INNERLYNX®

MODULAR MECHANICAL SEALS

Innerlynx® Type UL Fire Rated 3Hour Fire Stop

CLASSIFIED C UL US

aps ADVANCE PRODUCTS & SYSTEMS, INC.

ISO-9001 Certified Company - FM537405

www.apsonline.com

Why choose Innerlynx®?

- Innerlynx® offer 21 different sizes for all pipe diameters ranging from 1/2" – 144".
- Innerlynx® are made from synthetic rubbers with industrial strength UV and ozone resistant plastic or all metal plates.
- Innerlynx® help absorb vibrations, shocks, and sound waves and act as a sound dampener.
- Innerlynx® come in 5 models; EPDM Black, Nitrile Green, Silicone Grey, EPDM Blue & Silicone Red.
- Innerlynx® form a hydrostatic seal up to 40 psig and up to 92.28 feet of head pressure.
- Innerlynx® can be easily reinstalled many times over the life of the installation.
- Innerlynx® are manufactured and assembled in the U.S.A.
- Innerlynx® electrically isolate the inner carrier pipe from the penetrated structure.
- Innerlynx® can be installed easily and quickly by one worker with no special tools.

INNERLYNX®

Innerlynx® Applications

- Wall, Floor and Ceiling Penetrations
- Cased Road Crossings
- Cased Railroad Crossings
- Bridge Pipeline Crossings
- Hospital Mechanical
- Quiet Rooms
- Electronic Equipment Rooms
- Waste Water Treatment Plants
- Power Plants
- Fire Walls
- Boiler Rooms
- Power Generation Dams
- Berms & Dikes around Tank Farms
- Public Works
- Mechanical & Electrical
- Industrial & Chemical

Ductile Iron	***PVC & CPVC***
Copper Tubing	***Insulated Pipe***
Steel Conduit	***Plastic Conduit***
SDR-35	***Dual Containment***
Glass Pipe	***Electrical Wire***
Telecommunication Cable	***IPEX***

CORE DRILLED & PRE-CAST OPENINGS
HDPE & STEEL WALL SLEEVES

Cut-away view of Infinity® wall sleeve & Innerlynx®

- Manholes & Precast Concrete Forms
- Aquariums
- HVAC Systems
- Plumbing Commercial & Residential
- Offshore Platforms (Oil & Gas)
- Swimming Pools
- Decorative Fountains
- Septic Tanks
- Ship Bulkheads
- High Pressure Tank Guards
- Parking Garage Column Protectors
- Electrical Isolation for Corrosion Protection
- Vibration, Shock & Sound Dampening
- Pumps and Tanks

Innerlynx® Models and Properties

Model "C" Innerlynx® Modular Seal is suitable for most standard applications including: aboveground, direct underground burial, wet conditions and where cathodic protection is desired.
Type: Standard
Seal Element: EPDM (black)
Pressure Plates: Composite
Nuts & Bolts: Carbon Steel (Zinc plated)
Temp. range: -40 °F to +250 °F

Model "S-316" Innerlynx® Modular Seal is composed of a combination of stainless steel hardware, glass-filled epoxy resin and EPDM
Type: Standard
Seal Element: EPDM (black)
Pressure Plates: Composite
Nuts & Bolts: Stainless Steel
Temp. range: -40 °F to +250 °F

Model "L" Innerlynx® Modular Seal is composed of a low durometer EPDM rubber suitable for conduit, insulated pipe, copper pipe or thin walled pipe.
Type: Low Durometer
Seal Element: EPDM (blue)
Pressure Plates: Composite
Nuts & Bolts: Carbon Steel (Zinc plated)
Temp. range: -40 °F to +250 °F

Model "L-316" Innerlynx® Modular Seal is composed of stainless steel hardware, glass-filled epoxy resin and low durometer EPDM.
Type: Low Durometer
Seal Element: EPDM (blue)
Pressure Plates: Composite
Nuts & Bolts: Stainless Steel
Temp. range: -40 °F to +250 °F

