Fitting Solutions for many imaginative uses

SEAL MASTER®

ENGINEERED INFLATABLE SEALS

CUSTOM DESIGNED • FABRIC REINFORCED
PRECISION BUILT • FULLY MOLDED ELASTOMERS

SOLVE DIFFICULT DESIGN PROBLEMS…
HELP CONTROL & PROTECT THE ENVIRONMENT…
IMPROVE PRODUCTION & TESTING EFFICIENCY!

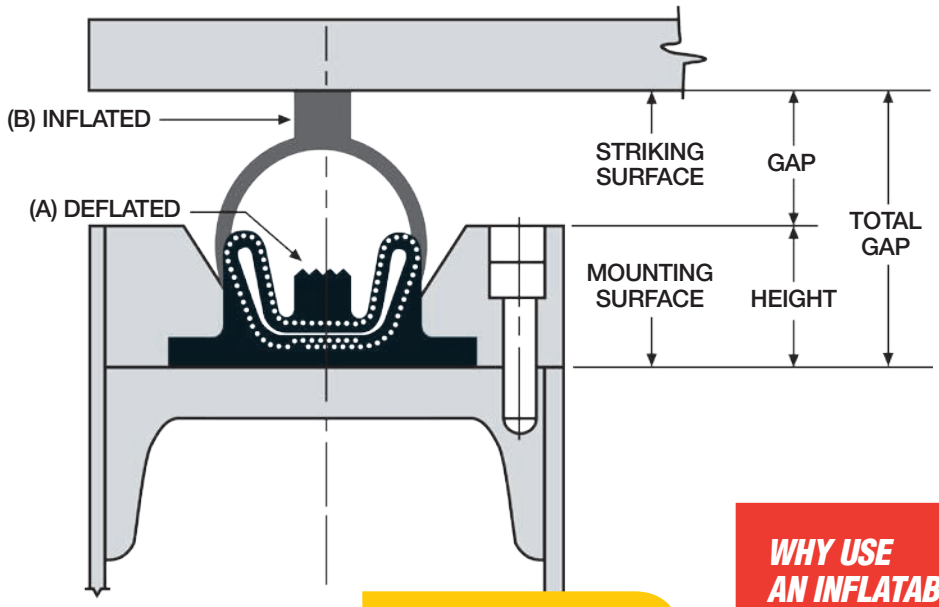
SEAL MASTER – SPECIALISTS IN A VERY SPECIALIZED FIELD

As inflatable seal usage and rubber technology has developed in recent decades, Seal Master has been in the forefront of product development and engineering advances. In serving design, process and manufacturing engineers, architects, environmentalists, the military and other government agencies, the firm has designed some 7,500 distinctly different elastomeric seal products since its founding in 1974. It's an experience unmatched in the industry.

WHAT IS AN INFLATABLE SEAL?

An inflatable seal is a fabric-reinforced elastomeric tube custom molded in a concave, convoluted or flat configuration. It is designed to round out with the introduction of an inflation medium to form a tight barrier between a mounting and striking surface. For example, see the cross section illustration below. *Position A* shows the molded configuration and *Position B* depicts the inflated configuration.

Seal Master products are made in a state-of-the-art production environment.



HOW DOES AN INFLATABLE SEAL WORK?

Upon introduction of the inflation medium, it quickly expands to the striking surface, effecting a positive seal. When the inflation medium is removed, the seal retracts naturally to the deflated molded configuration. This position provides clearance for free movement of one or both surfaces.

HOW IS AN INFLATABLE SEAL INFLATED?

The most common inflation medium is regulated air. The specific parameters of the application determine the optimum operating pressure. In some applications, liquid or gel may be used as the inflation medium. Introduction of the inflation medium is through a stem which is usually a flexible hose secured to an integrally molded fitting with a ferrule. A variety of fittings may be attached to the end of the hose.

WHY USE AN INFLATABLE SEAL?

An inflatable seal has several advantages over other sealing methods:

- **It provides a leak-proof closure, yet allows clearance when needed.**
- **It simplifies the design of the structure and hardware.**
- **It minimizes the need for close machining and/or fabricating tolerances.**
- **It is not subject to compression set which negates effectiveness of other seals.**

OVERCOMING SEALING CHALLENGES

WEATHER

WATER

NOISE

HEAT/COLD

LIGHT/DARK

PRESSURE/VACUUM

CHEMICALS

CONTAMINANTS

RADIATION

MEETING OTHER INDUSTRY NEEDS CREATIVELY

As flexible pressure vessels, Seal Master Inflatable Seals are used to apply forces in a more effective manner than common mechanical methods. This principle can be used for the following:

- **Actuators**
- **Brakes**
- **Couplers**
- **Cushions**
- **Gripping Devices**
- **Laminators**
- **Lifters**
- **Plugs**
- **Separators**

FABRIC REINFORCEMENT PROVIDES STRENGTH AND STRUCTURAL INTEGRITY

Seal Master Inflatable Seals are not simple rubber extrusions. They are custom built and molded specifically to fit your particular application. This ensures optimum performance for long-term inflating/deflating operations.

