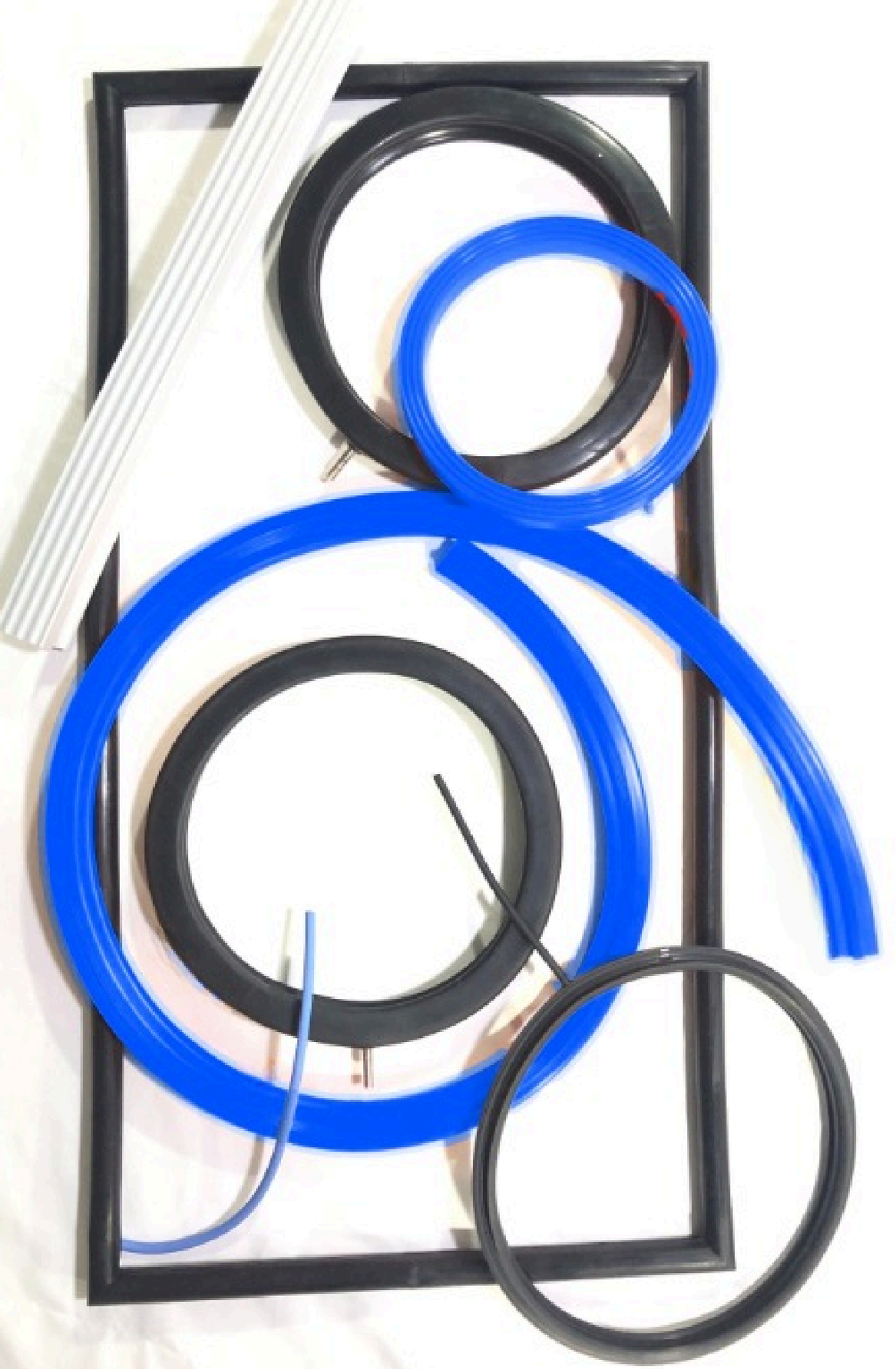
INFLATABLE SEALS

Product Catalogue

CONTENTS



INTRODUCTION

WHAT ARE INFLATABLE SEALS?

Inflatable seals are rubber seals which inflate (rather than compress) to offer contamination proof sealing in a wide range of applications. When compared to regular elastomeric seals, inflatable seals work effectively in irregular or misaligned surfaces, which enhances their sealing integrity. They are specifically designed to inflate, which ultimately helps to form a tight barrier between the mounting and striking surface. Inflatable seals are simpler to use as they demand less force while guaranteeing 100% sealing. It is the ideal fix for your unique sealing applications.

WHY USE Western Sealtech INFLATABLE SEALS?

With over 50+ years of experience, Western Sealtech has mastered the art of engineering customized inflatable seals to meet all customer specifications. Having an in-house tool room enables us to maintain standard cross sections in stock at all times. Our design team can custom engineer various designs for fabrication of clamps, offer a variety of air connectors, suggest the use of certain material for better seal performance, etc.Western Sealtech can also manufacture fabric strengthened fully molded inflatable seals to withstand aggressive temperature and pressure requirements.

ADVANTAGES

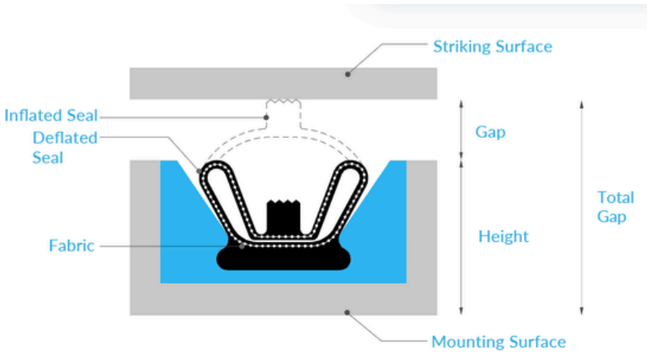
Inflatable seals offer a large number of advantages over traditional seals:

Seals uneven surfaces | Seals gaps with wide tolerances | Overcomes issues arising from compression set

Better operational seal life | Ideal for critical applications | Effective sealing in pressurized environment

TECHNICAL DETAILS

Parts of the Inflatable Seal



Seal inflation gap

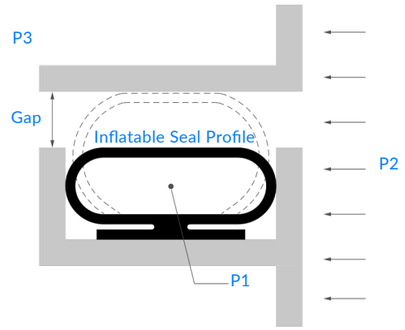
Inflation Gap should be as minimum as possible. Depending on the seal profile, for most inflatable seals, the ideal inflation gap should be anywhere between 4-5 mm. Very small gaps may cause problems during installation, as the groove and seal tolerances will affect the fitment. Very high gaps would cause increased wear and tear in seal material, thereby decreasing the seal life in the longer run.

Media

Seal material is selected depending upon the media that the seal is expected to operate in. The table on page 28 lists the available materials along with their properties.

