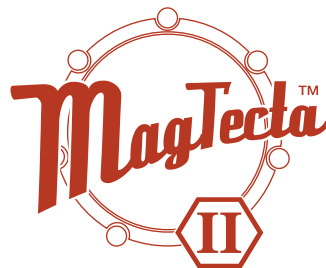





MagTecta-II™

ATEX & API 610 v9 Magnetic Double Face Bearing Protector



-  ATEX II 2 GD c T6 AVAILABLE AS STANDARD (ATEX IS A EUROPEAN SAFETY STANDARD FOR EXPLOSIVE ENVIRONMENTS)
- INDEPENDENT 3RD PARTY TESTED TO ENSURE SAFE OPERATION IN HAZARDOUS AREAS
- SUITABLE FOR MOST REFINERY, OFFSHORE, PETROCHEMICAL AND EXPLORATION APPLICATIONS
- PATENT PENDING DESIGN



- magnetic double face seal bearing protector

AESSEAL® is one of the leading specialists in the design and manufacture of mechanical seals and support systems.

Their relentless pursuit of affordable market driven innovation has resulted in the company filing over 35 product patent applications in the last 5 years.



Left: AESSEAL® API682 Version 2 Test Facilities

Right: The AESSEAL® Global Technology Centre is one of over 40 branches worldwide.

The MagTecta-II™ is a mechanical seal bearing protector which is ATEX Category II and API610 v9 compliant. It is simple, innovative and effective.

MagTecta-II™ - why a mechanical seal instead of a lip seal or labyrinth?



Shaft Damage from a Lip Seal

Limitations of Lip Seals

Lip seals are ineffective at keeping contamination from bearing housings and can seriously wear shafts. When lip seals leak, loss of lubrication causes catastrophic bearing and equipment failure.

API610 version 9, Section 5.10.2.7 recognises this and states that Lip-type Seals shall not be used in centrifugal pumps.



Shaft Damage from a Labyrinth Seal

Limitations of Labyrinth Bushes

Labyrinth bushes require close radial and axial clearances between rotating and stationary components. Such clearances can clog when operating in certain dust and dirt environments leading to a whole host of further problems.

Labyrinths cannot hold fluid which lies above the shaft level, especially when the item of rotating equipment is static. They cannot easily be applied to vertical applications such as mixing vessels since the fluid has to fight the effects of gravity and they are ineffective in oil mist and flooded gearbox applications.

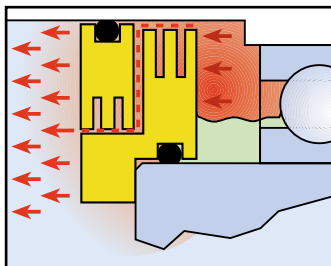
Some suppliers offer contacting or rubbing elastomers, in conjunction with a Labyrinth arrangement, in an attempt to overcome these inherent weaknesses. Unfortunately, no matter how sophisticated the design may claim to be, these contacting elastomers wear. This leads to bearing chamber contamination and eventual bearing seizure / equipment failure.

Bearing Chamber Breathing - moisture contamination

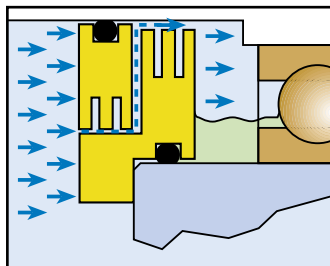
During operation the lubrication fluid and air in the bearing chamber expand as it warms. In a typical Labyrinth arrangement this expansion will expel air through the Labyrinth and out of the bearing chamber.

Once the equipment stops, the bearing chamber cools. The air inside then contracts sucking moist air past the Labyrinth arrangement and back into the bearing chamber. Even the smallest amount of moisture will reduce bearing life dramatically.

With the MagTecta-II™ it is possible to hermetically seal the bearing chamber preventing breathing and thus extending equipment life.



As the shaft turns, heat is generated and warm air is expelled.



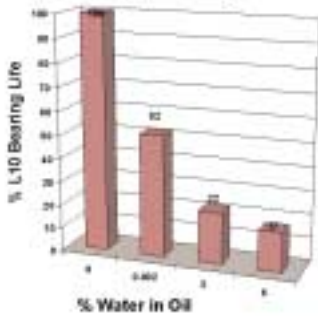
As the shaft stops turning and the equipment cools down, cold air and moisture is sucked in and the bearing fails.