SEAL MATERIALS

Depending on your special environmental requirements, Seal Master will recommend one of the following elastomers:

- **Butyl**
- **Chloroprene (Neoprene)**
- **Epichlorohydrin**
- **Ethylene Propylene**
- **Fluorinated Hydrocarbon (Viton)**
- **Natural Rubber**
- **Nitrile (Buna N)**
- **Polyurethane**
- **Silicone**
- **Styrene Butadiene (Buna S)**

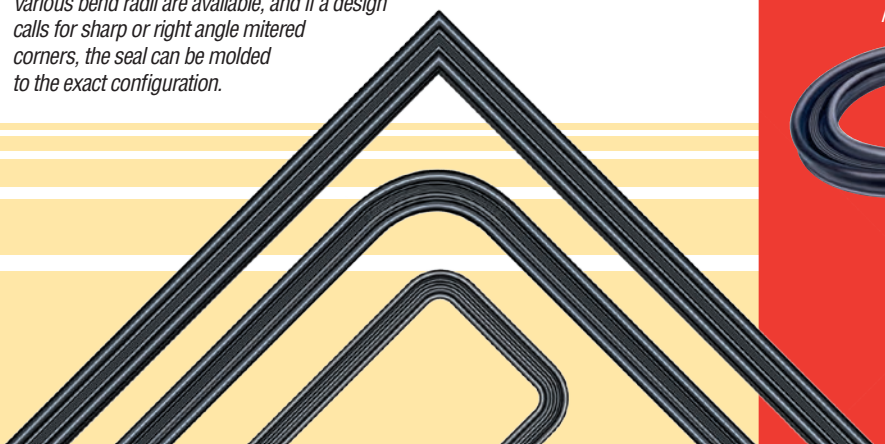
Reinforcement for maximum strength, durability and shape retention is provided by a variety of fabrics including:

- Dacron
- Kevlar
- Nomex
- Nylon

All Seal Master seals are hand built for optimum quality and performance.

The versatility of Seal Master custom seals permits an unlimited number of sizes, configurations, irregular and odd shapes — all tailored to design demands.

Various bend radii are available, and if a design calls for sharp or right angle mitered corners, the seal can be molded to the exact configuration.



INFLATABLE SEAL GEOMETRY

Inflatable seals are molded in different planes; radially in, radially out, axially and combinations thereof. They will conform to many different contours. They are made in strips with closed ends or in continuous loops. Each seal has super-tight mounting capabilities.

RADIALLY IN

RADIALLY OUT

AXIALLY

BROAD ACCEPTANCE

Seal Master Inflatable Seals are now being used successfully in the following applications and industries.

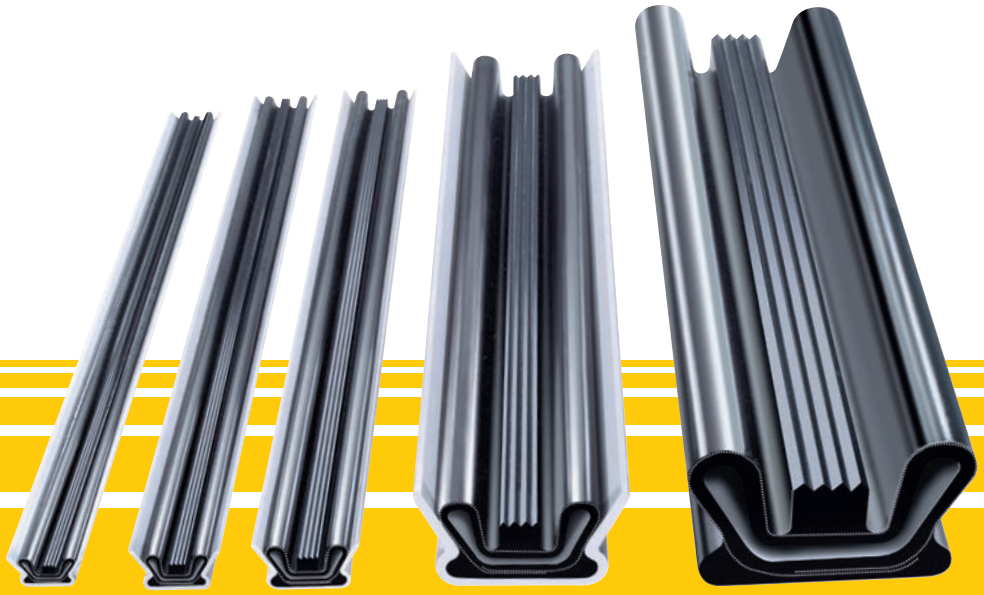
BY APPLICATION:

Actuating Devices
Attenuation Devices
Bins
Brake Devices
Canopies
Chambers
Clamping Devices
Clutch Devices
Clean Rooms
Computers
Containers
Conveyors
Cushioning Devices
Domes
Doors
Filters
Gates
Hatches
Hoppers
Pulverizers
Plugs
Robotics
Roofs
Shafts
Sifters
Sterilizers
Test Equipment
Valves
Windows
Wipers

BY INDUSTRY:

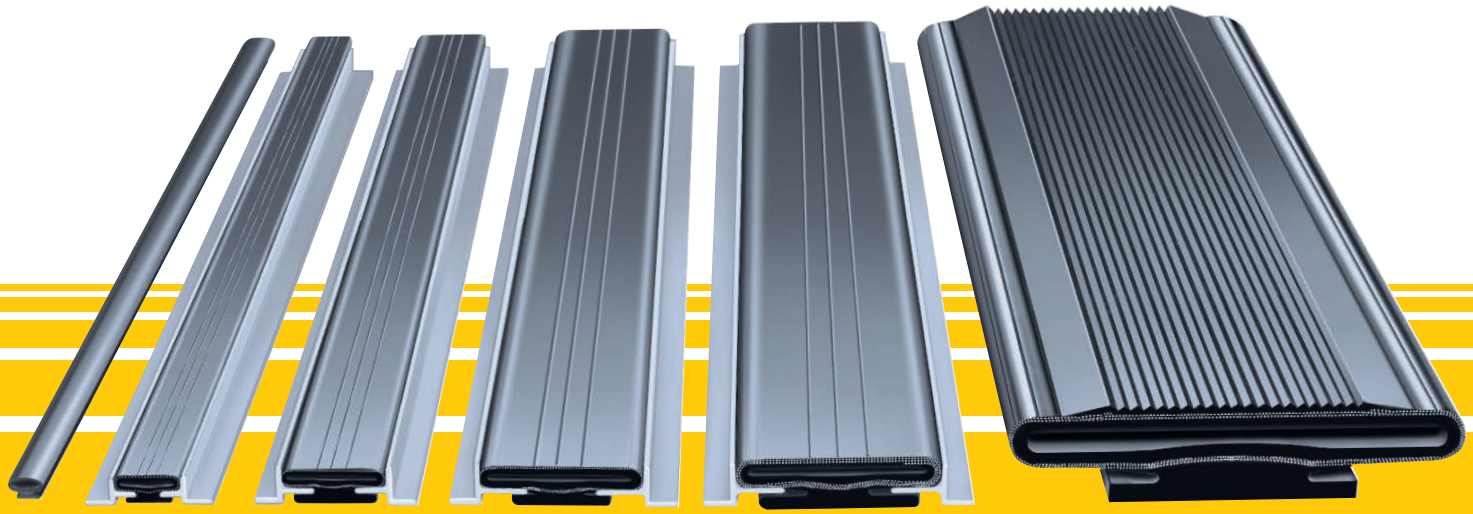
Aerospace
Aircraft
Aluminum
Appliance
Architectural
Automotive
Chemical Processing
Construction
Electric Power
Electronic
Fabricated Metal
Farm Equipment
Food Processing
Government Agencies
Laundry
Lumber/Logging
Marine
Medical
Military
Mining
Nuclear
Paper
Petroleum
Pharmaceutical
Railroad
Rubber
Shipping
Steel
Telecommunications
Textile
Transportation
Utility
Waste Disposal

TYPICAL INFLATABLE SEAL CONFIGURATIONS



G-15 G-5 G-1 G-12 G-21

Photo above shows cut sections of various seals with width (W1 dimension) ranging from .56 to 3.06 inches.