Optimum inflation pressure

For most non-reinforced inflatable seals, the optimum Inflation pressure is up to 2 bar (28 PSI). Fabric reinforced inflatable seals on the other hand, can withstand pressures up to 12 bar (170 PSI). In special conditions, the inflatable seal could demand higher inflation pressures. In such cases, the operational life of the seal could get hampered. Further, the replacement and downtime costs will also increase over time. More than 90 percent of all inflatable seal applications can effectively seal with pressures up to 2 bar.



The illustration shown here demonstrates a typical sealing application and the information required in order to determine the optimum seal pressure, and hence making the right profile choice.

Here,

Gap = Clearance between deflated seal and sealing surface
P1 = Inflation pressure
P2 = Pressure inside equipment
P3 = Outside (atmosphere)
Differential Pressure = P2-P3

As a general rule, inflation pressure i.e. P1 should be 0.1-0.13 MPa (1-1.37 bar) higher than the differential pressure.

Let's take a look at the following examples to better understand this.

Example 1:

If P2 = atmosphere (1 bar) and P3 = atmosphere (1 bar), then the pressure differential across the seal = 0 MPa (0 bar). In this case, it is recommended that the seal be inflated at 1 bar i.e. P1 should be 1 bar.

Example 2:

If P2 = 0.15 MPa (1.5 bar) and P3 = atmosphere, then the pressure differential across the seal = 0.17 MPa (1.5 bar). It is recommended that the seal be inflated at pressures between 2.5 to 3 bar i.e. P1 should be 2.5 to 3 bar.

Temperature

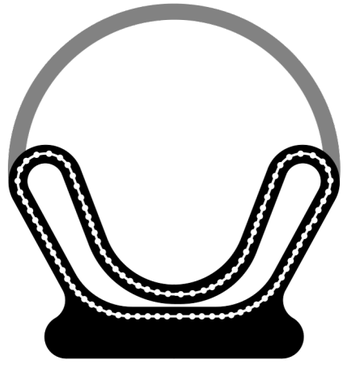
The temperature range depends on the seal material used. Approximately, the limits lie between -60°C and +300°C (-76°F and +482°F).

CLASSIFICATION OF INFLATABLE SEALS

BY CONSTRUCTION

Non-Reinforced Construction

Western Sealtech' non-reinforced inflatable seals are only made from elastomers. They are mostly extruded constructions; however, they can also be molded to meet specific dimensional parameters. Unlike fabric reinforced inflatable seals, non-reinforced constructions cannot withstand very high internal pressure. Being available at relatively lower prices, without compromising on quality and performance, non-reinforced inflatable seals are the preferred option across the globe for regular sealing applications.



Fabric Reinforced Construction

In applications involving extreme pressure and temperatures, or in rugged environments like ocean beds, high temperature furnaces, nuclear plants, etc. we recommend Western Sealtech molded fabric reinforced inflatable seals. The molding process eliminates joints and the fabric reinforcement adds to the seal's overall strength and resilience, hence offering superior seal shelf life. Western Sealtech fabric reinforced inflatable seals have complex manufacturing processes, requiring special tooling for the same. With over 50 years of industrial experience, Western Sealtech has developed the required tools and skill sets to manufacture standard as well as any custom engineered profile. Fabrics are carefully molded within the seals with high levels of precision. Depending upon the application of the seal, a fabric with appropriate properties is chosen.

Note: For Fabric Comparison Chart, please refer to the section: Technical Literature, on pg. 23

INFLATABLE SEALS | Classification of Inflatable Seals

BY EXPANSION

Western Sealtech inflatable seals inflate and deflate in three basic directions of operation. Each of these inflation directions come with their own performance parameters, such as height of inflation, bend radius, etc.

Axial

Radial-Inward

Radial-Outward

BY GEOMETRY

Western Sealtech inflatable seals can be constructed to practically any shape or size. We can supply inflatable seals as continuous loops for axial or radial expansion, in strip form with specially sealed ends, or in "U" or similar shapes with preformed corners. However, Western Sealtech has the expertise to custom mold them in unlimited number of sizes, configurations to meet client specifications. Various bend radii are available, and if a design calls for sharp or right-angled corners, the inflatable seal can be molded to the exact configuration.

Circular

Rectangular

U-Shaped

Strip

APPLICATIONS OF INFLATABLE SEALS

PHARMACEUTICAL

Inflatable seals are commonly used in the pharmaceutical industry, since they offer contamination free sealing.

Fluidized Bed Dryers

Inflatable Seals for Fluidized Bed Dryers:

Fluidized Bed Dryers are required for the uniform drying of granules and powders, which are to be used in tablet formation. Western Sealtech inflatable seals are used to seal the chambers of FBD. These seals ensure that no contaminant enters the system or no Active Pharmaceutical Ingredient (API) leaks from the system, both of which can pose a serious health threat to the end consumers or machine operators. The newer designs of inflatable seals can withstand positive or negative differential pressure. Western Sealtech has even developed explosion proof inflatable seals for 12 bar Fluidized Bed Dryers.

Inflatable Seals for Cleanrooms (Air Tight Doors):

Cleanrooms are constructed in such a manner so as to control the concentration of airborne particles and minimize introduction of contaminants. Western Sealtech manufactures custom engineered inflatable seals offer 100% leak proof sealing for the doors of cleanrooms, commonly known as Air Tight Doors.

MEGA FACTORIES

In a world of constant automation, efficient and accurate machinery is the need of the hour. Robotic machinery can be custom engineered to go levels beyond human capability, in areas like lifting weight, moving heavy objects, swiftness in processing, guaranteeing 100% accuracy and functioning tirelessly.

Robotic Clamp

Inflatable Robotic Clamps:

Western Sealtech has the expertise to design custom engineered inflatable seals, which can be easily installed in the hands of a robot. Robotic arms have their own clamps, which is fitted inside of the inflatable seal. While lifting any object, the seal inflates, allowing for clamping of the object. Once a firm grip is achieved, the object can be transferred to the desired location.

AEROSPACE

Rubber components are widely used in the aerospace industry. Their ability to seal and to withstand extreme temperatures, makes rubber parts the ideal preference for aerospace and aviation industries.

Inflatable Seal for Satellite Transportation Systems (STS):

Western Sealtech supplies its uniquely designed inflatable seals to be fixed inside the suspension cradle of the Satellite Transportation Systems, which have a vital role to play in securing the satellite against environmental hazards encountered during transportation. The role of the inflatable seal is to mitigate shock, vibration and handling loads, while maintaining a contamination proof environment.

Satellite Transportation Systems (STS)

Inflatable Seal for Vibration Testing Room:

Western Sealtech manufactures carefully designed inflatable seals that play a major role in sealing the vibration testing facility for satellites by creating a leak proof set up. This is of fundamental importance because during the testing phase, high frequency sound waves are generated, which in case of leakage, can pose serious health hazards to mankind as well as the surrounding environment.

Vibration Testing Room

Inflatable Seal for Aircraft Hangars:

Aircraft hangars need to be large as well as completely secure to protect the planes from weather damage and threats from other elements, like dust, debris, rodents, birds, etc. This can easily be taken care of by Western Sealtech custom engineered inflatable seals that offer dust proof sealing on all sides of the hangar door.

Inflatable Seal for Aircraft Canopies:

Aircraft cabins are pressurized using cooled and filtered air from the engines, for maintaining pressure equivalent to the altitude of the flight. This is essential for allowing hindrance free breathing for all on board the aircraft. Aircraft doors are tightly sealed with Western Sealtech inflatable seals, installed around the periphery of the door to expand radially outward.

