HUTCHINSON®

MEMBRAMATIC®
INFLATABLE SEALS






We make it ***possible***

MEMBRAMATIC®
INFLATABLE SEALS
Catalogue

HUTCHINSON®

INTRODUCTION

1. HUTCHINSON GROUP

To meet its clients' needs on land, in the air and at sea, Hutchinson has been designing, developing and manufacturing high-performance solutions for 170 years.

Our innovations cover a wide variety of particularly demanding markets: automotive, aeronautics, defence, energy, rail and industry in general.

As a world leader in anti-vibration systems, fluid management and sealing solutions, our group stands out for its multi-market and multi-expertise approach, a source of synergies and added value.


PRECISION SEALING


STRUCTURAL SEALING


FLUID MANAGEMENT


MATERIALS AND STRUCTURES


ANTI-VIBRATION SYSTEMS


TRANSMISSION SYSTEMS

A wide spectrum of resources

Our corporate Research & Innovation Centre brings together more than 200 engineers and technicians conducting fundamental and applied research. Innovative solutions are developed by combining our key technologies and skills:

- Chemistry and materials science
- Mechanical engineering
- Composite materials
- Transformation processes
- Vibration and acoustics
- Thermal insulation
- Mechatronics

"Our ambition: to play a role in the mobility of the future – a safer, more comfortable, more responsible form of mobility."

Our specialised teams in our technical centres around the world develop high-value solutions. They dedicate their resources in applied engineering to our clients.


> 41,700 employees


25 countries


100 sites


5% invested in R&D


> €4400 million in turnover

2. PRECISION SEALING SYSTEMS

As a leading manufacturer of sealing solutions, Hutchinson - Precision Sealing Systems designs and manufactures static and dynamic sealing solutions, magnetic washers, absolute rotary sensors, foams and composites for its international clients operating in a wide range of industrial sectors.

Our range of MEMBRAMATIC® inflatable seals meets the requirements of the most demanding environments such as nuclear, aeronautics & space and defence. We have complete control over the whole process – from development to production – meaning we can provide our clients with custom solutions, a range of approved materials and a certified guarantee of origin.

Our project team relies on ongoing testing and innovation to develop solutions that are perfectly adapted to the needs of our clients.

Service

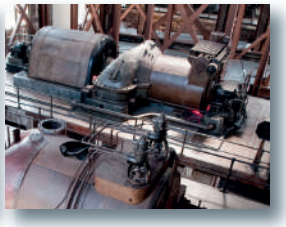
- Continuous product development – R&D
- Computer-assisted design (CAD)
- Single inventory policy
- Digital simulations

Technology & Expertise

- Metal and/or textile insert adhesion
- Insourcing & control over the production process (from design to production)

Certifications



MEMBRAMATIC® INFLATABLE SEALS

1. APPLICATIONS

Inflatable rubber seals provide sealing for installations with moving components, possibly ones on which there is a significant variable range of movement. They mitigate irregularities in the construction process and distortions on the various surfaces of the assembly to be sealed.

They address problems associated with tightening components and can be used for clamping, pressing, gripping or handling a given device. Based on a simple, safe and effective technology, they offer numerous advantages over conventional seals. They solve previously unsolved problems to do with sealing on installations where temperatures range from -40 to +170°C, and pressures can be of several bars.

Thanks to their performance, inflatable seals are used in many industries: nuclear, aeronautics, rail, public works, marine and armaments, and with a wide variety of applications.

Application examples

As a sealing component

- Cofferdams (shipbuilding industry, nuclear industry)
- Waterproof silencers
- Insulated boxes
- Mobile cell partitions (aviation industry)
- Formwork for reinforced concrete
- Storage containers
- Transport containers
- Nuclear enclosures (airlocks)
- Polytherm containers
- Canopy sealing
- Stopcock valves
- Shim panels (mineral vessels, oil vessels)
- Sliding doors, autoclaves, sterilisers
- Nuclear enclosure gates (airlocks for equipment and personnel)
- Railway car doors
- Aeroplane doors

As an actuator / gripping system

- Felting machines
- Continuous welding machines
- Forming or crimping presses
- Switching machines
- Tube handling
- Replacement for small travel actuators

2. OPERATION

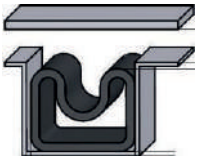
Supplying a pressurised fluid, usually a gas inside the seal, activates it and shifts it from the resting position to the operating position.

Releasing the pressurised fluid in the seal returns it to the idle position thanks to the elasticity of the elastomer. The seal resumes its original shape.

The internal pressure of the fluid contained in the seal results in a contact on the interface to be sealed that creates the watertightness / gas tightness. This pressure must always be higher than the pressure to be sealed (+0.2 to +1 bar, depending on the types of inflatable seals and the application scenario).

“RESTING” position (assembly)

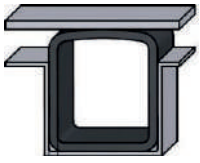
The seal occupies a minimum volume in its grove, which allows the moving parts of the device to move easily.



“RESTING” position

“OPERATING” position (sealing)

The seal is in contact with its interface, completely closing up the gap between the various components to be sealed, and blocking and locking of the device's moving components.



“OPERATING” position

3. MAIN FAMILIES OF INFLATABLE SEALS

We have four main families of inflatable seals with the following geometries:

Type D expansion seal

Type P expansion & runner seal

Type H seal

Type E extension seal

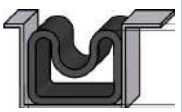
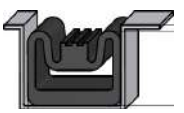
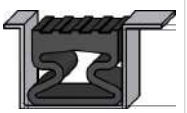
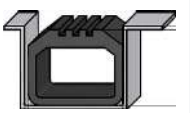
SELECTING AN INFLATABLE SEAL

An inflatable seal should be chosen when the gap to be sealed is significant or variable. To obtain a satisfactory level of watertightness / gas tightness with an inflatable seal, go through the following steps when selecting the seal.

