used when electrical isolation and corrosion control are required on pipes containing gas, natural gas, oil and other hydrocarbon based medias up to 392°F (200°C). Available for flat face, raised face and ring type joint flanges from ½" to 32", ANSI 150-2500# and API 2-10K. The Defender™ gasket is an engineered solution that eliminates costly leaks and provides a solution for fugitive emissions.

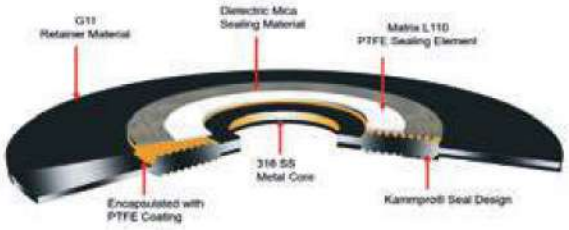
- *Gasket Type: E or F*
- *Seal Elements: KMT (Kammpro/Mica/PTFE)*
- *Pressure Class: ANSI(150#-2500#), API (2-10K), PN (20-420)*
- *Sizes: ½" through 48" diameter*
- *Temperature Range: Cryogenic-303°F (FS G10), -100-392°F (FS G11)*



DEFENDER™ FS Isolation Gaskets

Defender FS gaskets were engineered for Fire Safe, extreme, high reliability sealing and electrical isolation in critical service applications. They are designed to withstand the rigorous API standard 6FB (Third Edition) test and therefore provide a solution for those who want to electrically isolate their flange while also requiring protection against the introduction of fire in and around the flange. The Defender FS sealing/isolating gasket and kit, which includes sleeves and isolation washers, exceeds the pressure-containing capabilities in standard 6FB (Third Edition) as outlined by API and is able to maintain its fire safe characteristics throughout the entirety of the test. These gaskets are well suited for high reliability sealing and electrical isolation critical service applications and locations where highly volatile fluids are present.

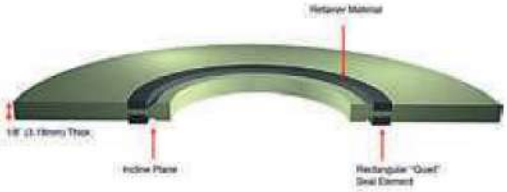
- *Gasket Type: E or F*
- *Seal Elements: KMT (Kammpro/Mica/PTFE)*
- *Pressure Class: ANSI(150#-2500#), API (2-10K), PN (20-420)*
- *Sizes: ½" through 48" diameter*
- *Temperature Range: Cryogenic-303°F (FS G10), -100-392°F (FS G11)*



ISOGUARD™ Sealing/Isolating Gaskets and Flange Isolation Kits

The **Isoguard** sealing/isolating gasket system is designed for general applications where electrical flange isolation and corrosion control are required on pipes containing water/wastewater, gas, natural gas, oil and other hydrocarbon based medias up to 392°F (200°C). Available for flat face, raised face and ring type joint flanges, this system consists of a retainer with an incline-plane seal groove designed to optimize each seal's elastic memory, in conjunction with a proven rectangular sealing element ("Quad" ring). This design guarantees low bolt load requirements and high sealing reliability. IsoGuard systems are available with a variety of retainers and seal elements.

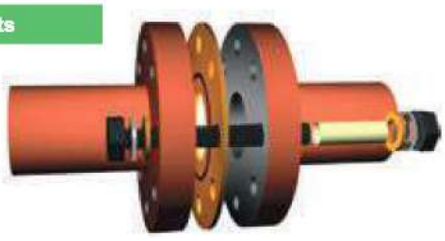
- *Gasket Type: E or F*
- *Seal Element: Self-Energizing "Quad" ring (EPDM, Nitrile, PTFE, Viton)*
- *Gasket Retainer: G10, G11, Phenolic, G7*
- *Pressure Class: Up to 1500#, AWWA, API 5K and PN 250*
- *Tested to Shell and NSF 61 Certification Standards*
- *Size Range: ½" through 120"+ diameter*
- *Temperature Range (°F): Cryogenic-303°F (G10), -100-392°F (G11) -65-200°F (Phenolic), -100-428°F (G7)*
- *Temperature Range (°C): Cryogenic-186°C (G10), -73-200°C (G11), -54-93°C (Phenolic), -54-220°C (G7)*



Recommended Standard Packaged Sleeve / Washer Sets

Defender™ Gasket
(Mylar Sleeves, Steel ZP and G-10 Washers)
(G10 Sleeves, Steel ZP and G10 Washers)

IsoGuard™ Gasket
(Mylar Sleeves, Steel ZP and G10 Washers)
(G10 Sleeves, Steel ZP and G10 Washers)