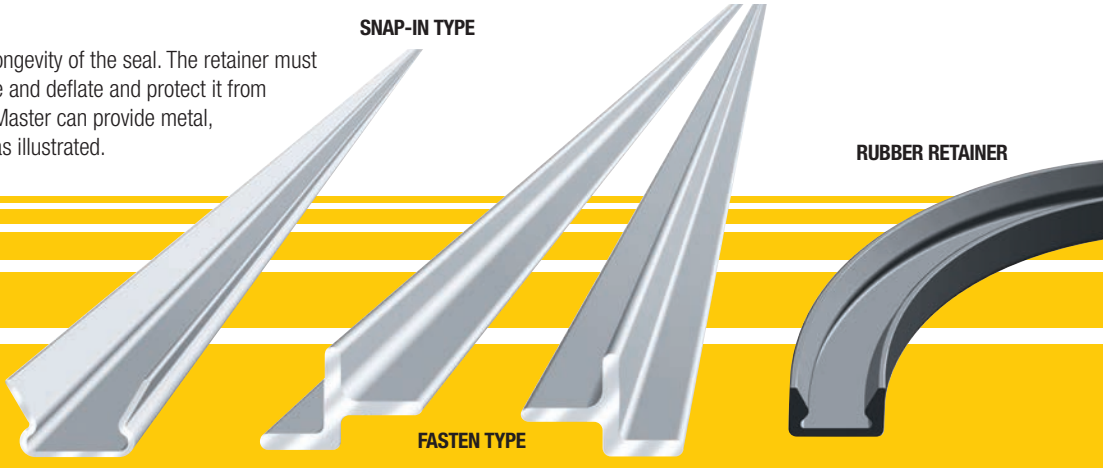


C-92 P-1 P-2 P-3 P-4 P-26

Photo above shows cut sections of various seals with width (W2 dimension) ranging from .50 to 9.00 inches.

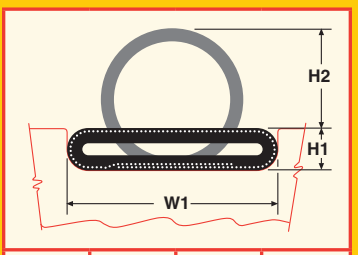
RETAINING SYSTEMS

Proper installation is essential to the function and longevity of the seal. The retainer must hold the seal in place, allow it the freedom to inflate and deflate and protect it from damage. To facilitate the installation of seals, Seal Master can provide metal, rubber, or plastic retainers in strip or circular form as illustrated.

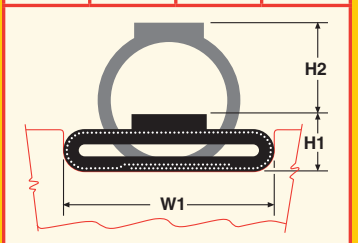


SEAL DETAIL

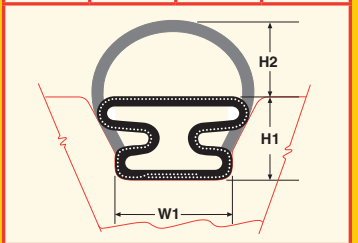
The cross sections shown below are typical inflatable seal designs. Details of each design may vary from the illustrations shown. Some particular sizes and shapes are identified by the code listings. Many different types of mountings may be employed. The red lines in the illustrations indicate some of the more common.



CODE	W1	H1	H2
P-6	1.50	.50	.50
P-7	2.00	.50	.63
P-8	2.25	.75	.75
P-9	2.25	.50	.90
P-13	6.00	1.50	2.50
P-14	.94	.31	.19
P-15	3.00	.75	1.00
P-20	3.25	.50	1.25
P-21	4.00	.50	1.75
P-24	1.25	.38	.25
P-33	1.00	.25	.25
P-51	1.88	.25	1.04

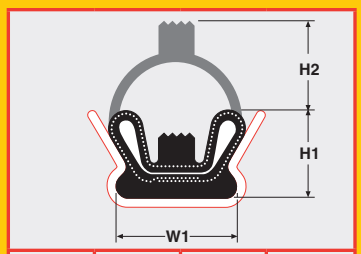


CODE	W1	H1	H2
C-13	1.00	.50	.20
C-20	1.00	.53	.21
C-37	1.25	.44	.20
C-40	1.50	.75	.39
C-44	1.38	.50	.32
C-62	6.00	1.75	2.23
C-80	.44	.25	.09

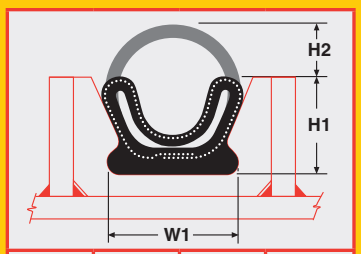


CODE	W1	H1	H2
C-7	.50	.83	.06
C-42	.75	1.13	.19
C-58	1.75	1.25	1.13
C-63	.44	.58	.07
C-64	.60	.62	.02

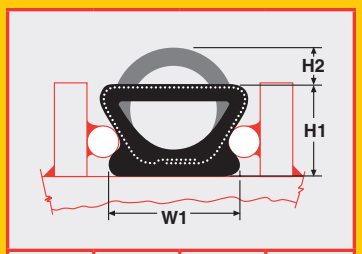
RECESSED GROOVE TYPE
This type, generally used with smaller diameter seals in a radially in or radially out mode, holds the seal in place by its own tension or force. If larger diameters are needed, studs can be used.