Model "O" Innerlynx® Modular Seal is composed of Nitrile rubber which is suitable for most Hydrocarbons, oils, hydraulic fluids, chemicals and solvents (gasoline, jet fuel, water, motor oil, kerosene, etc.)
Type: Oil resistant
Seal Element: Nitrile (green)
Pressure Plates: Composite
Nuts & Bolts: Carbon Steel (Zinc plated)
Temp. range: -40° to +210° F

Model "OS-316" Innerlynx® Modular Seal is composed of a combination of stainless steel hardware, glass-filled epoxy resin and nitrile.
Type: Oil/fuel resistant
Seal Element: Nitrile (green)
Pressure Plates: Composite
Nuts & Bolts: Stainless Steel
Temp. range: -40 °F to +210 °F

Model "T" Innerlynx® Modular Seal is composed of silicone able to endure extreme temperatures.
Type: Extreme Temperature
Seal Element: Silicone (grey)
Pressure Plates: Carbon Steel (Zinc plated)
Nuts & Bolts: Carbon Steel (Zinc plated)
Temp. range: -67 °F to +400 °F

Model "T-S316PP" Innerlynx® Modular Seal is composed of a combination of stainless steel hardware and silicone.
Type: Extreme Temperature
Seal Element: Silicone (grey)
Pressure Plates: Stainless Steel
Nuts & Bolts: Stainless Steel
Temp. range: -67 °F to +400 °F

Model "UL" Innerlynx® Modular Seal is composed of proprietary rubber where fire resistance is a must. Two seals must be inplace for UL approval.
Type: UL approved (3 hr. fire rating)
Seal Element: Proprietary Silicone (red)
Pressure Plates: Carbon Steel (Zinc plated)
Nuts & Bolts: Carbon Steel (Zinc plated)
Temp. range: 3 hrs fire rating (1900 °F/3hrs)

Model "UL-S316PP" Innerlynx® Modular Seal is composed of a combination of stainless steel hardware and silicone. Two seals must be in place for UL approval.
Type: UL approved (3 hr. fire rating)
Seal Element: Proprietary Silicone (red)
Pressure Plates: Stainless Steel
Nuts & Bolts: Stainless Steel
Temp. range: 3 hrs fire rating (1900 °F/3hrs)

Innerlynx® Modular Seal - Properties

Material Properties for Innerlynx® Modular Seal Elements

Property	ASTM Method	EPDM (Black)	EPDM (Blue)	Nitrile	Silicone	Silicone UL
Hardness	D-2240	50	40	50.50	50.50	50.50
Tensile	D-412	1828 psi	1828 psi	1200 psi	860 psi	860 psi
Elongation	D-412	784%	784%	600%	600%	600%
Compression Set	D-395	25% 22 hrs. @ 158 °F	25% 22 hrs. @ 158 °F	45% 22 hrs. @ 158 °F	38% 22 hrs. @ 350 °F	38% 22 hrs. @ 600 °F
Specific Gravity	D-297	1.15	1.15	1.42	1.30	1.30

Material Properties for Bolts and Nuts

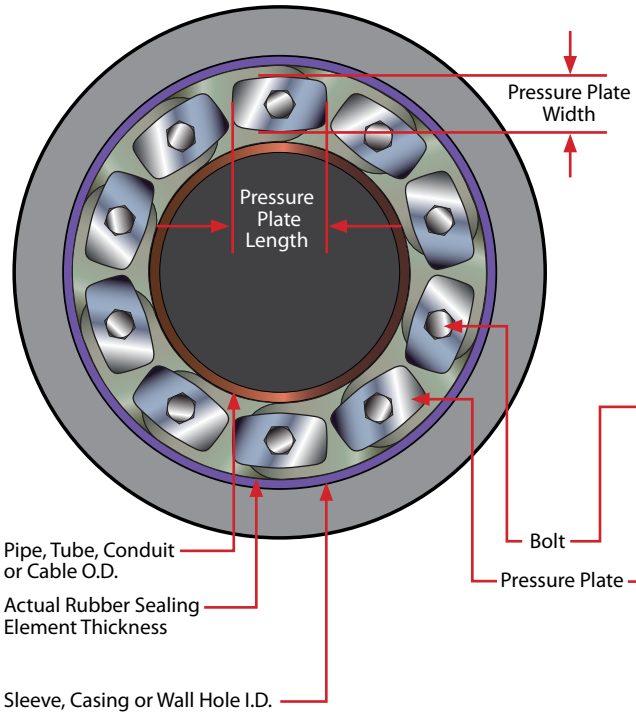
Type	Tensile Strength
Carbon Steel	60,000 psi
Stainless Steel: 316 Stainless Steel	85,000 psi

