



CDMSC[™] Cartridge Double Mixer Seal



- EXTERNALLY MOUNTED CARTRIDGE SEAL
- ABILITY TO ACCOMMODATE AXIAL AND RADIAL MOVEMENT ON MIXER APPLICATIONS
- INTEGRAL COOLING JACKET
- MULTI-PART FLUSH OPTION
- MONOLITHIC SEAL FACES
- EXOTIC ALLOY WETTED OPTIONS

CDMSC™ - the optimum mixer seal without bearings

The CDMSC™ is designed specifically for Mixer, Agitator and Reactor applications.

This externally mounted cartridge seal has many features incorporated into the design to help increase seal life.

The CDMSC™ is based around the modular technology of the patent pending DMSF™, thereby making it both available and affordable.

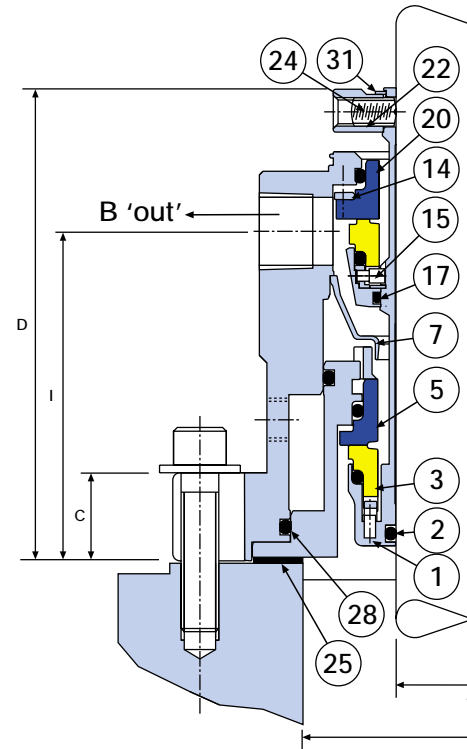
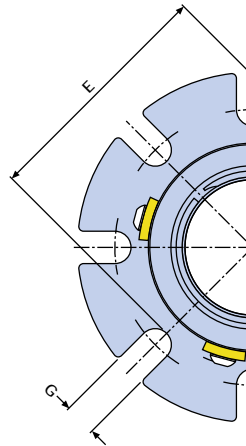
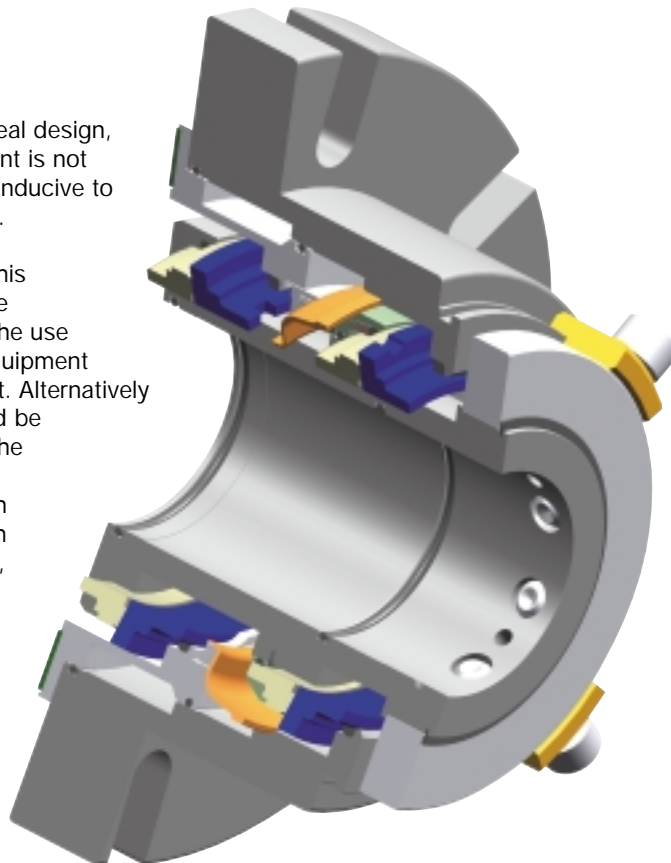
Radial Shaft Movement

Inevitably in most agitator applications, radial and/or axial shaft movement occurs.

Under slow shaft speed conditions, the CDMSC™ will accept moderate amounts of radial movement or Total Indicated Runout (TIR).

In any mechanical seal design, radial shaft movement is not preferred nor is it conducive to an optimum seal life.

Wherever possible this movement should be eliminated through the use of an appropriate equipment bearing arrangement. Alternatively this movement could be eliminated through the selection of an appropriate seal with integral bearing such as a Mixmaster IV™, V™ or VI™.



Axial Shaft Movement

Reciprocating shaft movement must also be eliminated.

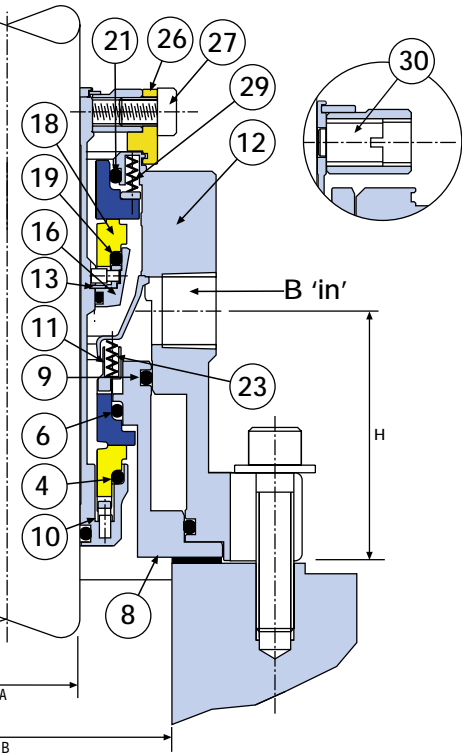
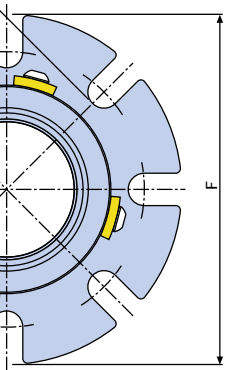
It is not uncommon to find thermal shaft growth in Agitator applications.

The CDMSC™ will accept moderate amounts of axial shaft movement from thermal growth.

For shaft growth in excess of the stated figures, an alternate seal design such as a CSWIB-AX™ or BSWIB-AX™, is the preferred solution. In such cases consult the AESSEAL® technical department.

Item	Description
1	Sleeve
2	Sleeve O Ring
3	Internal Rotary Face*
4	Internal Rotary Face O Ring
5	Internal Stationary Face*
6	Internal Stationary Face O Ring
7	Deflector
8	Gland Insert
9	Gland Insert O Ring
10	Internal Drive Ring / Drive Pins*
11	Internal Spring Plate
12	Gland
13	Circlip
14	External Spring Plate
15	External Drive Ring / Drive Pins*
16	External Rotary Holder
17	External Rotary Holder O Ring
18	External Rotary Face*
19	External Rotary Face O Ring
20	External Stationary Face*
21	External Stationary Face O Ring
22	Clamp Ring
23	Internal Springs
24	Drive Screws
25	Gasket
26	Setting Clips
27	Clip Screws
28	Gland Insert O Ring
29	External Springs
30	Anti Tamper Screws
31	Circlip

CDMSC™ - dimensional information



Seal Sizes:- 60mm - 125mm (2.375" - 5.000")

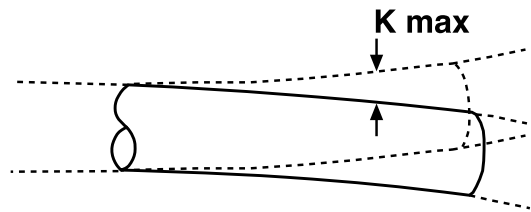
Seal Size	A	B Min	B Max	C	D	E	G (Qty.)	F	G	H	I	K (max)
60	60.0	85.0	133.0	36.8	122.6	154.0	8	210.0	14.0	67.2	83.7	6.0
65	65.0	90.0	139.0	36.8	122.6	154.0	8	210.0	14.0	67.2	83.7	6.0
70	70.0	95.0	139.0	36.8	122.6	154.0	8	210.0	14.0	67.2	83.7	6.0
75	75.0	100.0	139.0	36.8	122.6	154.0	8	210.0	14.0	67.2	83.7	6.0
80	80.0	105.0	165.0	36.8	127.0	189.2	8	261.0	14.0	67.2	83.7	6.0
85	85.0	110.0	165.0	36.8	127.0	189.2	8	261.0	14.0	67.2	83.7	6.0
90	90.0	115.0	190.5	36.8	127.0	212.7	8	261.0	14.0	67.2	83.7	6.0
95	95.0	120.0	190.5	36.8	127.0	212.7	8	261.0	14.0	67.2	83.7	6.0
100	100.0	125.0	190.5	36.8	127.0	212.7	8	261.0	14.0	67.2	83.7	6.0
105	105.0	130.0	203.2	36.8	127.0	233.5	8	273.0	14.0	67.2	83.7	6.0
110	110.0	135.0	203.2	36.8	127.0	233.5	8	273.0	14.0	67.2	83.7	6.0
115	115.0	140.0	222.2	36.8	127.0	259.0	8	305.0	14.0	67.2	83.7	6.0
120	120.0	145.0	222.2	36.8	127.0	259.0	8	305.0	14.0	67.2	83.7	6.0
125	125.0	150.0	222.2	36.8	127.0	259.0	8	305.0	14.0	67.2	83.7	6.0
2.375	2.375	3.375	5.236	1.447	4.829	6.063	8	8.260	0.551	2.647	3.294	0.236
2.500	2.500	3.500	5.236	1.447	4.829	6.063	8	8.260	0.551	2.647	3.294	0.236
2.625	2.625	3.625	5.472	1.447	4.829	6.063	8	8.260	0.551	2.647	3.294	0.236
2.750	2.750	3.750	5.472	1.447	4.829	6.063	8	8.260	0.551	2.647	3.294	0.236
2.875	2.875	3.875	5.472	1.447	4.829	6.063	8	8.260	0.551	2.647	3.294	0.236
3.000	3.000	4.000	5.472	1.447	4.829	6.063	8	8.260	0.551	2.647	3.294	0.236
3.125	3.125	4.125	6.500	1.447	5.000	7.449	8	10.276	0.551	2.647	3.294	0.236
3.250	3.250	4.250	6.500	1.447	5.000	7.449	8	10.276	0.551	2.647	3.294	0.236
3.375	3.375	4.375	6.500	1.447	5.000	7.449	8	10.276	0.551	2.647	3.294	0.236
3.500	3.500	4.500	6.500	1.447	5.000	7.449	8	10.276	0.551	2.647	3.294	0.236
3.625	3.625	4.625	7.500	1.447	5.000	8.375	8	10.276	0.551	2.647	3.294	0.236
3.750	3.750	4.750	7.500	1.447	5.000	8.375	8	10.276	0.551	2.647	3.294	0.236
3.875	3.875	4.875	7.500	1.447	5.000	8.375	8	10.276	0.551	2.647	3.294	0.236
4.000	4.000	5.000	7.500	1.447	5.000	8.375	8	10.276	0.551	2.647	3.294	0.236
4.125	4.125	5.125	8.000	1.447	5.000	9.193	8	10.750	0.551	2.647	3.294	0.236
4.250	4.250	5.250	8.000	1.447	5.000	9.193	8	10.750	0.551	2.647	3.294	0.236
4.375	4.375	5.375	8.000	1.447	5.000	9.193	8	10.750	0.551	2.647	3.294	0.236
4.500	4.500	5.500	8.000	1.447	5.000	9.193	8	10.750	0.551	2.647	3.294	0.236
4.625	4.625	5.625	8.750	1.447	5.000	10.197	8	12.000	0.551	2.647	3.294	0.236
4.750	4.750	5.750	8.750	1.447	5.000	10.197	8	12.000	0.551	2.647	3.294	0.236
4.875	4.875	5.875	8.750	1.447	5.000	10.197	8	12.000	0.551	2.647	3.294	0.236
5.000	5.000	6.000	8.750	1.447	5.000	10.197	8	12.000	0.551	2.647	3.294	0.236

• Check availability - most sizes are made to order only

Axial shaft movement under thermal expansion conditions only	
Seal Size	Axial Movement
60mm - 125mm	+/- 1.0mm
2.375" - 5.000"	+/- 0.040"

Material
316L SS
Viton® / EPR / Kalrez® / Aflas®
Carbon / SiC / TC
Viton® / EPR / Kalrez® / Aflas®
SiC / TC
Viton® / EPR / Kalrez® / Aflas®
316L SS
316L SS
Viton® / EPR / Kalrez® / Aflas®
316L SS
316L SS
316L SS
Stainless Steel
316L SS
316L SS
316L SS
Viton® / EPR / Kalrez® / Aflas®
Carbon / SiC / TC
Viton® / EPR / Kalrez® / Aflas®
SiC / TC
Viton® / EPR / Kalrez® / Aflas®
316L SS
Alloy 276
Stainless Steel
AF1 / GFT PTFE
Zinc Alloy / Brass
Stainless Steel
Viton® / EPR / Kalrez® / Aflas®
Alloy 276
Stainless Steel
Stainless Steel

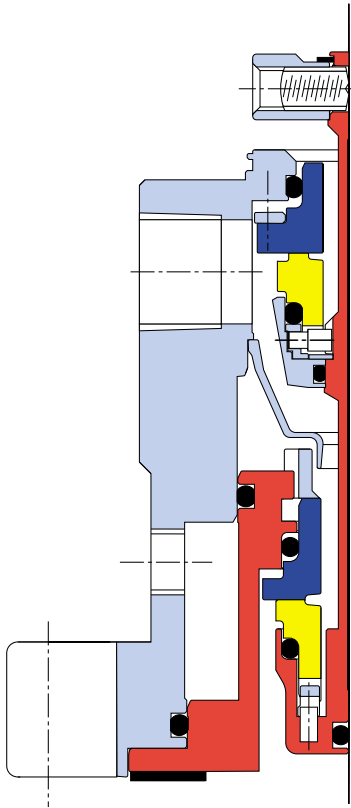
*Size dependant features



Thermal Applications

As the CDMSC™ incorporates FOUR monolithic seal faces, the design has an excellent ability to seal thermally challenging applications.

It is important to note that when selecting a seal to operate in the vapor space of a top entry agitator; the temperature at the inboard seal faces will be approximately 70% of the process temperature - see AESSEAL® Gold Training Course for further information.



The Importance of Correct Venting

If poorly vented, damage will occur to any mechanical seal face design, which is not designed for such "dry" running conditions.

Priming the seal faces is particularly important on vertical applications.

The CDMSC™ has a barrier outlet port positioned in such a manner as to correctly and reliably vent air from the barrier system.

Environmental Control

Often the most applicable solution to sealing difficult applications is to change the seal environment.

The CDMSC™ design includes an integral cooling / heating jacket. This can be used to cool or heat the seal environment helping to extend seal life in difficult thermal applications.

Furthermore, the gland insert used to create the environmental jacket can be offered to include a multi-port flush option. This ensures equal circumferential seal face quenching helping to eliminate un-quenched areas.

Exotic Alloy Options

Occasionally the process media in a reactor is chemically aggressive.

The CDMSC™ can be offered with wetted parts supplied in any commercially available material. Standard materials offered include Alloy 276, Titanium, Alloy 255 and Alloy 400.

In addition to a vast range of mechanical seals, AESSEAL® has a specialized systems division, dedicated to the design and manufacture of a comprehensive range of seal support packages for double mechanical seals. These range from the SSE10™ vessel to the fully featured SD™ and PUMPPAC™ forced circulation systems.

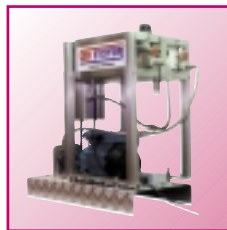
SSE10™



AS15™



SD™



PUMPPAC™



Environmental Control System Range

The systems above are compatible with a wide selection of Barrier and Buffer fluid mediums. They are supplied pre-assembled with all necessary components and fittings. On site inventory costs are reduced by modular system construction.

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.



INVESTOR IN PEOPLE

USE DOUBLE MECHANICAL SEALS WITH HAZARDOUS PRODUCTS. ALWAYS TAKE SAFETY PRECAUTIONS:

- GUARD YOUR EQUIPMENT
- WEAR PROTECTIVE CLOTHING



WARNING

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TOMORROW
AWARD**

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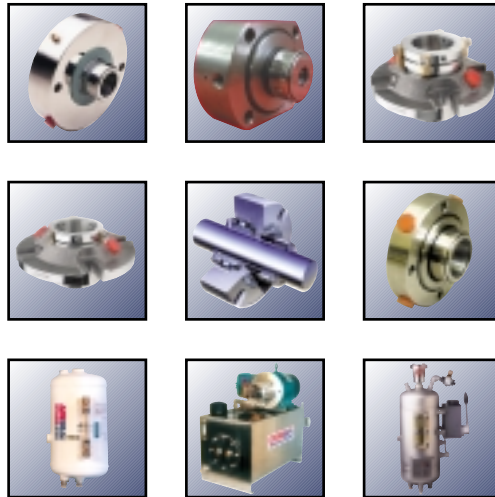
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ENVIRONMENTAL TECHNOLOGY



ESM™, CSM™, CDM™,
CSWIB™, DSWIB™
mixer cartridge
seal ranges

The AESSEAL® Group
of Companies

Designers and
Manufacturers of
Mechanical Seals and
Engineered Seal
Support Systems



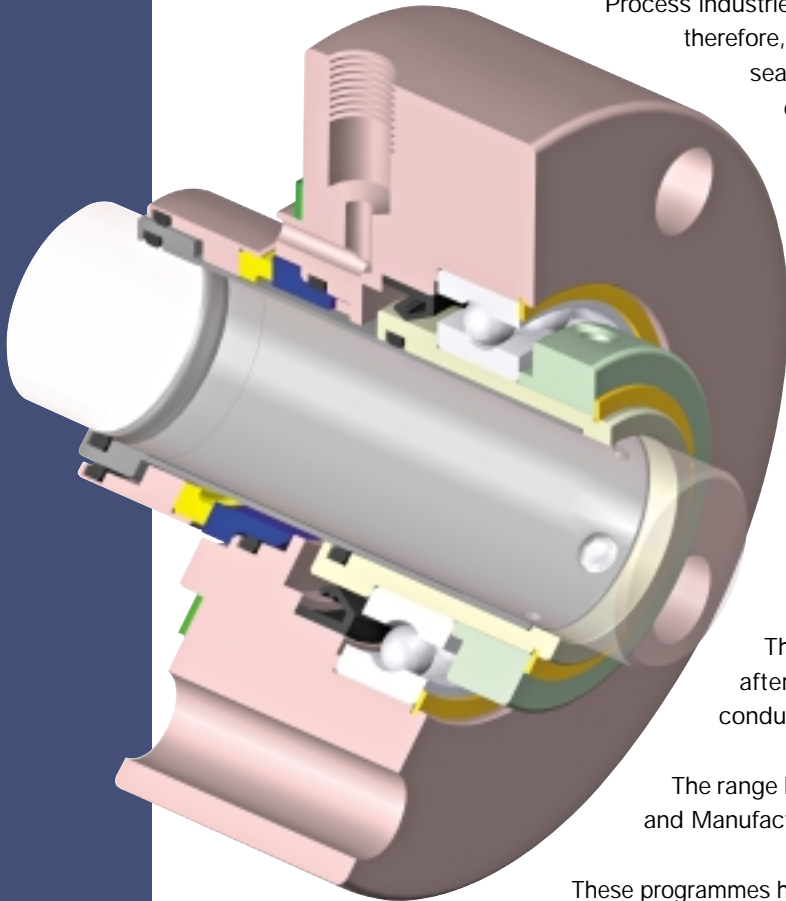
Basic Mixer Cartridge Seal Ranges

This brochure covers the range of AESSEAL® basic Mixer cartridge seals designed for Mixers, Agitators and Reactors. This range has been designed to accept and accommodate the prevalent conditions in mixing and associated applications.

Mixer, Agitator and Reactor applications vary from simple blending or solid dissolution to the more exacting standards of solids suspension, gas dispersion or containing/promoting chemical reactions.

The basic mixer range covers unit seals, cartridge seals, non-metallic seals and seals with and without bearings.

Mixers are used in the Food, Beverage and Pharmaceutical industries, yet generally the Chemical and Process industries have the most varied and difficult mixer problems and, therefore, require precise sealing technology. The AESSEAL® mixer seal range ensures that the most demanding applications can be accommodated.



Computer Generated
Mixmaster I™
(CSWIB™ Type C)
3D Model

Advanced Mixer Cartridge Seal Range

AESSEAL® also produce a Mixmaster brochure for the top end of the range which have high load carrying capabilities. We also produce a Mixer, Agitator & Reactor seal range booklet which incorporates more specialized seals for this industry as well as in depth case histories of seals.

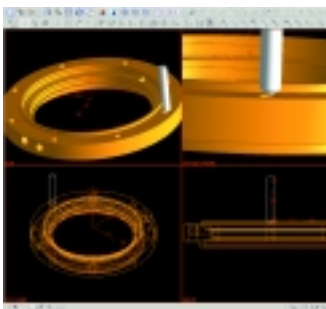
For more information these brochures can be downloaded from the AESSEAL® website at www.aesseal.com.

Development Background

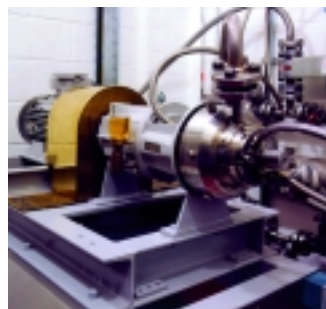
The AESSEAL® Mixmaster range has been developed only after extensive performance and field evaluation tests, conducted over many years.

The range has been created using the latest Computer Aided Design and Manufacture programmes including Finite Element Analysis.

These programmes help to predict how the seals can be produced and also how they will perform under various application conditions. This technology has vastly reduced the lead time for product development and thus reduced the overall cost of the seal range.



Massive investment in Computer Aided Design, Manufacture and PDM (Product Data Management) helps to ensure that the seal is fit for the purpose.



Computer simulation is very effective for evaluating seal performance, however, all AESSEAL® mechanical seals still have to undergo physical testing in various hazardous conditions.



Investment in inspection facilities which include the latest Co-ordinate Measuring Machines (CMM) allow computer controlled inspection for all AESSEAL® designs. The result is an industry leading range of mechanical seals.

ESM™ - External Seal for Mixers



The **AESSEAL® ESM™** is a unit external seal designed for ease of installation as the faces are clipped together and despatched assembled in a leak free state.