Aircraft Canopy Seal

TRANSPORTATION

From automobiles and water vessels to railways and planes, transportation has a profound role to play in our daily lives. And rubber seals have extensive application in the transportation sector.

Railway Door

Inflatable Seals for Railway Doors:

Western Sealtech inflatable seals are used to seal sliding doors in passenger railcars to keep unwanted elements out, while enhancing rider comfort and safety. Not only do these inflatable seals offer a moisture barrier, they also contribute to damping vibrations and support sound absorptions, while conforming to regulations and standards for flame, smoke and toxicity. We have also developed compounds that comply with EN45545R22/23 HL3 standards.

BULK MATERIAL HANDLING

Bulk materials can be powdery, granular, lumpy, abrasive or viscous in nature, and their handling can get quite complex. This is also because at industrial levels, there can be no scope of leakage of such material. And hence, the need for effective sealing in bulk material handling applications.

Butterfly Valve

Inflatable Seals for Butterfly Valves:

Western Sealtech inflatable seals are ideal for butterfly valves. Butterfly valves are used in fluid handling systems dealing in highly abrasive material, slurries, etc., to stop or regulate the flow of material, most often for maintenance or safety purposes.

OVENS & FURNACES

For any heat processing function in any industry, industrial ovens and furnaces are sought after. Desirable functionality of the oven is directly dependent on its sealing design and efficiency.

Inflatable Seals for Oven/Furnace Doors:

Western Sealtech inflatable seals play a vital role in maximizing the furnace efficiency while minimizing heat and other emissions. Since furnaces operate at tremendously high temperatures, any form of heat loss is equivalent to energy loss, in turn leading to added expenses, along with posing serious health and environmental hazards.

Oven & Furnace Door

PAPER INDUSTRY

The pulp and paper industry has added value to the daily life of every individual. With the ever-increasing demand for paper made using eco-friendly materials and processes, the need for superior equipment technology is also rising.

Inflatable Seals for Doctor Blades:

In the milling process, doctor blades typically serve multiple purposes such as removing water, cleaning contaminants off the roll, inking of sheet, etc. Western Sealtech inflatable seals guarantee even contact pressure throughout the length of the doctor blade, which can even go up to 50 feet.

Doctor Blades in Paper Manufacturing

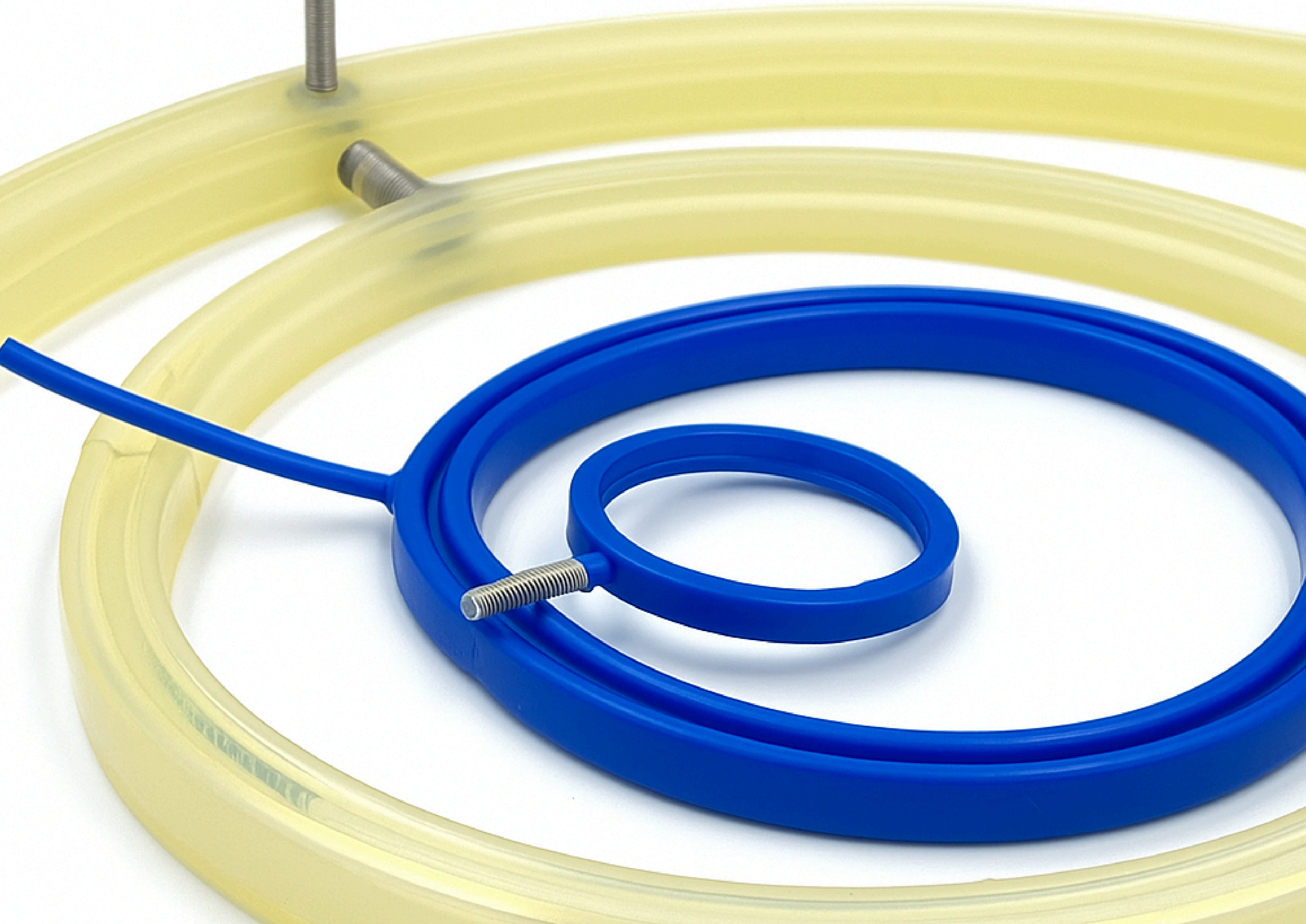
NUCLEAR

The nuclear power industry uses elastomers for many sealing applications such as in airtight doors, covers, liners, vibration dampeners, etc. Needless to say, this industry comes with its set of environmental and health hazards that can be taken care of by complying with specified regulations and guidelines.

Inflatable Seals for Nuclear Containment Facility:

Western Sealtech inflatable seals offer 100% leak proof sealing for doors in nuclear containment facilities. These inflatable seals are inflated upon door closure to seal the gap between door and its surrounding frame, thereby preventing any kind of contaminants from entering the room or any hazardous particle leaking from the room.