Material Properties for Composite Pressure Plates

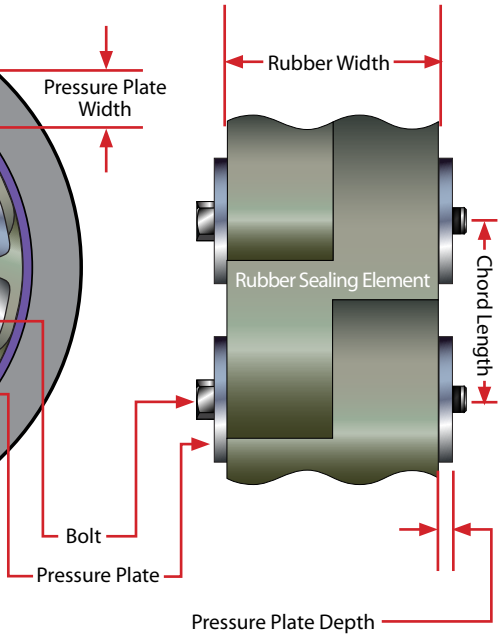
Property	ASTM Method	Value
Tensile Strength	D-638	27,000 psi
Stress at Break	D-638	28,000 psi
Elongation at Break	D-638	3%
Flexural Strength	D-790	40,000 psi
Flexural Modulus	D-790	1,300,000 psi
Izod Impact	D-256	2.0
Specific Gravity	D-792	1.39

Innerlynx® Dimensions

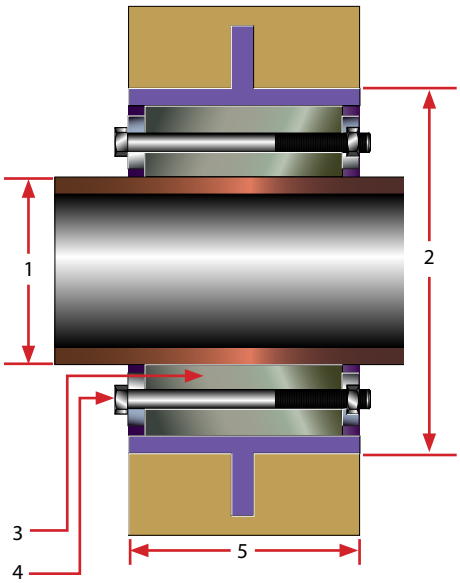
Innerlynx® Assembly
Front View



Innerlynx®
Side View



Innerlynx® Assembly
Side View/Cut Away



1. Pipe outside diameter
2. Wall sleeve or core drill inside diameter
3. Model of Innerlynx®
4. Specify steel or stainless steel hardware
5. Wall thickness