The standard ESM™ seal is driven through socket set screw clamping, with a Carbon/Ceramic seal face combination and a gland which is designed to suit the customer's equipment.

All wetted parts are non-metallic, therefore, the seal is ideally suited for corrosive vapour applications commonly found in Top Entry Mixers.

- Balanced seal face design
- Modular design
- Unit designed for ease of installation
- ESM™, ESCM™, ESTM™, ESCTM™ non-metallic wetted design
- NCM™ non-chemical design
- Springs out of product
- Seal flange manufactured to suit equipment



ESM™
External Seal for Mixers

Sizes Available	1.000" to 2.500"	25mm to 63mm
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Designed for ease of installation the ESM™ has non-metallic wetted parts and is therefore ideally suited for corrosive vapour applications commonly found in Top Entry Mixers.

NCM™
Non-Chemical for Mixers

Sizes Available	1.000" to 5.000"	24mm to 125mm
------------------------	------------------	---------------

The NCM™ is an external seal unit designed for ease of installation, as the faces are clipped together and despatched assembled in a leak free state. Some wetted parts are metallic, therefore the seal is unsuited for some severe corrosive applications.

ESTM™
External Seal Teflon for Mixers

Sizes Available	1.000" to 2.500"	25mm to 63mm
------------------------	------------------	--------------

A sister variant on the ESM™, the ESTM™ replaces the Carbon/Ceramic face combination with Teflon (P.T.F.E.)/Ceramic, for applications where Carbon is not compatible with the process fluid.

ESCM™
External Seal Colleted for Mixers

Sizes Available	1.000" to 2.500"	25mm to 63mm
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The ESCM™ employs the same seal principles as the ESM™ except for the clamping device. The ESCM™ utilises a collet clamp ring making the unit particularly applicable to hard and soft shafts.

Buffer Canister™ Option

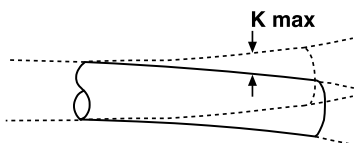
Buffer Canister™ option available on ESM™ - NCM™ - ESTM™ - ESCM™ - ESCTM™

The buffer canister option is available on both the ESM™ and NCM™ range of unit seals. The simple design can be of an open or closed top construction and slides over the external seal. An O-ring is then placed in the clip groove to prevent leakage. The fluid in the canister "bathes" the seal faces and therefore is applicable for the dry running applications which are commonly found in top entry mixers.

ESCTM™ - External Seal Colleted Teflon for Mixers

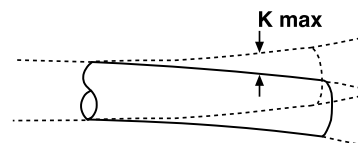
Sizes Available	1.000" to 2.500"	25mm to 63mm
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A hybrid unit seal of the previous options. The ESCTM™ offers a Teflon/Ceramic face combination, collet clamping and gland designed to suit the customer's equipment. All wetted parts are non-metallic.



ESM™ - ESCM™ - ESTM™ - ESCTM™	
Seal Size	T.I.R. (K max)
1.000" to 1.500"	0.030"
25mm to 38mm	0.8mm
1.625" to 2.500"	0.040"
40mm to 63mm	1.0mm

Seal Type	Face Availability	Drive
ESM™	CAR - CER	Standard
ESCM™	CAR - CER	Collet
ESTM™	PTFE - CER	Standard
ESCTM™	PTFE - CER	Collet
NCM™	Rotary Face Car - SiC - TC	Standard
	Stationary Face CROX-CER-SiC-TC	



NCM™	
Seal Size	T.I.R. (K max)
1.000" to 2.375"	0.040"
24mm to 60mm	1.0mm
2.500" to 5.000"	0.060"
40mm to 63mm	1.5mm

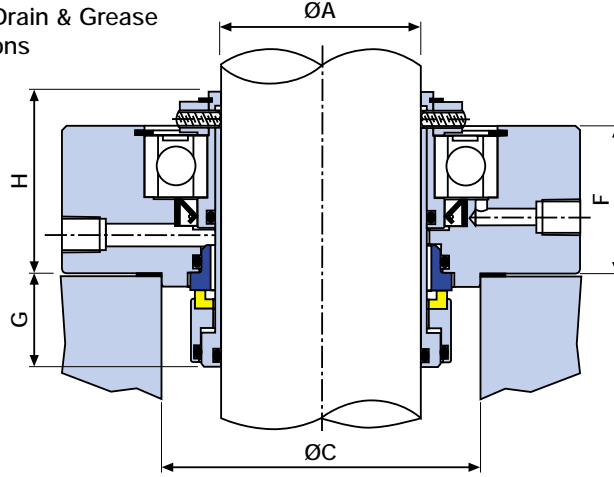


Mixmaster I™ - CSWIB™

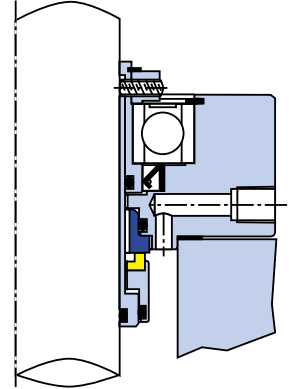
The AESSEAL® Mixmaster I™ is a single cartridge mechanical seal, with balanced seal faces and an integral (steady) bearing.

The Mixmaster I™ can be ordered in types B, C & D in a variety of gland combinations concerning flush, quench, drain and grease connections and also different face combinations. The gland plate is machined to meet the customer's requirements with respect to outside diameter, bolt circle diameter and stuffing box location.

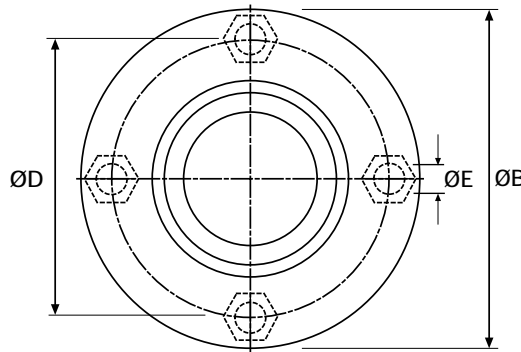
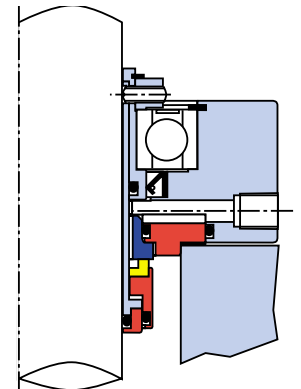
Type B
Quench, Drain & Grease Connections



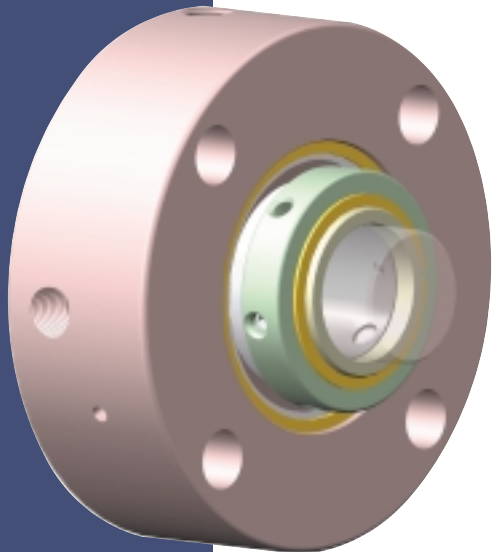
Type C
Type B Design with Flush



Type D
Exotic Alloy Option with Quench, Drain & Grease Connections



Minimum bolt circle based on bolt size shown.



CSWIB™ - Dimensional Information (inches)

ØA	ØB	ØC		ØD		ØE	F	G	H
		Min	Max	Min	Max				
1.000	1.663		3.000	3/8	1.750	1.150	2.312		
1.125	1.780		3.250	3/8	1.750	1.150	2.312		
1.250	1.931		3.500	3/8	1.750	1.150	2.312		
1.375	2.056		3.500	3/8	1.750	1.150	2.312		
1.500	2.303		3.875	1/2	1.812	1.187	2.375		
1.625	2.428		4.500	1/2	1.812	1.187	2.375		
1.750	2.553		4.500	1/2	1.812	1.187	2.375		
1.875	2.678		4.625	1/2	1.812	1.312	2.375		
2.000	2.803		4.625	1/2	1.812	1.312	2.375		
2.125	2.928		4.937	1/2	1.812	1.312	2.375		
2.250	3.053		5.000	5/8	1.812	1.312	2.375		
2.375	3.178		5.375	5/8	1.812	1.312	2.375		
2.500	3.428		5.500	5/8	2.000	1.312	2.625		
2.625	3.553		5.500	5/8	2.000	1.312	2.625		
2.750	3.678		5.875	5/8	2.062	1.312	2.625		
2.875	3.803		6.125	5/8	2.062	1.312	2.625		
3.000	3.928		6.125	5/8	2.062	1.312	2.625		
3.125	4.053		6.500	5/8	2.062	1.312	2.625		
3.250	4.178		6.625	3/4	2.062	1.312	2.625		
3.375	4.303		6.875	3/4	2.062	1.312	2.625		
3.500	4.428		6.875	3/4	2.062	1.312	2.625		
3.625	4.553		7.375	3/4	2.062	1.312	2.625		
3.750	4.678		7.375	3/4	2.062	1.312	2.625		
3.875	4.803		7.875	3/4	2.125	1.312	2.625		
4.000	4.928		7.875	3/4	2.125	1.312	2.625		

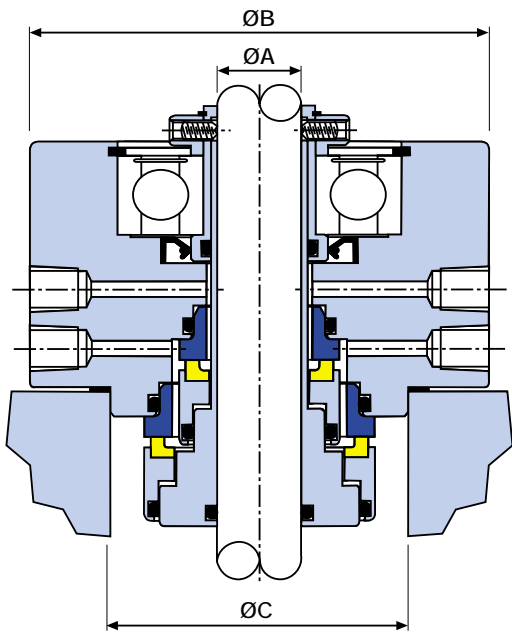
Note: ØE, F, G, H are typical sizes only. This seal design is made to suit customer requirements and these sizes can be changed.

CSWIB™ - Dimensional Information (mm)

ØA	ØB	ØC		ØD		ØE	F	G	H
		Min	Max	Min	Max				
24		41.2	76.2	10	44.5	29.2	58.7		
25		42.2	76.2	10	44.5	29.2	58.7		
28		45.2	82.6	10	44.5	29.2	58.7		
30		47.2	82.6	10	44.5	29.2	58.7		
32		49.0	88.9	10	44.5	29.2	58.7		
33		49.0	88.9	10	44.5	29.2	58.7		
35		52.2	88.9	10	44.5	29.2	58.7		
38		58.5	98.4	12	46.0	30.1	60.3		
40		58.5	98.4	12	46.0	30.1	60.3		
43		61.7	114.3	12	46.0	30.1	60.3		
45		64.8	114.3	12	46.0	30.1	60.3		
48		68.0	117.5	12	46.0	33.3	60.3		
50		68.0	117.5	12	46.0	33.3	60.3		
53		71.2	117.5	12	46.0	33.3	60.3		
55		74.4	125.4	12	46.0	33.3	60.3		
58		77.5	136.5	16	46.0	33.3	60.3		
60		80.7	136.5	16	46.0	33.3	60.3		
63		87.1	139.7	16	50.8	33.3	66.7		
65		90.2	139.7	16	50.8	33.3	66.7		
68		93.4	149.2	16	52.4	33.3	66.7		
70		93.4	149.2	16	52.4	33.3	66.7		
75		99.8	155.6	16	52.4	33.3	66.7		
80		102.9	165.1	16	52.4	33.3	66.7		
85		109.3	174.6	20	52.4	33.3	66.7		
90		115.6	187.3	20	52.4	33.3	66.7		
95		118.8	187.3	20	52.4	33.3	66.7		
100		125.2	200.0	20	54.0	33.3	66.7		

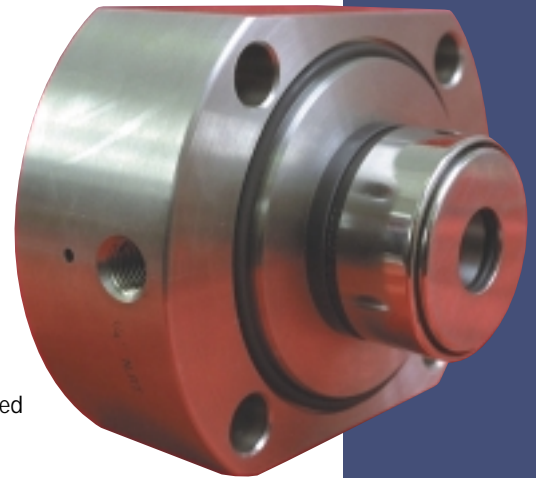
Mixmaster II™ - DSWIB™

The AESSEAL® Mixmaster II™ is a double cartridge seal with integral bearing design with concentric faces so that the seals overall length is reduced.



The CSWIB™ & DSWIB™ are offered with the following features:

- The integral bearing (pre-installed) is designed as a steady bearing and may not take the full radial load applied to a mixer
- Quench drain & grease connections as standard
- Available with flush connection (type 'C' only)
- No shaft fretting
- Balanced seal faces
- Non-clogging rotaries
- Most suitable for low shaft speeds
- Supplied with high tensile, corrosion resistant socket set screws



DSWIB™ - (inches)

ØA	ØB	ØC	
		Min	Max
1.000		2.303	
1.125		2.428	
1.250		2.553	
1.375		2.678	
1.500		2.928	
1.625		3.053	
1.750		3.178	
1.875		3.428	
2.000		3.553	
2.125		3.678	
2.250		3.803	
2.375		3.928	
2.500		4.178	
2.625		4.303	
2.750		4.428	
2.875		4.553	
3.000		4.678	
3.125		4.803	
3.250		4.928	
3.375		5.178	
3.500		5.178	
3.625		5.428	
3.750		5.428	
3.875		5.678	
4.000		5.678	

Dependent upon application

DSWIB™ - (mm)

ØA	ØB	ØC	
		Min	Max
24		58.5	
25		58.5	
28		61.7	
30		61.7	
32		64.8	
33		64.8	
35		68.0	
38		74.4	
40		74.4	
43		77.5	
45		80.7	
48		87.1	
50		87.1	
53		90.2	
55		93.4	
58		96.6	
60		99.8	
63		106.1	
65		109.3	
68		112.5	
70		112.5	
75		118.8	
80		122.0	
85		131.5	
90		137.9	
95		137.9	
100		144.2	

Dependent upon application

The Mixmaster II™ can be ordered in types B, C & D.

Like the Mixmaster I™, the Mixmaster II™ seal is manufactured from a fully machined gland, to the customer's specification.

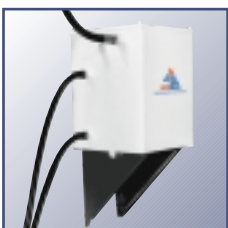
Note: All face combinations up to 3.250" are standard AESSEAL® face materials. Contact the AESSEAL® technical department for hard face options above this size.

When ordering a CSWIB™ or DSWIB™ seal, please state accurately the following details: STUFFING BOX BORE - QUANTITY, SIZE AND SPACING OF BOLTS and BOLT CIRCLE DIAMETER. Please read and quote document Ref. AW 0810 and complete a seal application form with all enquiries. This can be obtained from marketing@aes seal.com.

Environmental Control Systems for Double Seals

In addition to a vast range of mechanical seals, AESSEAL® has a specialized systems division, dedicated to the design and manufacture of a comprehensive range of seal support packages for double mechanical seals. These range from the Buffer Reservoir™, SSE10™ and AS15™ (ASME) vessels to the fully featured PUMPPAC™ forced circulation systems.

Buffer Reservoir™



SSE10™



AS15™



PUMPPAC™



The systems above are compatible with a wide selection of barrier and buffer fluid media. They are supplied pre-assembled with all necessary components and fittings. On site inventory costs are reduced by modular system construction.

CDM™ - Cartridge Double for Mixers

The AESSEAL® CDM™ is available in a wide range of seal face, elastomer and alloy combinations, to suit individual applications.



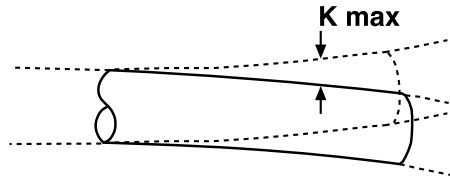
CDM™ - Dimensional Information (inches)

A	B	C	D	E	F			G		H	I	J	K
					Min	Min†	Max	Min	Max	Max			Max
1.000	4.125	2.125	1.937	0.519	1.625	1.665	1.937	2.687	3.562	1/2	1.281	2.062	0.040
1.125	4.250	2.250	2.063	0.519	1.750	1.790	2.062	2.812	3.687	1/2	1.281	2.062	0.040
1.250	4.375	2.375	2.187	0.519	1.875	1.915	2.187	2.937	3.812	1/2	1.281	2.062	0.040
1.375	4.375	2.500	2.312	0.519	2.000	2.040	2.250	3.062	3.812	1/2	1.281	2.062	0.040
1.500	5.000	2.812	2.562	0.644	2.250	2.290	2.375	3.375	4.437	1/2	1.312	2.125	0.040
1.625	5.000	2.812	2.562	0.644	2.375	2.415	2.500	3.375	4.437	1/2	1.312	2.125	0.040
1.750	5.500	3.187	2.812	0.644	2.500	2.540	2.750	3.750	4.937	1/2	1.312	2.125	0.040
1.875	5.500	3.187	2.812	0.644	2.625	2.665	2.875	3.750	4.937	1/2	1.312	2.125	0.040
2.000	6.000	3.562	3.063	0.644	2.750	2.790	3.000	4.125	5.437	1/2	1.380	2.125	0.040
2.000-AC	5.250	3.450	3.035	0.644	2.750	2.790	3.000	4.000	4.750	1/2	1.380	2.125	0.040
2.125	6.000	3.562	3.063	0.644	2.875	2.915	3.125	4.125	5.437	1/2	1.380	2.125	0.040
2.250	6.500	3.812	3.312	0.644	3.000	3.040	3.250	4.500	5.812	5/8	1.380	2.125	0.040
2.375	6.500	3.812	3.312	0.644	3.125	3.165	3.375	4.500	5.812	5/8	1.380	2.125	0.040
2.500	7.000	4.312	3.812	0.769	3.375	3.435	3.625	5.000	6.312	5/8	1.500	2.375	0.060
2.625	7.000	4.312	3.812	0.769	3.500	3.560	3.750	5.000	6.312	5/8	1.500	2.375	0.060
2.750	7.000	4.312	3.812	0.769	3.625	3.685	3.875	5.000	6.312	5/8	1.500	2.375	0.060
2.875	7.500	4.937	4.250	0.769	3.750	3.810	4.125	5.625	6.812	5/8	1.500	2.375	0.060
3.000	7.500	4.937	4.250	0.769	3.875	3.935	4.250	5.625	6.812	5/8	1.500	2.375	0.060
3.125	7.500	4.937	4.250	0.769	4.000	4.060	4.375	5.625	6.812	5/8	1.500	2.375	0.060
3.250	8.000	5.312	4.625	0.769	4.125	4.185	4.500	6.125	7.187	3/4	1.500	2.375	0.060
3.375	8.000	5.312	4.625	0.769	4.250	4.310	4.625	6.125	7.187	3/4	1.500	2.375	0.060
3.500	8.000	5.312	4.625	0.769	4.375	4.435	4.750	6.125	7.187	3/4	1.500	2.375	0.060
3.625	8.500	5.937	5.000	0.769	4.500	4.560	5.000	6.750	7.687	3/4	1.500	2.375	0.060
3.750	8.500	5.937	5.000	0.769	4.625	4.685	5.125	6.750	7.687	3/4	1.500	2.375	0.060
3.875	8.500	5.937	5.000	0.769	4.750	4.810	5.250	6.750	7.687	3/4	1.500	2.375	0.060
4.000	9.000	6.625	5.375	0.769	4.875	4.935	5.500	7.437	8.187	3/4	1.500	2.375	0.060
4.125	9.000	6.625	5.375	0.769	5.125	5.185	5.875	7.437	8.187	3/4	1.500	2.375	0.060
4.250	9.000	6.625	5.375	0.769	5.125	5.185	5.875	7.437	8.187	3/4	1.500	2.375	0.060
4.375	9.500	7.000	5.750	0.769	5.375	5.435	6.250	7.812	8.687	3/4	1.500	2.375	0.060
4.500	9.500	7.000	5.750	0.769	5.375	5.435	6.250	7.812	8.687	3/4	1.500	2.375	0.060
4.625	10.000	7.345	6.125	0.769	5.625	5.685	6.625	8.312	9.062	7/8	1.500	2.375	0.060
4.750	10.000	7.345	6.125	0.769	5.625	5.685	6.625	8.312	9.062	7/8	1.500	2.375	0.060
4.875	10.000	7.345	6.125	0.769	5.875	5.935	6.625	8.312	9.062	7/8	1.500	2.375	0.060
5.000	10.000	7.345	6.125	0.769	5.875	5.935	6.625	8.312	9.062	7/8	1.500	2.375	0.060

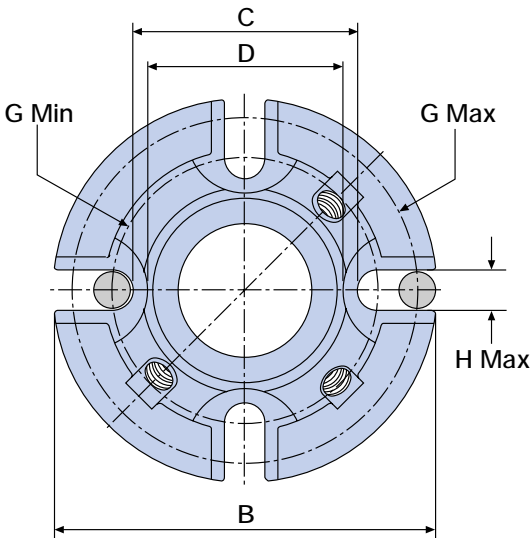
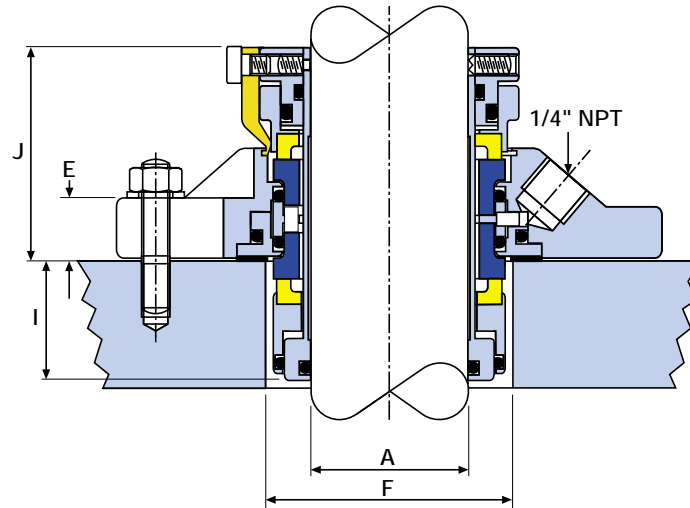
Double cartridge seal for mixers/agitators.