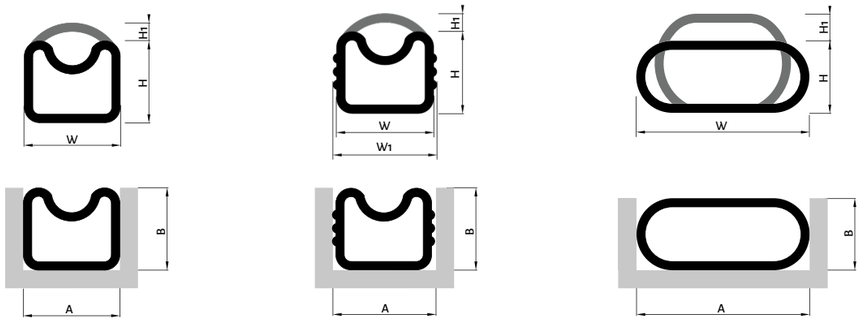
Nuclear Containment Facility



TYPE 1: FOOTLESS SEALS

This seal is one of the simplest configurations. Footless Seals do not have foot like structures for clamping and retention. Owing to easy use and installation, nearly 60-70% of inflatable seals are fabricated using this profile. It can withstand moderate pressures, and in case of higher inflation pressures, Type B Footless Seals, which are fabric reinforced, are used.

TYPE 1A: NON-REINFORCED CONSTRUCTION

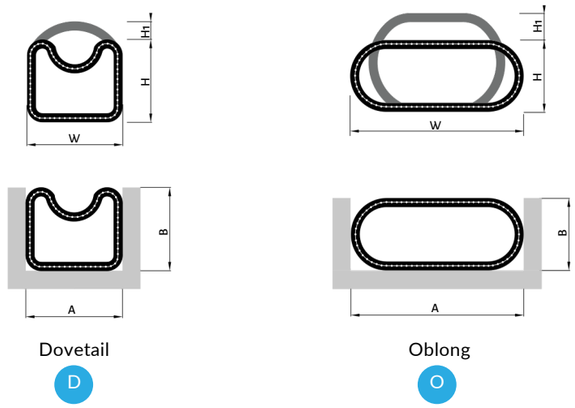


Dovetail (D) | Ribbed Dovetail (RD) | Oblong (O)

All dimensions in mm

PROFILE CODE	TYPE	W	H	W1	H1	MAX. INTERNAL PRESSURE(in bar)	U-CHANNEL A	U-CHANNEL B
IN-1A25	D	12.7	12.7	-	6.35	2	13.7	13.5
IN-1A06	D	15	15	-	7.5	2	16	15.8
IN-1A26	D	23.6	19	-	9.5	3	24.8	20
IN-1A16	D	35	32	-	16	3	36.5	33.3
IN-1A27	D	63.5	50	-	25.4	3	65.7	51.6
IN-1A28	RD	17	16	20	8	2	18.2	16.8
IN-1A29	RD	25.4	19	27.4	9.5	3	26.6	20
IN-1A18	O	19.1	6.4	-	4.8	1	20.3	7.1
IN-1A19	O	31.8	9.6	-	9.6	2	33.3	10.3
IN-1A20	O	38.1	12.7	-	11.2	2	39.6	13.5
IN-1A21	O	50.8	12.7	-	19.1	2	52.6	13.5
IN-1A30	O	76.2	19	-	25.4	3	78.4	20

TYPE 1B: FABRIC REINFORCED CONSTRUCTION



Dovetail (D) | Oblong (O)

All dimensions in mm

PROFILE CODE	TYPE	W	H	H1	MAX. INTERNAL PRESSURE(in bar)	U-CHANNEL A	U-CHANNEL B
IN-1B16	D	63.5	50	25.4	10	65.7	51.6
IN-1B01	O	19.6	9.6	3.2	6	20.8	10.3
IN-1B04	O	38.1	12.7	12.7	6	39.6	13.5
IN-1B14	O	76.2	19	31.8	10	78.4	20
IN-1B07	O	101.6	25.4	44.5	10	103.8	26.7

RETENTION SYSTEMS

Adhesive/Tape

Seals expandingaxially or radially-in can be retained inside the groove channel by bonding the bottom of the seal to the channel with an adhesive, glue, or double sided tape.

Tight Fit

Sealsexpanding radially outwards can be retained within the groove by making them slightly smaller in length than the required length i.e. by under-sizing the seal. Due to the elastomeric properties of rubber, the undersized seal will stretch and tightly fit inside the groove channel. Engineers at Western Sealtech possess the expertise in deciding the proportion in which the seal should be undersized.

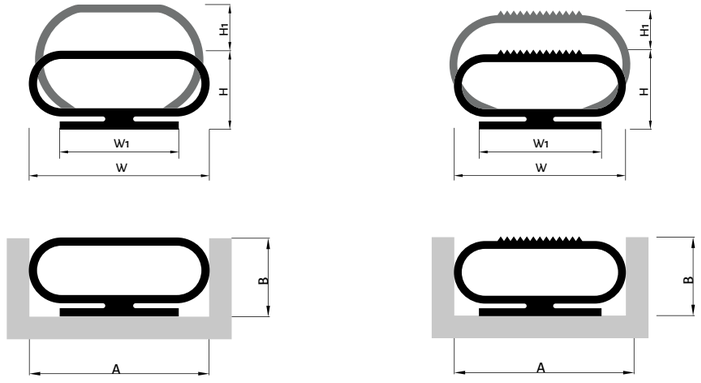
Ribs

Inselected cases, seals are manufactured with ridges given on the outer side of the side walls. They offer increased friction and hold the seal tightly inside the groove channel.

TYPE 2: FASTEN-IN SEALS

Fasten-In Seals come with foot like structures for clamping the seal in slots or grooves below. These footed seal profiles are widely used due to their ease of retention and ability to fully round out when inflated.

TYPE 2A: NON-REINFORCED CONSTRUCTION

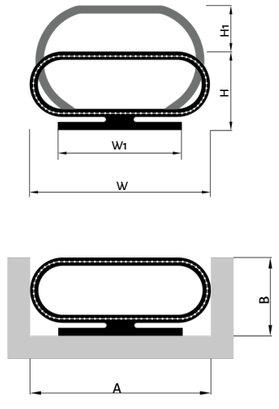


Smooth (S) | Ridged (R)

All dimensions in mm

PROFILE CODE	TYPE	W	H	W1	H1	MAX. INTERNAL PRESSURE(in bar)	U-CHANNEL A	U-CHANNEL B
IN-2A01	S	17.5	11.1	14	3.2	1.5	18.7	11.9
IN-2A02	S	25.4	12.7	19.1	6.5	2	26.9	13.5
IN-2A03	S	31.8	16	25.4	9.6	3	33.3	16.8
IN-2A04	S	50.8	22.3	44.5	19.1	3	52.6	23.3
IN-2A05	S	76.2	31.8	50.8	25.4	3	78.4	33.1
IN-2A10	S	101.6	41.4	82.5	44.4	3	103.8	43
IN-2A06	R	30	20	24	8	3	31.5	21
IN-2A07	R	39.7	25.4	33.1	11.2	3	41.2	26.7
IN-2A08	R	60.4	35	45.3	20.7	3	62.2	36.3

TYPE 2B: FABRIC REINFORCED CONSTRUCTION

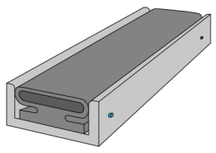


Smooth (S)

All dimensions in mm

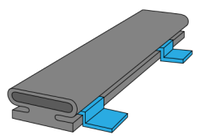
PROFILE CODE	TYPE	W	H	W1	H1	MAX. INTERNAL PRESSURE(in bar)	U-CHANNEL A	U-CHANNEL B
IN-2B10	S	25.4	12.7	19.1	8	6	26.9	13.5
IN-2B11	S	31.8	16	25.4	9.6	10	33.3	16.8
IN-2B12	S	50.8	22.3	44.5	19.1	10	52.6	23.3
IN-2B13	S	76.2	31.8	50.8	31.8	10	78.4	33.1

RETENTION SYSTEMS



U-Channel with Side Pins

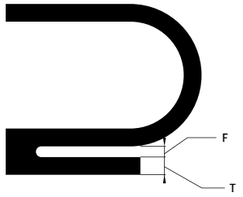
The seal is assembled in an extruded channel. Footed seals are supported by 'pins' that are screwed from outside the channel into the seal flanges. The pins provide additional support to hold the seal in place.