CODE	W1	H1	H2
G-1	.88	.60	.65
G-2	.88	.50	.50
G-5	.69	.50	.50
G-8	.63	.50	.35
G-12	1.75	1.20	1.30
G-14	.88	.31	.25
G-15	.56	.38	.38
G-21	3.06	2.13	2.25
G-31	.75	.63	.63
G-32	.75	.44	.44
G-38	1.53	.72	.75

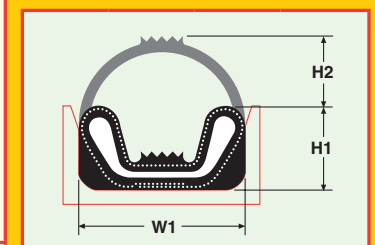


CODE	W1	H1	H2
G-25	.63	.50	.25
G-26	.68	.50	.25
G-27	.88	.50	.25
G-28	.88	.60	.35
G-29	1.75	1.20	.85
G-30	.56	.38	.22

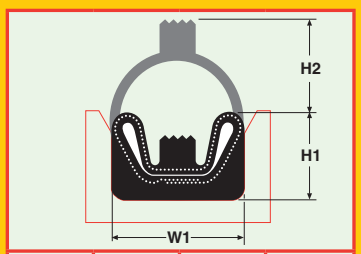


CODE	W1	H1	H2
G-13	.88	.60	.20
G-24	.88	.50	.20

SNAP-IN TYPE
This type uses a popular dove-tail design in which the seal simply "snaps" into a matching groove that provides support and protection. Installation and replacement is quick and easy.

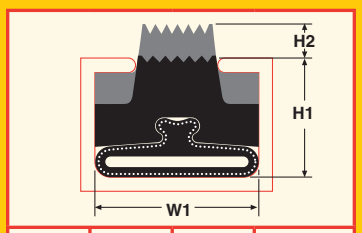


CODE	W1	H1	H2
G-7	.88	.56	.44
G-34	2.00	1.00	.78
G-35	2.75	1.38	1.12
G-36	1.38	1.19	.70
G-40	.63	.50	.21



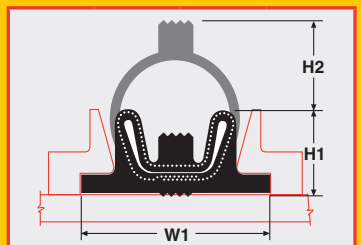
CODE	W1	H1	H2
G-3	.54	.44	.44
G-4	.69	.46	.54
G-10	1.75	1.38	1.25
G-22	1.38	1.13	1.00
G-41	.39	.30	.04
G-42	.30	.30	.03
G-43	.51	.34	.12

BOND-IN TYPE
This system takes advantage of an easily machined or fabricated straight-wall groove that allows the seal to be positioned and bonded into place.

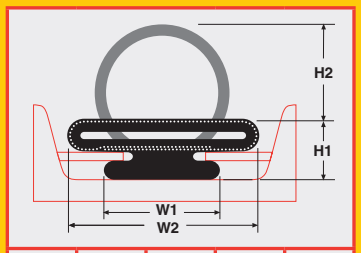


CODE	W1	H1	H2
S-1	1.38	1.00	.28
S-2	2.00	1.00	.44
S-3	2.75	.88	.81

ENCAPSULATED TYPE
This design "captures" the seal in a groove by securing bar stock over the edges of the groove. The same effect is realized by trapping the seal in a specially formed channel. This type employs an inflatable tube actuating a solid rubber shoe to the striking surface.

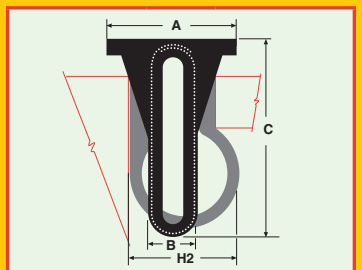


CODE	W1	H1	H2
G-9	2.75	1.50	1.43
G-11	3.63	2.00	1.75
G-16	5.88	1.25	.75
G-17	5.38	1.25	.75
G-18	3.88	1.25	.75
G-39	1.75	.80	.95



CODE	W1	W2	H1	H2
P-1	1.00	1.25	.63	.38
P-2	1.75	2.00	.88	.75
P-3	2.00	3.25	1.00	1.63
P-4	3.25	4.00	1.13	2.00
P-10	4.25	7.25	2.06	3.00
P-12	.50	.75	.56	.10
P-22	3.00	4.00	1.63	1.75
P-23	.75	1.00	.50	.31
P-26	5.00	9.00	2.38	4.00
P-30	2.00	3.00	1.25	1.25
P-50	3.25	5.00	1.25	2.63

FASTEN TYPE
This versatile system uses a variety of metal fasteners such as bars, pins and clips which can be tack welded or screwed down to the mounting surface. The seal can then be "snaked" or "fed" into this mounting system.