† = F Min + K Max



K Max = Maximum TOTAL Radial Movement



CDM™ - Dimensional Information (mm)

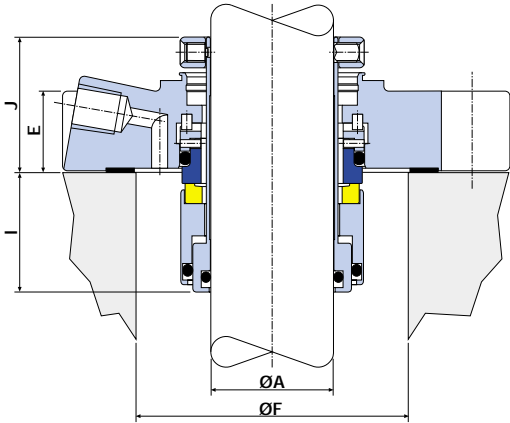
A	B	C	D	E	F			G		H	I	J	K
					Min	Min†	Max	Min	Max	Max			Max
24	104.8	54.0	49.2	13.2	40.0	41.0	46.0	67.0	90.5	12	32.5	52.4	1.0
25	104.8	54.0	49.2	13.2	41.0	42.0	49.0	67.0	90.5	12	32.5	52.4	1.0
28	108.0	57.2	52.4	13.2	44.0	45.0	52.3	70.3	93.6	12	32.5	52.4	1.0
30	111.0	60.4	55.6	13.2	46.0	47.0	55.5	73.5	96.8	12	32.5	52.4	1.0
32	111.0	60.4	55.6	13.2	48.0	49.0	55.5	73.5	96.8	12	32.5	52.4	1.0
33	111.0	60.4	55.6	13.2	49.0	50.0	55.5	73.5	96.8	12	32.5	52.4	1.0
35	111.0	63.5	58.8	13.2	51.0	52.0	57.5	76.6	96.8	12	32.5	52.4	1.0
38	127.0	71.5	65.0	16.4	57.2	58.2	60.3	85.7	114.3	12	33.3	54.0	1.0
40	127.0	71.5	65.0	16.4	58.0	59.0	60.4	85.7	114.3	12	33.3	54.0	1.0
43	127.0	71.5	65.0	16.4	61.0	62.0	63.5	85.7	114.3	12	33.3	54.0	1.0
45	139.7	81.0	71.4	16.4	63.5	64.5	69.9	95.3	127.0	12	33.3	54.0	1.0
48	139.7	81.0	71.4	16.4	66.7	67.7	73.0	95.3	127.0	12	33.3	54.0	1.0
50	139.7	81.0	71.4	16.4	68.0	69.0	73.0	95.3	127.0	12	33.3	54.0	1.0
53	152.4	90.5	77.8	16.4	71.0	72.0	76.2	104.8	139.7	12	35.0	54.0	1.0
55	152.4	90.5	77.8	16.4	74.0	75.0	79.4	104.8	139.7	12	35.0	54.0	1.0
58	165.1	96.8	84.1	16.4	76.2	77.2	82.5	114.3	149.2	16	35.0	54.0	1.0
60	165.1	96.8	84.1	16.4	79.4	80.4	85.7	114.3	149.2	16	35.0	54.0	1.0
63	177.8	109.5	96.8	19.6	85.8	87.3	92.1	127.0	160.3	16	38.1	60.3	1.5
65	177.8	109.5	96.8	19.6	88.9	90.4	95.3	127.0	160.3	16	38.1	60.3	1.5
68	177.8	109.5	96.8	19.6	92.1	93.6	98.4	127.0	160.3	16	38.1	60.3	1.5
70	177.8	109.5	96.8	19.6	92.1	93.6	98.4	127.0	160.3	16	38.1	60.3	1.5
75	190.5	125.4	108.0	19.6	98.5	100.0	108.0	142.9	173.0	16	38.1	60.3	1.5
80	190.5	125.4	108.0	19.6	101.6	103.1	111.1	142.9	173.0	16	38.1	60.3	1.5
85	203.2	135.0	117.5	19.6	108.0	109.5	117.5	155.6	182.5	20	38.1	60.3	1.5
90	215.9	150.8	127.0	19.6	114.3	115.8	127.0	171.5	195.2	20	38.1	60.3	1.5
95	215.9	150.8	127.0	19.6	117.5	119.0	130.2	171.5	195.2	20	38.1	60.3	1.5
100	228.6	168.3	136.5	19.6	123.9	125.4	139.7	188.9	208.0	20	38.1	60.3	1.5
105	228.6	168.3	136.5	19.6	130.1	131.6	149.2	188.9	208.0	20	38.1	60.3	1.5
110	241.3	177.8	146.1	19.6	136.5	138.0	158.8	198.4	220.4	20	38.1	60.3	1.5
115	254.0	186.6	155.8	19.6	142.9	144.4	168.3	211.1	230.2	22	38.1	60.3	1.5
120	254.0	186.6	155.8	19.6	142.9	144.4	168.3	211.1	230.2	22	38.1	60.3	1.5
125	254.0	186.6	155.8	19.6	149.2	150.7	168.3	211.1	230.2	22	38.1	60.3	1.5

Seal sizes from 130mm to 300mm are designed to suit specific equipment using modular components. Contact AESSEAL® technical department for dimensional information and availability.

† = F Min + K Max

See next pages for support systems available.

ANSI+ CSM™ and CDM™ - gland designs to suit ANSI+ pumps



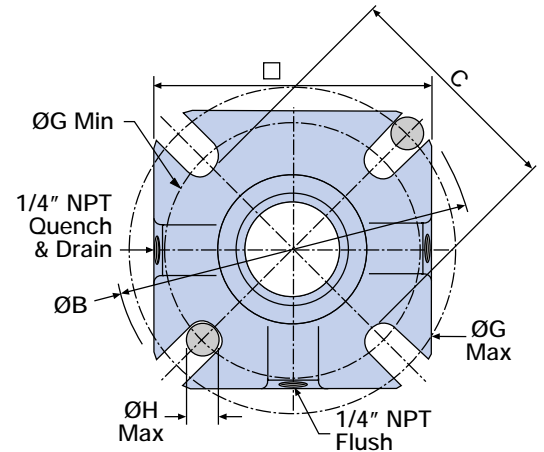
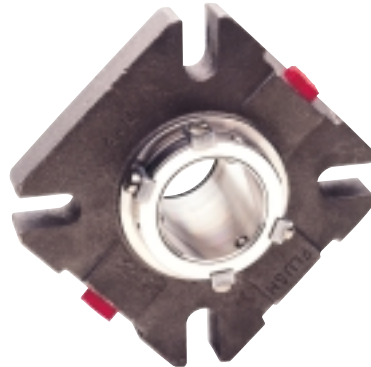
ANSI+ CSM™ - ANSI+ Gland format Dimensional Information (inches)

A	B	C	E	F min	F max	G min	G max	H max	I	J	□L	K max
1.125	5.000	3.188	1.000	2.625	2.850	3.750	4.250	0.500	1.125	1.565	3.990	0.040
1.375	5.375	3.438	1.000	2.875	3.100	4.000	4.625	0.500	1.125	1.565	4.240	0.040
1.750	6.750	4.438	0.644	3.500	4.100	5.000	6.000	0.500	1.125	1.690	5.480	0.040
1.875	6.750	4.438	0.644	3.625	4.100	5.000	6.000	0.500	1.125	1.690	5.480	0.040
2.125	7.625	4.688	0.644	3.875	4.225	5.375	6.687	0.625	1.250	1.690	6.230	0.040
2.500	8.250	5.438	0.644	4.500	5.100	6.125	7.312	0.625	1.300	1.890	6.730	0.060
2.625	8.250	5.438	0.644	4.625	5.100	6.125	7.312	0.625	1.300	1.890	6.730	0.060
2.750	8.250	5.438	0.644	4.625	5.100	6.125	7.312	0.625	1.300	1.890	6.730	0.060

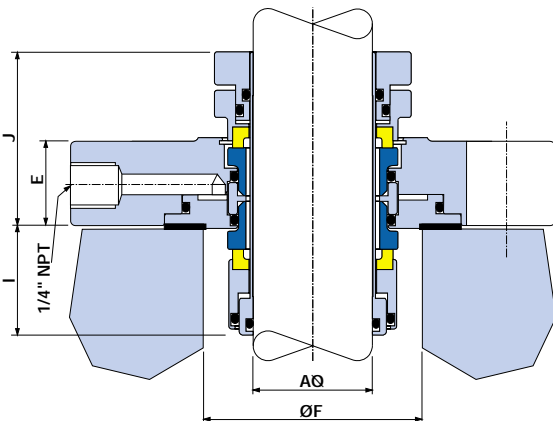
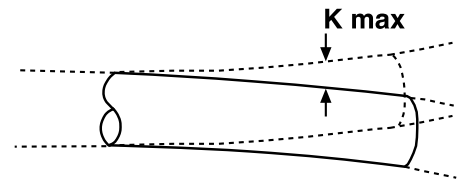
Minimum bolt circle based on bolt size shown.

The CSM™ and CDM™ range of single and double mechanical seals are available with ANSI+ size gland designs in order to fit ANSI+ equipment.

For any more information on these seals please contact the AESSEAL® Technical Department.



K Max = Maximum TOTAL Radial Movement



ANSI+ CDM™ - ANSI+ Gland format Dimensional Information (inches)

A	B	C	E	F Min	F Max	G Min	G Max	H Max	I	J	□L	K max
1.125	5.000	3.188	1.000	2.625	2.850	3.750	4.250	0.500	1.250	2.000	3.990	0.040
1.375	5.375	3.438	1.000	2.875	3.100	4.000	4.625	0.500	1.250	2.000	4.240	0.040
1.750	6.750	4.438	0.644	3.500	4.100	5.000	6.000	0.500	1.350	2.000	5.480	0.040
1.875	6.750	4.438	0.644	3.625	4.100	5.000	6.000	0.500	1.350	2.000	5.480	0.040
2.125	7.625	4.688	0.644	3.875	4.225	5.375	6.687	0.625	1.437	2.000	6.230	0.040
2.500	8.250	5.438	0.644	4.500	5.100	6.125	7.312	0.625	1.500	2.187	6.730	0.060
2.625	8.250	5.438	0.644	4.625	5.100	6.125	7.312	0.625	1.500	2.187	6.730	0.060
2.750	8.250	5.438	0.644	4.625	5.100	6.125	7.312	0.625	1.500	2.187	6.730	0.060

Minimum bolt circle based on bolt size shown.

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.



INVESTOR IN PEOPLE

USE DOUBLE MECHANICAL SEALS WITH HAZARDOUS PRODUCTS. ALWAYS TAKE SAFETY PRECAUTIONS:

- GUARD YOUR EQUIPMENT
- WEAR PROTECTIVE CLOTHING



WARNING

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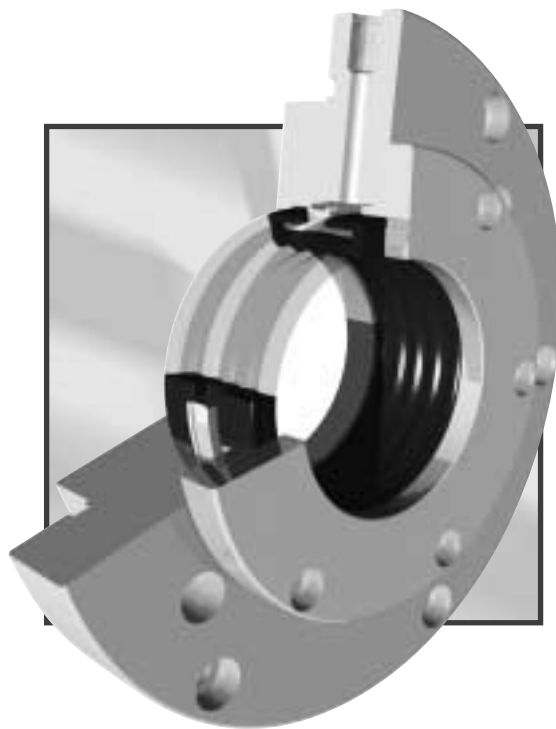
USA Sales & Technical advice:
AESSEAL Inc.
10231 Cogdill Road
Suite 105
Knoxville, TN 37932
USA

Telephone: 865 531 0192
Fax: 865 531 0571

ALL SIZES ARE SUBJECT TO MANUFACTURING TOLERANCES. WE RESERVE THE RIGHT TO MODIFY SPECIFICATIONS AT ANY TIME.



ISOS[™] Inflatable Shut Off Seal



- FOR USE IN CONJUNCTION WITH RADIALLY DIVIDED SEALS
- ALLOWS EASIER AND QUICKER REPLACEMENT OF A MECHANICAL SEAL WITHOUT HAVING TO DRAIN EQUIPMENT
- ALLOWS REPLACEMENT OF SEAL WHEN PUMP SHUT OFF VALVES ARE FAULTY
- ELIMINATES THE NEED FOR PUMP SHUT OFF VALVES WHEN REPLACING SEAL
- NO REPRIMING OF PUMPS NEEDED AFTER SEAL REPLACEMENT
- ONCE INFLATED BY A SUITABLE AND CONTINUOUS SUPPLY IT FORMS A PRESSURIZED SEAL FOR ZERO PRODUCT LEAKAGE

ISOS™ - inflatable shut off seal

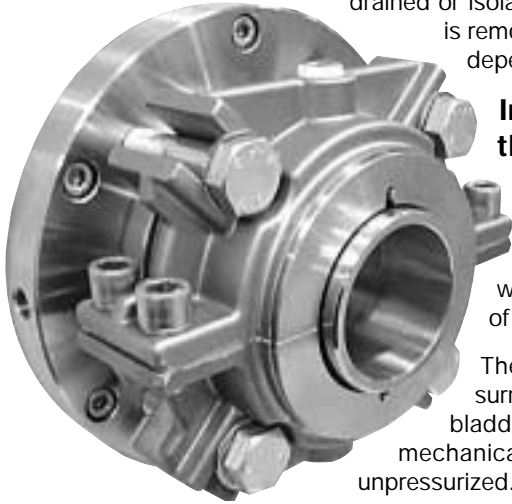
Most engineers will relate to the problems encountered when installing or removing a radially divided mechanical seal from rotating equipment.

However, the biggest single problem is that the whole system has to be drained or isolated so that liquids do not pour out when the seal is removed. This can sometimes take hours or even days depending on the application - all lost production time.

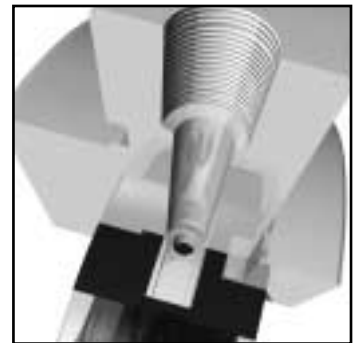
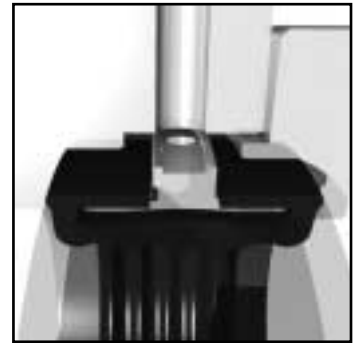
Introducing the AESSEAL® ISOS™ - the Inflatable Shut Off Seal, which solves this major problem.

The ISOS™, which is fitted between the pump and radially divided seal, forms a separate seal when required, allowing the quick and easy removal of the mechanical seal.

The ISOS™ works around the principle of surrounding the shaft with an inflatable elastomeric bladder. Under normal operating conditions, when the mechanical seal is working, the bladder remains unpressurized.

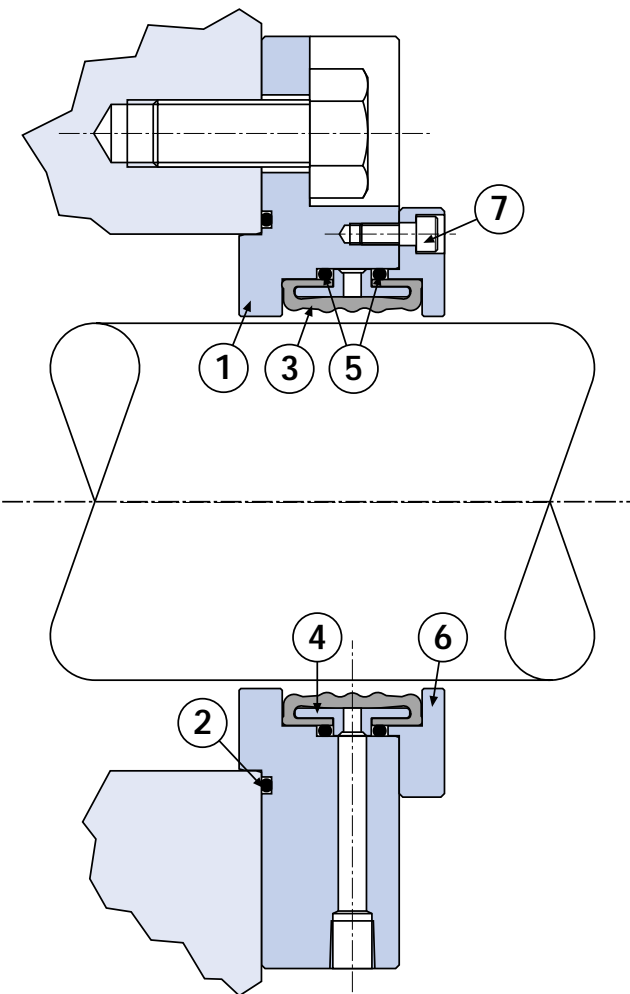


ISOS™ and RDS™ shown together



When the mechanical seal fails or needs removing, the bladder can be inflated thereby mechanically sealing the shaft. The seal can then be easily removed without draining or isolating the equipment.

Note - can be pressurized by air or water.



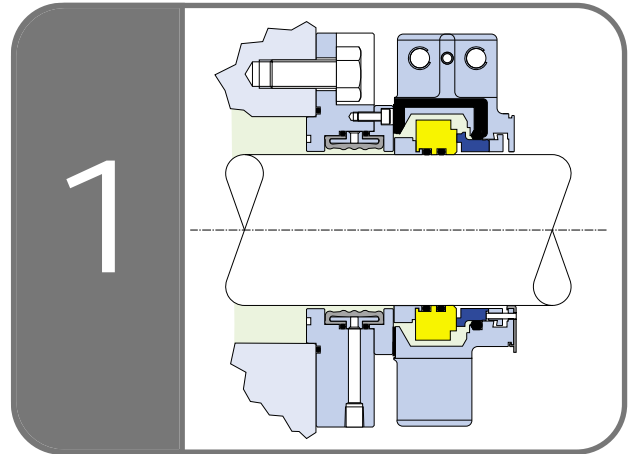
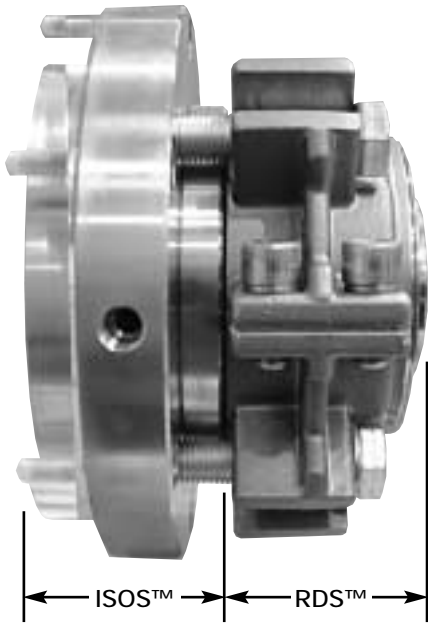
ISOS™ - Inventoried Bladder Sizes

Imperial (Inches)	Metric (mm)
2.500	63
2.750	70
3.000	75
3.500	90
4.000	100
5.000	127
9.625	245

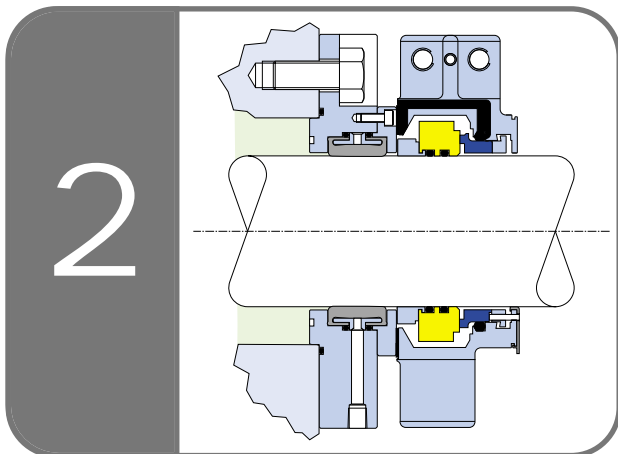
All metal components are designed to suit the application and made to order only.