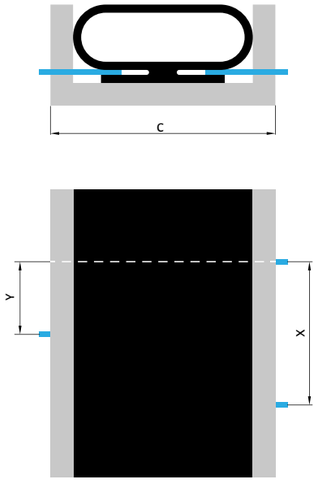
Z-Clamps

Stainless steel Z Clamps are screwed along the seal at intervals. Seal is firmly clamped with the help of this mechanism.

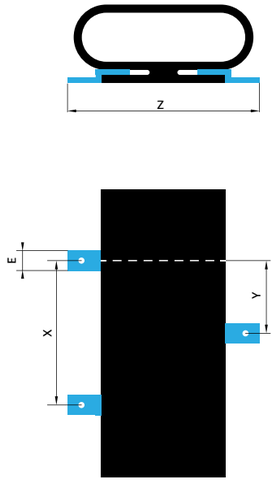
RETENTION SYSTEM MEASUREMENTS



Foot Thickness & Gap



U-Channel with side pins



Z-Clamp Retention

All dimensions in mm

PROFILE CODE	FOOT THICKNESS (T)	GAP ABOVE FOOT (F)	X	Y	U- CHANNEL WIDTH (C)	OPEN INSTALLATION- Z CLAMP	
						Z-Clamp Width (Z)	Z-Clamp Length (E)
IN-2A01	3 3	2 2	101.6	50.8	25.4	40	9.5
IN-2A02	3.5	2.5	127	63.5	38.1	44.4	9.5
IN-2A03	6.35	5.35	152.4	76.2	38.1	54	9.5
IN-2A04	7.5	6.5	254	127	76.2	76.2	12.7
IN-2A05	8	7	381	190.5	101.6	85.7	12.7
IN-2A10	3.5	2.5	508	254	127	124	15.88
IN-2A06	4.8	3.8	152.4	76.2	38.1	54	9.5
IN-2A07	6.5	5.5	254	127	76.2	76.2	12.7
IN-2A08	3	2	381	190.5	101.6	85.7	12.7
IN-2B10	3.5	2.5	127	63.5	38.1	44.4	9.5
IN-2B11	6.35	5.35	152.4	76.2	38.1	54	9.5
IN-2B12	7.5	6.5	254	127	76.2	76.2	12.7
IN-2B13			381	190.5	101.6	85.7	12.7

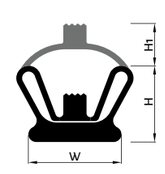
TYPE 3: SNAP-IN SEALS

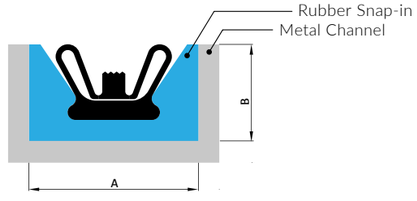
The Snap-In Seals are used in applications that demand the need to seal large inflation gaps, especially the crown type configuration. These profiles are best suited for expansion axially or radially outward. They are not recommended for inward expansion. They are the preferred seal choice for straight seals.

TYPE 3A: NON-REINFORCED CONSTRUCTION

Crown

C





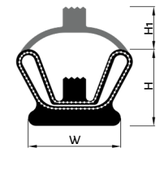
All dimensions in mm

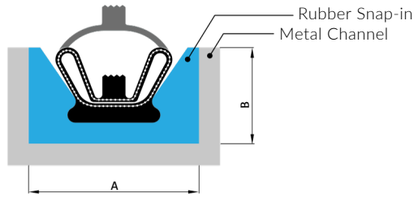
PROFILE CODE	TYPE	W	H	H1	MAX. INTERNAL PRESSURE(in bar)	U-CHANNEL	
						A	B
IN-3A01	C	15.9	12.7	9.53	1.5	23.9	18.7
IN-3A08	C	17.5	12.7	9.53	2	25.5	18.7
IN-3A02	C	25.4	16	12.7	2	33.4	22
IN-3A09	C	38.1	18.2	15	3	46.1	24.2
IN-3A03	C	50.8	31	28	3	58.8	37

TYPE 3B: FABRIC REINFORCED CONSTRUCTION

Crown

C





All dimensions in mm

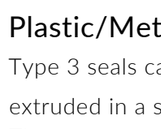
PROFILE CODE	TYPE	W	H	H1	MAX. INTERNAL PRESSURE(in bar)	U-CHANNEL	
						A	B
IN-3B05	C	17.6	12.7	11.1	6	25.6	18.7
IN-3B18	C	25.4	16	14.8	6	33.4	22
IN-3B09	C	44.5	30.5	29	10	52.5	36.5

TYPE 4: BONDED BOTTOM SEALS

These seals do not have a base structure for retention, instead they are bonded on the bottom within a square channel. Bonded Bottom Seals can cover maximum seal gaps compared to other profiles. They can inflate up to almost 90-100% of their original height.

TYPE 4A: NON-REINFORCED CONSTRUCTION

Crown
C



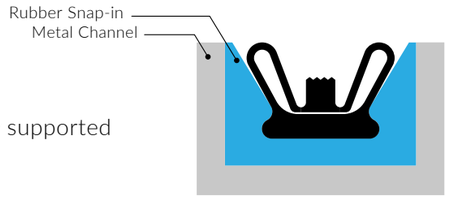
All dimensions in mm

PROFILE CODE	TYPE	W	H	H1	MAX. INTERNAL PRESSURE(in bar)	U-CHANNEL A	U-CHANNEL B
IN-4A01	C	13.72	11.17	9.53	1.5	14.72	11.97
IN-4A02	C	16.66	11.1	11.13	1.5	17.86	11.9
IN-4A03	C	25	25	23.8	3	26.2	26
IN-4A04	C	35	32	30	3	36.5	33.3
IN-4A05	C	50.8	38.1	35	3	52.6	39.4

RETENTION SYSTEMS

Plastic/Metal Retainer

Type 3 seals can be snappedin plastic/metallic retainers. Plastic retainers can be extruded in a single piece. Metal retainers, however, are extruded in three parts. These parts are then held together using bolting pins. The seal is snapped in place.