INNERLYNX® Model No.	RUBBER SEALING ELEMENT			PRESSURE PLATE			BOLT		Minimum Wall Thickness	Weight By Piece (lbs/approx)
	Actual Thickness	Width	Chord Length	Width	Length	Depth	Thread Size	Length		
IL200	0.50	1.80	1.15	0.45	1.14	0.32	10/32	2.50	2.500	0.05
IL265	0.59	1.77	1.58	0.55	1.49	0.37	5mm	2.75	2.875	0.10
IL275	0.63	1.80	0,89	0.63	0.90	0.36	10/32	2.50	2.500	0.05
IL300	0.70	2.57	1.50	0.68	1.52	0.43	5/16	3.50	3.625	0.20
IL310	0.65	2.40	2.22	0.63	2.00	0.50	6mm	3.50	3.750	0.22
IL315	0.83	2.49	1.47	0.79	1.46	0.48	5/16	3.50	3.625	0.25
IL325	0.93	3.04	3.15	0.81	2.87	0.94	5/16	5.00	5.125	0.60
IL340	1.02	2.75	1.52	0.96	1.50	0.70	5/16	4.50	5.125	0.35
IL360	1.25	2.80	2.08	1.12	2.10	0.76	5/16	4.50	5.125	0.50
IL400	1.41	3.56	3.63	1.33	3.51	1.06	3/8	6.00	6.250	1.20
IL410	1.41	3.38	2.62	1.42	2.52	0.87	3/8	5.50	5.625	0.80
IL425	1.13	3.54	3.60	1.03	3.45	1.18	3/8	6.00	6.250	0.69
IL440	1.74	3.36	3.94	1.52	3.54	0.96	10mm	6.00	6.125	1.00
IL475	1.61	3.16	2.68	1.48	2.60	0.78	3/8	5.50	5.625	0.90
IL500	2.39	3.90	3.90	2.17	3.72	1.04	1/2	6.00	6.250	2.30
IL525	2.20	3.80	3.95	2.00	3.72	1.03	1/2	6.00	6.250	2.15
IL575	1.81	3.78	3.16	1.79	3.01	1.00	1/2	6.00	6.250	1.55
IL600	3.20	4.08	6.06	3.07	6.12	1.90	3/4	8.00	8.250	6.25
IL625	3.28	4.02	4.09	3.08	3.93	1.18	12mm	7.00	8.250	3.25
IL650	2.67	4.07	4.16	2.17	3.72	0.87	1/2	6.00	6.250	2.50
IL700	3.74	3.98	6.02	3.58	5.85	1.12	12mm	7.00	8.250	5.25

*All dimensions are in inches

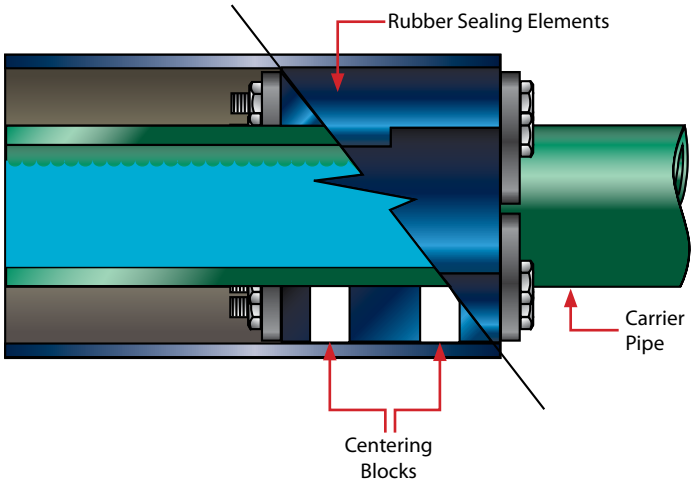
Standard sizing charts from our past brochures have been relocated to the website:
www.apsonline.com
If you would like a hard copy of the Innerlynx® reference charts please contact your Innerlynx® representative or call 1-800-315-6009

Centering Blocks-End Seals

Innerlynx® Centering Blocks

Around pipes of at least 14" in diameter, HDPE centering blocks are embedded into the bottom 25% of the Innerlynx® assembly to assist in centering the carrier pipe during installation.

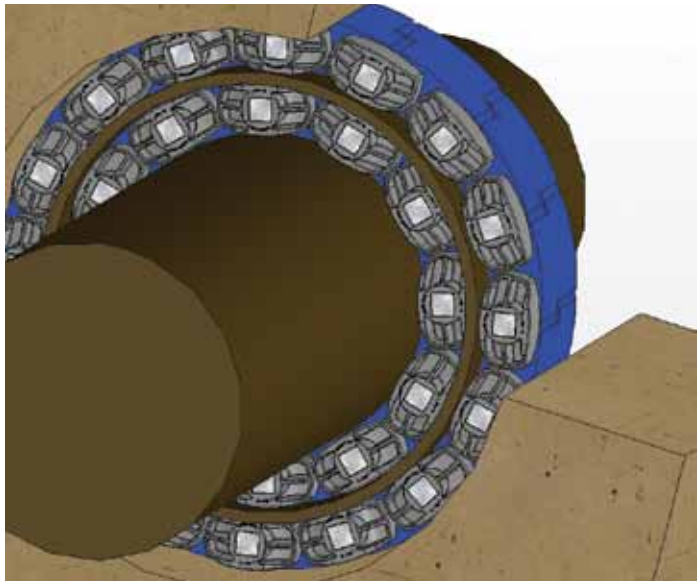
Unlike pipeline "boots", when used as end seals, on pipes of these sizes, Innerlynx® are set within the casing and are protected from sharp aggregate and equipment, making them perfect end seals for cased pipelines.