Type F
Gasket Installed Inside the bolts

Type E
Gasket Installed Over the bolts

COMPRESSION PACKINGS & DIE MOULDED RINGS

COMPRESSION PACKINGS

Spira Power is a leading supplier of high quality packing materials for pumps and valves. Our compression packing is used to provide a 'compression seal', hence the term Compression packing is also called valve packing, pump packing, gland packing, braided packing and mechanical packing. Packing is a very reliable sealing device that is simple to install, cost effective and one that's easy to maintain. Compared to complex alternatives, it is cost effective when considering plant down time and maintenance costs. Many of our packings will dramatically reduce your stockholding levels - as one carefully selected length-form product can often be used for many different valves, pumps and other fluid handling plant at your site.

PRODUCTS STYLES

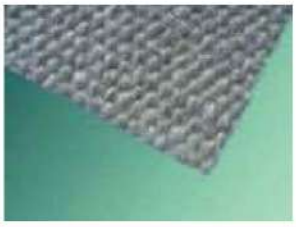
Style 3010- Expanded Pure Graphite
Style 3011- Expanded Pure Graphite With Thin Inconel Wire Reinforcement

DIE MOLDED RINGS

Die Molded Seals are manufactured from pure graphite using special moulded tools, they are produced applications where tight dimensional tolerances are critical. The molding process creates a high-density ring providing resilience regardless of thermal excursions. Spira Power's ability of manufacturing proces control dimensions, density and packing. The packing can also be produced with metal caps for high temperature/pressure applications.

Properties

Minimum Operating temp.	: -240 Deg C to 430 Deg C
Max Steam Temperature	: 650 Deg C
PH	: 0-14
Max. Static Pressure	: 350 Bar
Max Dynamic pressure	: 20 Bar
Max. Running speed	: 5 m/s

Style	Specification	Temperature & Application
SP-1260- CERAMIC CLOTH (E GLASS)		**650~1050°C**
	• ceramic fiber fabric • fiberglass or steel wire reinforced • 1.2-3.0mm thickness	• heat insulation curtain • large area thermal insulation • radiant heat shielding • flexible fabric expansion joints
SP-1261- CERAMIC CLOTH (SS WIRE)		**750~1050°C**
	• ceramic fiber fabric heat treated • reinforced by steel wire • 1.2-3.0mm thickness	• heat insulation curtain • large area thermal insulation • radiant heat shielding • flexible fabric expansion joints
SP-1250- CERAMIC TAPE (E- GLASS)		**650~1050°C**
	• ceramic fiber woven tape • 20mm-500mm width	• high temperature resistant electrical cable, wire covering • high temperature pipe wrapping
SP-1251 CERAMIC TAPE (SS - WIRE)		**650~1050°C**
	• ceramic fiber tape • fiberglass or steel wire reinforced • coated with AL foil	• shielding against heat radiation • thermal wrapping for exhaust pipe
SP-1240 CERAMIC ROPE (E GLASS)		**650~1050°C**
	• ceramic fiber rope • twisted • 10mm-30mm	• expansion joint • seals for stoves and ovens • bulb in tadpole gaskets
SP-1241 CERAMIC SQUARE ROPE (E GLASS)		**650~1050°C**
	• ceramic fiber rope • square braided • 6x6mm-50x50mm	• thermal insulation and sealing for stove • burner, chimney door sealing • seal for heat exchanger, kiln car

EXPANSION JOINTS/EXPANSION BELLOWS

Pipe Expansion Joints are necessary in systems that convey high temperature substances such as steam or exhaust gases, or to absorb movement and vibration. A typical joint is a bellows of metal (most commonly stainless steel), plastic (such as PTFE), fabric (such as glass fiber) or an elastomer such as rubber.

A bellows is made up of a series of convolutions, with the shape of the convolution designed to withstand the accept axial, lateral, and angular deflections. Expansion joints are also designed for other criteria, such as noice absorption, anti-vibration, earthquake movement, and knwn as "compensators", as they compensate for the thermal movement. Typical pump and piping layout using expansion joints.

Expansion joints is a specially engineered product inserted in a rigid piping system to achieve one or more or the following.