Item	Description	Material
1	Main Housing	316L Stainless Steel
2	Housing O Ring	Viton® - EPR - Kalrez® - Aflas®
3	Inflatable Bladder	EPR
4	Inner Ring	316L Stainless Steel
5	Bladder O Ring	Viton® - EPR - Kalrez® - Aflas®
6	Cover Plate	316L Stainless Steel
7	Caphead Bolt	Stainless Steel

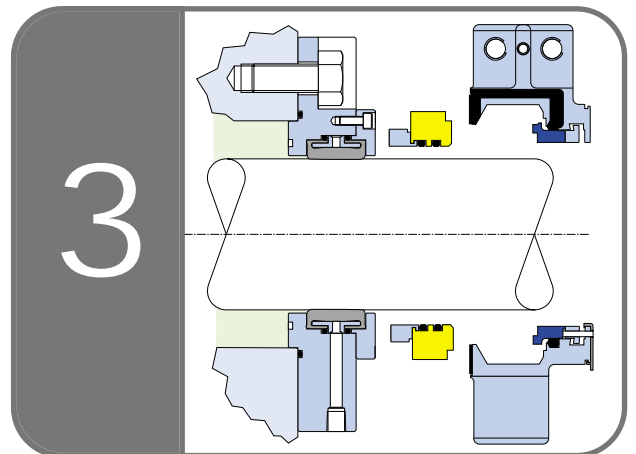
ISOS™ - operation using the AESSEAL® RDS™ Mechanical Seal



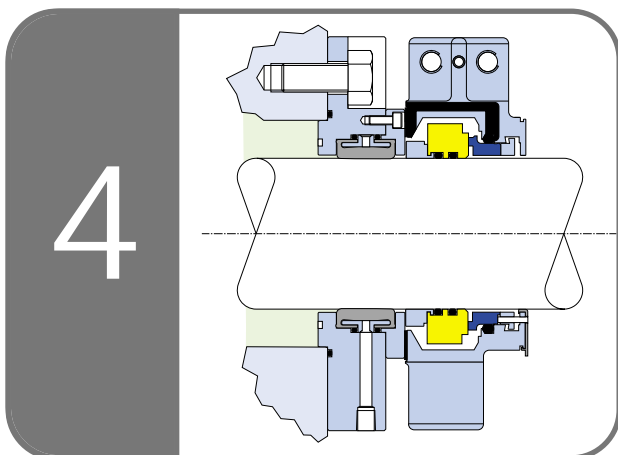
Seal in operation. The bladder is uninflated.



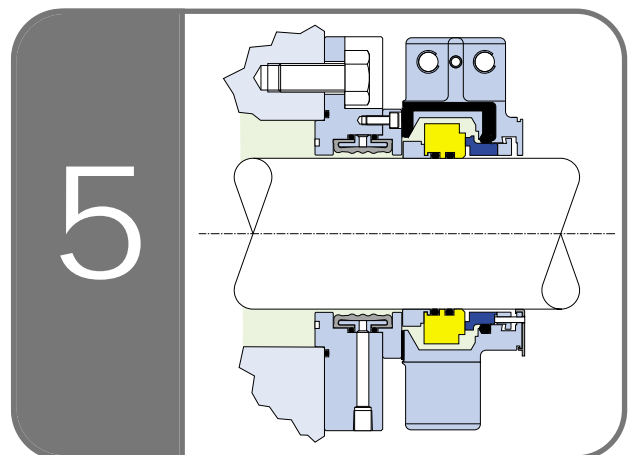
The pump is stopped, the Bladder is inflated and then seals onto the shaft. The radially divided seal can then be drained of fluid by its flush port.



Whilst the bladder is inflated the seal is replaced.



Bladder is still inflated and a new seal is installed.



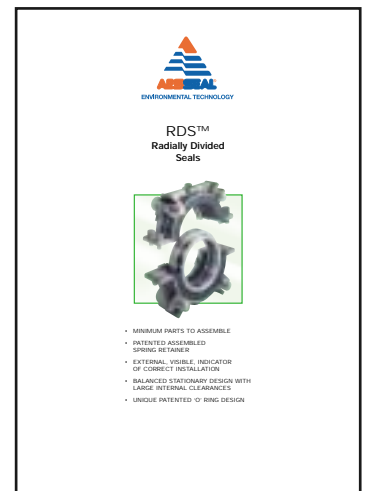
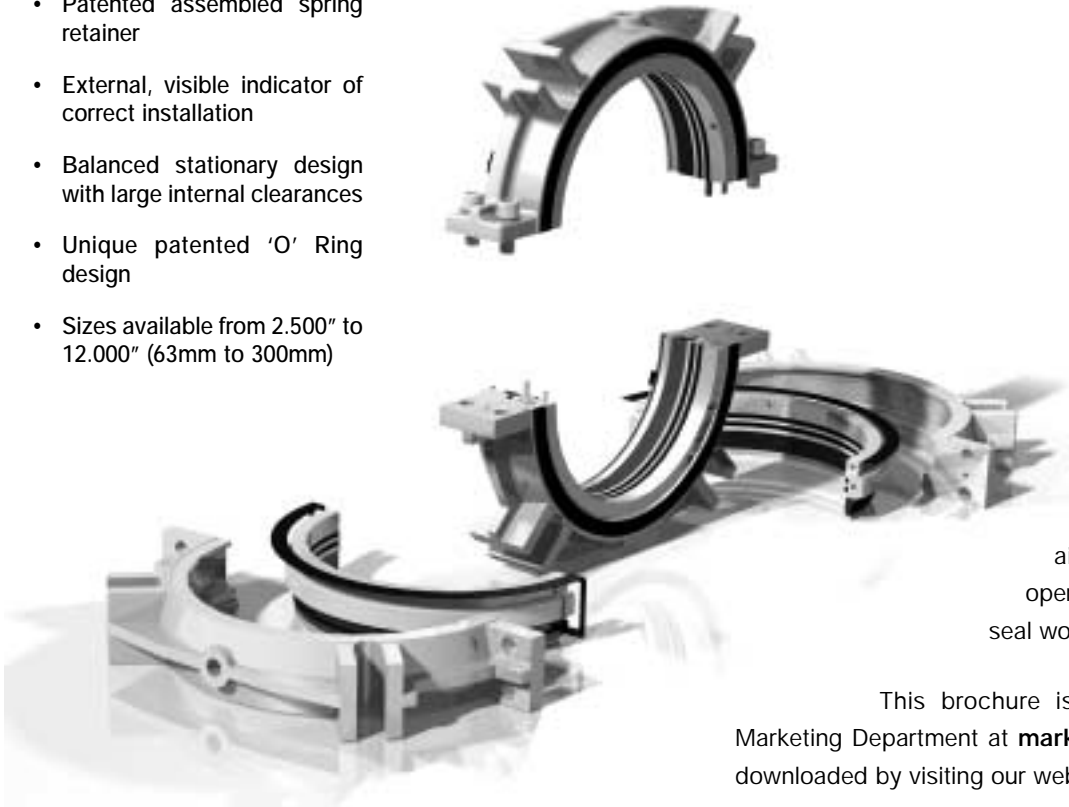
Bladder is deflated, the seal is primed and set to run again.

RDS™ - Radially Divided Seal

The AESSEAL® RDS™ (Radially Divided Seal) is an ideal seal to be used in conjunction with the ISOS™ due to its unique separation technology.

The RDS™ mechanical seal has been designed to be the fastest two-part seal to install in the market place and includes the following features:

- Minimum parts to assemble
- Patented assembled spring retainer
- External, visible indicator of correct installation
- Balanced stationary design with large internal clearances
- Unique patented 'O' Ring design
- Sizes available from 2.500" to 12.000" (63mm to 300mm)



It represents a significant advancement in separation technology and bridges the gap between pump packing and conventional mechanical seals.

Significant product development and dynamic testing were aimed at ensuring that the operating performance of the RDS™ seal would be predictable.

This brochure is available by contacting the Marketing Department at marketing@aes seal.com or can be downloaded by visiting our website at www.aes seal.com

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.



INVESTOR IN PEOPLE

USE DOUBLE MECHANICAL SEALS WITH HAZARDOUS PRODUCTS. ALWAYS TAKE SAFETY PRECAUTIONS:

- GUARD YOUR EQUIPMENT
- WEAR PROTECTIVE CLOTHING



WARNING

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mixer cartridge seal
range

The AESSEAL[®] Group
of Companies

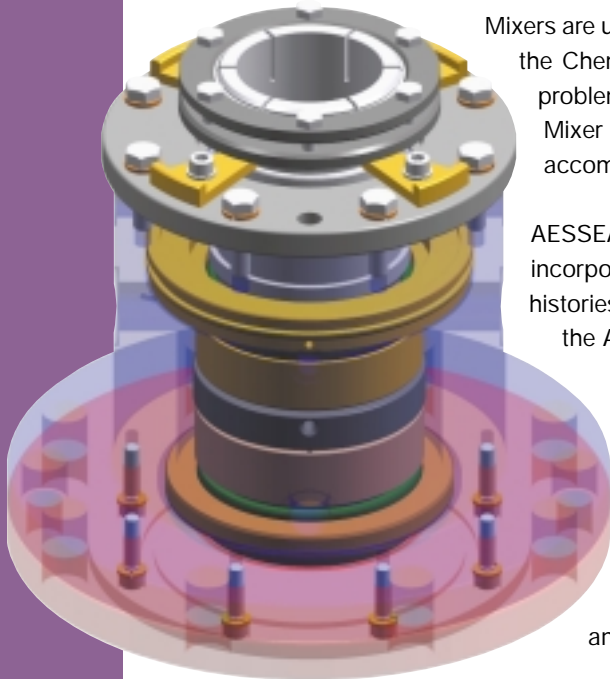
Designers and
Manufacturers of
Mechanical Seals and
Engineered Seal
Support Systems



Mixmaster Range of Cartridge seals for Mixers

This brochure covers the range of AESSEAL® Mixmaster mechanical seals designed for Mixers, Agitators and Reactors.

Mixer, Agitator and Reactor applications vary from simple blending or solid dissolution to the more exacting standards of solids suspension, gas dispersion or containing/promoting chemical reactions.



3D creation of a Mixmaster IV™ seal

Mixers are used in the Food, Beverage and Pharmaceutical industries, yet generally the Chemical and Process industries have the most varied and difficult mixer problems and therefore require precise sealing technology. The AESSEAL® Mixer seal range ensures that the most demanding applications can be accommodated.

AESSEAL® also produce a Mixer Agitator & Reactor Seal Range Booklet which incorporates more specialized seals for this industry as well as in depth case histories of seals. For more information this brochure can be downloaded from the AESSEAL® website at www.aesseal.com.

Development Background

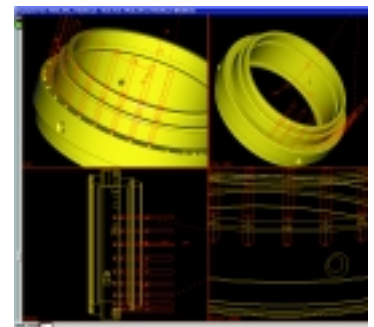
The AESSEAL® Mixmaster range has been developed only after extensive performance and field evaluation tests, conducted over many years.

The range has been created using the latest Computer Aided Design and Manufacture programmes including Finite Element Analysis.

These programmes help to predict how the seals can be produced and also how they will perform under various application conditions. This technology has vastly reduced the lead time for product development and thus reduced the overall cost of the seal range.



Computer simulation is very effective for evaluating seal performance, however, all AESSEAL® mechanical seals still have to undergo physical testing in various hazardous conditions.

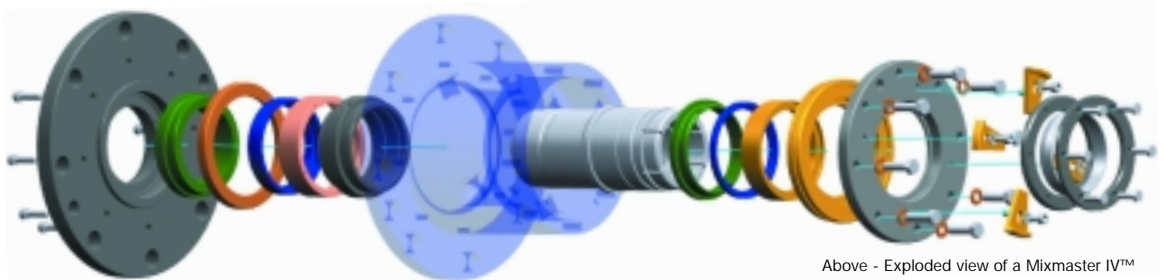


Integrated CAM programming

Massive investment in Computer Aided Design, Manufacture and PDM (Product Data Management) helps to ensure that the seal is fit for the purpose.



Investment in test facilities to suit API-682 allows computer controlled 24hr product testing for all AESSEAL® designs. The result is an industry leading range of mechanical seals.



Above - Exploded view of a Mixmaster IV™

Mixmaster IV™



The seal range is offered with the following design features:

- Designed for mixers, agitators and reactors
- Double hydraulically balanced seal faces
- Available with non-metallic wetted components
- Cartridge seal with integral load carrying bearing to DIN 28 138 parts 1 and 2
- Available to suit any shaft (within the size range)
- No shaft fretting

Specifications Mixmaster IV™

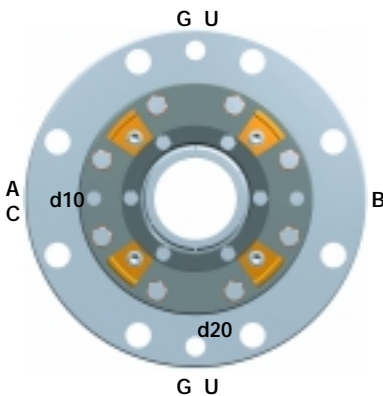
The Mixmaster IV™ Range of Mixer Seals conform to the following relevant DIN Specifications.

- DIN 28 138 part 1 - Stainless Mixer Seal
- DIN 28 138 part 2 - Glass Lined
- DIN 28 138 part 3 - Screwed Connection Designation & Position
- DIN 28 137 part 2 - Glass Lined Mounting Flanges
- DIN 28 141 - Stainless Steel Mounting Flanges
- DIN 28 154 & 159 - Shaft Dimensions



Environmental Connections

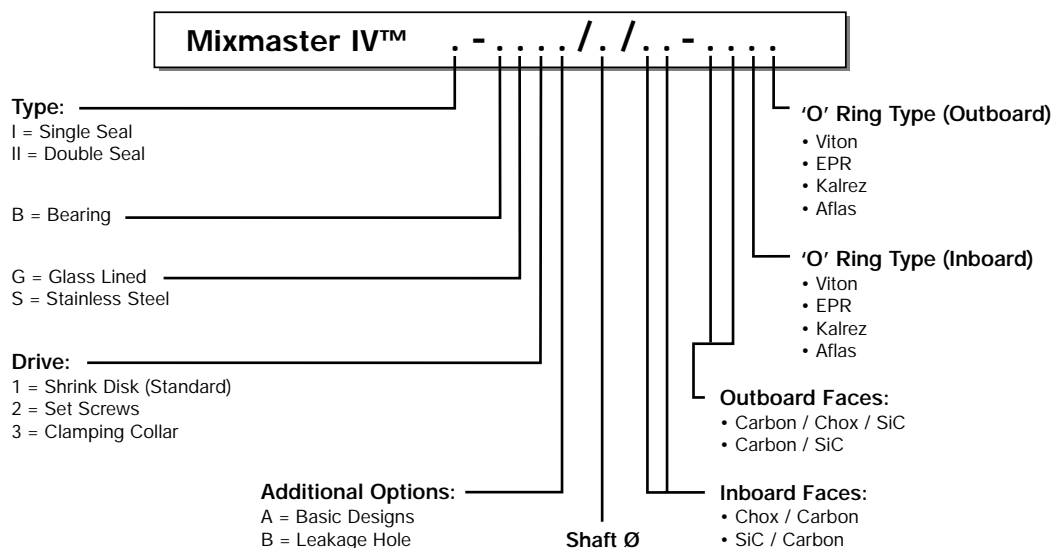
The Mixmaster IV™ connections are positioned in accordance with DIN 28 138 part 3.



- A = Barrier IN
- B = Barrier OUT
- C = Leakage to Atmosphere
- G = Grease Port
- U = Pressure / Thermometer Port
- d10 = Lifting Threads
- d20 = Jacking Threads

MIXMASTER IV™ Load Carrying Capabilities			
ØD3	DIN 28 159 Max Loads		
	40mm (1.500")	1,562 N	351 lbs
50mm (2.000")	3,468 N	779 lbs	
60mm (2.375")	6,640 N	1492 lbs	
80mm (3.125")	17,289 N	3886 lbs	
100mm (4.000")	34,820 N	7827 lbs	
125mm (5.000")	44,188 N	9933 lbs	
140mm (5.500")	38,147 N	8575 lbs	
160mm (6.250")	60,185 N	13530 lbs	

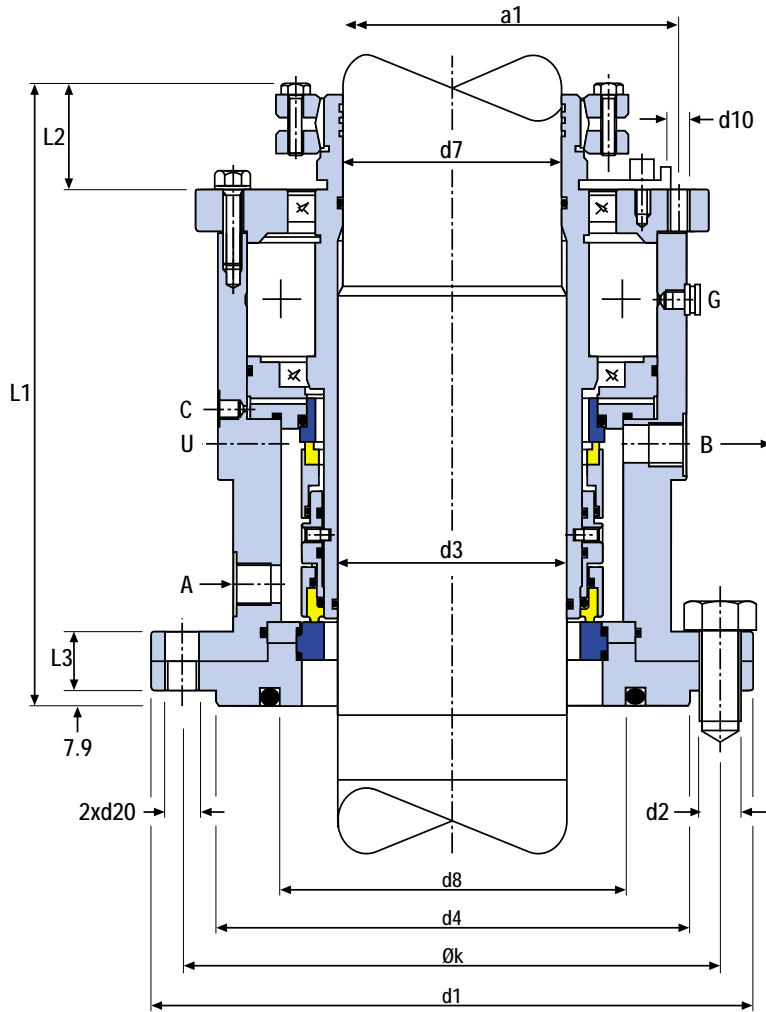
AESSEAL® Code System for Mixmaster IV™ Seals





Mixmaster IV-II-BS™

The Mixmaster IV™ is a fully customizable top entry seal designed in accordance with DIN 28 138.



- Top entry seal design
- Double hydraulically balanced inboard seal faces
- Conforms to DIN 28 138 Part 1 and DIN 28 141
- Modular design
- Available to fit any shaft size within the seal range
- Connections positioned in accordance with DIN 28 138 Part 3
- Integral load carrying bearing
- Metallic wetted parts

Mixmaster IV-II-BS™ Size Chart (mm)

d3	d7	d1	nx d2	d4	d8	Øk	L1	L2	d10	d20	A,B	C	U	L3	a1
30, 33, 35, 38	-	175	4x18	110	95	145	210	33.5	M12	M16	G3/8	G1/8	G1/2	28	109.5
40	38	175	4x18	110	95	145	210	33.5	M12	M16	G3/8	G1/8	G1/2	28	109.5
43, 45, 48	-	240	8x18	176	107	210	215	33.5	M12	M16	G3/8	G1/8	G1/2	28	133
50	48	240	8x18	176	107	210	215	33.5	M12	M16	G3/8	G1/8	G1/2	28	133
53, 55, 58	-	240	8x18	176	121	210	225	33.5	M12	M16	G3/8	G1/8	G1/2	35	146
60	58	240	8x18	176	121	210	225	33.5	M12	M16	G3/8	G1/8	G1/2	35	146
63, 65, 68, 70, 75	-	275	8x22	204	150	240	265	45	M16	M20	G1/2	G1/8	G1/2	40	190
80	78	275	8x22	204	150	240	265	45	M16	M20	G1/2	G1/8	G1/2	40	190
85, 90, 95	-	305	8x22	234	174	270	270	45	M16	M20	G1/2	G1/8	G1/2	40	220
100	98	305	8x22	234	174	270	270	45	M16	M20	G1/2	G1/8	G1/2	40	220
105, 110, 115, 120	-	330	8x22	260	200	295	312	45	M20	M20	G1/2	G1/8	G1/2	40	249
125	120	330	8x22	260	200	295	312	45	M20	M20	G1/2	G1/8	G1/2	40	249
130, 135	-	395	12x22	313	219	350	318	52	M20	M20	G1/2	G1/8	G1/2	22	264
140	135	395	12x22	313	219	350	318	52	M20	M20	G1/2	G1/8	G1/2	22	264
145, 150, 155	-	395	12x22	313	219	350	318	52	M20	M20	G1/2	G1/8	G1/2	44	304
160	150	395	12x22	313	238	350	345	52	M20	M20	G1/2	G1/8	G1/2	44	304

Dimensional information on larger sizes is available on request.