CODE	W1	W2	H1	H2
P-5	4.00	1.50	6.50	3.50
P-25	2.00	.75	3.60	1.75

DROP-IN TYPE
First used in the nuclear industry, this unique design does not require the help of any extraneous "hold down" or "hold in" devices for retention. The seal is simply dropped into a groove or gap and is held in position by gravity and its own geometry.

NOTE: When properly installed the seals will compensate for variation in the gap up to the maximums indicated by the H2 (inflated height) dimensions.

SEAL MASTER QUALITY PLEDGE

Quality built, quality tested. At Seal Master we take pride in our products and stand by their quality. Each Seal Master Product is inspected a minimum of two times prior to shipment by two separate Seal Master Quality inspectors. During this process inspectors are looking for obvious cosmetic defects but are also trained to be aware of other problems that may occur during operation. Seal Master maintains an in-depth, formal Quality Assurance Program.

Each Seal Master product must pass a mandatory under water-leak test inspection, twice prior to shipment. Each part is inflated with a standard air pressure during these tests.

When a polymer batch of material is received at Seal Master two report certifications must be received with the batch. This ensures the utmost quality of material.

At Seal Master, only tested and certified material components are used to build Seal Master products. We hold our suppliers to very high standards in order to pass down that same quality directly to our customers.

Each batch of material is assigned a unique identifier that allows for full tractability throughout production. By using the Seal Master serial number and the identifier of the material, finished products can be traced back to their original batch material.

SPECIALTY SEALS

Specialty rubber products include couplers, covers, compression seals, bags, diaphragms, small ring seals and seals that plug together. Specialty rubber product design is fueled by your requirements and our creativity.

FDA-COMPLIANT COMPOUNDS

For food and pharmaceutical applications, Seal Master compounds are available with FDA-compliant ingredients in food-grade white and gray as well as black.

SMALL RING SEALS

Examples of ring seals which are used for laboratory testing and production line fixtures. This seal has an outside diameter of only one inch.

PLUG-TOGETHER SEALS

Unique design seal wraps around shafts to provide a 360˚ sealing capability. This type is used in many marine applications.

ELASTOMERIC COUPLERS

For an easy and cost-efficient method of fastening hoses for moving materials there is Seal Master's fabric-reinforced, elastomeric coupler.

ACCESSORIES

Seal Master offers accessory products designed to facilitate the use of inflatable seals. They include:

- Extruded metal retainers
- Machined metal retainers
- Extruded, molded or formed rubber retainers
- Extruded, molded or formed plastic retainers
- Fasteners
- Inflation control devices, including boxes, valves, regulators, gauges, alarms, compressors, plumbing fittings and hoses

DESIGN ASSISTANCE

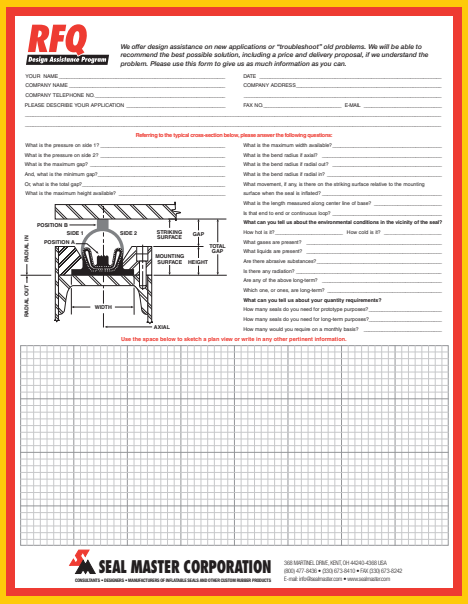
Seal Master recognizes the uniqueness of each customer's application and will provide design and engineering assistance for new applications or troubleshoot old sealing problems. Our questionnaire (illustrated at right), when completed, allows us to analyze your sealing application. From the information you provide, we can determine and recommend the most effective solution for your sealing problems and subsequently provide a quote. This information is critical in getting the project started.