1. CHOOSING THE PROFILE

The most appropriate profile should be selected, based on operating and assembly conditions: the gap and the pressure to be sealed.

Use the following table to choose from among the various standard profiles in our catalogue.

Gap	Medium	High	Medium	Low
Pressure	Low	Low	Medium	High
Profile type	D 	P 	H 	E 

2. RUBBER SELECTION

The main factors to be taken into account when choosing the material are:

- Nature of fluids in contact during operation
- Nature of fluids in contact during maintenance operations
- Service and storage temperature
- Other agents (UV, irradiation, ozone, etc.)

We have specially developed formulations in the main elastomer families, so they can be used in a wide variety of conditions in which MEMBRAMATIC® seals are used.

The following table shows the main characteristics of the most common compounds, which include, depending on the type of elastomer: maximum temperatures for using the material (for static applications), recommended maximum temperatures for MEMBRAMATIC® seals and main applications.

Maximum temperature values are given for guidance only as fluids in contact with one another can significantly influence maximum usage temperatures.

Basic elastomer	Min. & Max. temperature of the material (ºC)	Min. & Max admissible temperature for our seals (ºC)	Textile reinforcement	Main properties and applications
NR - Natural rubber	Min -50 Max +100	Min -40 Max +70	Possible	Cold resistance
SBR - Styrene-butadiene	Min: -30 Max: +125	Min -15 Max +100	Possible	Demineralised water resistance
NBR - Nitrile	Min -20 Max +125	Min 0 Max +100	Possible	Aliphatic hydrocarbon & medium aromatic resistance
CR - Polychloroprene	Min -30 Max +120	Min -20 [1] Max +90	Possible	Atmospheric ageing, aliphatic & weak aromatic hydrocarbon resistance
IIR - Butyl	Min -40 Max +120	Min -30 Max +100	Possible Contact us	Acid & alkalis, hot water resistance Excellent impermeability to air & other gases in general
IIR - Butyl heat	Min -40 Max +170	Min -30 Max +130[2]	Possible Contact us	Same as butyl with better temperature resistance
EPDM – Ethylene propylene	Min -40 Max +150	Min -30 Max +120	Possible Contact us	Acid and alkalis, hot water, intermediary temperatures & radiation (nuclear use) resistance
MVQ - Silicone	Min -45 Max +225	Min -30 Max +180	Possible	Resistance to extreme temperatures (high & low)
FKM - Fluorocarbon	Min -20 Max +250	Min 0 Max +180	Not feasible	Maximum chemical & high temperature resistance

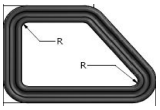
Reserves:
[1] For polychloroprenes used at temperatures below 0ºC, it is advisable to consult us.
[2] For better retraction of the seals used at these temperatures, it is advisable to operate with a vacuum.

3. DEFINING THE GEOMETRY & THE DIRECTION OF EXPANSION

The geometry of the seal depends on the shape to seal.
We have 4 possible scenarios:

- Ring seal: C geometry
- Closed frame seal: F geometry
- Linear seal: L geometry
- Open seal with angle(s): U geometry

Type C geometry



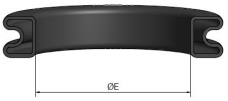
Type F geometry

Type L geometry

Type U geometry

The direction of expansion is defined as below:

- External Expansion : E Type
- Internal Expansion : I Type
- Front axial expansion : F Type



C Type geometry

E Type direction of expansion

C Type geometry

I Type direction of expansion

C Type geometry

F Type direction of expansion

In all cases, the radius of curvature that is compatible with the geometry and direction of expansion must be monitored, *see tables p.25.*

We can create specific tools if the system to be sealed requires lower curvature radius.

The internal expansion is usually reserved for profiles E or H.
It is recommended that you consult us for this type of assembly.

4. CHOOSING & POSITIONING THE INFLATION CONNECTORS

Fluid usually enters the inflatable seal via a metal connector or valve which can be connected to the main supply circuit of the device to be sealed, *see p.29.*

Pressurised fluid can be supplied by various devices such as a general compressed air circuit, compressor, bottle, tank, etc.

Materials

Supply connectors are made of either brass or stainless steel (special metal connectors may be considered on request). Inflation connectors are attached to the seal either mechanically or by over moulding.

The number and size of the connectors depend on the volume of the seal and the desired inflation or deflation speed.

Position

The connector is usually mounted in the back of the groove.

In all cases, check that the diameter of the connector base is less than the internal diameter of the profile, so as not to distort the seal's diameter after assembly.

We can include connectors for seals manufactured with obturations.

GENERAL RECOMMENDATIONS

1. CALCULATION OF STRUCTURES

The structures must be sized taking into account the force applied by the inflatable seals when activated. This force will be evaluated by the formula:

F: Force in DaN (decaNewton) over a given length
LD: Length of the seal in cm
L: Width of a section of the seal in cm
Pi: Internal pressure of the seal in bar

F = LD x L x Pi

2. DEFINING THE GROOVES

The groove should be chosen based on the gap to be compensated for and the space available once the profile to be used has been defined. *See p.20 to 24*.

In general, the not inflated seal should be withdrawn relative to the top of the groove. The groove can be made from raw laminating sheet or profiles free of crusts or scale. The welds must be shaved.

There must be no straight angles or horizontal scratches in the groove or on the supporting surfaces of the seal.