1. Compensate for misalignment
2. Absorb pipe movement/stress
3. Reduce system / mechanical noise
4. Prevents stress due to expansion / contraction
5. Insulate against the transfer of noise and vibration
6. Greater recovery from movements
7. High resistance to shocks

Application areas

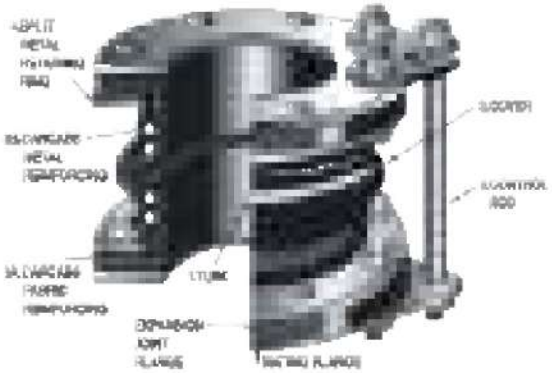
- Cement industry
- Chemical industry
- Glass Industry
- Metal finishing
- Offshore industry
- Paint-spray lines
- Plant engineering
- Power Station
- Pulp and peper industry
- Refineries
- Shipbuilding
- Steel mills
- Sugar Industry
- Heating and cooling devices
- Materials handling technologies
- Water Pipes
- Desalination plants
- Compressors
- Wood processing Industries

Expansion Joints - Fabric

Fabric expansion joints perform a function of compensating for duct misalignment and duct thermal growth typical in power plants and other ducting systems
- Composite layer bellows
- Anatomy bellows
- Single Type layer bellows

- Proven design & construction for continuous high temperature environment, even up to 1000 °C.
- High resistance to corrosion.
- Size as large as 6000mm dia. and any transportable size in rectangular as total assembly.
- Expertise to develop and supply for every end use in Power. Metallurgical and process plans.

Expansion Joints - Rubber

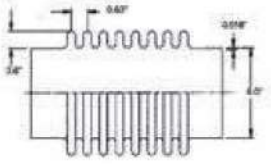


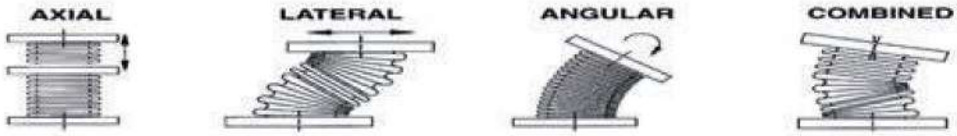
Rubber expansion joints, designed by engineers and fabricated by skilled craftsmen, are used in all systems conveing fluids under pressure and or vacuum at various temperatures.
- Single spool wide arch
- Multiple arch type
- Filled arch type
- Wide arch type
- Spool type double arch
- Rectangular / Circular / Square bellows

- Test pressure up to 24 bar (up to 300NB)
- Cyclic movement test for 5000 cycles under design pressure conducted on sizes 1600NB, 2100NB and 2200NB bellows.
- Manufactured sizes up to 3600mm (144 inches)*.
- Safety factor built in upto4:1.
- Low spring rates.
- Galvanized carbon steel or stainless steel split backup rings.

Expansion Joints - Metal

- (Also called compensators) are compensating elements for thermal expansion and relative movement in pipelines, containers and machines. They consist of one or more metal bellows, connectors at both ends, and tie rods that depends on the application.
- Round Single layer bellows
- Round Multiple layer bellows
- Rectangular Single layer bellows
- Universal Pipe expansion joints
- Inline Pressure Balanced
- Temperature range of media -40 to 300°C
- Good resistance to milling, heat aging and corrosiveness and long service life
- Shock absorption and noise decrease, heat and dust insulation
  Economical end usage.
- Provides lower initial costs in piping & construction work
- Low movement forces required
- Reduce fatigue factor and heat loss
- Differentiated according to the three basic types of movement: Axial, Angular and Lateral expansion joints





FASTENERS

Spira Power's market presence, vast experience & existing infrastructure in the related products have given us the confidence to manufacture and supply fasteners of various specifications.

Stringent, In-House Quality Control

As we know the quality is the key for any business success, products are thoroughly checked for dimensions, finishing and to meet all industry standards/clients specific requirements.

Quality Sourcing

Spira have lots of experience in the steel industry, that helps us to source the best raw materials, to create our high-quality fasteners.

Bolting style and material grades for flanged joints are selected by service temperature, and corrosivity of the environment.
Bolt Lengths and Sizes: Bolt length and diameter are determined by the flange standard used. Each of the flange standards has a method for the determination of bolt length.

The fasteners are designated by "grade" denoting tensile strength and intended use, as follows: Grade description

- **Grade A** Bolts and studs having a minimum tensile strength of 60 ksi (414 MPa) and intended for general use.
- **Grade B** Bolts and studs having a tensile strength of 60 to 100 ksi (414 to 690 MPa) and intended for flanged joints in piping systems with cast iron flanges.
- **Grade C** Non headed anchor bolts, either bent or straight having a tensile strength of 58 to 80 ksi (400 to 550 MPa) and intended for structural anchorage purposes

Finished hex nuts are the most common type. Heavy hex nuts are used in high temperature and high pressure applications. This is the most common type of nut for flanged joints. Heavy hex nuts are slightly larger and thicker than finished hex nuts.