SPECIFICALLY, WE NEED TO KNOW THE FOLLOWING:

- What is being sealed
- Dimensions of gap to be sealed
- Length of seal required
- Seal to be strip or continuous loop
- Surrounding environment
- Temperature range
- Pressures across seal
- Is inflation radially in, radially out or axial
- Inflation source

RFQ

Design Assistance Program


RFQ

Design Assistance Program

We offer design assistance on new applications or "troubleshoot" old problems. We will be able to recommend the best possible solution, including a price and delivery proposal, if we understand the problem. Please use this form to give us as much information as you can.

YOUR NAME _____ DATE _____

COMPANY NAME _____ COMPANY ADDRESS _____

COMPANY TELEPHONE NO. _____

PLEASE DESCRIBE YOUR APPLICATION _____ FAX NO. _____ E-MAIL _____

Referring to the typical cross-section below, please answer the following questions:

What is the pressure on side 1? _____

What is the pressure on side 2? _____

What is the maximum gap? _____

And, what is the minimum gap? _____

Or, what is the total gap? _____

What is the maximum height available? _____

What is the maximum width available? _____

What is the bend radius if axial? _____

What is the bend radius if radial out? _____

What is the bend radius if radial in? _____

What movement, if any, is there on the striking surface relative to the mounting surface when the seal is inflated? _____

What is the length measured along center line of base? _____

Is that end to end or continuous loop? _____

POSITION B — SIDE 1 — SIDE 2 — STRIKING SURFACE — GAP

POSITION A — MOUNTING SURFACE — HEIGHT — TOTAL GAP

RADIAL, IN — RADIAL, OUT — WIDTH — AXIAL

What can you tell us about the environmental conditions in the vicinity of the seal?

How hot is it? _____ How cold is it? _____

What gases are present? _____

What liquids are present? _____

Are there abrasive substances? _____

Is there any radiation? _____

Are any of the above long-term? _____

Which one, or ones, are long-term? _____

What can you tell us about your quantity requirements?

How many seals do you need for prototype purposes? _____

How many seals do you need for long-term purposes? _____

How many would you require on a monthly basis? _____

Use the space below to sketch a plan view or write in any other pertinent information.

SEAL MASTER CORPORATION

CONSULTANTS • DESIGNERS • MANUFACTURERS OF INFLATABLE SEALS AND OTHER CUSTOM RUBBER PRODUCTS

368 MARTINEL DRIVE, KENT, OH 44240-4368 USA

(800) 477-8436 • (330) 673-0410 • FAX (330) 673-8242

E-mail: info@sealmaster.com • www.sealmaster.com

Note: For copies download RFQ form at www.sealmaster.com or call 1-800-477-8436

CUSTOM ENGINEERED INFLATABLE BAGS

Take advantage of Seal Master Corporation's extensive rubber fabricating expertise. Custom inflatable shapes and structures required for sealing and/or lifting purposes can be engineered and manufactured for your specific application requirements.

O-RING FITTING

Shown in the base location, this unique connection is designed to be a slip fit into a drilled hole in the mounting structure.

TYPICAL AIR CONNECTIONS

Every Seal Master seal has an integrally molded fitting in one of three locations:

A. BASE LOCATION

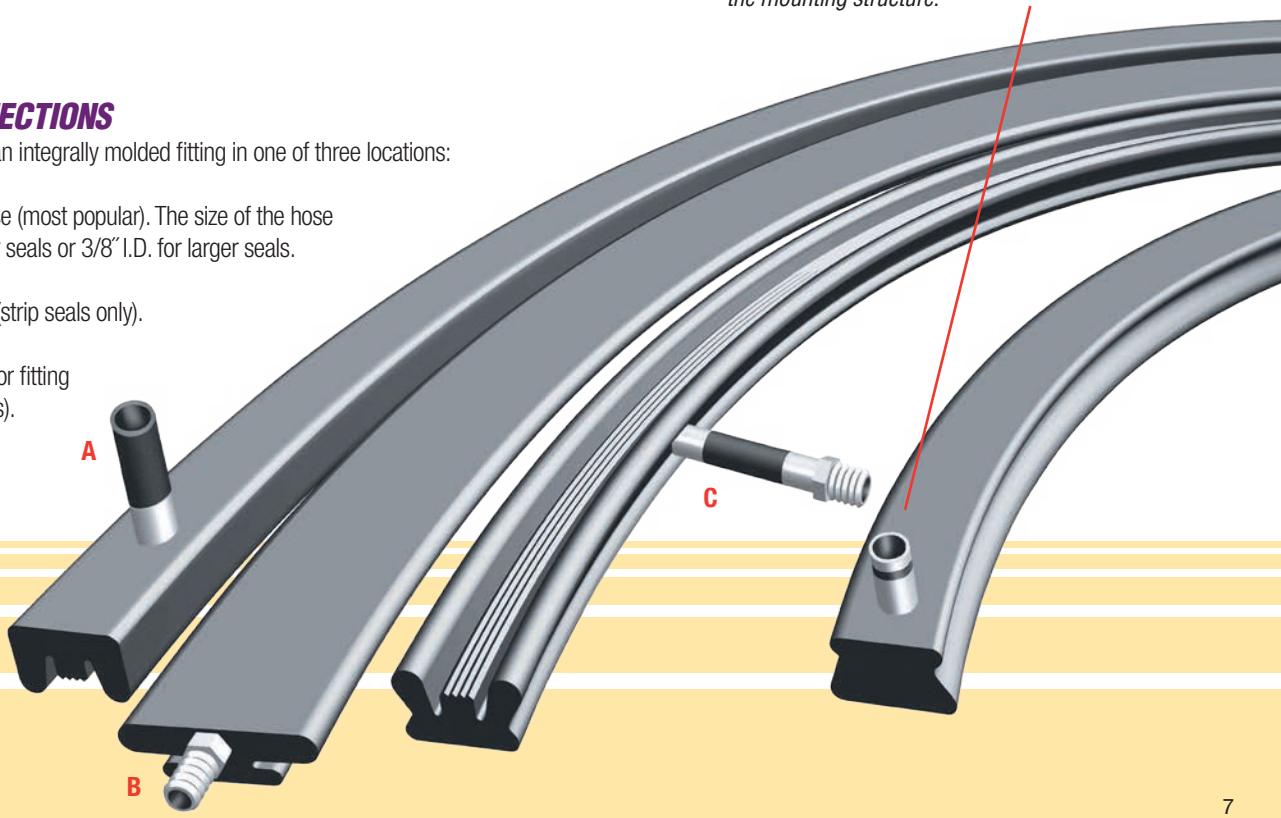
Shown with open-ended hose (most popular). The size of the hose may be 3/16˝ I.D. for smaller seals or 3/8˝ I.D. for larger seals.

B. END LOCATION

Shown with threaded fitting (strip seals only).

C. SIDE LOCATION

Shown with hose with adaptor fitting attached (limited applications).



ABOUT SEAL MASTER

Seal Master Corporation is an industry leading manufacturer of custom engineered, hand built, fabric reinforced inflatable seals. Founded in 1974, Seal Master is widely recognized for its expertise and resourcefulness as a consultant, designer and producer of inflatable seals and other custom rubber products. Seal Master takes pride in serving our customers. We are here to assist in developing a solution to the customer's problem while also establishing a strong relationship. With our knowledge and expertise of the product we can provide unmatched customer service and satisfaction.

BBB ACCREDITED BUSINESS

Seal Master takes pride in offering a quality product and excellent customer service. Seal Master is currently a Better Business Bureau A+ accredited company and has been since 1984.

BBB ACCREDITED BUSINESS

SEAL MASTER – PROUD TO SERVE PRESTIGIOUS CUSTOMERS WORLDWIDE

3M
AAR BROOKS & PERKINS
AEROJET
AEROQUIP
ALD VACUUM TECHNOLOGIES
ALKAR
ALLIANCE LAUNDRY SYSTEM
ALLIS CHALMERS
ALCOA
AMERICAN STEAMSHIP
ARMOUR FOOD
ARMSTRONG WORLD
ASEC MANUFACTURING
ATOMIC ENERGY CANADA
BASF BAY SHIPBUILDING
BECHTEL POWER CORP.
BELOIT
BOEING COMPANY
BRUCE POWER L P
BRIDGESTONE FIRESTONE
BUHLER
CANADAIR
CANADIAN GENERAL ELECTRIC
CAROLINA POWER & LIGHT
CATERPILLAR COMBUSTION ENGINEERING
COMMONWEALTH EDISON
COOPER TIRE & RUBBER
CRC EVANS PIPELINE
CRESCENT WASHINGTON HARBOUR
DELPHI COMPONENTS
DOOR ENGINEERING & MFG.
DOW CHEMICAL
DYNAMIC AIR
E.I. DUPONT
EASTMAN KODAK
E.G. & G
ELECTRIC POWER DOOR
ELLIS DON LTD.
ENERTEC S.A.
ENVIRONMENT CANADA
EXXON
FMC
FAIRFIELD ENGINEERING
FARREL CONNECTICUT
FLORIDA POWER & LIGHT
FORD MOTOR COMPANY
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