3. CONDITION OF BEARING SURFACES

The effectiveness of the sealing system depends largely on the cleanliness and flatness of the support surfaces. Some precautions should therefore be taken:

- There must be no scratches on any of the supporting surfaces, particularly horizontal ones
- If the parts in question are for boiler equipment, carefully grind any connecting areas which have any welds
- Ensure that the radii are in compliance with the indications given in our catalogue
- Thoroughly inspect the supporting areas (use a millstone or a scraper to remove any “drops” of weld that might still remain on the surface of the sheets after modification of the spans) before assembly

For all supports, we recommend a Ra < 3.2. This value generally provides a good compromise between satisfactory sealing and reasonable cost.

Better surface condition will ensure better sealing.

4. DEFINITION OF FASTENINGS

The profiles shown here are without heels; unless otherwise stated, they are bonded into the groove. We can provide profiles for mechanical fastening on request.

Note: for bonding the seals, see point 2.3, p.18.

5. INFLATION SUPPLY

It is advisable to have a permanent inflation pressure for the seal. The pressure must be controlled by a pressure regulator so that pressure losses can be compensated and pressure chocs due in particular to temperature rises can be avoided.

If the seal is to remain pressurised, and cut off from its supply circuit for a prolonged period of time, the diffusion of the fluid through the elastomer will cause a loss of pressure over time. The seal's effectiveness should be checked periodically.

The seal can be retracted, especially at low temperatures, using an ejector (Venturi System) to create a vacuum inside the seal (except Type E expansion seal).

6. USE, MAINTENANCE & REPAIR

Usage

It is advisable to avoid pressurising the seal when the mobile components to be sealed are not in place.
Similarly, the moving components must not be operated when the seal is pressurised.

Maintenance

Equipment with inflatable and retractable MEMBRAMATIC® seals does not require any special maintenance, but certain precautions must be taken:

- Avoid scratches, tears, impact from tools
- Periodically perform a complete cleaning of the seal's surface with a mixture of water and multi-purpose TEEPOL type detergent in order to remove any miscellaneous deposits that might adhere to the surface in the sealing zone and cause problems during operation

Repair

Repairs without vulcanisation are not recommended.

Damaged seals must be returned to us. Our experts will then decide whether to try and repair the seal or replace it.

1. CHECKING & STORING INFLATABLE SEALS

1.1 Factory seal checks

All our seals are factory-checked under the following conditions:

- Appearance 100%
- Dimensions 100%
- Watertightness 100%

In the free state out of its groove, the pressure test is 0.5 bar for all rubber seals and 1 bar for seals with textile reinforcement.

1.2 Storage & acceptance conditions

The packaging of our seals is designed for a maximum storage period of 6 months without material deterioration, except for orders submitted according to specific requirements.

For other applicable conditions, clients should refer to ISO 2230:2002 (or equivalent).

Attention is drawn to the fact that under no circumstances should the seal be inflated to its service pressure when it is not in its working position: seal in the groove with its sealing interface.

2. ASSEMBLY BY BONDING

2.1 General bonding instructions

The inflatable seal is bonded in its groove. To achieve good results during bonding operations, certain precautions must be taken.

Weather conditions play an important role, so it is necessary to factor temperature and humidity where the bonding operation is being performed.

To obtain optimum guarantees, the following conditions must be met:

- Humidity < 75%
- Ambient temperature > 16ºC

Cleaning solvents, as well as solvents that may be used in the composition of the bonding products, are toxic and flammable to varying degrees, so proper ventilation should be provided during work and safety regulations should be followed. Reference should be made to the technical data sheets of bonding products.

The first thing to do is to check the use-by date of the bonding product.

2.2 Solvents recommended for cleaning

Any non-greasy solvent may be used, for example:

- MEC (Methyl-ethyl-ketone)
- Acetone

2.3 Products recommended for bonding

Any elastomer except silicone and fluorocarbon

- Quick polymerisation mastic sealing gum

KIT	Size	Reference	Polymerisation
Semkits	100 cm^3	JB 2206 B ½	½ hour
Semkits	100 cm^3	JB 2206 B 2	2 hours

Made up of:

- Base
- Accelerator
- Primary

Silicone

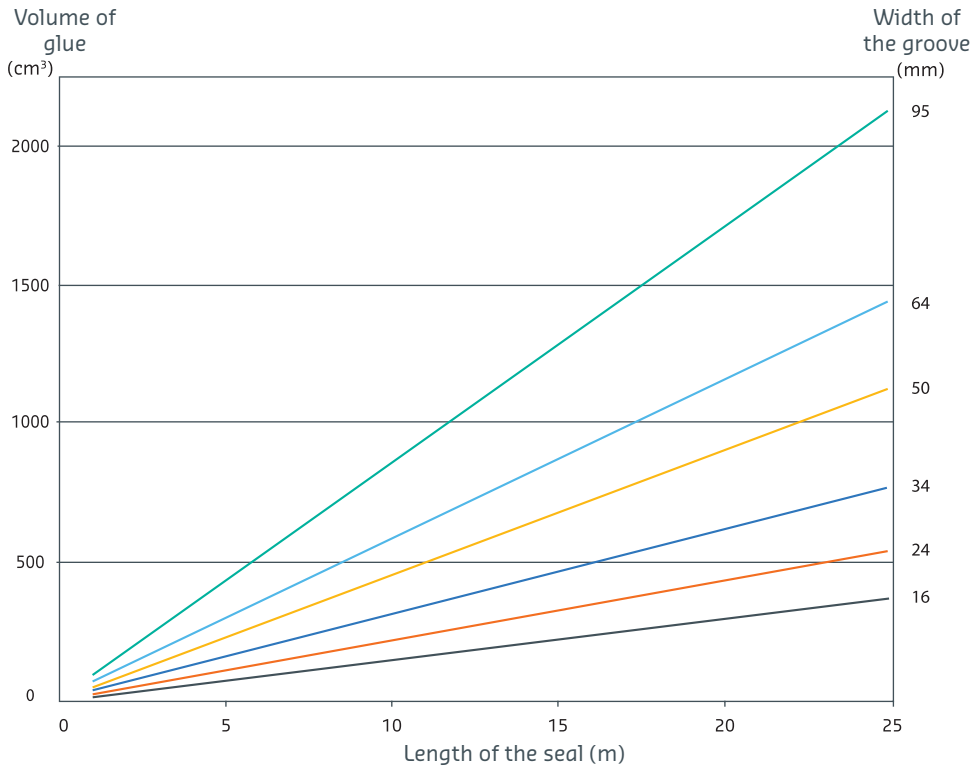
All RTV type silicone glues, for example:

- CAF 4 (RHONE POULENC) standard supply
- SILASTIC 732 / SILASTIC 3145 (DOW CORNING)
- ELASTOSIL E41 (WACKER)

Fluorocarbon

- PR 1720 SM Kit 35
- PR-1732, PR-1733 primaries

Quantity of glue for 1 mm of deposit

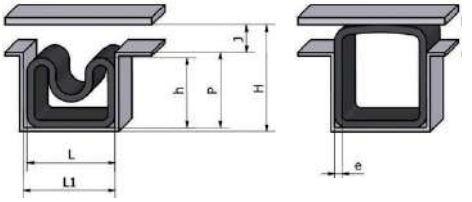


LIST OF SIZES

1. PROFILE TYPES

1.1 MEMBRAMATIC® type D

L: Width of the seal
e: Thickness of the seal
H: Maximum height of the inflated seal
P: Depth of the groove
J: Gap
h: Height of the seal not inflated
PgM: Maximum inflation pressure
L1: Groove width
PeM: Maximum watertight pressure



Reference	L (mm)	h (mm)	e (mm)	H (mm)	L1 (mm)	P (mm)	J (mm)	PgM (bar)	PeM (bar)
0-289	16	12.5	2	15	L+0.5/-0	13	2	4.5	4.2
0-290	16	14	1.8	18.5	L+0.5/-0	14.5	4	4.5	4.2
0-254	24	20	3	25	L+0.5/-0	21	4	3.5	3.3
0-115/3	18	16.5	2	22	L+0.5/-0	17.5	4.5	3	2.8
0-216/3	34	25	3	33	L+1/-0	26.5	6.5	3	2.8
0-115	18	15.5	2	24	L+0.5/-0	16	8	0.75	0.6
0-217	24	20	2	30	L+0.5/-0	21	9	1	0.9
0-111	16	14.5	1.5	24.5	L+0.5/-0	15	9.5	0.5	0.4
0-216	34	25	3	38	L+1/-0	26.5	11.5	1	0.9
0-281	50	35	4.5	55	L+1.5/-0	37	18	1.5	1.4
0-233	64	50	4	80	L+1.5/-0	53	27	2	1.8
0-1-2-116-2	95	65	3.5	120	L+1.5/-0	68	52	1	0.9

Materials for this type of profile :

Standard materials:

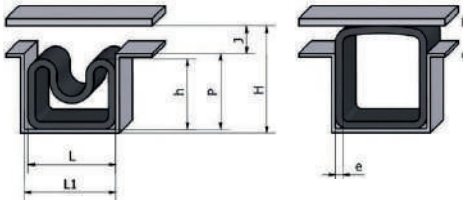
- Polychloroprene CR
- Nitrile NBR
- Ethylene-propylene EPDM
- Silicone MVQ

Materials useable on request:

- Styrene Butadiene SBR
- Fluorocarbon FKM
- Butyl IIR

1.2 MEMBRAMATIC® type D Textile

L: Width of the seal
e: Thickness of the seal
H: Maximum height of the inflated seal
P: Depth of the groove
J: Gap
h: Height of the seal not inflated
PgM: Maximum inflation pressure
L1: Groove width
PeM: Maximum watertight pressure



Reference	L (mm)	h (mm)	e (mm)	H (mm)	L1 (mm)	P (mm)	J (mm)	PgM (bar)	PeM (bar)
0-116	16	14.5	1.5	25	L+0.5/-0	15	9	2	1.8
0-222	24	20	2.5	30	L+0.5/-0	21	8	3	2.7
0-218	34	27	3	45	L+1/-0	29	16	3	2.7
0-1-2-116-B	95	65	6	110	L+1.5/-0	68	42	3	2.7

Materials for this type of profile :

Standard materials:

- Polychloroprene CR
- Nitrile NBR
- Silicone MVQ

Materials useable on request:

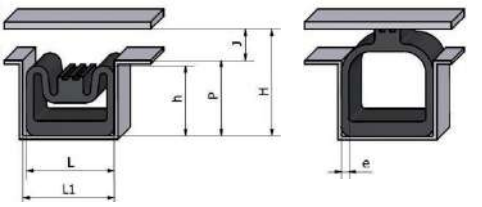
- Styrene-butadiene SBR

Unusable materials:

- Ethylene-propylene EPDM
- Fluorocarbon FKM
- Butyl IIR

1.3 MEMBRAMATIC® type P

L: Width of the seal
e: Thickness of the seal
H: Maximum height of the inflated seal
P: Depth of the groove
J: Gap
h: Height of the seal not inflated
PgM: Maximum inflation pressure
L1: Groove width
PeM: Maximum watertight pressure



Reference	L (mm)	h (mm)	e (mm)	H (mm)	L1 (mm)	P (mm)	J (mm)	PgM (bar)	PeM (bar)
0- 432	16	14.5	1.3	25	L+0.5/-0	15	10	1	0.8
0- 433	24	20	2	36	L+0.5/-0	21	15	1	0.8
0- 434	34	25	2.6	43	L+1/-0	26	20	1	0.8