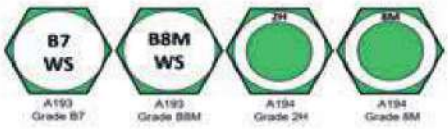
ASTM A193 covers alloy and stainless steel bolting material for pressure vessels, Valves, flanges, and fittings for high temperature or high pressure service, or other special purpose applications.

ASTM A194 covers a variety of carbon, alloy, and martensitic and austenitic stainless steel nuts. These nuts are intended for high-pressure or high-temperature service, or both.

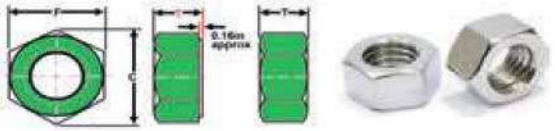
For pipe flange connections, the dimensions of the Stud Bolts are defined in the flange standard ASME B16m with the material qualities for studs are defined in the different ASTM standards, and are indicated by Grade.

The nut and washer must be compatible with the selected stud-bolt material to avoid galvanic corrosion.

Marking of Stud Bolts Thread rods and nuts must be marked by the manufacturer with a unique identifier to identify the manufacturer or private label distributor, as appropriate. Below are a number of ASTM examples.



Hex Nuts (dimensional data) are defined in ASME B18.2.2, and even as bolts the threading in ASME B1.1. Depending on a customer specification, nuts must be both Sides chamfered or with on one side a washer-face.



Studs are measured parallel to the axis
(L) from the first to the thread without the chamfers (points) (S) = free threads equals 1/3 time bolt dia.

Hex bolts are measured from under the head to the top of the bolt

Note..
To allow the use of hydraulic tensioning equipment, larger dimension studs shall be often one diameter longer than "standard". That bolts to have plastic end cap protection.

The common coating materials are:

Electro zinc plating	Electro cadmium plating
PTFE Coating	Hot-dip galvanizing
Zinc-Nickel coating	Aluminum coating
Xylan	Xylar
Takecoat 1000	

O-Rings are designed to totally confined by the joint configuration and usually fitted into a groove and compressed during assembly between two or more parts, creating a seal at the interface. O-Rings are one of the most common seals used in machine design are inexpensive and easy to make, reliable, and have simple mounting requirements. They can seal thousands of psi pressure when the design of the joint allows this to be needed

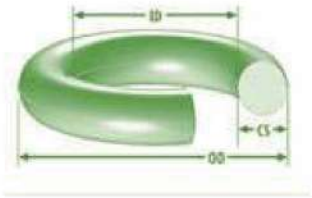
Custom sizes of almost any dimension are possible, such as molded small mm sizes through to large diameters by continuous extrusion cord which would be spliced and vulcanized into as a single seal.

O-ring compounds are formulated to meet the most stringent industry standard and customer requirements.

STANDARD MATERIALS WITH TEMPERATURE LIMIT		
Material	**Low end Operating Temperature**	**High end Operating Temperature**
Buna-N - Nitrile	-30°F	250°F
EPDM	-40°F	300°F
FFKM (Perfluoroelastomer)	0°F	500°F
Fluorosilicone (FVMQ)	-60°F	350°F
HNBR	-20°F	300°F
Neoprene®	-30°F	212°F
Nitrile - Buna-N	-30°F	250°F
Polyacrylate	-10°F	300°F
Polyurethane	-40°F	175°F
Silicone CLR	-60°F	430°F
Silicone GP	-60°F	400°F
Silicone LSR	-60°F	400°F
Viton®	-10°F	400°F

O-RINGS/ O-RING CORDS – INDUSTRIES SERVED	
Electronics	Gas and Petroleum
Chemical	Construction Equipment
Transportation	Automotive
Mining	Glass
Farm Equipment	Sporting Goods
Food and Beverages	Water
Power Generation	Waste Water Treatment

O-RINGS/ O-RING CORDS – APPLICATIONS	
Mechanical Pumps	Compressors
Relief and Emergency Valves	Glass Heat Exchanger Tube
Corrosive Fluid Seals	Mechanical Seals
Air Operated Vents	Butterfly Valves
Pressure Vessels	Gas Service
Seals in Diaphragm Pumps	Face Flange Seals
Filter Housing	Low Pressure Piping System
Large Diameter Access Cover	Dairy and Beverage Service
High Purity Water	Medical Equipment



NOTE:
To calculate an O-ring's outside diameter (OD) you may use this formula: 2(CS) + ID = OD If you have the OD and need to find the ID use this formula: OD - 2(CS) = ID

OTHER SEALS PRODUCTS WE CAN SUPPLY :
Oil Seal, Moulded Seals, Wiper Seals and Machined Seals and Pads

LASER & WATER JET CUTTING

In addition to our core gasket design and manufacturing we provide laser cutting services.