Moisture Contaminated Bearings.



Water Contamination Reduces Bearing Life Significantly



From research done by a major oil company water contamination as low as 0.002% can reduce bearing life by as much as 48%.

After over 18 months of research, development and testing, AESSEAL® are proud to offer a product which, in their opinion, is probably the most technologically advanced bearing protector in the world.

The MagTecta-II™ design is ATEX Category II compliant for applications in T6 areas (peripheral speed dependant).

After many thousands of hours conducting competitor benchmark test results, AESSEAL® are confident that the MagTecta-II™ is the ultimate solution for practically all rotating equipment bearing sealing problems.

Furthermore, the MagTecta-II™ has undergone independent 3rd party testing with regard to it's electro static and electro magnetic properties, to ensure safe operation in Hazardous areas and potentially explosive atmospheres.

API 610 Ninth Edition January 2003 - mechanical seals are the future!

API 610 is considered, by many, as the premium equipment specification for Centrifugal Pumps in the Petroleum, Petrochemical and Natural Gas Industries. It is reported to be technically equivalent to ISO 13709.

The very latest edition (9th) recognises the need for proper bearing protection. The following text is an API 610 v9 specification extract.

5.10.2.7 - *Bearing housings for rolling element bearings shall be designed to prevent contamination by moisture, dust and other foreign matter. This shall be achieved without the requirement for external service for example, air purge. Bearing housings shall be equipped with replaceable labyrinth-type or magnetic-type end seals and deflectors where the shaft passes through the housing. Lip-type seals shall not be used.*

The seals and deflectors shall be made of non sparking materials. The design of the seals and deflectors shall effectively retain oil in the housing and prevent entry of foreign material into the housing.

5.1.25 - *Oil reservoirs and housings that enclose moving lubricated parts such as bearings, shaft seals, highly polished parts, instruments, and control elements shall be designed to minimise contamination by moisture, dust, and other foreign matter during periods of operation and idleness.*

AESSEAL anticipated this industry requirement with the introduction of the MagTecta™ in 2002. **THE ONLY TRUE WAY TO PROTECT BEARING CHAMBERS IS TO HERMETICALLY SEAL THEM.**



One of Three AESSEAL® Computer Controlled, 24hour test facilities which are used to qualify all of the companies API682 version 2 and ATEX product ranges.

MagTecta-II™ - an ATEX & API compliant, 3rd Party tested mechanical seal

- Lip type seals should not be used, as stated by API610 v9.
- Labyrinth-type bushes do not work in some equipment configurations.
- Floating elastomers used in Labyrinths, acting between counter rotating surfaces, quickly wear and may permit moisture ingress.
- Single magnetic-type seals may not adequately protect from moisture ingress as they can leak in equipment misalignment, axial shaft movement and hose-down applications.

The Magtecta-II™ is currently the only double face seal bearing protector in the world which:

- is a one piece cartridge design for ease of installation.
- is so compact that it fits where a lip seal fitted.
- is 3rd party tested for safe use in Hazardous areas
- offers double face protection.
- is widely inventoried in 1/16th and mm shaft increments
- is ATEX and API 610 v9 compliant



- bearing protector design features

The Most Reliable Bearing Protector in the World?

The MagTecta-II™ will work in both static and dynamic rotating equipment applications whether they are vertically or horizontally orientated.

There are no rubbing elastomers to wear and replace. Rubbing elastomers damage and wear mating components, whilst simultaneously increasing equipment power consumption.

Furthermore, the design does not include a complex Labyrinth arrangement which could clog or seize parts with close radial and axial running clearances.



AESSEAL® bearing chamber expansion unit stock code: EEC16-03

Hermetically sealed bearing chambers

Using the MagTecta-II™ it is possible to hermetically seal the bearing chamber. AESSEAL® also offer a sealed Expansion Unit, with integral diaphragm. In some applications this is used to seal the breather port orifice, in the bearing chamber, which is sometimes the other source of moisture ingress.

Double Faces – Double the Protection?

The MagTecta-II™ includes two sets of seal faces.

The world's first modular double bearing protector, in the opinion of AESSEAL®, therefore has double the protection of a conventional single seal face design.