Layered Applications

Layered Applications

Multiple layers of Innerlynx® assemblies can be successfully installed using intermediate sleeves between wraps when the annular space is wider than the expanded thickness of a single Innerlynx® assembly (as seen in the example below). Call the factory for sizing assistance at 1-800-315-6009.



Wall Sleeves

Why use Wall Sleeves

Protect your investment using APS wall sleeves to provide a better seal than a core drilled hole. In the absence of wall sleeves, mechanical/utility piping vibration can cause costly damage. In addition, wall sleeves make it easier to repair piping without damaging the wall.

APS offers three types of wall sleeves designed to mate with Innerlynx® for leak free performance. Steel, Galvoplast coated steel and HDPE Infinity Sleeves.

Each model is available with a 2" water stop that anchors the sleeve to prevent thrust movement and ensure positive water sealing. APS standard water stops are centered, unless otherwise requested.

Infinity® Wall Sleeve Features

High Density Polyethylene (HDPE)

- Excellent resistance to acids, alkalis and other organic solvents
- Positive hydrostatic seal
- 16 sizes - 2" to 25" diameter
- Lighter than steel
- Resists water migration
- 16" Long
- Locator caps make installation easier
- Adjust to wall thickness onsite

Gal-vo-plast® Wall Sleeve Features

MODEL: GPWSW are made of steel with a welded steel water stop with Gal-vo-plast® coating.

- Less expensive than galvanized
- More corrosion resistant
- Faster availability, especially for custom wall sleeves
- Longer installation life
- All coating performed in house
- Considerably more economical
- Available in 2" to 120" diameter

Innerlynx® Sizing

How to calculate sizes and amount of Innerlynx® needed to seal your penetration:

Part 1

To figure which IL style number is needed to seal the annular space

I.D. of casing/core drilled hole - O.D. of carrier pipe = Y

Y ÷ 2 = Sealing Range

Find the correct sealing range and the corresponding style number on the chart adjacent. If there is more than one IL size to choose from, choose the IL size that is closer to the untightened seal range.

Part 2

To figure out how many Innerlynx® are needed to seal the penetration:

I.D. of casing/core drilled hole + O.D. of carrier pipe = Y

Y ÷ 2 = Bolt Circle

Bolt Circle x 3.14 = Circumference of bolt circle

Circumference of bolt circle ÷ chord length = Innerlynx® per seal

Use the chord length matched with proper Innerlynx® number

Example:

8" Ductile Iron Pipe into a 12" core drilled hole

Part 1:

12 – 9.05 = 2.95

2.95 ÷ 2 = 1.475 seal range

1.475 falls between the range for IL 400

Part 2:

12 + 9.05 = 21.05

21.05 ÷ 2 = 10.525 Bolt Circle

10.525 x 3.14 = 33.0485 Cirumference Bolt Circle

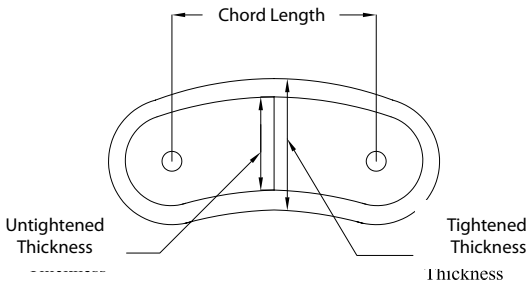
33.0485 ÷ 3.63 = 9.10427 Number of Innerlynx®

Answer: 9 IL400

Note: If the calculation ends in .79 or lower, round **down** to the nearest whole number. If the calculation ends in .80 or higher round **up** to the nearest whole number.

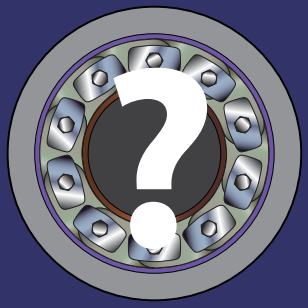
Get your FREE Innerlynx® calculator app.