Materials for this type of profile :

Standard materials:

- Polychloroprene CR
- Ethylene-propylene EPDM
- Silicone MVQ

Materials useable on request:

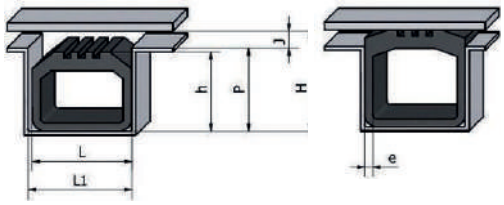
- Nitrile NBR
- Styrene Butadiene SBR
- Butyl IIR

Unusable material:

- Fluorocarbon FKM

1.4 MEMBRAMATIC® type E

L: Width of the seal
e: Thickness of the seal
H: Maximum height of the inflated seal
P: Depth of the groove
J: Gap
h: Height of the seal not inflated
PgM: Maximum inflation pressure
L1: Groove width
PeM: Maximum watertight pressure



Reference	L (mm)	h (mm)	e (mm)	H (mm)	L1 (mm)	P (mm)	J (mm)	PgM (bar)	PeM (bar)
0-332	16	12	3	15	16.5	12.5	2.5	5	6
0-330	21	24	4	24	21.5	25	4.5	5	6
0-340	30	16	3	24	31	16.5	7	5	6
0-324	35	26	5	33	36	28	5	5	6
0-248	40	26	3	34	41	28	6	5	6
0-353	50	45	6	55	51	49	7	5	6

Materials for this type of profile :

Standard materials:

- Ethylene-propylene EPDM
- Silicone MVQ

Materials useable on request:

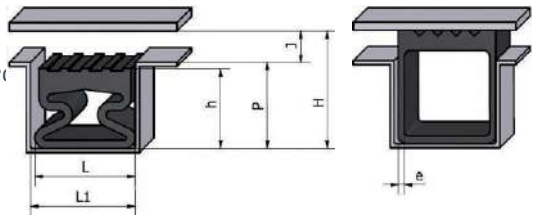
- Polychloroprene CR
- Nitrile NBR
- Styrene Butadiene SBR
- Butyl IIR

Unusable material:

- Fluorocarbon FKM

1.5 MEMBRAMATIC® type H

L: Width of the seal
e: Thickness of the seal
H: Maximum height of the inflated se
P: Depth of the groove
J: Gap
h: height of the seal not inflated
PgM: Maximum inflation pressure
L1: Groove width
PeM: Maximum watertight pressure



Reference	L (mm)	h (mm)	e (mm)	H (mm)	L1 (mm)	P (mm)	J (mm)	PgM (bar)	PeM (bar)
0 - 358	16	14.5	1.8	20	L+0.5/-0	15	5	8	6
0 - 430	24	20	2	26	L+0.5/-0	21	6	8	6
0 - 431	34	25	2.5	35	L+1/-0	26	9	8	6

Materials for this type of profile :

Standard materials:

- Ethylene-propylene EPDM
- Silicone MVQ

Materials useable on request:

- Polychloroprene CR
- Nitrile NBR
- Styrene Butadiene SBR
- Butyl IIR

Unusable material:

- Fluorocarbon FKM

2. TYPES OF GEOMETRY

2.1 C geometry

The following values are the minimum radii that straight-length components can accept.

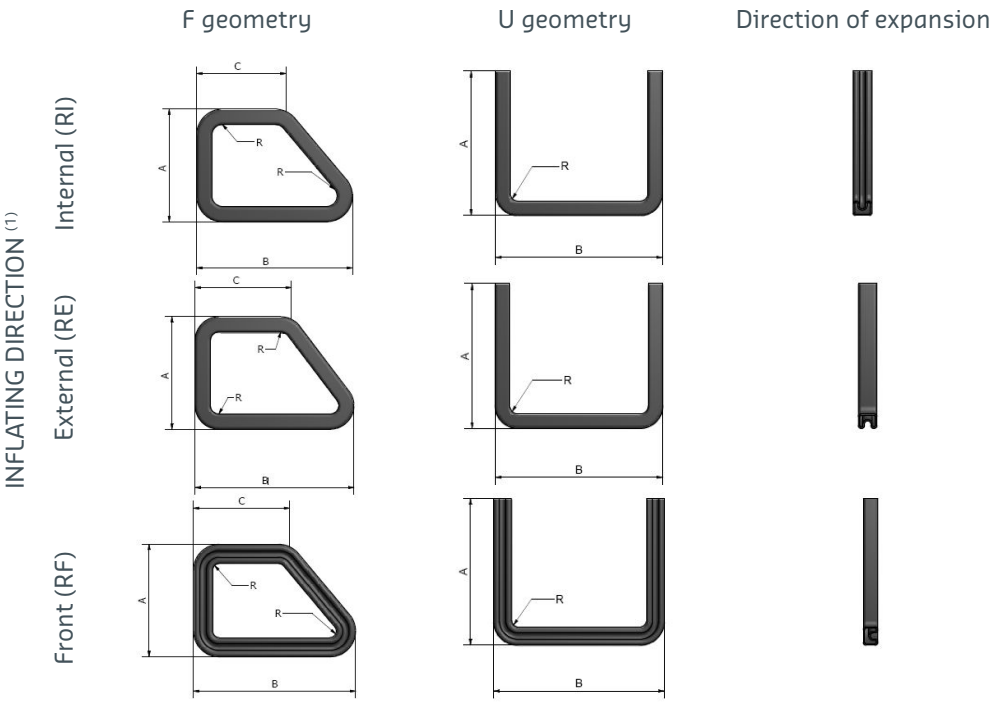
To insert inflatable seals into grooves with diameters lower than these values, pre-forming needs to be performed in a specific tool (to be approved by us).