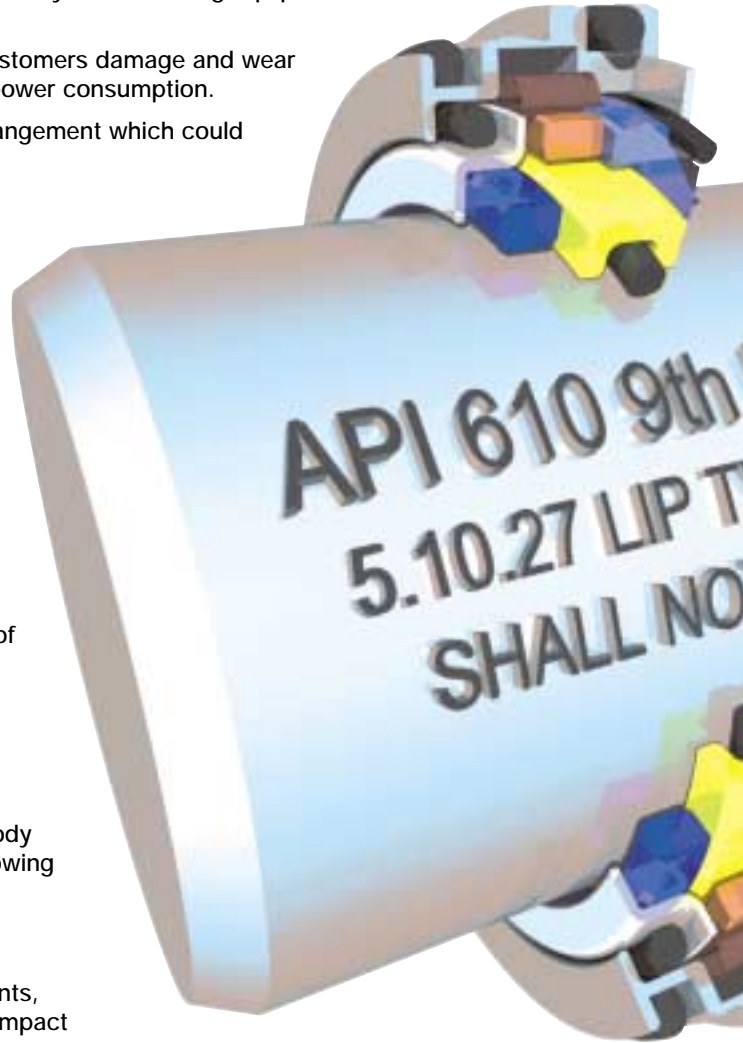
The Most Universal Bearing Protector in the World!

The MagTecta-II™ incorporates a universal and reversible outer body which reduces customer and supplier inventory levels, thereby allowing AESSEAL® to maximize customer service levels.

Compact Design

The MagTecta-II™ has no setting clips or axially floating components, which can move or be damaged during installation. The robust, compact construction is therefore very installation / operator friendly.

Furthermore, the short inboard and outboard length means that the MagTecta-II™ can be installed in just about all physical spaces, which were previously occupied by labyrinth bushes and Lip / oil seals.



MagTecta-II™ - ATEX information - Oil Splash Running (marginal lubrication)

The MagTecta-II™ is specifically designed to operate in marginal lubrication applications as found in most bearing chamber designs.

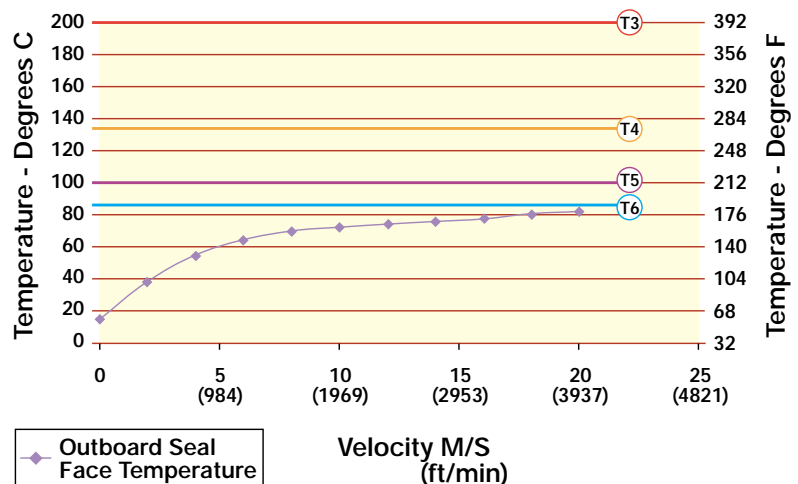
It will however operate successfully in flooded, oil mist, dry running or grease applications and as such different ATEX operational performance characteristics will result.