Mixmaster IV-II-BS™ Size Chart (inches)

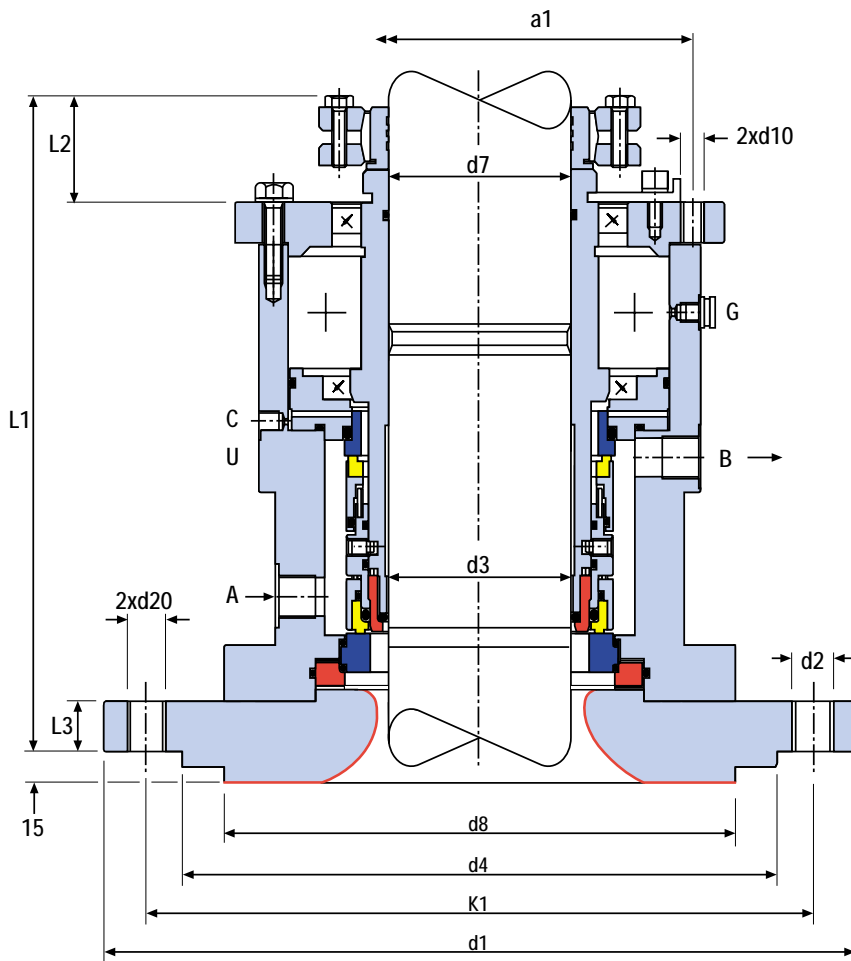
d3	d7	d1	nx d2	d4	d8	Øk	L1	L2	d10	d20	A,B	C	U
1.125" / 1.250" / 1.500"	-	6.890"	4 x 0.750"	4.330"	3.740"	5.710"	8.270"	1.320"	M12	M16	G3/8"	G1/8"	G1/2"
1.750" / 2.000" / 2.250"	-	9.450"	8 x 0.750"	6.930"	4.210"	8.260"	8.860"	1.320"	M12	M16	G3/8"	G1/8"	G1/2"
2.500" / 2.750" / 3.000"	-	10.830"	8 x 0.875"	8.030"	5.910"	9.450"	10.450"	1.770"	M16	M20	G1/2"	G1/8"	G1/2"
3.250" / 3.500" / 3.750" / 4.000"	-	12.000"	8 x 0.875"	9.210"	6.850"	10.630"	10.700"	1.770"	M16	M20	G1/2"	G1/8"	G1/2"
4.250" / 4.500" / 4.750" / 5.000"	-	13.000"	8 x 0.875"	10.240"	7.870"	11.610"	12.300"	1.770"	M20	M20	G1/2"	G1/8"	G1/2"
5.250" / 5.500"	-	15.550"	12 x 0.875"	12.320"	8.620"	13.780"	12.520"	2.050"	M20	M20	G1/2"	G1/8"	G1/2"
5.750" / 6.000" / 6.250"	-	15.550"	12 x 0.875"	12.320"	9.370"	13.780"	13.600"	2.050"	M20	M20	G1/2"	G1/8"	G1/2"

Dimensional information on larger sizes is available on request.

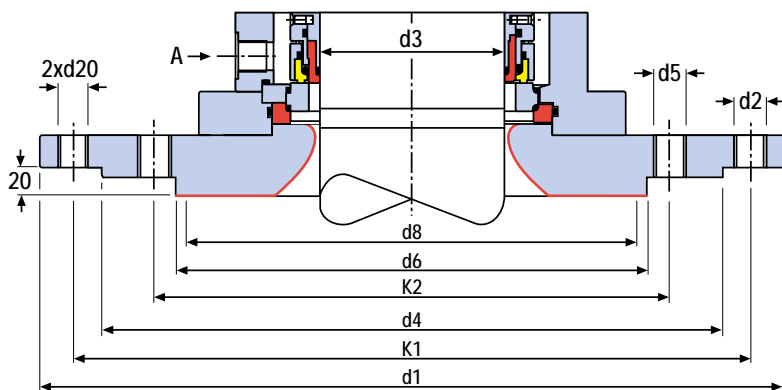
Mixmaster IV-II-BG™ Glass (Enamel) Lined



- Top entry seal design
- All wetted parts are non-metallic
- Double hydraulically balanced inboard seal faces
- Conforms to DIN 28 138 Part 2 and DIN 28 137 Part 2
- Modular design
- Available to fit any shaft size with the seal range
- Connections positioned in accordance with DIN 28 138 Part 3
- Designed to order with exotic alloy wetted materials including Alloy C276/Titanium/Alloy 20
- The flange can be designed to suit customer specific equipment



Flanges Nominal Diameters E700-E901



Mixmaster IV-II-BG™ Size Chart (mm)

d3	d7	d1	nx d2	d4	nx d5	d6	d8	d10	d20	a1	L1	K1	K2	L3	L2	A,B	C	U	NFD
40	38	175	4x18	110	-	-	138	M12	M16	110	226	145	-	20	33.5	G3/8	G1/8	G1/2	E125
50	48	240	8x18	176	-	-	138	M12	M16	133	226	210	-	20	33.5	G3/8	G1/8	G1/2	E200
60	58	275	8x22	204	-	-	188	M12	M16	146	234	240	-	22	33.5	G3/8	G1/8	G1/2	E250
80	78	305	8x22	234	-	-	212	M16	M20	190	275	270	-	25	45	G1/2	G1/8	G1/2	E300
100	98	395	12x22	313	-	-	268	M16	M20	200	282	350	-	25	45	G1/2	G1/8	G1/2	E500
125	120	505	4x22	422	12x22	320	306	M20	M20	249	323	460	350	22	52	G1/2	G1/8	G1/2	E700
140	135	505	4x22	422	12x22	320	306	M20	M20	264	331	460	350	22	52	G1/2	G1/8	G1/2	E700
160	150	505	4x22	422	12x22	320	306	M20	M20	304	355	460	350	22	52	G1/2	G1/8	G1/2	E900
160*	150	565	4x26	474	12x22	370	356	M20	M20	304	355	515	400	22	52	G1/2	G1/8	G1/2	E901

Dimensional information on larger sizes is available on request.

* Nominal size 161

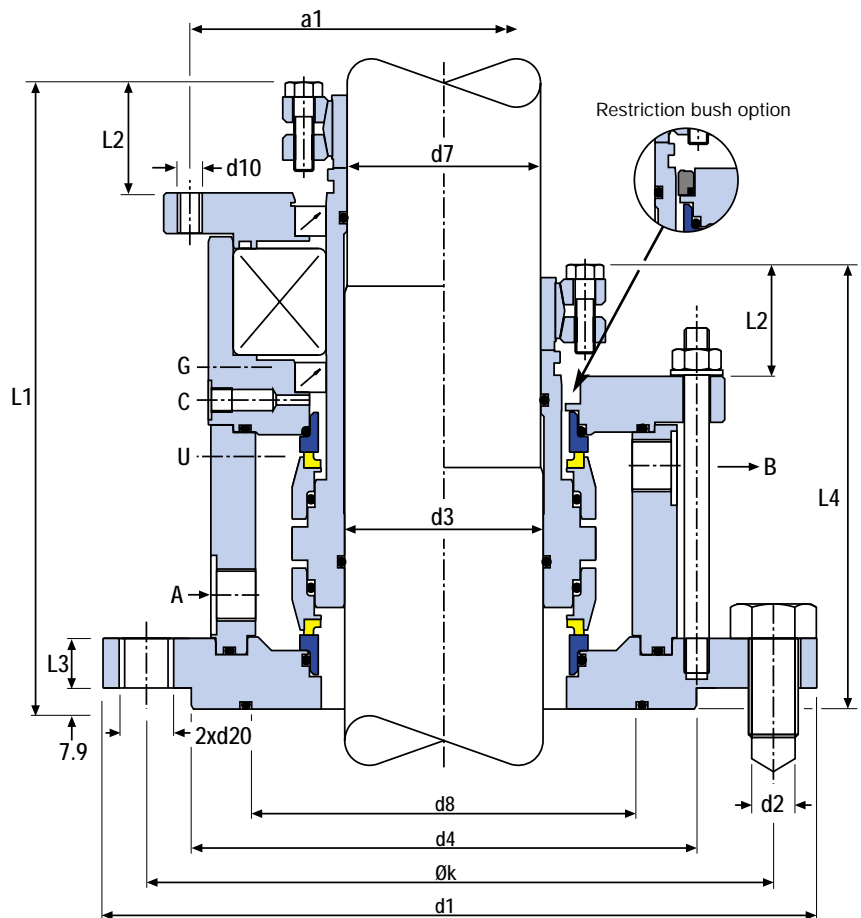


Mixmaster V™ - internal balanced mechanical seal

The Mixmaster V™ is a value for money, modular design with balanced seal faces and an integral load carrying bearing. The seal is designed in accordance with DIN 28 138. The Mixmaster V™ is a standard design which can not be customized.

The seal is offered with the following features:

- Top entry seal design
- Designed for mixers, agitators and reactors
- Balanced seal faces for the barrier fluid (Mixmaster V™)
- Cartridge seal with integral load carrying bearing to DIN 28 159
- No shaft fretting
- Modular design
- Seal faces remain closed in reverse pressure conditions



NOTE: The mounting flange is designed to DIN 28 138

Mixmaster V-II-BS™ Size Chart (mm)

d3	d7	d1	nxd2	d4	d8	Øk	L1	L2	d10	d20	A,B	C	U	L3	L4	a1
40	38	175	4x18	110	92	145	204	32	M12	M16	G3/8	G1/8	G1/2	15	149	132
50	48	240	8x18	176	136	210	213	32	M12	M16	G3/8	G1/8	G1/2	17	152	155
60	58	240	8x18	176	140	210	217	32	M12	M16	G3/8	G1/8	G1/2	17	155	164
80	78	275	8x22	204	155	240	253	45	M16	M20	G1/2	G1/8	G1/2	20	179	204
100	98	305	8x22	234	187	270	256	45	M16	M20	G1/2	G1/8	G1/2	20	179	215
125	120	330	8x22	260	213	295	293	46	M20	M20	G1/2	G1/8	G1/2	20	200	275
140	135	395	12x22	313	251	350	306	46	M20	M20	G1/2	G1/8	G1/2	20	208	285

Dimensional information on larger sizes is available on request.

The seal range is also available without the bearing assembly, as shown on the right hand side of the above diagram.

A single seal option which includes the bearing is available on request.

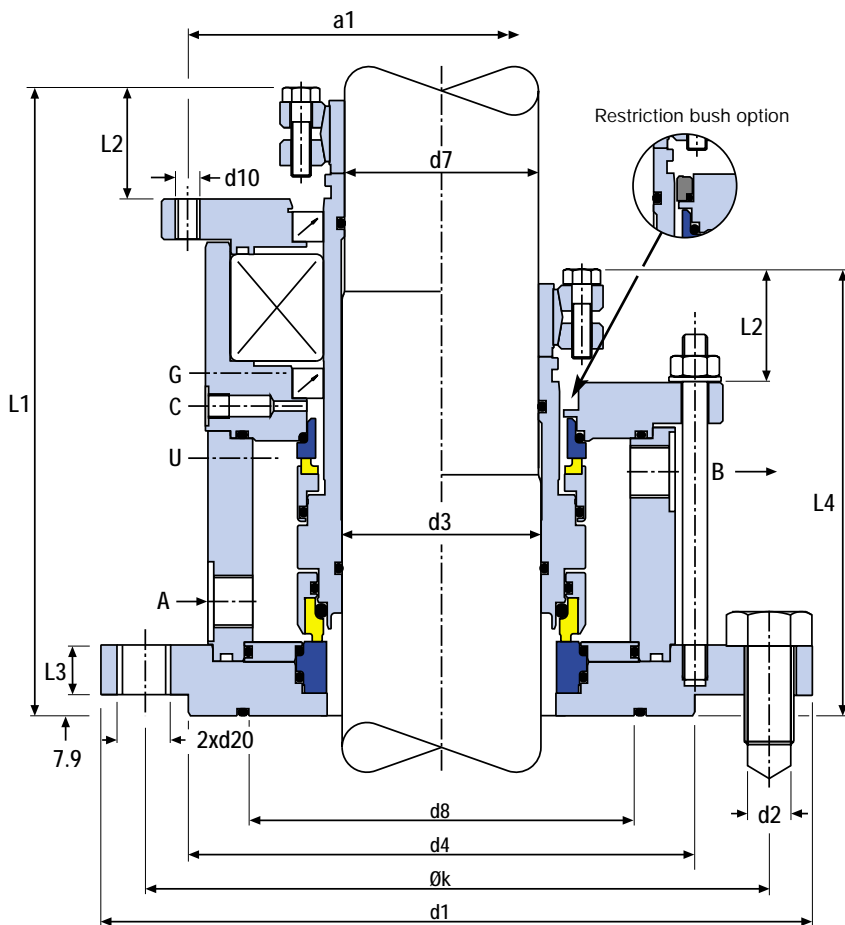
Mixmaster VI™



The Mixmaster VI™ uses the modular components of the Mixmaster V™ and incorporates double balanced seal faces. The seal is designed in accordance with DIN 28 138. The Mixmaster VI™ is a standard design which can only be customized in 3 ways: 1 - thick sleeve, 2 - flange modification, 3 - exotic alloy wetted components. For any other modifications refer to the Mixmaster IV™ design.

The seal is offered with the following features:

- Top entry seal design
- Designed for mixers, agitators and reactors
- Double balanced inboard seal faces (Mixmaster VI™)
- Cartridge seal with integral load carrying bearing to DIN 28 159
- No shaft fretting
- Modular design



NOTE: The mounting flange can be supplied to suit customer equipment

Mixmaster VI-II-BS™ Size Chart (mm)

d3	d7	d1	nxd2	d4	d8	Øk	L1	L2	d10	d20	A,B	C	U	L3	L4	a1
40	38	175	4x18	110	92	145	204	32	M12	M16	G3/8	G1/8	G1/2	15	149	132
50	48	240	8x18	176	136	210	213	32	M12	M16	G3/8	G1/8	G1/2	17	152	155
60	58	240	8x18	176	140	210	217	32	M12	M16	G3/8	G1/8	G1/2	17	155	164
80	78	275	8x22	204	155	240	253	45	M16	M20	G1/2	G1/8	G1/2	20	179	204
100	98	305	8x22	234	187	270	256	45	M16	M20	G1/2	G1/8	G1/2	20	179	215
125	120	330	8x22	260	213	295	293	46	M20	M20	G1/2	G1/8	G1/2	20	200	275
140	135	395	12x22	313	251	350	306	46	M20	M20	G1/2	G1/8	G1/2	20	208	285

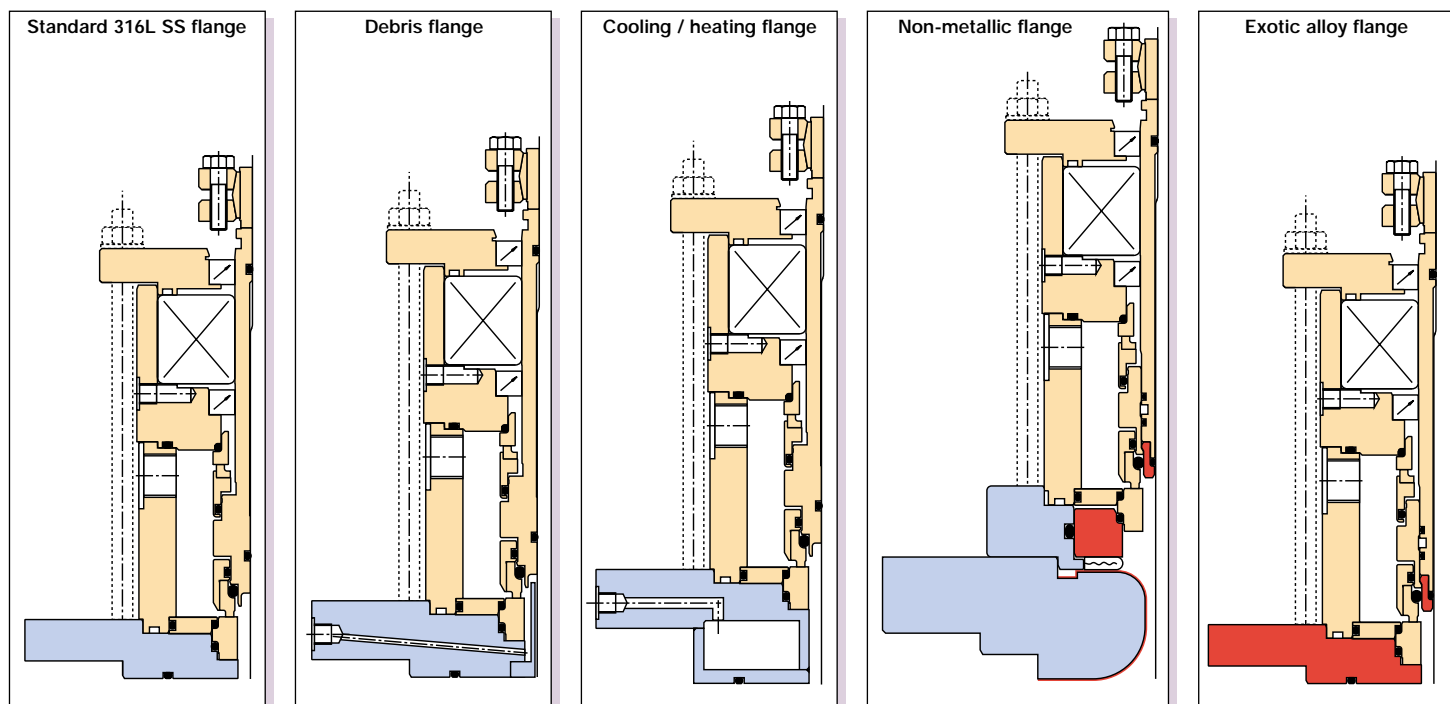
Dimensional information on larger sizes is available on request.

The seal range is also available without the bearing assembly, as shown on the right hand side of the above diagram.

A single seal option which includes the bearing is available on request.

Mixmaster VI™ - flange options

Extensive design modularity has been incorporated into the standard Mixmaster VI™ range. In addition to the standard stainless steel flange design, AESSEAL® offer FOUR further alternates as shown below.



Debris Flange

In some applications, particularly in the food or pharmaceutical industries, an in-place cleaning operation such as CIP is required.

In addition to this, often on vertical applications, carbon seal face debris is not permitted to enter the process media.

The Debris Flange with optional deflector arrangement is offered to facilitate such process requirements.

Cooling / Heating Flange

Changing the seal environment is often key when sealing difficult applications.

The Cooling / Heating flange option allows the temperature at the seal faces to be controlled, thereby helping to extend seal life in some difficult thermal applications.

Non-Metallic Flange

To complement the non-metallic product offering, AESSEAL® offer inventoried enamel flanges, conforming to DIN 28-137 part 2.

The Mixmaster VI™ non-metallic design also allows the cartridge seal to be removed and replaced without disturbing the enamelled flange.

Exotic Alloy Flange

The standard Mixmaster VI™ Exotic flange option is designed to DIN 28-141 and offered in any commercially available material including Alloy C276 and Titanium.

While some DIN style Stainless Steel, Enamel and Exotic flanges are inventoried, most flanges are made to suit customer requirements.

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.



USE DOUBLE MECHANICAL SEALS WITH HAZARDOUS PRODUCTS. ALWAYS TAKE SAFETY PRECAUTIONS:

- GUARD YOUR EQUIPMENT
- WEAR PROTECTIVE CLOTHING



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ALL SIZES ARE SUBJECT TO MANUFACTURING TOLERANCES. WE RESERVE THE RIGHT TO MODIFY SPECIFICATIONS AT ANY TIME.



Mixer, Agitator & Reactor SEAL RANGE



- SIZE CODE INFORMATION
- MIXER UNIT SEALS
- MIXER CARTRIDGE SEALS
- NON-METALLIC MIXER SEALS
- MIXMASTER™ SEALS
- CASE HISTORIES

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IMPERIAL SEAL SIZE CODES

-06	0.750"
-07	0.875"
-08	1.000"
-09	1.125"
-10	1.250"
-11	1.375"
-12	1.500"
-13	1.625"
-14	1.750"
-15	1.875"
-16	2.000"
-17	2.125"
-18	2.250"
-19	2.375"
-20	2.500"
-21	2.625"
-22	2.750"
-23	2.875"

-24	3.000"
-25	3.125"
-26	3.250"
-27	3.375"
-28	3.500"
-29	3.625"
-30	3.750"
-31	3.875"
-32	4.000"
-33	4.125"
-34	4.250"
-35	4.375"
-36	4.500"
-37	4.625"
-38	4.750"
-39	4.875"
-40	5.000"

eg. APCS14AO1
Refers to 1.750" seal



METRIC SEAL SIZE CODES

0024	24mm
0025	25mm
0028	28mm
0030	30mm
0032	32mm
0033	33mm
0035	35mm
0038	38mm
0040	40mm
0043	43mm
0045	45mm
0048	48mm
0050	50mm
0053	53mm
0055	55mm
0058	58mm
0060	60mm

0063	63mm
0065	65mm
0068	68mm
0070	70mm
0075	75mm
0080	80mm
0085	85mm
0090	90mm
0095	95mm
0100	100mm
0105	105mm
0110	110mm
0115	115mm
0120	120mm
0125	125mm

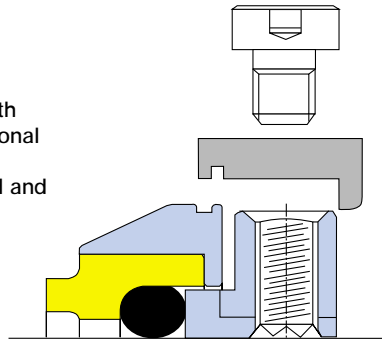
eg. APCS0075AO1
Refers to 75mm seal



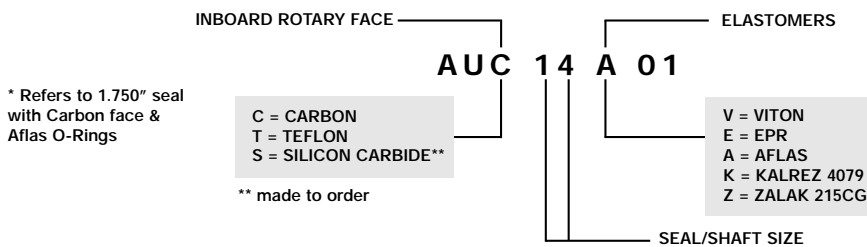
CS™ BALANCED EXTERNAL SEAL FOR MIXERS



Chemical external component seal with non-metallic wetted parts and an optional Kalrez® or Zalak® perfluoroelastomer. Available with collet clamping for hard and soft shafts.