Download on the App Store



IL Size	Sealing Range		Chord Length	Min Qty	Min Pipe	Max Pipe
	Untightened	Tightened				
200	0.50	0.63	1.15	4	0.84	12.75
265	0.59	0.79	1.58	5	1.90	16.00
275	0.63	0.78	0.89	4	0.50	1.05
300	0.70	0.88	1.50	4	1.32	9.84
310	0.65	0.88	2.22	6	3.96	16.00
315	0.83	1.03	1.47	5	1.63	12.40
325	0.93	1.19	3.15	7	6.63	27.99
340	1.02	1.32	1.52	5	1.38	12.75
360	1.25	1.65	2.08	5	2.13	16.00
400	1.41	1.81	3.63	6	6.13	48.03
410	1.41	1.81	2.62	5	2.75	12.75
425	1.13	1.50	3.60	7	6.90	48.03
440	1.74	2.19	3.94	8	8.13	48.03
475	1.61	2.00	2.68	5	2.38	48.03
500	2.39	2.81	3.90	8	8.13	50.80
525	2.20	2.50	3.95	8	8.13	48.03
575	1.81	2.35	3.16	8	6.13	61.61
600	3.20	4.00	6.06	8	12.13	118.11
625	3.28	4,00	4.09	9	8.13	78.74
650	2.67	3.20	4.16	10	10.75	78.74
700	3.74	4.32	6.02	8	12.13	118.11

Having trouble sizing Innerlynx®?



Call the factory with all information applicable: 1-800-315-6009
Online calculator available at www.apsonline.com/innerlynx

Innerlynx® Installation Instructions

Innerlynx® Check List

1. Make sure installation area is free of dirt or debris.
2. Make sure pipe is centered in sleeve or hole.
3. Make sure pressure plates and bolt heads are facing out.
4. Make sure that Innerlynx are hand-tightend only.
5. Make sure that the carrier pipe is supported.
6. Make sure that you use an anti-seizing compound if using stainless steel hardware.

Innerlynx® Don'ts

1. Never use power tools or air tools on any Innerlynx bolt.
2. Do not tighten bolts more than a couple of turns at a time.
3. Do not tighten bolts completely at one time.
4. Do not use Innerlynx as a mean of pipe support.
5. Do not install Innerlynx® on uneven surfaces.
6. Do not tighten in a star pattern. Do go clockwise.

Please Read Above Before Installing

1. Center the pipe, cable or conduit in wall sleeve, casing or core drilled hole. Make sure the pipe will be adequately supported on both ends. Innerlynx® are not intended to support the weight of the pipe.

2. Connect both ends of the belt assembly around the pipe. Check to be sure all bolt heads are facing the installer.

3. Slide Innerlynx assembly into annular space. Lubrication with thin soap/water solution may help if tight.

4. Assembly may fit tightly or be loose depending on fit designed for your annular space.

5. Use HAND tools only. DO NOT USE power or air driven tools. This not only voids your warranty, but does not let Innerlynx work to its full potential.

6. Start at the bolt located at 12 o'clock with 2-3 turns of wrench/ratchet. Continue clockwise. Do not tighten in a star pattern.

7. Repeat process until rubber begins to slightly bulge and bolt is tight. Make one more turn on each bolt around the entire assembly.

8. Installation is complete. If the seal doesn't appear to be correct using the instructions provided, call Advance Products & Systems, Inc. at 800-315-6009

For the best possible wall penetration seal when using Innerlynx® you may also need either Gal-vo-plast® or Infinity® wall sleeves from APS. Refer to the reference within this brochure or request a copy of these brochures from your APS representative.

OTHER PRODUCTS AVAILABLE

- Flange Isolation Gasket Kits
- Radolid® Nut & Bolt Protection Caps
- U Bolt Cote®
- Casing Spacers and End Seals
- Kleerband® Flange Protectors
- Safety Spray Shields
- Foreman Night Caps, temporary pipe plugs
- Kleergel®
- Bore Spacers
- ISOJOINT® - Monolithic Isolating Joint

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