	Direction of expansion **E**	Direction of expansion **A**	Direction of expansion **I**
Reference	minimum bending radius without the use of tools (mm)		
0-111	250	250	Contact us
0-115	250	250	
0-289	250	250	
0-290	250	250	
0-115/3	250	250	
0-217	350	350	
0-216	350	350	
0-254	350	350	
0-216/3	350	350	
0-281	450	450	
0-233	550	550	
0-1-2-116-2	750	750	

2.2 F and U geometries

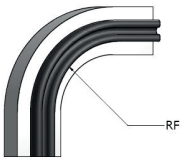
The following values are the minimum radii that straight-length components can accept.

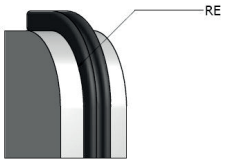
To insert inflatable seals into grooves with radii lower than these values, pre-forming needs to be performed in a specific tool (to be approved by our teams).

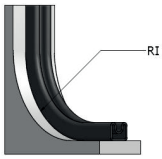


(1) top view

Minimum bend radii without tools







	RF	RE	RI
Reference	Min. bend radii without the use of tools (mm)		
0-111	100	60	Contact us
0-115	100	80	
0-217	160	100	
0-216	200	250	
0-281	350	250	
0-233	400	250	
0-1-2-116-2	Contact us		

2.3 L geometry

Straight length without obturation

Standard

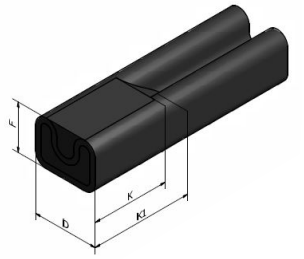
Straight length with retracted obturation

Standard

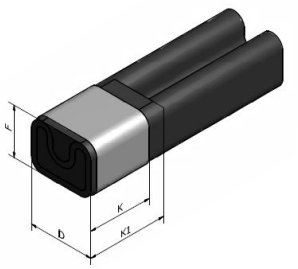
Straight length with expanded obturation

On request

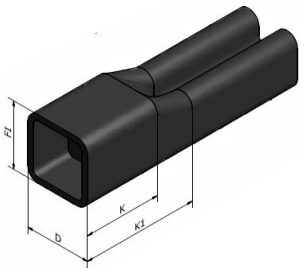
2.4 Obturation types



Standard retracted obturation (R)



Retracted obturation with clamp (on request)



Expanded obturation (E)

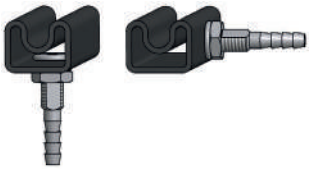
Retracted obturations (mm)				
Reference	K	D	F	K1
0-111	20	Seal width when retracted*	Seal height when retracted*	40
0-115	20			40
0-254	30			50
0-255	30			50
0-216	40			60
0-233	70			100
0-1-2-116-2	115			140

Expanded obturations (mm)				
Reference	**K**	**D**	**F1**	**K1**
0-111	20	Seal width when retracted*	20	40
0-115	20		20	40
0-217	30		29	50
0-255	30		30	50
0-216	40		34	60
0-233	70		75	100
0-1-2-116-2	115		110	140

* see list of sizes

3. CONNECTORS

3.1 Standard connector assembly



Mechanical fastening

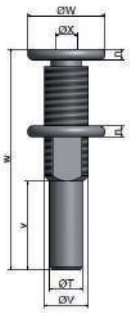
Vulcanised connector

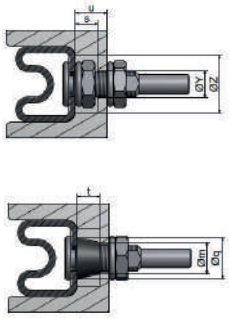
Other possible assembly

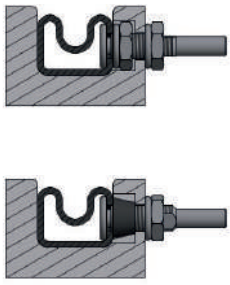
3.2 Ra inflation connectors

Assembly A

Assembly B



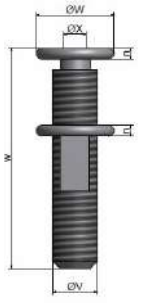




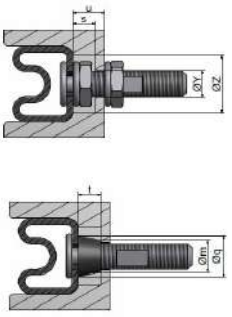
Connector dimensions (mm)								Machining dimensions (mm)				Overcast cone (mm)			Assembly condition* (mm)	
ØV	ØT	Pitch 1/100 (mm)	ØW	ØX	n	v	w	ØY	ØZ	s	min. u	Øq	Øm	t	A	B**
M6	4	100	12	3	2	20	40	8	14	6	8	14	8	6	ØW < 0.9L-2nd	ØW < 0.9h-2e
M8	6	125	14	4.5	2	20	40	10	16	6.7	8.7	16	10	6.7		
M10	8	150	18	6	2.5	25	50	12	20	8.5	10.5	20	12	8.5		
M12	9.5	175	22	7	2.5	25	50	14	24	8.8	10.8	24	14	8.8		
M14	11.3	200	24	8.5	3	30	60	16	26	10	12	26	16	10		
M16	13.3	200	26	10	3	30	60	18	28	10.5	12.5	28	18	10.5		

* For L and e values, refer to the seal faces
** Assembly only possible for D and P profiles