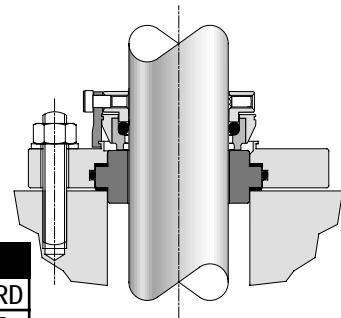
- Available in sizes 0.625" - 4.000" (20mm - 100mm).
- Metallic components offered in 316L S/S. Other materials available upon request.



THE ESM™ UNIT SEAL RANGE

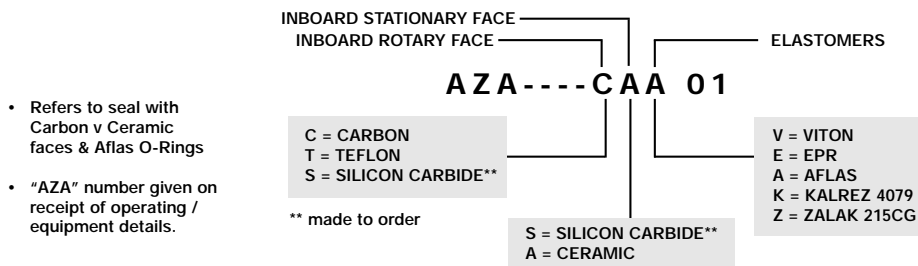


External unit mechanical seal with non-metallic wetted components and an optional Kalrez® or Zalak® wetted elastomer. Available with collet drive for hard and soft shaft applications.



SEAL TYPE	FACE AVAILABILITY	DRIVE
ESM™	CAR - CER	STANDARD
ESCM™	CAR - CER	COLLET
ESTM™	PTFE - CER	STANDARD
ESCTM™	PTFE - CER	COLLET

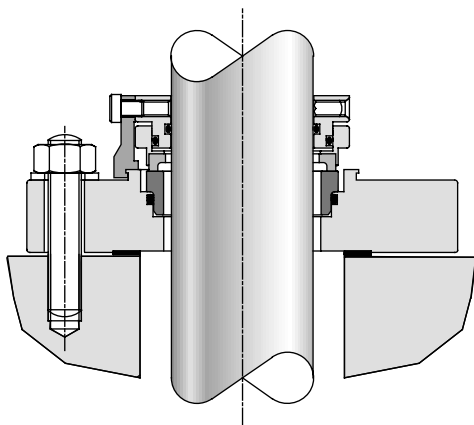
- Available in sizes 0.625" - 2.625" (20mm - 65mm) as standard.
- Larger sizes available upon request. Gland designed to suit equipment.
- Metallic components are offered in 316L S/S as standard. Other materials available upon request.



- Refers to seal with Carbon v Ceramic faces & Aflas O-Rings
- "AZA" number given on receipt of operating / equipment details.

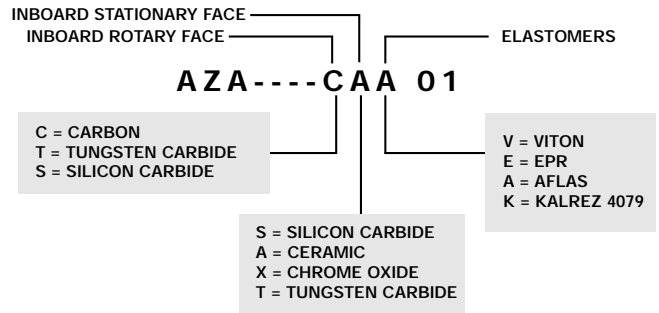


NCM™ - NON CHEMICAL FOR MIXERS



External unit mechanical seal with an optional Kalrez® or Zalak® wetted elastomer. Available with collet drive for hard and soft shaft applications.

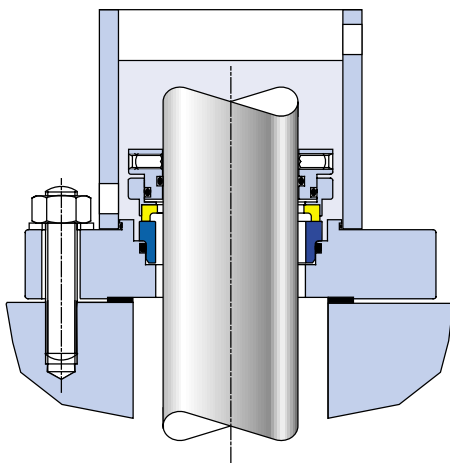
Seal Coding System



- Refers to seal with Carbon v Ceramic faces & Aflas O-Rings
- "AZA" number given on receipt of operating / equipment details.

- Available in sizes 1.000" - 4.000" (24mm - 100mm) as standard.
- Larger sizes available upon request. Gland designed to suit equipment.

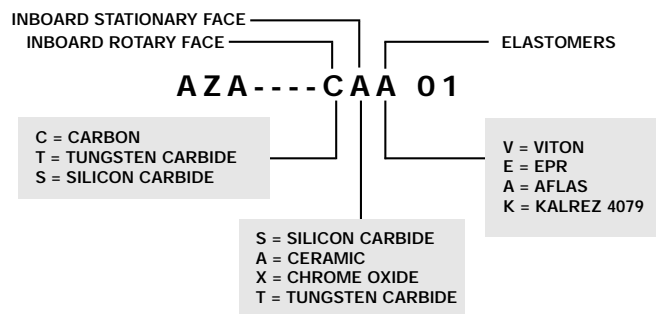
BUFFER CANISTER OPTION



Optional Buffer Canister™ to lubricate the seal faces in a buffer fluid, to help facilitate seal operation. (Seal shown is an NCM™, with metallic wetted components).

The Buffer Canister option is available on both the ESM™ NCM™ range of unit seals, and is designed to suit equipment.

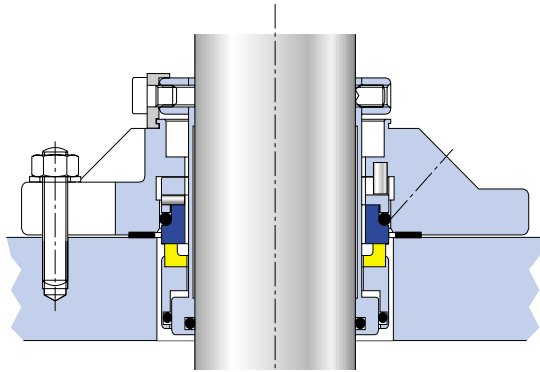
Seal Coding System



- Refers to seal with Carbon v Ceramic faces & Aflas O-Rings
- "AZA" number given on receipt of operating / equipment details.



CSM™ - CARTRIDGE SINGLE FOR MIXERS

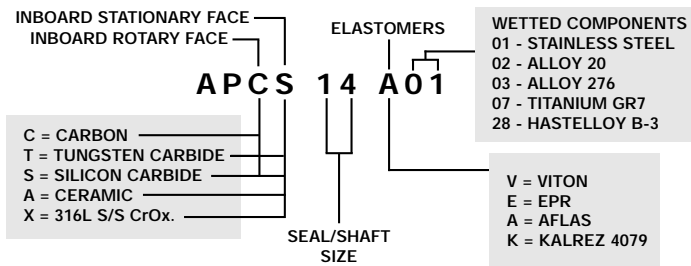


Cartridge Single mechanical seal specifically designed for mixer applications. Can be supplied with Kalrez® wetted elastomers and exotic alloy wetted components.

- Available in sizes 1.000" - 5.000" (24mm - 125mm) as standard.
- Larger sizes available upon request.

* Refers to 1.750" seal with Carbon v SiC faces & Aflas O-Rings

Seal Coding System

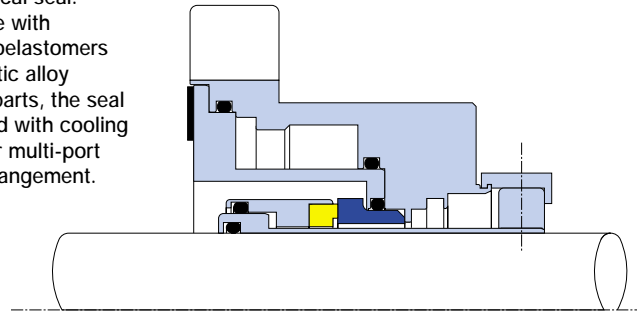


- Exotic Alloy wetted components are inventoried in Alloy 20, Hastelloy B-3, Alloy 276, Titanium and Monel.

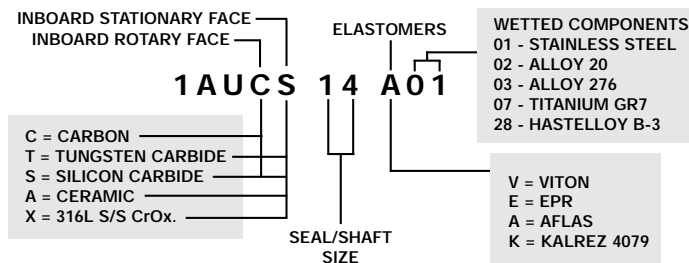
CCSM™ - CANISTER CARTRIDGE SINGLE FOR MIXERS



Externally mounted cartridge single mechanical seal. Available with perfluoroelastomers and exotic alloy wetted parts, the seal is offered with cooling jacket or multi-port flush arrangement.



Seal Coding System



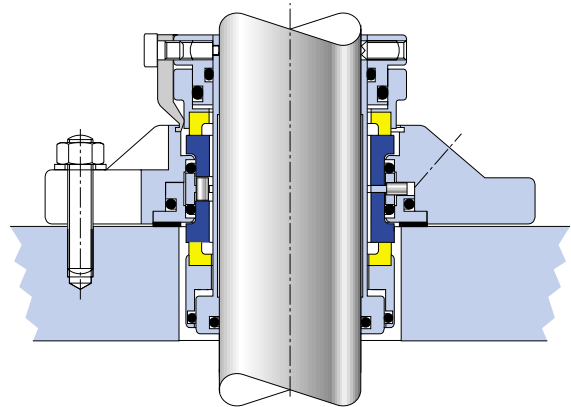
- Exotic Alloy wetted components are available in Alloy 20, Hastelloy B-3, Alloy 276, Titanium and Monel.
- The gland is designed to suit the application.

- Available in sizes 1.000" - 4.000" (24mm - 100mm) as standard.
- Larger sizes available upon request.

* Refers to 1.750" seal with Carbon v SiC faces & Aflas O-Rings



CDM™ - CARTRIDGE DOUBLE FOR MIXERS

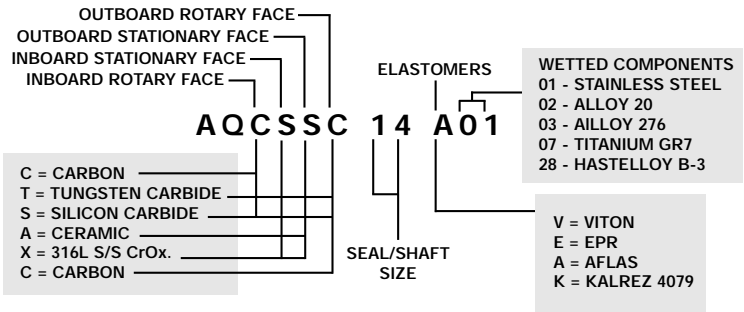


Cartridge double mechanical seal specifically designed for mixer applications. Can be supplied with Kalrez® wetted elastomers and exotic alloy wetted components.

- Available in sizes 1.000" - 5.000" (24mm - 125mm) as standard.
- Larger sizes available upon request.

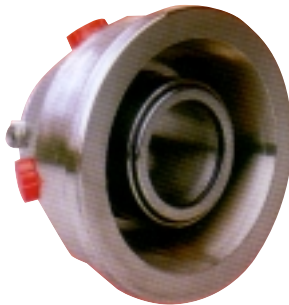
* Refers to 1.750" seal with Carbon v SIC faces & Aflas O-Rings

Seal Coding System

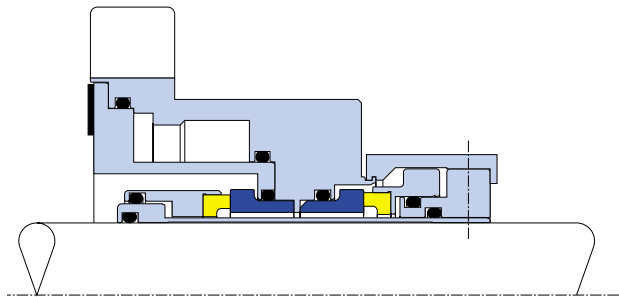


Exotic Alloy wetted components are inventoried in Alloy 20, Hastelloy B-3, Alloy 276, Titanium and Monel.

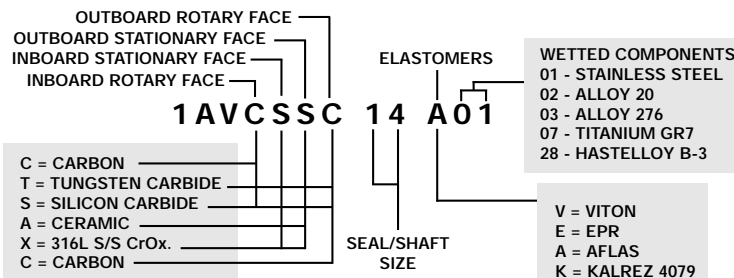
CCDM™ - CANISTER CARTRIDGE DOUBLE FOR MIXERS



Externally mounted cartridge double mechanical seal. Available with perfluoroelastomers and exotic alloy wetted parts, the seal is offered with cooling jacket or multi-port flush arrangement.



Seal Coding System



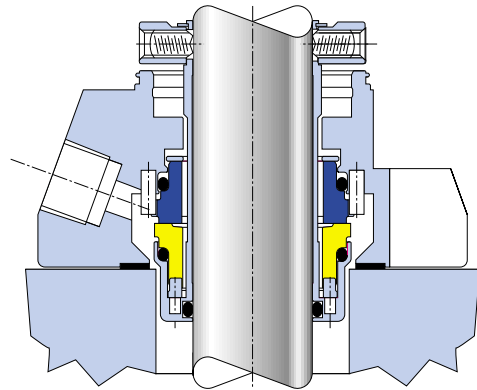
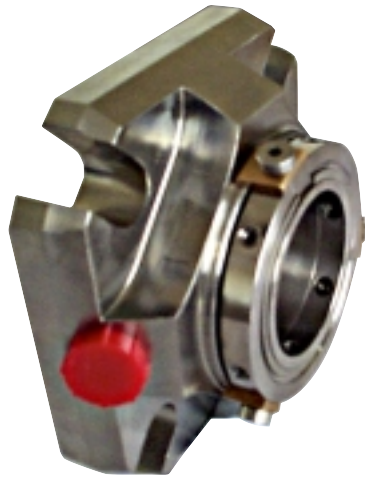
- Available in sizes 1.000" - 4.000" (24mm - 100mm).
- Larger sizes available upon request.

* Refers to 1.750" seal with Carbon v SiC faces & Aflas O-Rings



- Exotic Alloy wetted components are available in Alloy 20, Hastelloy B-3, Alloy 276, Titanium and Monel.
- The gland is designed to suit the application.

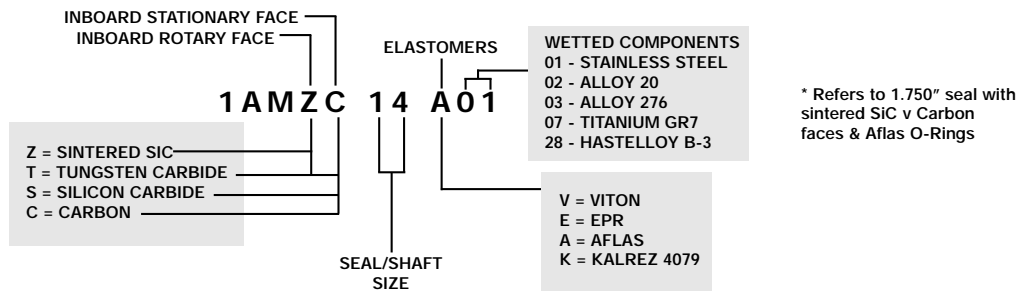
SMSS™ - SINGLE MONOLITHIC STATIONARY SEAL



Cartridge single mechanical seal with monolithic seal faces. Offered as standard with a tangential flush.

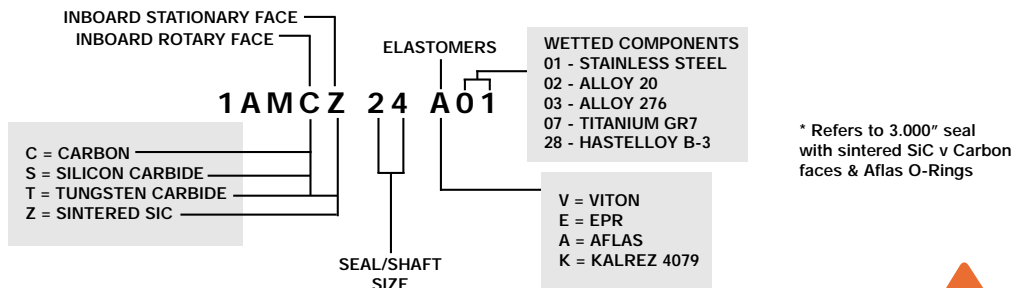
- Available in sizes 1.000" - 2.750" (24mm - 70mm).

Seal Coding System

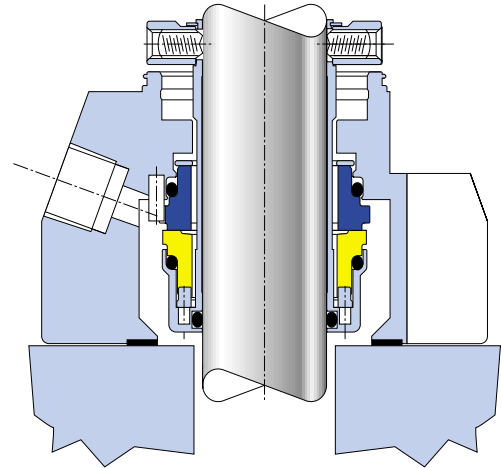


- Available in sizes 2.875" - 4.000" (75mm - 100mm).
- Larger sizes available upon request.

Seal Coding System



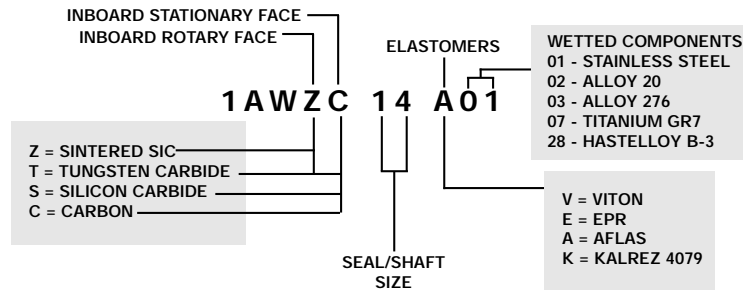
CSMSS™ - CANISTER SINGLE MONOLITHIC STATIONARY SEAL



- Available in sizes 1.000" - 2.750" (24mm - 70mm)

Externally mounted cartridge single mechanical seal with monolithic seal faces. Offered as standard with a tangential flush.

Seal Coding System

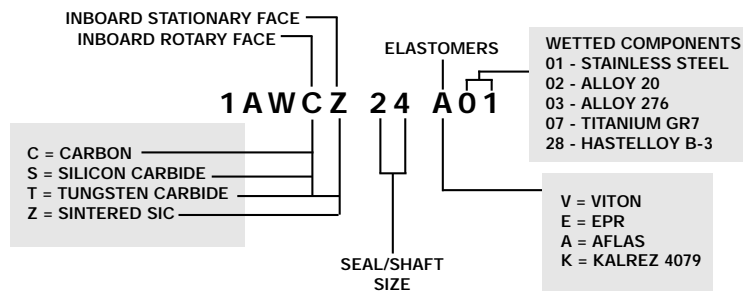


* Refers to 1.750" seal with sintered SiC v Carbon faces & Aflas O-Rings

Exotic Alloy wetted components are available in Alloy 20, Hastelloy B-3, Alloy 276, Titanium and Monel.

- Available in sizes 2.875" - 4.000" (75mm - 100mm)
- Larger sizes available upon request.

Seal Coding System

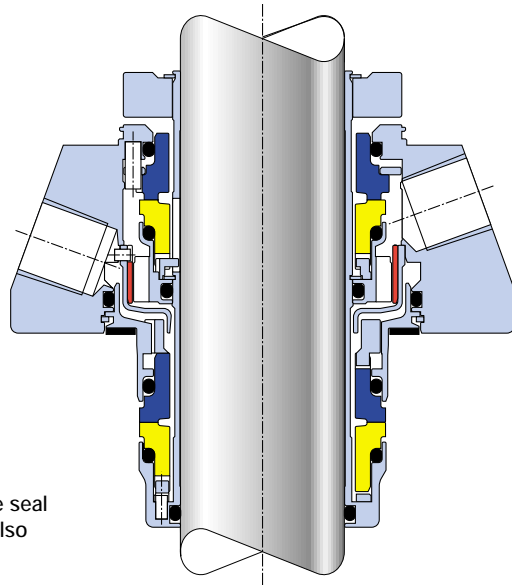
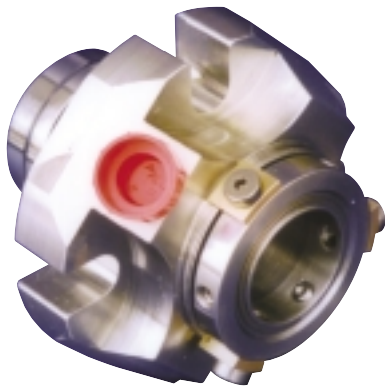


* Refers to 3.000" seal with sintered SiC v Carbon faces & Aflas O-Rings

Exotic Alloy wetted components are available in Alloy 20, Hastelloy B-3, Alloy 276, Titanium and Monel.



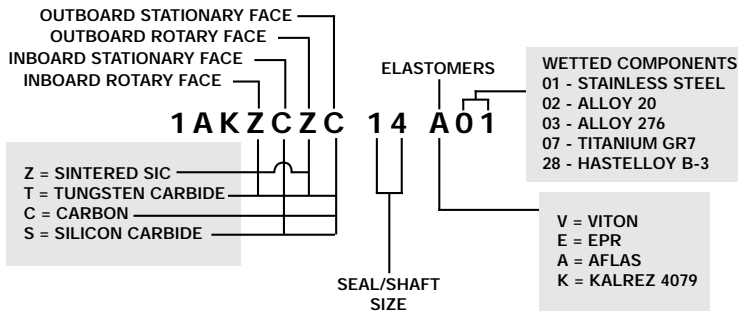
DMSF™ - DOUBLE MONOLITHIC STATIONARY FLOW



Cartridge double mechanical seal with monolithic seal faces. The seal incorporates a highly efficient pumping scroll (patent pending). Also available with perfluoroelastomers and exotic alloy wetted parts.