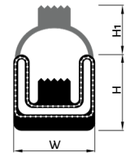


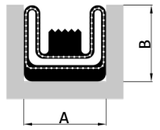
Snap-In (rubber retainer)

The sealsnaps in placeinan extruded rubber retainer, which is firmly supported on the sides or in a channel.

TYPE 4B: FABRIC REINFORCED CONSTRUCTION

Crown
C

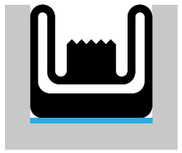




All dimensions in mm

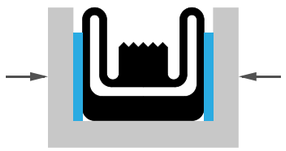
PROFILE CODE	TYPE	W	H	H1	MAX. INTERNAL PRESSURE(in bar)	U-CHANNEL A	U-CHANNEL B
IN-4B13	C	16.66	11.1	11.13	6	17.86	11.9
IN-4B14	C	25	25	23.8	6	26.2	26
IN-4B15	C	50.8	38.1	35	10	52.6	39.4

RETENTION SYSTEMS



Adhesive/Tape

Seals expanding axially or radially in can be retained inside the groove channel by bonding the bottom of the seal to the channel, by applying an adhesive/glue or with the help of a double sided tape.



Tight Fit

Seals expanding radially outwards can be retained within the groove by making them slightly smaller in length than the required length i.e. by under-sizing the seal. Due to the elastomeric properties of rubber, the undersized seal will stretch and tightly fit inside the groove channel. Engineers at Western Sealtech possess the expertise in deciding the proportion in which the seal should be undersized.

TYPE 5: SLOT-FIT SQUARE SEALS

Slot Fit Square Seals are preferred in heavy duty lifting or gripping applications. This profile offers higher seal life and hence is widely seen in uses where inflation and deflation cycles are very high. These seals can withstand higher pressures compared to other non-reinforced seals due to their rigid walls.

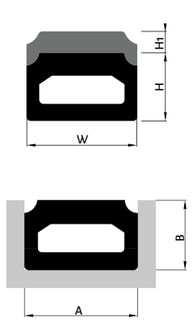
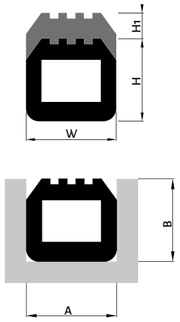


Table Top

TT



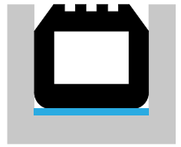
Stud Top

ST

All dimensions in mm

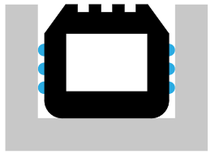
PROFILE CODE	TYPE	W	H	H1	MAX. INTERNAL PRESSURE(in bar)	U-CHANNEL A	U-CHANNEL B
IN-501	T	7	5	1.25	1	7.9	5.35
IN-502	T	14.5	11	2.75	1.5	15.5	11.5
IN-527	T	35	32	10	6	36.5	32.8
IN-528	ST	14	10	2.5	2	15	10.4
IN-504	ST	16	12	3	2	17	12.5
IN-505	ST	18	17	4.25	3	19.2	17.7
IN-529	ST	23	20	5	3	24.2	20.7
IN-522	ST	25	12	3	3	26.2	12.5
IN-526	ST	26		6.5	6	27	23
IN-510	ST	30		7.5	6	31.5	30.8
IN-511	ST	35		8	6	36.5	32.8
IN-521	ST	40		5.5	6	41.5	22.7
IN-523	ST	50		5	6	51.8	20.7

RETENTION SYSTEMS



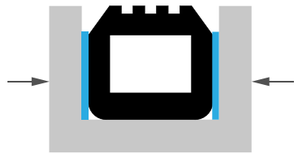
Adhesive/Tape

Seals expanding axially or radially in can be retained inside the groove channel by bonding the bottom of the seal to the channel, by applying an adhesive/glue or with the help of a double sided tape.



Ribs

In selected cases, seals are manufactured with ridges given on the outer side of the side walls. The ridges basically offer increased friction and hold the seal tightly inside the groove channel.



Tight Fit

Seals expanding radially outwards can be retained within the groove by making them slightly smaller in length than the required length i.e. by under-sizing the seal. Due to the elastomeric properties of rubber, the undersized seal will stretch and tightly fit inside the groove channel. Engineers at Western Sealtech possess the expertise in deciding the proportion in which the seal should be undersized.

NOTES:

Recommended Inflation Gap:
Inflation gap recommendations assume optimal sealing conditions. Depending on the application and environment, the gap should be reduced accordingly to ensure effective sealing. Contact Western Sealtech at sales@westernsealtech.com for more details.

Max. Internal Pressure:
Seal must be pressurized only in closed (supported) conditions. The lesser the sealing pressure, the longer the operational life of the seal.

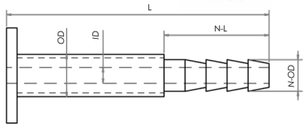
Materials:
All standard profiles are available in EPDM and Silicone. Inflatable seals in other materials* like Nitrile, HNBR, Natural Rubber can also be custom manufactured.
*Additional tooling and design charges will be applicable for the same.

Need more Technical Info?
Check https://www.westernsealtech.com for details on profiles listed above or simply call us; our sales engineers will be happy to help determine the best seal for your application.

AIR CONNECTORS

AC 1

Threaded
with Nipple

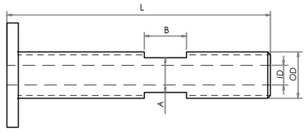


All dimensions in mm

AC CODE	OUTER DIAMETER (OD)	INNER DIAMETER (ID)	NIPPLE LENGTH	NIPPLE OD	LENGTH
AC1F	M4	1.5	8	2.7	20
AC1A	M6	2.0	12	4	30
AC1B	M8	3.4	16	6	40
AC1D	M12	5.2	20	10	50

AC 2

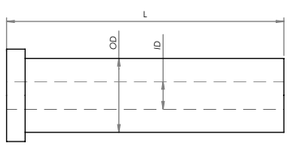
Simple
Threaded
with Slot



AC CODE	OUTER DIAMETER (OD)	INNER DIAMETER (ID)	SLOT FOR WRENCH (AXB)	LENGTH
AC2A	M4	1.5	3 x 4 5	20
AC2B	M6	3.4	x 6 6 x	30
AC2C	M8	3.4	8 10 x	40
AC2E	M12	5.2	12	50

AC 4

Elastomer
Hose



AC CODE	OUTER DIAMETER (OD)	INNER DIAMETER (ID)	LENGTH
AC4A	8	3	Minimum Length:
AC4B	12	6	200mm (In multiples
AC4C	16	9	of 100)

END CONNECTORS

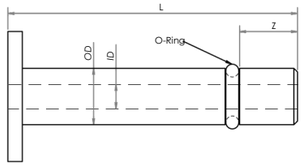
Male-Fit Connecter

Female-Fit Connecter

THREAD TYPE	
METRIC	BSPP
SIZES	
M6	1/8"
M8	1/4"