The following graphs provide an indication of worst case temperature synarios, plotted against peripheral shaft speeds as defined by ATEX.

Data was gathered over many shaft sizes using continuous computerised data logging. Temperatures were recorded at several positions of the MagTecta-II™ as well as the oil temperature.

Test results, shown to the right, were conducted with a small volume of Mineral oil, in a splash environment operating in a 316L s/s (semi-insulated) housing in STILL AIR. Clearly, operating temperatures will be significantly lower in DYNAMIC AIR, with synthetic oil and/or a typical bearing chamber.

Magtecta-II™ ATEX Temperature Graph (@18°C/ 65°F Amb.) for Oil Splash (marginal lubrication)



Safe by Design

The MagTecta-II™ is a magnetically energized mechanical seal, with magnetic attraction between two stationary components. Since the magnetic field is stationary the magnet life is maximized.

Due to this inherently "safe design", the universal MagTecta-II™ can therefore be more readily applied to all types of industrial applications. The MagTecta-II™ has undergone independent 3rd party testing with regard to its electrostatic and electro magnetic properties, to ensure safe operation in Hazardous areas and potentially explosive atmospheres.

Self venting Pressure relief system

The MagTecta-II™ incorporates a patent pending self venting system in the housing. This system ensures that pressure, in the bearing chamber, is relieved before it can overcome the Magtecta-II™ housing interference fit thereby acting to displace the MagTecta-II™. However, this safe design will not operate in reverse and allow moisture into the bearing chamber.

Multiple Seal Face Material Selection

Since the MagTecta-II™ seal faces are not limited to materials which need to be magnetic, the product can be supplied in standard mechanical seal face materials.

Standard MagTecta-II™ seal face materials are Antimony Carbon versus solid Tungsten Carbide and Tungsten Carbide versus Bronze impregnated Teflon.

Original Equipment Manufacturer (OEM) Specific Designs

The MagTecta-II™ is available to suit standard and popular OEM specific equipment.

Where a standard MagTecta-II™ is unable to fit a specific piece of rotating equipment, AESSEAL® have inventoried OEM specific designs. Some of these designs and stock codes are listed on the AESSEAL® website in the Applications section.

Axial Position of the Rotary Elastomer

Certain pieces of equipment have stepped shafts adjacent to the axial face of the bearing chamber.

The axial position of the rotary elastomer helps to ensure that the standard MagTecta-II™ will fit both plain and stepped shafts alike, without resorting to unique special designs.

Given the demand, special MagTecta's, to suit very small radial cross sectional spaces or unusual stepped shaft configurations, can be supplied.

Equal Face Loading

The MagTecta-II™ incorporates a phosphor bronze shroud, which equally spaces the magnets to ensure uniform seal face loading.

MagTecta-II™ - ATEX information - Dry Running (no lubrication)

Test results, shown to the right, were conducted completely dry, with no lubrication.

Once again, the temperatures were logged in a STILL AIR environment, plotting the worst case data over a number of shaft sizes.

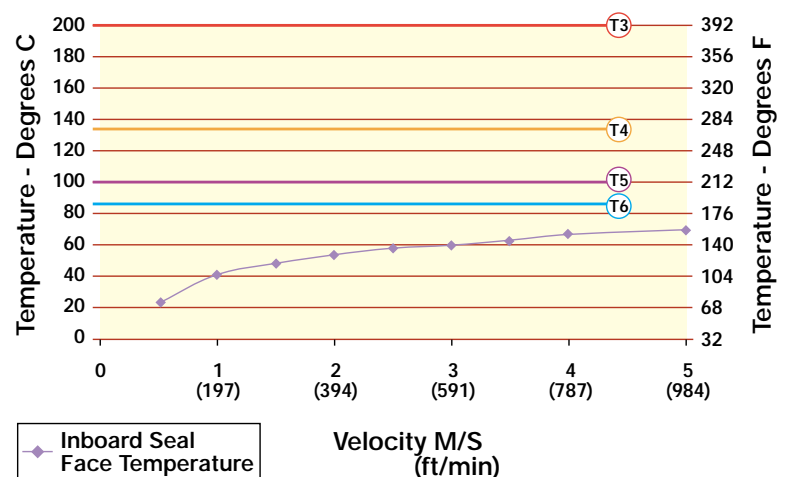
Clearly, operating temperatures will be significantly lower in DYNAMIC AIR, and/or with marginal lubrication from grease in a typical bearing chamber.