- Available in sizes 1.000" - 2.750" (24mm - 70mm).

Seal Coding System

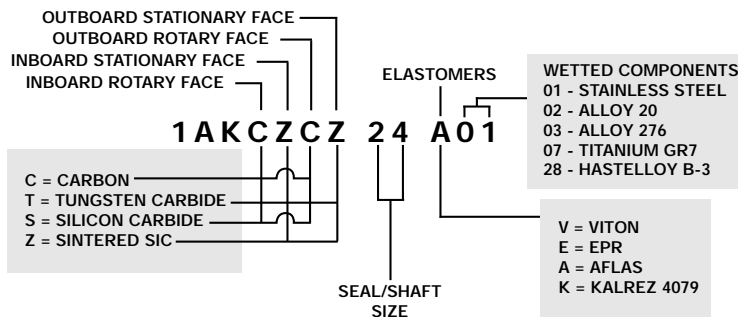


Exotic Alloy wetted components are available in Alloy 20, Hastelloy B-3, Alloy 276, Titanium and Monel.

* Refers to 1.750" seal with sintered SiC v Carbon faces & Aflas O-Rings

- Available in sizes 2.875" - 4.000" (75mm - 100mm).
- Larger sizes available upon request.

Seal Coding System



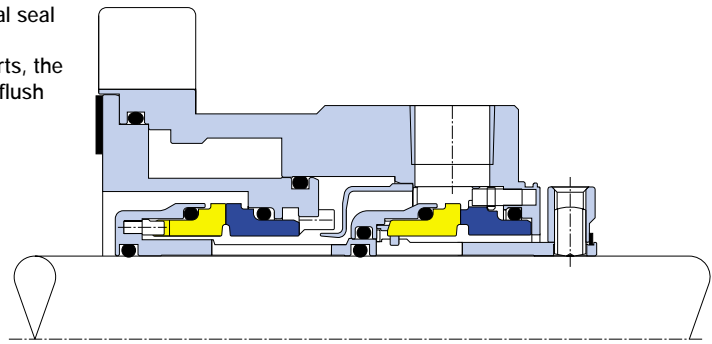
Exotic Alloy wetted components are available in Alloy 20, Hastelloy B-3, Alloy 276, Titanium and Monel.

* Refers to 3.000" seal with sintered SiC v Carbon faces & Aflas O-Rings



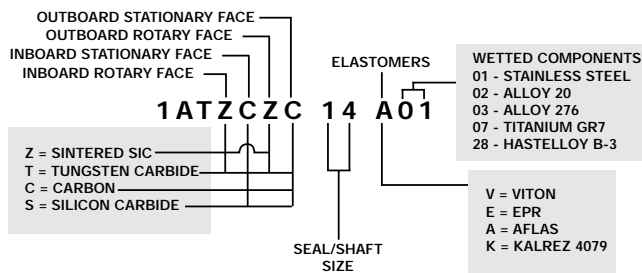
CDMSC™ - CANISTER DOUBLE MONOLITHIC STATIONARY CONVECTION

Externally mounted cartridge double mechanical seal with monolithic seal faces. Available with perfluoroelastomers and exotic alloy wetted parts, the seal is offered with cooling jacket or multi-port flush arrangement.



- Available in sizes 1.000" - 2.750" (24mm - 70mm)

Seal Coding System

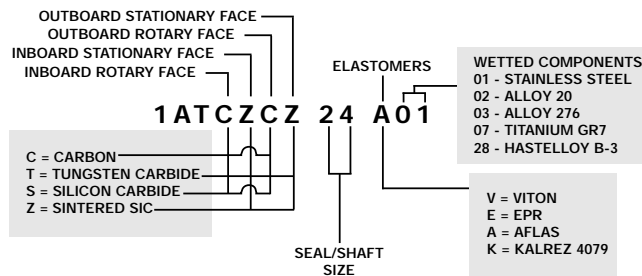


* Refers to 1.750" seal with sintered SiC v Carbon faces & Aflas O-Rings

Exotic Alloy wetted components are available in Alloy 20, Hastelloy B-3, Alloy 276, Titanium and Monel.

- Available in sizes 2.875" - 4.000" (75mm - 100mm).
- Larger sizes available upon request.

Seal Coding System



* Refers to 3.000" seal with sintered SiC v Carbon faces & Aflas O-Rings

Exotic Alloy wetted components are available in Alloy 20, Hastelloy B-3, Alloy 276, Titanium and Monel.

Standard CDMSC

Shaft Size	Axial	Radial
Upto 2.625" (65.00mm)	±0.040" (±1.00mm)	±0.010" (±0.25mm)
Above 2.750" (70.00mm)	±0.060" (±1.50mm)	±0.030" (±0.75mm)

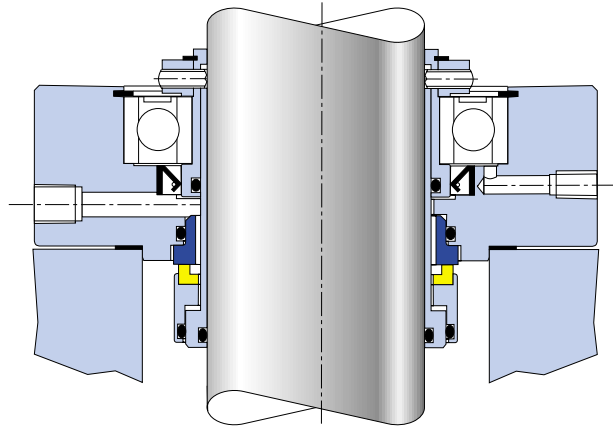
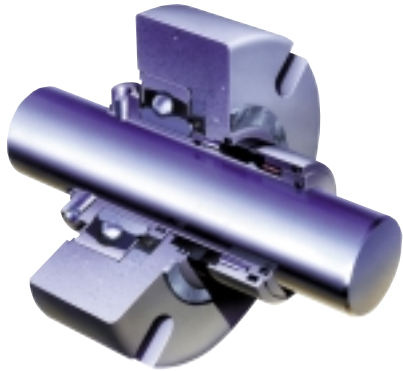
Special Radial Motion CDMSC*

Shaft Size	Axial	Radial
Upto 2.625" (65.00mm)	±0.040" (±1.00mm)	±0.040" (±1.00mm)
Above 2.750" (70.00mm)	±0.060" (±1.50mm)	±0.080" (±1.00mm)

* Extended lead time - ask for availability.



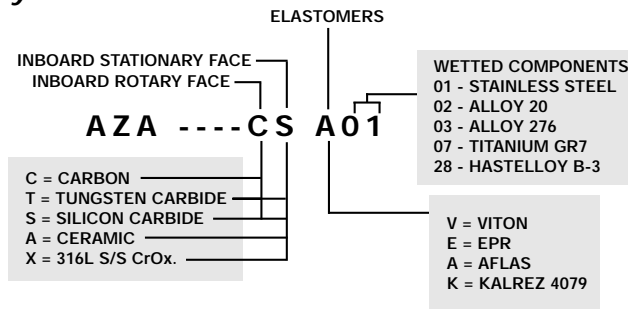
Mixmaster I™ (CSWIB™) - Cartridge Seal with Integral Bearing



Cartridge single mechanical seal with integral bearing and optional Kalrez® wetted elastomers. Available with Flush, Quench and Drain, together with exotic alloy wetted components.

- Available in sizes 1.000" - 4.000" (24mm - 100mm).
- Larger sizes available upon request.

Seal Coding System



Exotic Alloy wetted components are available in Alloy 20, Hastelloy B-3, Alloy 276, Titanium and Monel.

OPTIONS

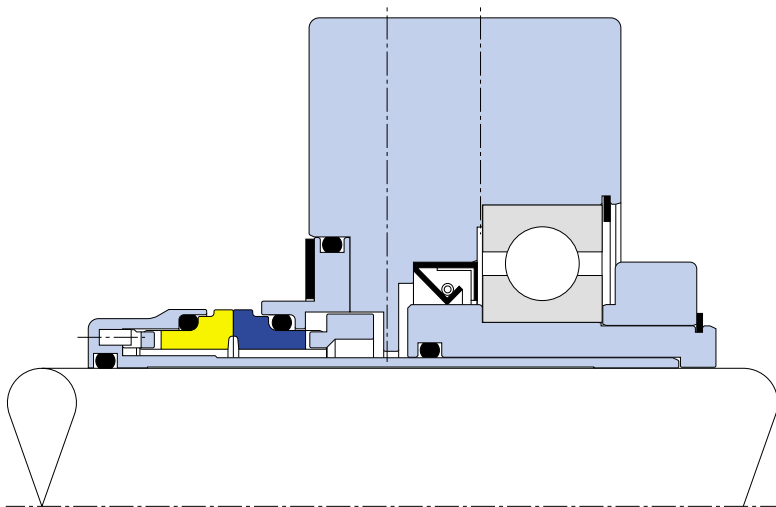
Type B = Standard
Type C = with Flush
Type D = Exotic Alloy wetted parts.
(Flush not available).

Notes

- Gland designed to suit equipment.
- "AZA" number given on receipt of operating / equipment details.
- When ordering please specify "Type" of Mixmaster I™ required, ie:- B,C, or D.



MIXMASTER IM™ (CSWIB-M™) - SINGLE MONOLITHIC CARTRIDGE SEAL WITH INTEGRAL BEARING



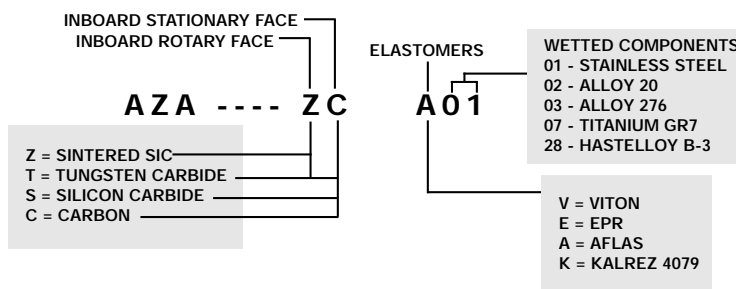
Cartridge single mechanical seal with monolithic faces, integral bearing and optional Kalrez® wetted parts. Available with Flush, Quench and Drain, together with exotic alloy wetted components.

OPTIONS

- Type B = Standard
- Type C = with Flush
- Type D = Exotic Alloy wetted parts. (Flush not available).

- Available in sizes 1.000" - 2.750" (24mm - 70mm).

Seal Coding System

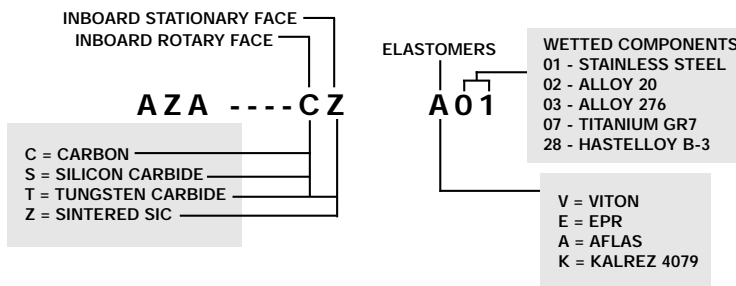


* Refers to 1.750" seal with sintered SiC v Carbon faces & Aflas O-Rings

Exotic Alloy wetted components are inventoried in Alloy 20, Hastelloy B-3, Alloy 276, Titanium and Monel.

- Available in sizes 2.875" - 4.000" (75mm - 100mm).
- Larger sizes available upon request.

Seal Coding System



* Refers to 3.000" seal with sintered SiC v Carbon faces & Aflas O-Rings

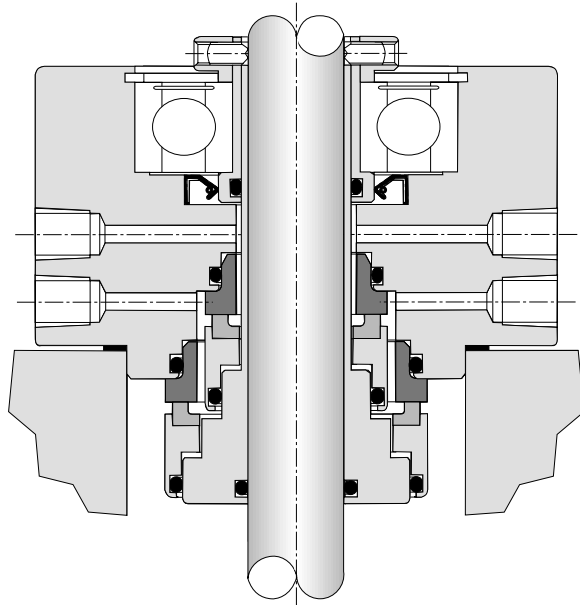
Notes

- Gland designed to suit equipment.
- "AZA" number given on receipt of operating / equipment details.
- When ordering please specify "Type" of Mixmaster IM™ required, ie:- B,C, or D.

Exotic Alloy wetted components are inventoried in Alloy 20, Hastelloy B-3, Alloy 276, Titanium and Monel.



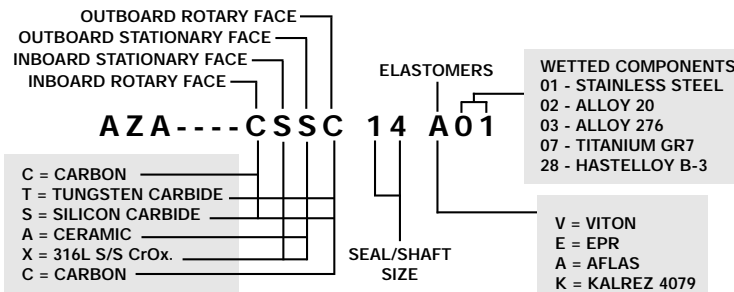
MIXMASTER IIB™ (DSWIB™) - DOUBLE CARTRIDGE SEAL WITH INTEGRAL BEARING



Cartridge double mechanical seal with integral bearing and optional Kalrez® wetted elastomers. Available with Flush, Quench and Drain, together with exotic alloy wetted components.

- Available in sizes 1.000" - 4.000" (24mm - 100mm).
- Larger sizes available upon request.

Seal Coding System



Exotic Alloy wetted components are inventoried in Alloy 20, Hastelloy B-3, Alloy 276, Titanium and Monel.

Notes

- Gland designed to suit equipment.
- "AZA" number given on receipt of operating / equipment details.
- When ordering please specify "Type" of Mixmaster II™ required, ie:- B,C, or D.

OPTIONS

Type B = Standard
 Type C = with Flush
 Type D = Exotic Alloy wetted parts.
 (Flush not available).

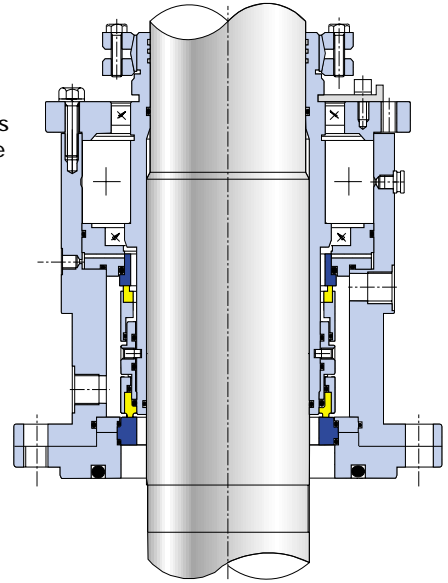


MIXMASTER IV-II-BS™ STAINLESS STEEL MIXER SEAL

Mixmaster IV™ range of cartridge mechanical seals, have been specifically designed to comply with the international DIN specification.



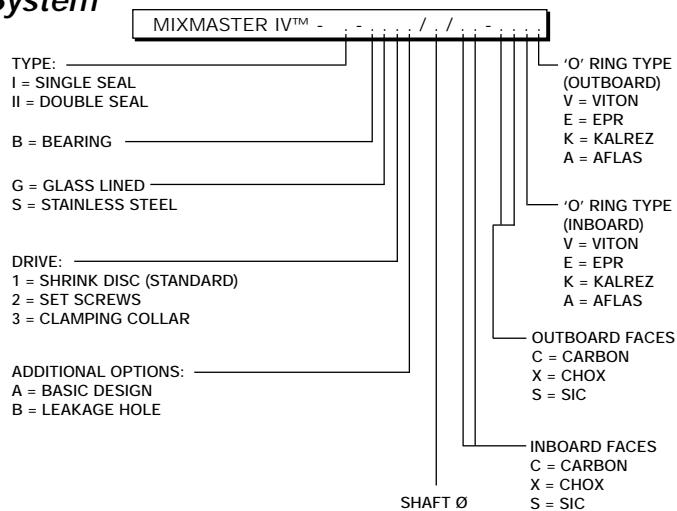
The Mixmaster IV - II - BS™ is a metallic wetted part, double seal design, with an integral (load carrying) bearing and is flange mounted.



Mixmaster IV™ is available in single or double seal arrangements, in Stainless Steel and Glass & FEP lined flange versions, in all metric and imperial sizes from Ø30mm - Ø160mm - (Ø1.125" - Ø6.250"). There is an option of 3 clamping arrangements to suit the customer / application preference.

The range of seals has been originally designed to conform to DIN 28 138 parts 1 & 2, however, because of the modular design and thick sleeve technology, the seals are available to fit ANY SHAFT SIZE.

Seal Coding System



SPECIFICATIONS

The range of seals conform to the following specifications:-

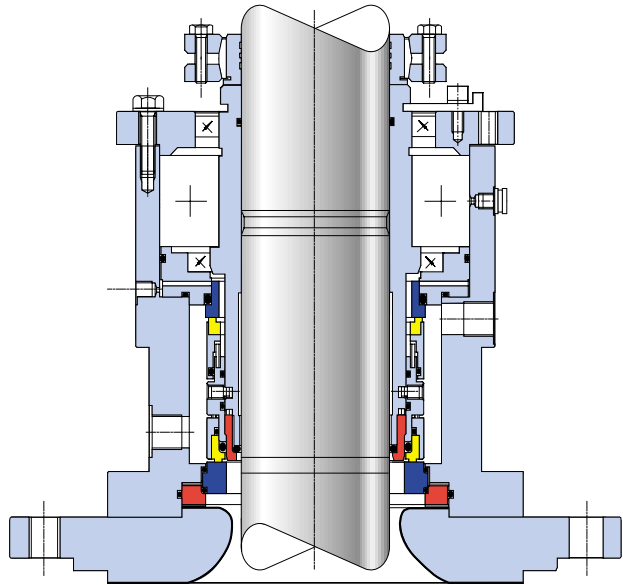
DIN	28 138 part 1	Stainless Mixer Seal
DIN	28 138 part 2	Glass Lined
DIN	28 138 part 3	Screwed Connection, Designation and Position
DIN	28 137 part 2	Glass Lined Mounted Flanges
DIN	28 138 part 1	Stainless Steel Mounted Flanges
DIN	28 154 & 159	Shaft dimensions



MIXMASTER IV-II-BG™ GLASS (ENAMEL) LINED

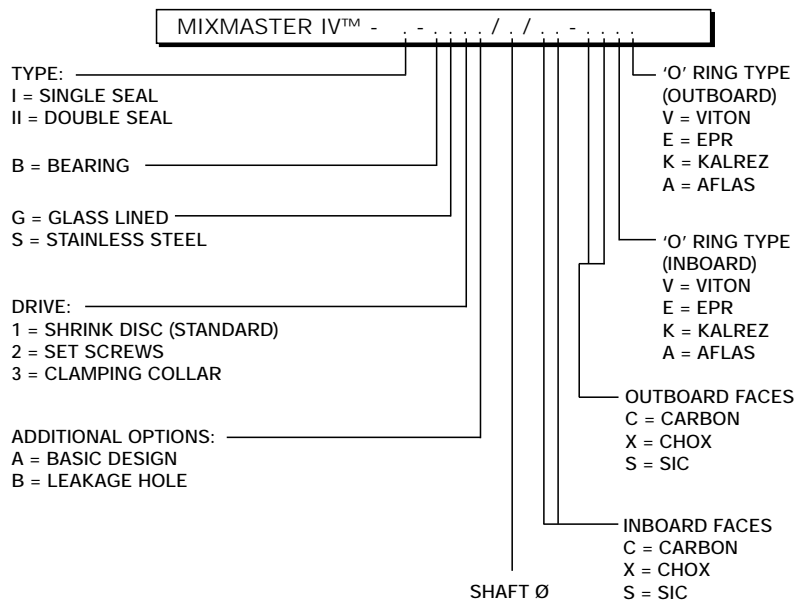
The Mixmaster IV-II-BG™ range is the glass lined version of the stainless steel Mixmaster IV - BS™. All wetted parts are non-metallic.

- Double balanced.
- Modular design.
- Available with FEP lined flange



The seal range is available in the following DIN sizes 40mm, 50mm, 60mm, 80mm, 100mm, 125mm, 140mm, 160mm and 161mm, however the internal modular concept employed, allows the seal to be made to suit ANY SHAFT SIZE, within the range. (1.125" - 6.250") 30mm - 160mm)

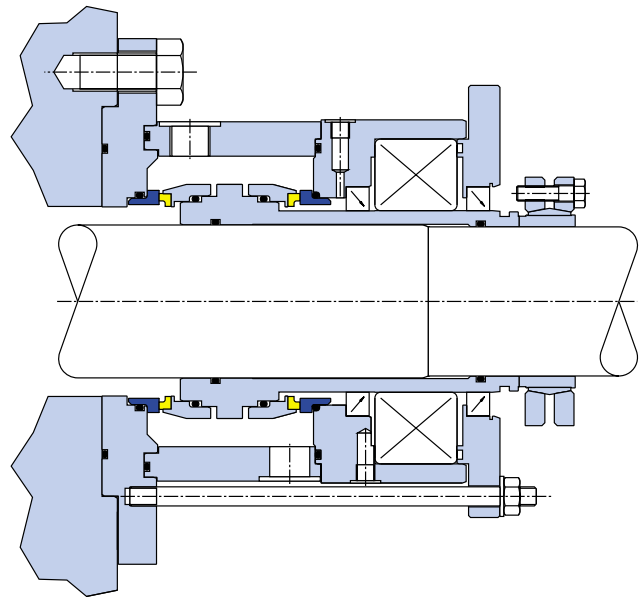
Seal Coding System



MIXMASTER V-II-BS™ STAINLESS STEEL MIXER SEAL

Mixmaster V™ range of cartridge mechanical seals, have been specifically designed to comply with the international DIN specification.