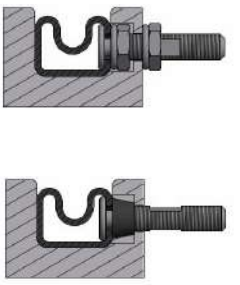
3.3 Rb inflation connectors



Assembly A



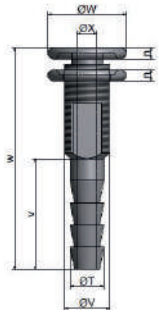
Assembly B



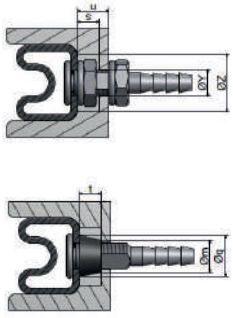
Connector dimensions (mm)						Machining dimensions (mm)				Overcast cone (mm)			Assembly condition* (mm)	
ØV	Pitch 1/100 (mm)	ØW	ØX	n	w	ØY	ØZ	s	min. u	Øq	Øm	t	A	B**
M4	70	12	1.5	2	40	6	14	4	6	10	7	7	ØW < 0.9L-2nd	ØW < 0.9h-2e
M6	100	12	3	2	40	8	14	5	W7	13	10	7		
M8	125	14	4.5	2	40	10	16	6	8	13	10	7		
M10	150	18	6	2.5	50	12	20	7.5	9.5	18	14	7		
M12	175	22	7	2.5	50	14	24	8.5	10.5	18	14	7		
M14	200	24	8.5	3	60	16	26	10	12	25	20	10		
M16	200	26	10	3	60	18	28	11	13	25	20	10		
1/16	0.907	14	4.5	2	40	10	16	6	8	13	10	7		
1/8	0.907	18	6	2.5	50	14	20	7.5	9.5	18	14	7		
1/4	1.337	24	8.5	3	60	16	26	10	12	25	20	10		

* For L and e values, refer to the seal faces
** Assembly only possible for D and P profiles

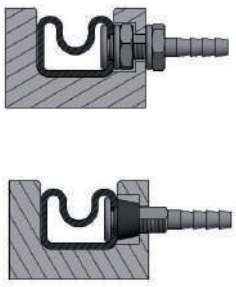
3.4 Rc inflation connectors



Assembly A



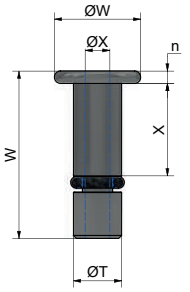
Assembly B



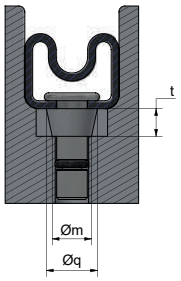
Connector dimensions (mm)								Machining dimensions (mm)				Overcast cone (mm)			Assembly condition* (mm)	
ØV	ØT	Pitch (1/100 (mm)	ØW	ØX	n	v	w	ØY	ØZ	s	min. u	Øq	Øm	t	A	B**
M6	4	100	12	1.5	2	20	40	8	14	5	7	13	10	7	ØW < 0.9L-2nd	ØW < 0.9h-2e
M8	6	125	14	3.5	2	20	40	10	16	6	8	13	10	7		
M10	8	150	18	5.5	2.5	25	50	12	20	7.5	9.5	18	14	7		
M12	10	175	22	7	2.5	25	50	14	24	8.5	10.5	18	14	7		
M14	12	200	24	8.5	3	30	60	16	26	10	12	25	20	10		
M16	14	200	26	10	3	30	60	18	28	11	13	25	20	10		

* For L and e values, refer to the seal faces
** Assembly only possible for D and P profiles

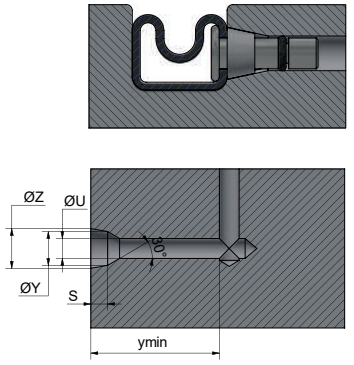
3.5 Rd inflation connectors



Assembly A



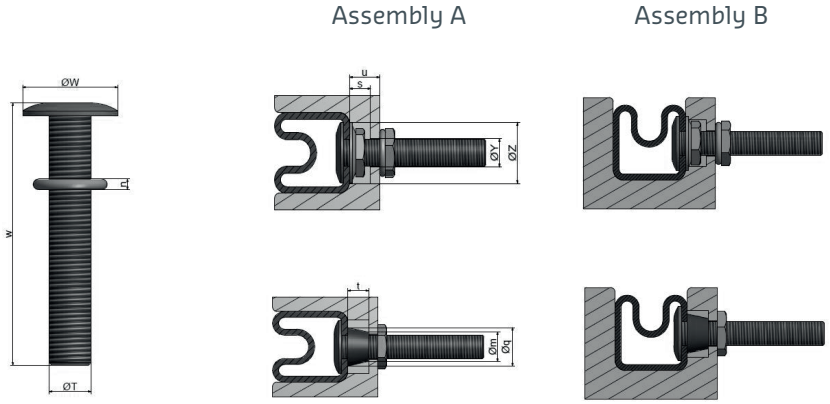
Assembly B



Connector dimensions (mm)							Machining dimensions (mm)					Overcast cone (mm)			Assembly condition* (mm)	
ØV	ØW	ØX	w	X	n	Washer R*	ØY	ØZ	ØU	s	min. y	Øq	Øm	t	A	B**
7.8	16	4	25	15	2	R4	10.5	13.5	8	7.3	22	13	10	7	ØW < 0.9L-2nd	ØW < 0.9h-2e
9.8	16	5	25	15	2.5	R5a	14.5	18.5	10	7.5	23	18	14	7		
11.8	20	7	28	18	2.5	R7	14.5	18.5	12	7.5	25	18	14	7		
15.8	26	8	30	18	3	R9	20.8	25.8	16	10.6	26	25	20	10		