The graphs shown are illustrative representations of some of the worst case temperatures that one could expect from the MagTecta-II™. Also shown on the graphs are the ATEX defined temperature limits for T3 to T6 classification.

Clearly, like all mechanical seals, ATEX ratings depend on a number of variables, not least the peripheral shaft speed.

An ATEX rating, for any of AESSEAL's products, is obtained, through their seal software on receipt of user defined application information. Contact your nearest technical support office for further information.

Magtecta-II™ ATEX Temperature Graph (@18°C/ 65°F Amb.) for Dry Running (no lubrication)

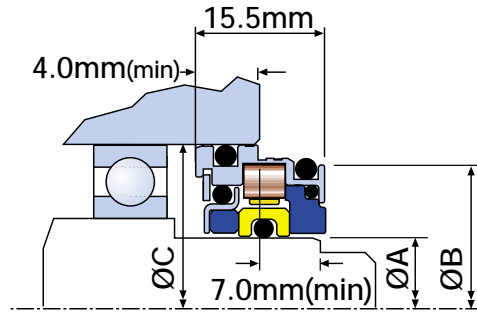
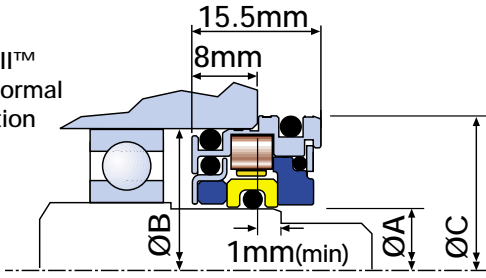




MagTecta-II™ M-TXN, M-LXN, M-TXR & M-LXR dimensions



MagTecta-II™ shown in normal (N) orientation



MagTecta-II™ shown in reverse (R) orientation (larger radial cross section)

(M-TXN)

DIM A	DIM B	DIM C
16.0	36.0	41.0
18.0	38.0	43.0
20.0	40.0	45.0
22.0	42.0	47.0
24.0	44.0	49.0
25.0	45.0	50.0
28.0	48.0	53.0
30.0	50.0	55.0
32.0	52.0	57.0
33.0	53.0	58.0
35.0	55.0	60.0
38.0	58.0	63.0
40.0	60.0	65.0
43.0	63.0	68.0
45.0	65.0	70.0
48.0	68.0	73.0
50.0	70.0	75.0
52.0	72.0	77.0
53.0	73.0	78.0
55.0	75.0	80.0
58.0	78.0	83.0
60.0	80.0	85.0
63.0	83.0	88.0
65.0	85.0	90.0
68.0	88.0	93.0
70.0	90.0	95.0
75.0	95.0	100.0
80.0	100.0	105.0
85.0	105.0	110.0
90.0	110.0	115.0
95.0	115.0	120.0
100.0	120.0	125.0
105.0	125.0	130.0
110.0	130.0	135.0
115.0	135.0	140.0
120.0	140.0	145.0
125.0	145.0	150.0
130.0	150.0	155.0
135.0	155.0	160.0
140.0	160.0	165.0
145.0	165.0	170.0

(M-LXN)

A	B	C
16.0	34.0	38.0
18.0	36.0	40.0
20.0	38.0	42.0
22.0	40.0	44.0
24.0	42.0	46.0
25.0	43.0	47.0
28.0	46.0	50.0
30.0	48.0	52.0
32.0	50.0	54.0
33.0	51.0	55.0
35.0	53.0	57.0
38.0	56.0	60.0
40.0	58.0	62.0
43.0	61.0	65.0
45.0	71.0	75.0
48.0	74.0	78.0
50.0	76.0	80.0
52.0	78.0	82.0
53.0	79.0	83.0
55.0	81.0	85.0
58.0	84.0	88.0
60.0	86.0	90.0
63.0	89.0	93.0
65.0	91.0	95.0
68.0	94.0	98.0
70.0	96.0	100.0
75.0	101.0	105.0
80.0	106.0	110.0
85.0	111.0	115.0
90.0	116.0	120.0
95.0	121.0	125.0
100.0	126.0	130.0
105.0	131.0	135.0
110.0	136.0	140.0
115.0	141.0	145.0
120.0	146.0	150.0
125.0	151.0	155.0
130.0	156.0	160.0
135.0	161.0	165.0
140.0	166.0	170.0
145.0	171.0	175.0