AC 5

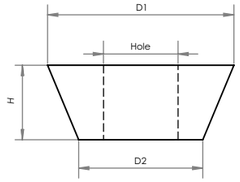
O-Ring
Nozzle



All dimensions in mm

AC CODE	OUTER DIAMETER (OD)	INNER DIAMETER (ID)	Z	METRIC O-RING	LENGTH
AC5G	3.8	1.5	2	0.8x2.7	20
AC5H	5.8	2.5	3	1.27x3.91	30
AC5I	7.8	3.4	4	1.5x5.5	40
AC5J	11.8	5.2	6	1.9x8.7	50

CONE DIMENSIONS

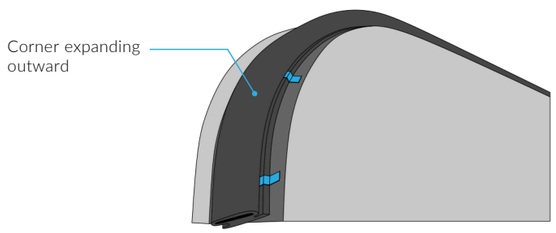


HOLE	D1	D2	H
4	6	5	3
6	12	10	6
8	14	12	6
12	24	16	10

TECHNICAL DATA ON CORNER RADIUS

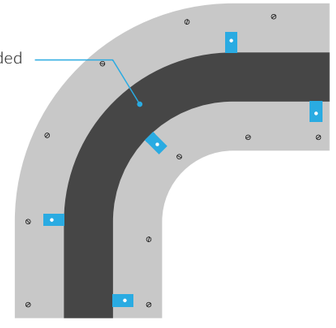
CORNER RADIUS FOR RADIAL EXPANSIONS

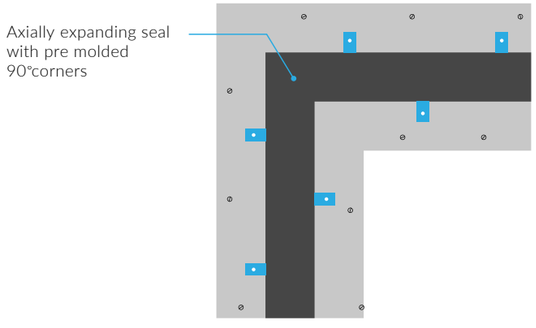
Depending upon the cross section of the seal profile, usually non-reinforced or fabric reinforced inflatable seals by Western Sealtech, designed for radially outward expanding applications, can be customized to operate with a minimum corner radius of four to eight times its relaxed height. However, the expansion at the corners will be slightly restricted, unless the corner radius is even more liberal. The expansion is further restricted when the seal is designed for radially inward expansion. If there is a choice, designing seals with radially outward expansion is always recommended. Right angled corners are not available for radially expanding seals.



CORNER RADIUS FOR AXIAL EXPANSIONS

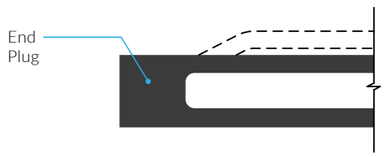
For inflatable seals expanding axially; corners with a minimum centreline radius, approximately twice the cross section width, can be pre-formed or pre-molded. In fact, if the corner radii are more liberal, a circular seal with a single join can comfortably be seated in the seal groove. Very selected profiles have a requirement of molded 90° corner radius. Although Western Sealtech does not recommend this design because it increases strain on the weakest portion of the seal, if needed, a seal with 90° corner radii can be custom engineered.



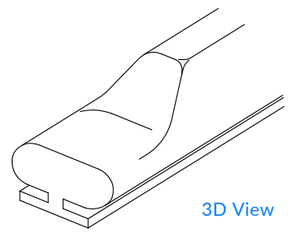


END PLUGS AND CLAMPING

If inflatable seals are not fabricated in a closed geometric form i.e. when seals are manufactured in a straight form, it is necessary to close off the ends of the seal. These seals are offered with 'End Plugs' or vulcanized blocks on both ends of the seal. End plugs cannot be inflated. Standard designs have the end plugs in the deflated state of the profile. In case end plugs are required to be supplied in the inflated state of the seal, kindly contact any of our sales engineers. Additional tooling and fabrication charges will be applicable for the same.



Side Section View



3D View

For straight seals, end clamping mechanism is used. Pressure plates are bolted to reduce stress on the seal ends.

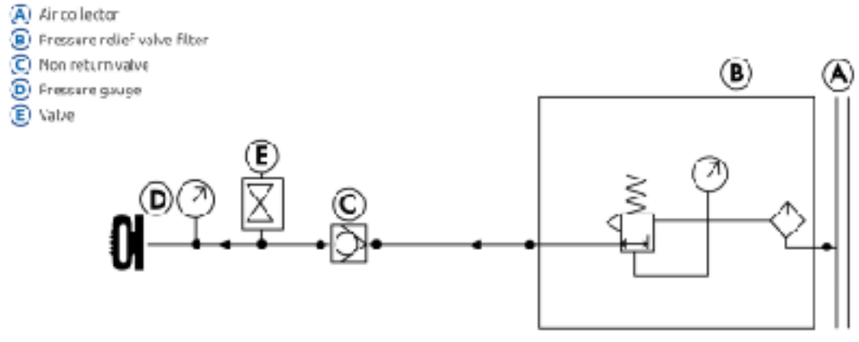
Single Screw Pressure Plate

Double Screw Pressure Plate

Fixed Pressure Plate

PRESSURE SUPPLY

Western Sealtech Inflatable Seals can be inflated with air, gas or fluids. However, it is necessary to provide a constant supply, which must be guaranteed by a pressure regulator to avoid over-pressure. Due to the relative permeability of elastomers (when inflated with air or gas), notably for silicone, it is necessary to provide pressure regulation for this type of inflation. It is also possible to use fluids (water, oil, etc.) to prevent elastomer gas permeability.



FABRIC COMPARISON

Fabric reinforced seals are used in extreme pressure/temperature applications. The fabric reinforcement adds to the seal's overall strength. Fabrics are cautiously molded within the inflatable seal using special processes by highly skilled labor.

Every fabric differs in its properties. Hence, the functioning of the seal is carefully studied by our production engineers for selection of the appropriate fabric. Some fabrics used will have limitations with regards to the thickness of the fabric that can be used within the part, the temperature it can withstand during operation, and more. Western Sealtech uses the following fabrics for crafting fabric reinforced inflatable seals:

NYLON

Nylon is one of the most commonly used fabrics in our inflatable seals. It is a tough and abrasion resistant fabric. Further, being strong as well as flexible, it enhances the dynamic properties of seals. Nylon can resist temperatures up to 250 °F.

DACRON®

Dacron exhibits very good tensile properties, and therefore is the preferred option in applications where high flexibility is required. Being chemically inert, it offers good resistance to degradation by chemical bleaches and to abrasion. Dacron is especially effective in applications where the temperature is higher than 250°F (120°C).