Precise control over the cut variables make it possible to cut a wide variety of materials

Laser Cutting variables

SS sheet	0.2* - 10 mm thick
MS sheet	0.2* - 20 mm thick
Brass sheet	0.2* - 5 mm thick
Copper sheet	0.2* - 4 mm thick
Aluminum sheet	0.2* - 6 mm thick
Galvanized iron	0.2* - 4 mm thick

Machine Bed Size: 3mtr x 1.5mtr

Water Jet Cutting
Metals & Non-Metals upto 100mm thk

*** Shims ranging from 0.05mm to 1mm shall also be cut in our laser machine**

CERTIFICATES AND APPROVALS

Certificate of Authority to use the Official API Monogram
License Number: 6A-2188

SPIRA POWER GASKET FACTORY LLC
Sohar Industrial Estate, Falaj Al Qabail
Sohar, North Al Batinah
Sultanate of Oman

API-6A

6A-2188

The scope of this license includes the following: Ring Gaskets

QMS Exclusions: Design and Development; Servicing; Customer Property

Effective Date: MARCH 31, 2022
Expiration Date: JANUARY 23, 2023

American Petroleum Institute

Test Report

Customer:	Spira Power Gasket Factory, LLC. Sohar Industrial Estate, 311 Falaj Al Qabail OM - Sultanate of Oman
Project number (amtec):	304 792
Report number:	304 792 1/-
Test procedure:	Shell Specification MESC SPE 85/300 (dated February 2019)
Material:	Kammprofile Gasket
Date:	February 18th, 2022
Pages:	13
Appendices:	27
Author:	Approval:
Dipl.-Ing. F. Herkert **Head of Laboratory**	B. Eng. M. Metzger **Test Engineer**

Test results are only relevant to the test objects submitted.

Test Report

Customer:	Spira Power Gasket Manufacturing, LLC. Unit 30, Street 22, Al Quoz Industrial Area 3, DUBAI, U.A.E.
Project number (amtec):	303 776
Report number:	303 776 1/-
Test procedure:	Shell Specification MESC SPE 85/300 (dated February 2016)
Material:	EPDM Gasket w/Metal Insert
Date:	June 20th, 2018
Pages:	12
Appendices:	27
Dipl.-Ing. F. Herkert **Head of Laboratory**	Dipl.-Ing. B. Unser **Test Engineer**

Test results are only relevant to the test objects submitted.

CERTIFICATE

In accordance with the Specification API 6FB (dated December 2006) the gasket

4 Inch Cl 300 Graphite SS316L Expanded Graphite Filled Spiral Wound Gasket with SS316 Inner and CS Outer Ring
4" Class 300

of the gasket manufacturer

Spira Power Gasket Factory, LLC.
Sohar Industrial Estate, 311 Falaj Al Qabail, Sultanate of Oman

was tested in respect of fire safety. The test was made under the following conditions:

Total bolt load:	547.6	kN
Burn period:	30	min
Average temperature calorimeters:	> 650	°C
Test pressure (absolute):	40	Bar
Test medium:	Water	
Leak rate complete test:	**0.03**	**ml/(inch · min)**

After the burn period the connection was to a flange temperature below 100 °C. During the cool-down the connection was still pressurized with the test pressure. Afterwards a pressure test for 5 min was done.

Therefore the gasket is in compliance with the tightness criteria of **1 ml/(inch · min)** of API 6FB during burn period, cool-down and pressure test. The gasket manufacturer can mark the gasket as **"Fire Safe"** in accordance to the specification API 6FB.

This certificate is only valid in combination with the test report 304 792 2/-

Lauffen, February 24th, 2022

AMTEC Advanced Measurement Messtechnischer Service GmbH

Dipl.-Ing. F. Herkert
Head of Laboratory

B. Eng. M. Metzger
Test Engineer

Our Valuable Clients

ADNOC
شركة تنمية نفط عمان
Petroleum Development Oman
أورپك Orpic
تكرير TAKREER
We Refine Right
NPCC
National Petroleum Construction Company
EGA
Drydocks World
OXY
هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

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