(M-TXR)

DIM A	DIM B	DIM C
16.0	36.0	41.0
18.0	38.0	43.0
20.0	40.0	45.0
22.0	42.0	47.0
24.0	44.0	49.0
25.0	45.0	50.0
28.0	48.0	53.0
30.0	50.0	55.0
32.0	52.0	57.0
33.0	53.0	58.0
35.0	55.0	60.0
38.0	58.0	63.0
40.0	60.0	65.0
43.0	63.0	68.0
45.0	65.0	70.0
48.0	68.0	73.0
50.0	70.0	75.0
52.0	72.0	77.0
53.0	73.0	78.0
55.0	75.0	80.0
58.0	78.0	83.0
60.0	80.0	85.0
63.0	83.0	88.0
65.0	85.0	90.0
68.0	88.0	93.0
70.0	90.0	95.0
75.0	95.0	100.0
80.0	100.0	105.0
85.0	105.0	110.0
90.0	110.0	115.0
95.0	115.0	120.0
100.0	120.0	125.0
105.0	125.0	130.0
110.0	130.0	135.0
115.0	135.0	140.0
120.0	140.0	145.0
125.0	145.0	150.0
130.0	150.0	155.0
135.0	155.0	160.0
140.0	160.0	165.0
145.0	165.0	170.0

(M-LXR)

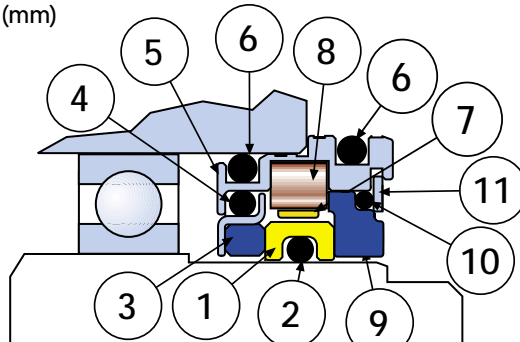
A	B	C
16.0	34.0	38.0
18.0	36.0	40.0
20.0	38.0	42.0
22.0	40.0	44.0
24.0	42.0	46.0
25.0	43.0	47.0
28.0	46.0	50.0
30.0	48.0	52.0
32.0	50.0	54.0
33.0	51.0	55.0
35.0	53.0	57.0
38.0	56.0	60.0
40.0	58.0	62.0
43.0	61.0	65.0
45.0	71.0	75.0
48.0	74.0	78.0
50.0	76.0	80.0
52.0	78.0	82.0
53.0	79.0	83.0
55.0	81.0	85.0
58.0	84.0	88.0
60.0	86.0	90.0
63.0	89.0	93.0
65.0	91.0	95.0
68.0	94.0	98.0
70.0	96.0	100.0
75.0	101.0	105.0
80.0	106.0	110.0
85.0	111.0	115.0
90.0	116.0	120.0
95.0	121.0	125.0
100.0	126.0	130.0
105.0	131.0	135.0
110.0	136.0	140.0
115.0	141.0	145.0
120.0	146.0	150.0
125.0	151.0	155.0
130.0	156.0	160.0
135.0	161.0	165.0
140.0	166.0	170.0
145.0	171.0	175.0

The MagTecta™ real-time inventory levels can be viewed on-line on the AESSEAL website in the Applications section.

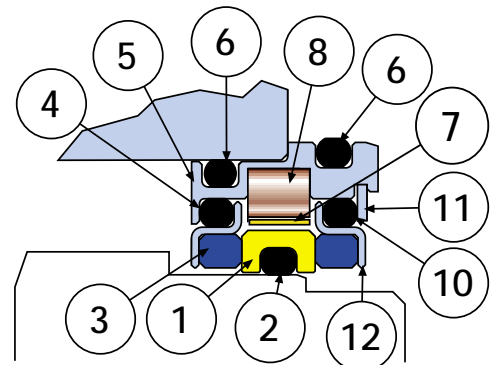
Larger Sizes are available on request

Not all mm sizes have inventoried housings

Dimensional Information (mm)