NOMEX®

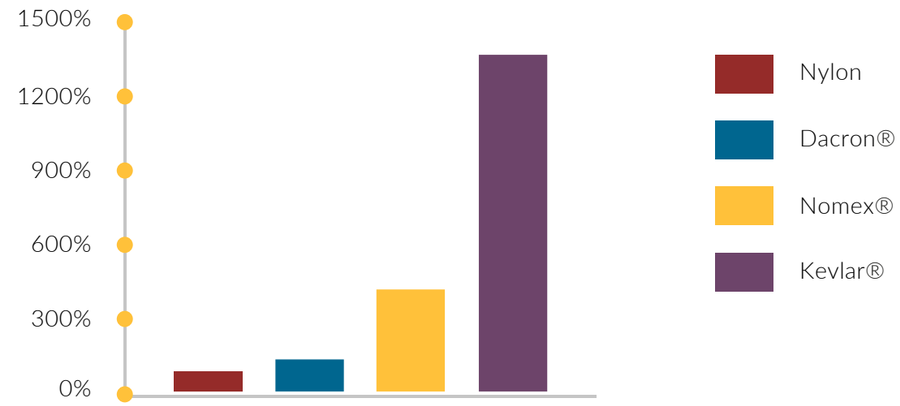
Nomex is a step above Dacron in its temperature and chemical resistant properties. Nomex products are strong, resilient and (in the thinner grades) flexible, with good resistance to tearing and abrasion. It is sold in both fiber and sheet forms and is used as a fabric wherever resistance from heat and flame is required. Nomex can resist temperatures up to 450°F.

KEVLAR®

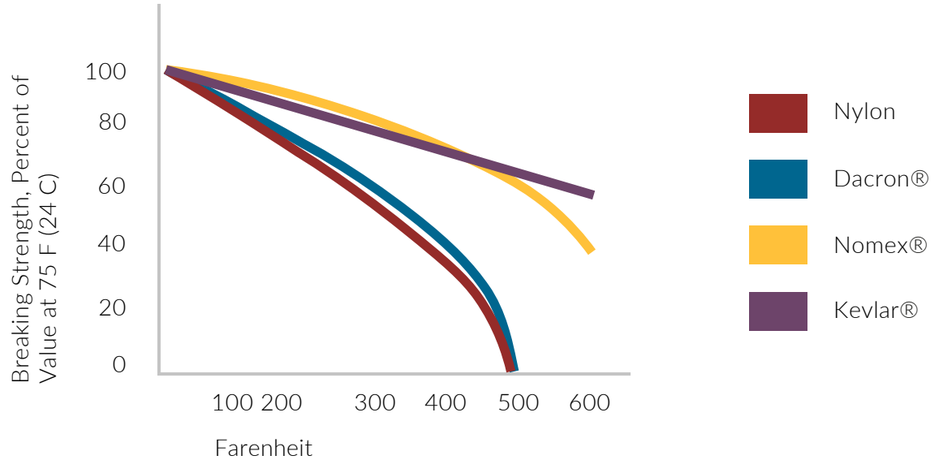
Kevlar is a heat-resistant and strong synthetic fiber. It is lightweight, durable and extraordinarily strong. Kevlar is by far the strongest fabric Western Sealtech uses, and more expensive compared to other fibers. However, it can only be used in larger cross sections due to its thickness. It exhibits excellent heat resistant properties and decomposes above 400°F without melting. The same high temperature resistance as Nomex with approximately three times the strength.

INFLATABLE SEALS | Fabric Comparison

FABRIC STRENGTH AS COMPARED TO NYLON



STRENGTHS OF TYPICAL INDUSTRIAL YARNS AT ELEVATED TEMPERATURES



*Dacron®, Nomex®, and Kevlar® are registered trademarks of E. I. du Pont de Nemours and Company or its affiliates. Typical Industrial Yarn Strength chart is also courtesy of E. I. du Pont de Nemours and Company or its affiliates.

MATERIAL COMPARISON CHART

● EXCELLENT ● VERY GOOD ● GOOD ● FAIR ● POOR

COMMON NAME	EPDM OR EP RUBBER	NEOPRENE	NBR OR BUNA-N	HBNR	NATURAL RUBBER	SILICONE	FLOUROSILICONE	FKM (VITON®)
CHEMICAL NAME	Ethylene Propylene	Chloroprene	Acrylonitrile Butadiene	Hydrogenated Nitrile Rubber	Natural Isoprene	Silicone	Flourosilicone	Flouroelastomer
ASTM DESIGNATION (D1418)	EP	CR	NBR	HNBR	NR	VMQ	FVMQ	FKM
PHYSICAL PROPERTIES								
Tensile Strength (MPa)	15.2	14	13	22	22	10	8	10
Elongation	450%	400%	350%	300%	750%	580%	225%	300%
Hardness Range (Sh A)	50-80	50-80	50-80	50-90	40-80	30-80	40-80	70-85
Low Temperature (°C)	-50	-25	-50	-30	-55	-50	-63	-15
High Temperature (°C)	150	110	120	150	90	230	175	230
Density (g/cm3)	1.2	1.3	1.3	1.4	1.1	1.2	1.5	1.8
Compression Set (ASTM D 395 2B) Tear	50% (22h @ 125°C)	35% (24h @ 100°C)	36% (24h @ 100°C)	20% (24h @ 100°C)	20% (24h @ 70°C)	39% (22h @ 175°C)	22% (22h @ 177°C)	15% (70h @ 200°C)
Resistance Abrasion	●	●	●	●	●	●	●	●
Resistance	●	●	●	●	●	●	●	●
Resilience (Cold) Heat	●	●	●	●	●	●	●	●
Resistance	●	●	●	●	●	●	●	●
Radiation Resistance	●	●	●	●	●	●	●	●
Impermiability to gases	●	●	●	●	●	●	●	●
ACID RESISTANCE								
Mild Dilute	●	●	●	●	●	●	●	●
Strong Concentrate	●	●	●	●	●	●	●	●
SOLVENT RESISTANCE								
Aliphatic Hydrocarbons	●	●	●	●	●	●	●	●
Aromatic Hydrocarbons	●	●	●	●	●	●	●	●
Oxygenated (Ketones, etc)	●	●	●	●	●	●	●	●
RESISTANCE TO								
Swelling in Lubricating Oil	●	●	●	●	●	●	●	●
Oil and Gasoline	●	●	●	●	●	●	●	●
Animal Oils	●	●	●	●	●	●	●	●
Water Absorption	●	●	●	●	●	●	●	●
Oxidation	●	●	●	●	●	●	●	●
Ozone	●	●	●	●	●	●	●	●
Sunlight Aging	●	●	●	●	●	●	●	●
Heat Aging	●	●	●	●	●	●	●	●
Flame	●	●	●	●	●	●	●	●
Vegetable Oils Chlorinated Hydrocarbons	●	●	●	●	●	●	●	●

INFLATABLE SEALS | Material Comparison Chart

Head Office

Office No. 1012, 72 Corp, Sakinaka,
Near Metro Station, Andheri (E), Mumbai
400072, MH, India.

Sales Office (USA)

3524, Silverside Road, Suite 35B,
Wilmington, Delaware 19810-4929.

Western Rubbers Europe B.V.

Smederijstraat 2, 4814 DB Breda,
Netherlands

Manufacturing Unit 1 & 2

Plot No, 21 And Plot No. 24, Survey No.
1994 and 1997, At Daheri, Umbergaon,
Valsad, Gujarat 396171, India

Plot no. 28, Survey No. 39, At Daheri,
Umbergaon, Valsad, Gujarat 396170,
India

www.westernsealtech.com

sales@westernsealtech.com

+91 9130026591 | +91 9130026592

Western Sealtech