* For L and e values, refer to the seal faces
** Assembly only possible for D and P profiles

3.6 Specific connectors: VL valve



Dimension	Connector dimensions (mm)					Machining dimensions (mm)				Overcast cone (mm)			Assembly condition* (mm)	
	ØT	Pitch (1/100 (mm)	ØW	w	n	ØY	ØZ	s	min. u	Øq	Øm	t	A	B**
VL 35	7.65	0.79	14	35	2.5	10	18	5.5	7.5	13	10	7	ØW < 0.9L-2nd	ØW < 0.9h-2e
VL 50	7.65	0.79	14	50	2.5	10	18	5.5	7.5	13	10	7		

* For L and e values, refer to the seal faces
** Assembly only possible for D and P profiles

3.7 Examples of air supply

On long, high-diameter profiles, several valves or connectors can be mounted in order to reduce inflation and deflation times.

When MEMBRAMATIC® inflatable and retractable seals need to remain pressurised for long periods and the fill fluid is air or any another gas, it is advisable to have a continuous supply – given the porosity of elastomers.

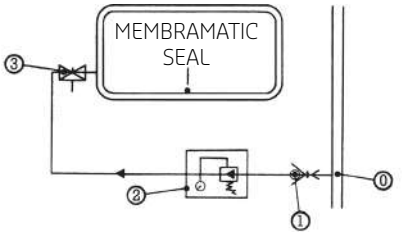
Simplified manual control diagram

0: High-pressure collector

1: Non-return valve

2: Pressure reducing valve

3: Three-way valve



Simplified automatic control diagram

0: High-pressure collector

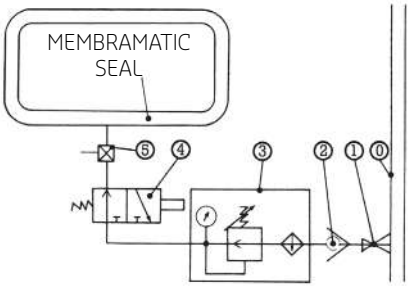
1: Two-way valve

2: Non-return valve

3: Pressure reducing valve filter assembly

4: Two-position three-aperture distributor

5: Three-way valve



Automatic control diagram with vacuum assist

0: High-pressure collector

1: Two-way valve

2: Non-return valve

3: Pressure reducing valve filter assembly

4: Two-position three-aperture distributor

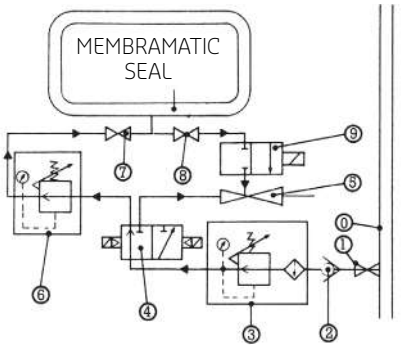
5: Ejector

6: Pressure reducing valve

7: Two-way valve

8: Three-way valve

9: Two-aperture electromagnetic valve



ORDER PROCESS

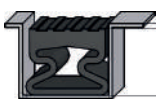
To place an order for MEMBRAMATIC® inflatable and retractable seals, please send us following information:

- The profile reference *(p.20-24)*
- Diameter (outside, inside) or the neutral fibre length
- Type of obturation (for straight lengths or U-shape *(p.28)*
- The elastomer *(p.11)*
- The direction of expansion, relative to the bonding face *(p.12)*
- The type and position of the air connector *(p. 29-33)*

1. CODING SYSTEM

The coding system must include the following in the order given:

1.1 Profile type

Type code	D	P	H	E
Description	Development	Runner	H	Extension
Diagram				

1.2 Seal geometry

Seal shape	Direction of swelling	Geometry code
Length	/	LG
Ring	Internal	CI
	External	CE
	Frontal	CF
U-shape	Internal	UI
	External	UE
	Frontal	UF
Frame	Internal	FI
	External	FE
	Frontal	FF

1.3 Obturation types

Obturation code	S	E	R
Type of obturation	No obturation	Expanded	Retracted

2. CODING EXAMPLES

0-111DLGE:

Inflatable expansion seal reference 0-111 manufactured as a straight length with expanded obturations

0-432PCES:

Inflatable runner seal reference 0-432 manufactured as an external inflated ring without obturations

0-430HUIR:

Inflatable type H seal reference 0-430 manufactured as an internal inflated U with retracted obturations

0-330EFFS:

Inflatable expansion seal reference 0-330 manufactured as a frame in the frontal inflation direction without obturation

This catalogue contains recommendations that should be checked with our teams and that may change depending on the seal's environment.

Many environmental factors influence a seal's sealing performance (fluids in contact, materials, manufacturing process, operating conditions, etc.). These recommendations do not constitute a commitment on our part and all claims are excluded. It is essential to carry out final approval tests, which remain the client's responsibility.

The information contained in this catalogue is valid at the date of printing.

As part of our optimisation process, we reserve the right to modify without prior notice the range, production locations, products, their manufacturing methods and the information in this catalogue. The publication of this catalogue supersedes all previous editions.

Printing: June 2023 | Photo credits: Hutchinson, Adobe Stock, Flaticon






Hutchinson - Le Joint Français SNC
ZA Les Perriers, 1 rue des Bois Rochefort – CS 96315
78500 – Sartrouville – France
Contact: +33 (0)1 39 04 50 50 | sales.sartrouville@hutchinson.com
Website: www.hutchinson.com