MagTecta-II™ shown in normal (N) orientation



MagTecta™ shown in normal orientation

MagTecta-II™ parts list

Item	Description	Material
1	Rotary Seal Face	Tungsten Carbide
2	Rotary Elastomer	Viton® / Aflas® / EPR / Kalrez®
3	Stationary Seal Face	Ant.Car-S/S
4	Stationary Elastomer	Viton® / EPR
5	Outer Body	Stainless Steel
6	Outer Body Elastomer	Viton® / Aflas® / EPR / Kalrez®
7	Shroud	Phosphor Bronze
8	Magnet	Metal
9	Stationary Seal Face	Bronze filled Teflon
10	Stationary Elastomer	Viton® / EPR
11	Circlip	Stainless Steel

See separate AESSEAL® MagTecta™ literature for information on this product.

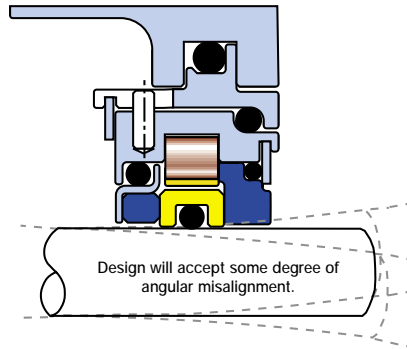
MagTecta™ parts list additions

Item	Description	Material
12	Stationary Seal Face Assy	Ant.Car-S/S

MagTecta-II™ (PB) - Plummer / Pillar Block Design



AESSEAL® also produce a wide range of bespoke/custom designed MagTecta-II™ double face seals. These are available to order only.



The design shown is fitted in a self aligning housing to suit a Pillow / Plummer Block.

The patent pending self aligning feature ensures that the MagTecta-II™ will accept some degree of angular misalignment as typically found with certain bearing types.

Many further designs are also available, including very axially compact designs for rollers, as used in the steel processing industry.

For further information please contact the AESSEAL® Technical Department, technical@aesseal.co.uk.

AESSEAL® CAPI™ 610 & 682 Mechanical Seals



**CAPI™ 610 & 682
Single & Dual Seals**
API 610 V9 & API 682 version 2 Certified
Cartridge Mechanical Seal Range

AESSEAL® design, manufacture and test their full range of API specific mechanical seals to API 682 VERSION 2.

Like the MagTecta™, the AESSEAL CAPI™ 610 & 682 Single and Dual mechanical seal range is highly innovative employing 21st century sealing technology.

Modular technology allows the CAPI 610 & 682 range to be offered in many rotary, stationary, pusher and metal bellows designs with hydraulically balanced seal faces.

For more information or to download this brochure contact marketing@aesseal.com or visit www.aesseal.com.



THE MAGTECTA-II™ IS A DOUBLE FACE MECHANICAL SEAL BUT IT IS **NOT** A FULLY FUNCTIONING DOUBLE MECHANICAL SEAL. IT IS DESIGNED TO SEAL SPLASH ENVIRONMENTS ONLY AND WILL NOT SUPPORT A BARRIER FLUID. A FULLY FUNCTIONAL DOUBLE MECHANICAL SEAL SHOULD ALWAYS BE USED WITH HAZARDOUS PRODUCTS.

ALWAYS TAKE SAFETY PRECAUTIONS:

- GUARD YOUR EQUIPMENT
- WEAR PROTECTIVE CLOTHING



THIS DOCUMENT IS DESIGNED TO PROVIDE DIMENSIONAL INFORMATION AND AN INDICATION OF AVAILABILITY.

FOR FURTHER INFORMATION AND SAFE OPERATING LIMITS CONTACT OUR TECHNICAL SPECIALISTS AT THE LOCATIONS BELOW.

AESSEAL plc
Mill Close
Templeborough
Rotherham
S60 1BZ
United Kingdom
Telephone:
Fax:
E-mail:
Internet:



INVESTOR IN PEOPLE

+44 (0) 1709 369966
+44 (0) 1709 720788
seals@aesseal.com
<http://www.aesseal.com>

Distributed by:

USA Sales & Technical advice:
AESSEAL Inc.
10231 Cogdill Road
Suite 105
Knoxville, TN 37932
USA
Telephone: 865 531 0192
Fax: 865 531 0571