The Mixmaster V-II-BS™ is a metallic wetted part, double seal design, with an integral (load carrying) bearing and is flange mounted. The Mixmaster V-II-BS has balanced seal faces for the barrier fluid.

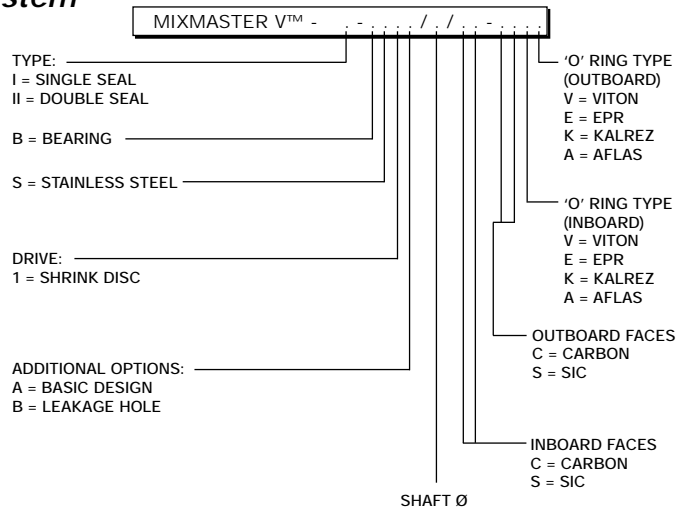


The Mixmaster V™ is available in single or double seal arrangements, with or without a bearing, in Stainless Steel. It is available in all metric and imperial sizes from Ø30mm - Ø160mm - (Ø1.125" - Ø6.250").

The range of seals has been originally designed to conform to DIN 28 138 parts 1 & 2, however, because of the modular design and thick sleeve technology, the seals are available to fit ANY SHAFT SIZE.

The Mixmaster V™ can not be customised in any way. The only modification that can be made to the standard design is a thick sleeve. For any other modifications refer to the Mixmaster IV™ or Mixmaster VI™ designs.

Seal Coding System



SPECIFICATIONS

The range of seals conform to the following specifications:-

DIN	28 138 part 1	Stainless Mixer Seal
DIN	28 138 part 3	Screwed Connection, Designation and Position
DIN	28 138 part 1	Stainless Steel Mounted Flanges
DIN	28 154 & 159	Shaft dimensions

Internal use only:-

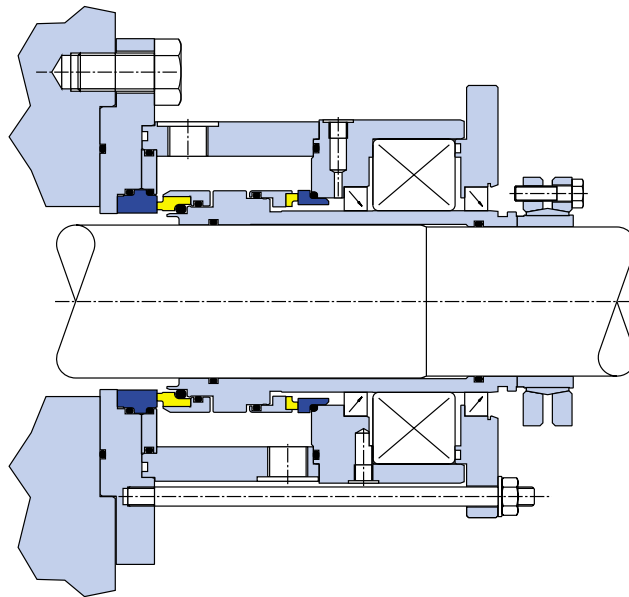
* Stock code for MIXMASTER V= 2AW _____



MIXMASTER VI-II-BS™ STAINLESS STEEL MIXER SEAL

Mixmaster VI™ range of cartridge mechanical seals, have been specifically designed to comply with the international DIN specification.

The Mixmaster VI-II-BS™ is a metallic wetted part, double seal design, with an integral (load carrying) bearing and is flange mounted. The Mixmaster VI has double balanced inboard seal faces.

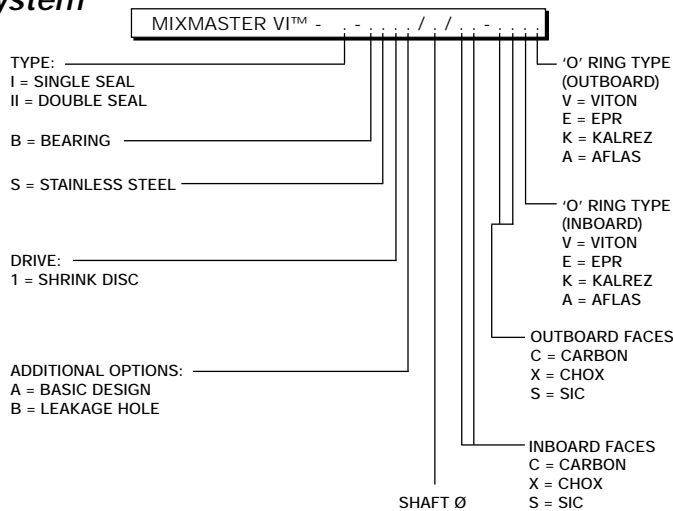


The Mixmaster VI™ is available in single or double seal arrangements, with or without a bearing in Stainless Steel. It is available in all metric and imperial sizes from Ø30mm - Ø160mm - (Ø1.125" - Ø6.250").

The range of seals has been originally designed to conform to DIN 28 138 parts 1 & 2, however, because of the modular design and thick sleeve technology, the seals are available to fit ANY SHAFT SIZE.

The Mixmaster VI™ can only be customised in 3 ways. 1 - thick sleeve, 2 - flange modification, 3 - exotic alloy wetted components. For any other modifications, including non-metallic options, refer to the Mixmaster IV™ design.

Seal Coding System



SPECIFICATIONS

The range of seals conform to the following specifications:-

DIN	28 138 part 1	Stainless Mixer Seal
DIN	28 138 part 3	Screwed Connection, Designation and Position
DIN	28 138 part 1	Stainless Steel Mounted Flanges
DIN	28 154 & 159	Shaft dimensions

Internal use only:-

* Stock code for MIXMASTER V = 2AV_____



Index of Specific Applications

Seal Type	Case History No.
Back to Back	840H, 841H, 842H
CDMSC™	1021I, 1022I, 1024I, 1026I
CSWIB™ Type B	834H, 835H, 836H, 837H, 838H, 839H
CSWIB™ Type C	1023I
DSWIB™ Type B	830H, 831H
DSWIB™ Type D	832H, 833H
Mixmaster IV-II-BG™	1017I
Mixmaster IV-II-BS™	823H, 824H, 825H, 826H, 827H, 828H, 1018I, 1019I, 1025I

Equipment Type	
Ahesion Mixer	836H
Ballestra Mixer	842H
Chemineer Mixer	827H, 828H, 1019I
De Dietrich Agitator	840H
Ekato Agitator	824H, 829H, 1024H
Joshua Greeves Reactor	832H
Lightnin Mixer	823H, 837H, 838H, 839H, 1023I, 1025I
Lump Agitator	1018I
Oakes Mixer	835H
Pfaudler Balfour	1017I, 1022I
Philadelphia Agitator	1026I
Plenty Agitator	831H
Ross Retention Mixer	834H
Shinko Mixer	1022I
Silverson Mixer	841H
Tycon Reactor	826H
Viz Slurry Vessel	833H

Product	
Acetic Acid	828H, 831H
Benzoquinone	833H
Butadiene	840H
C.P.A.	832H
Calcium Carbonate Slurry	841H
Cosmetic	825H
Dodecylphenal	829H
Ether Aldehyde	829H
Ethonal	826H
Ethylene Glycol	1024I
Food Colorants	825H
Formaldehyde	829H
Hexane	1022I
Hydrogen Sulphide	824H
Hydroxide	840H
Isopropnel	826H
KE2 Tilcom	829H
Methanol	826H, 829H
Paraformaldehyde	829H
Pearl Starch	836H
Polystyrene Nitrogen	1023I
Potassium	840H
Pyridine	829H
Sodium Salt	842H
Soyabean Oil	834H
Sponge Cake Batter	835H
Steam	840H
Styrene	840H
Sulphuric Acid	24H
Teraphthalic	831H, 1024I
Toluene	829H
Vegetable Oil	823H
Yeast	838H

Temperature	Case History No.
260°C (500°F)	830H
230°C (446°F)	823H, 829H
204°C (400°F)	1025I
200°C (393°F)	1024I, 1026I
176°C (350°F)	827H, 1019I
150°C (302°F)	832H
149°C (300°F)	834H
131°C (267°F)	831H
121°C (250°F)	824H
110°C (230°F)	1017I
104°C (219°F)	840H
100°C (212°F)	826H
95°C (203°F)	825H
80°C (176°F)	839H, 1021I
65°C (150°F)	1023I
60°C (140°F)	828H, 1018I
43°C (110°F)	836H
40°C (104°F)	841H, 842H
10°C (50°F)	1022H
1°C (34°F)	838H



CASE No. 823H

In January 1997, in a plant in Germany, two off 50mm (1.968") Mixmaster IV™ IIBS double mixer seals were fitted to Lightnin mixers. The duty was vegetable oil and Catalyst operating at 230 degrees C (446°F), with product pressure of 4 bar (58psi) and shaft speed of 67 rpm.

The seal faces were SIC/Car//Car/SIC with Kalrez® elastomers inboard and Viton elastomers outboard.

See Z3316 and AESSEAL® Drawing 6456770 for further details.

CASE No. 824H

In October 1998, in a plant in Edmonton, Canada, a 100mm (3.937") Mixmaster IV™ IIB double mixer seal was fitted to an Ekato Agitator. The duty was HYDROGEN SULPHIDE/SULPHURIC ACID operating at 121 degrees C (250°F), with a shaft speed of 100 rpm.

The seal faces were SIC/Car//Car/SIC with Viton® elastomers inboard and outboard.

See Z4772 and AESSEAL® Drawing 6464074 for further details.

CASE No. 825H

In August 1997, in a Drier plant in the UK, a 125mm (4.921") Mixmaster IV™ IIB double mixer seal was fitted to a mixer. The duty was Food Colorants/Cosmetic operating up to 95 degrees C (203°F), with a shaft speed of 45 rpm.

The seal faces were C/SIC/SIC/C with Viton® elastomers inboard and outboard.

The customer was previously using a Double Latty Bottom Entry Seal, with seal faces SIC/SIC//SIC/SIC with Viton® elastomers.

See Z4348 and AESSEAL® Drawing 6461772 for further details.

CASE No. 826H

In October 1997, in a Pharmaceutical plant in Cork, a 80mm (3.149") Mixmaster IV™ double mixer seal was fitted to a Tycon Reactor. The product was ETHONAL, METHANOL, ISOPROPNEL at 100 degrees C (212°F), with a shaft speed of 20/120 rpm.

The seal faces were SIC/Car//Car/SIC with Kalrez® elastomers inboard and Viton® elastomers outboard.

See Z4244 and AESSEAL® Drawing 6461210 for further details.

CASE No. 827H

In September 1998, in a Chemical plant in Tennessee, USA, a 5.000" (127mm) Mixmaster IV™ double mixer seal with Titanium Grade 7 wetted components was fitted to a Chemineer Mixer. The duty was various chemicals operating at 350 degrees F (176°C), with a shaft speed of 100 rpm.

The seal faces were SIC/Car//Car/SIC with Kalrez® elastomers.

The customer was previously using a competition Double seal. The seal faces were C/SIC//C/SIC with Kalrez® elastomer inboard and outboard.

See Z4731 and AESSEAL® Drawing 6463642 for further details

CASE No. 828H

In May 1998, in a Chemical plant in Tennessee, USA, two 2.500" (63.5mm) Mixmaster IV™ double mixer seals were fitted to a Chemineer Mixer. The duty was Acetic Acid Dope operating at 140 degrees F (60°C), with product pressure at 14 bar (203 psi) with a shaft speed of 130 rpm.

The seal faces were SIC/SIC//Car/SiC with Kalrez® elastomers.

See Z4732 and AESSEAL® Drawing 6463626 for further details.



CASE No. 829H

In April 1998, in a Chemical plant in Ireland, a 100mm (3.937") Ekato Short Working Length Mixer seal was fitted to a Reactor.

The duties were various, Formaldehyde, Toluene, Dodecylphenal, Pyridine, Paraformaldehyde, Titanium Catalyst, KE2 Tilcom, Methanol and Ether Aldehyde operating at 230 degrees C (446°F), with product pressure at 0 - 20 bar (290 psi) with a shaft speed of 100 rpm.

The seal faces were C/TC/TC/C with Kalrez® 31018 inboard elastomers and Viton outboard elastomers.

See Z4685 and AESSEAL® Drawing 6463553 for further details.

CASE No. 830H

In July 1998, in a plant in the UK, a 65mm (2.559") DSWIB™-B seal was fitted to a Reactor. The duty was various chemicals operating at 260°C (500°F), with a production pressure of 5 psi (0.3 bar), with a shaft speed of 156 rpm.

The seal faces were SIC/SIC//CAR/SIC with Kalrez® elastomer inboard and Viton elastomer outboard.

The customer was previously using a CDM™, with seal faces SIC/SIC//CAR/SIC with Kalrez elastomer inboard and Viton® elastomer outboard.

See Z4875 and AESSEAL® Drawing 6464346 for further details.

CASE No. 831H

In October 1996, in a Pilot plant in the UK, a 1.250" (31.7mm) DSWIB™ seal was fitted to a Plenty Mixer Agitator, model number PMG 55. The duty was 60% ACETIC ACID/35% TERAPHTHALIC operating at 131°C (267.8mm), with a production pressure of 2 bar (29 psi), with a shaft speed of 190 rpm.

The seal faces were C/TC//C/CRO2 with EPR elastomer inboard and outboard.

See Z3695 and AESSEAL® Drawing 6459078 for further details.

CASE No. 832H

In August 1996, in a Agriculture plant in the UK, a 85mm (3.346") DSWIB™ Type D (Exotic) seal was fitted to a Joshua Greeves Reactor. The duty was C.P.A. operating at 150°C (302°F).

The seal faces were TC/SIC//CAR/CHROX with Kalrez® elastomer inboard and Viton® elastomer outboard, with Alloy 276 wetted parts.

See Z3609 and AESSEAL® Drawing 6458560 for further details.

CASE No. 833H

In December 1994, in a plant in the UK, a 80MM (3.150") DSWIB™-D seal was fitted to a Viz Slurry Vessel. The duty was Benzoquinone.

See Z2147 and AESSEAL® Drawing 6453819 for further details.

CASE No. 834H

In June 1998, in a Oil Seed Refinery plant in the UK, a 1.625" (41.28mm) CSWIB™ type B seal was fitted to a Ross Retention Mixer, model number SF-302-01. The duty was Soyabean Oil operating at 300°F (149°C), with product pressure of 200 psi (13.8 bar), and a shaft speed of 600 rpm.

See Z4796 and AESSEAL® Drawing 6464046 for further details.

CASE No. 835H

In September 1997, in a plant in the UK, a 40mm (1.575") CSWIB™ seal was fitted to a Oakes Mixer. The duty was Sponge Cake Batter operating at ambient temperature, with a shaft speed of 218 rpm.

The seal faces were TC/TC with Viton® elastomer inboard.

See Z4376 and AESSEAL® Drawing 6461830 for further details.



CASE No. 836H

In March 1997, in a plant in the USA, a 1.500" (38.1mm) CSWIB™ seal was fitted to a Adhesion Mixer. The duty was Pearl Starch operating at 110°F (43°C), with a shaft speed of 990 rpm.

The seal faces were TC/TC with EPR elastomer inboard.

See Z3968 and AESSEAL® Drawing 6460193 for further details.

CASE No. 837H

In January 1997, in a plant in the UK, a 40mm (1.575") CSWIB™ seal was fitted to a Lightnin Mixer.

The seal faces were TC/SIC with Viton® elastomer inboard.

See Z3868 and AESSEAL® Drawing 6459873 for further details.

CASE No. 838H

In October 1997, in a plant in the UK, a 40mm (1.575") CSWIB™ seal was fitted to a Lightnin Mixer. The duty was Yeast operating at 1°C (34°F), with a product pressure of 15 psi (1bar).

The seal faces were CAR/SIC with EPR elastomer inboard.

See Z4392 and AESSEAL® Drawing 6461909 for further details.

CASE No. 839H

In July 1996, in a plant in Ireland a 40mm (1.575") CSWIB™ type B seal was fitted to a Lightnin Top Entry Agitator, model number H5110NX-1. The duty was Buffer Solutions operating at 80°C (176°F), with a product pressure of 16 psi (1 bar) and shaft speed of 290 - 1450 rpm.

The seal faces were C/SIC with Aflas® elastomer inboard.

See Z3572 and AESSEAL® Drawing 6458273 for further details.

CASE No. 840H

In August 1997, in a plant in the USA, a 3.625" (92mm) BACK TO BACK Canister seal was fitted to a De Dietrich Agitator model number 63010. The duty was various, Styrene, Butadiene, Potassium, Hydroxide and Steam operating at 104°C (219°F) with a product pressure of 90 psi (6.2 bar), with a shaft speed of 84 rpm.

The seal faces were TC/Car//Car/TC with Viton® elastomer inboard and outboard.

The customer was previously using a John Crane 109 double seal.

See Z4382 and AESSEAL® Drawing 6461567 for further details.

CASE No. 841H

In March 1998, in a Line plant in Ireland, a 2.250" (57.15mm) BACK TO BACK seal was fitted to a Silverson In Line Mixer. The duty was Calcium Carbonate Slurry operating at 40°C (104°F), with a product pressure of 2 bar (29 psi), and shaft speed of 3000 rpm.

The seal faces were SIC/CAR//SIC/CAR with Aflas® elastomer inboard and Viton elastomer outboard.

The customer was previously using a John Crane T2 BACK TO BACK Double seal with seal faces CAR/CER//CAR/CER with Viton® elastomers. It was unable to keep the faces clean and had a seal life of 6 months.

See Z3008 and AESSEAL® Drawing 6454758 for further details.



CASE No. 842H

In August 1998, in a plant in USA, a 60mm (2.362") BACK TO BACK seal was fitted to a Ballestra Mixer/Reactor, model number WD284TD. The duty was Sodium Salt of Alpha Olefin operating at 40°C (104°F), with a shaft speed of 900 rpm.

The seal faces were SIC/C//C/SIC with Viton® elastomer.

See Z4948 and AESSEAL® Drawing 6464821 for further details.

CASE NO. 1017 I

In November 1998, in a Chemical plant in the North of England, a 4.000" (101.6mm) MIXMASTER IV™-II-BG (Glass lined Flange), was fitted to a Pfaudler Balfour Reactor as a direct replacement for the existing VS20 seal. The VS20 comprised a two back to back Crane 109 component seals mounted in a Pfaudler Balfour canister.

The duty was a mixture of various chemicals at 110 degrees C (230 degrees F) and pressure of 3 barg (45 psi).

The seal was supplied as a full cartridge with integral bearing, SiC/Car // Car / SiC with Kalrez® 1050LF elastomers throughout. Wetted components were Alloy 276 and the seal mounted to the existing Glass Lined Flange.

See Z4994 and AESSEAL® Drawing 6464936 for further details.

CASE NO. 1018 I

In 1999, AESSEAL® supplied and installed a 120mm (4.724") Mixmaster IV™ seal with CAR/SIC faces and Viton 'O' rings for a Lump Agitator mixer, model A2811 in a Chemical Plant in England.

The pump operates at 14 - 45 rpm with a temperature of 60°C (140°F) under dry running conditions.

The seal replaced an AESSEAL® 65mm CURC™ seal, with C/TC faces and Viton elastomers, which ran for 12 months. There was no problem with the seal, it was only changed for a new agitator and new size.

See Z5388 and AESSEAL® Drawing 6467828 for further details.

CASE NO. 1019 I

In 1999, AESSEAL® supplied and installed a 2.000" (50.8mm) Mixmaster IV™ seal with CAR/SIC//CAR/SIC faces and Kalrez®/Viton® 'O' rings for a Chemineer mixer, model 1-HTH-2 for a Chemical Plant in the USA.

A Mixture of products were processed at a shaft speed of 200 rpm with a temperature of 350°F (176°C) with a stuffing box pressure of 133 psi (9 bar).

The seal replaced a competition Double seal, with CAR/SIC//CAR/SIC faces and Kalrez® elastomers, which ran for 18 months.

See Z5262 and AESSEAL® Drawing 6467019 for further details.

CASE NO. 1021 I

In 1999, AESSEAL® supplied and installed a 65mm (2.559") CDMSC™ seal with TC/TC//TC/CAR faces and Kalrez®/EPR 'O' rings for a CEMO pump, model S710-S5-RH for a Chemical Plant in England. A new stuffing box was machined.

The product being pumped is Dispex / Polyacrylic Acid with a temperature of 80°C (176°F) with a stuffing box pressure of 10 psi (0.7 bar).

See Z5335 and AESSEAL® Drawing 6467458 for further details.

CASE NO. 1022 I

In 1999, AESSEAL® supplied and installed a 50mm (1.969") CDMSC™ seal with SIC/SIC//SIC/CAR faces and Viton® 'O' rings for a Shinko – Pfaudler mixer.

The product being processed was Hexane and Catalyst at a shaft speed of 170 rpm with a temperature of 50°F (10°C) with a stuffing box pressure of 28 psi (2 bar).

See Z5466 and AESSEAL® Drawing 6468265 for further details.



CASE NO. 1023 I

In 1999, AESSEAL® supplied and installed a 1.937" (49.2mm) CSWIB™ Type C seal with CAR/SIC faces and Viton® 'O' rings for a Lightnin Top Entry Agitator for a plant in Dallas, USA.

The product being processed was Polystyrene Nitrogen at a shaft speed of 100 rpm with a temperature of 150°F (65°C) with a stuffing box pressure of 15 psi (1 bar).

A stub shaft and seal adapter plate was designed to accommodate the seal.

See Z1590 and AESSEAL® Drawing 6453025 for further details.

CASE No. 1024 I

In September 1999, AESSEAL® supplied and installed a special 3.375" (85.73mm) CDMSC™ cartridge seal, with an integral inboard Bush and Lip seal / Flush configuration, for a major chemical company in the North of England. The seal was supplied with Ant.Car/SiC // Ant.Car/SiC and Viton® elastomers, with integral bearing for an Ekato bottom entry mixer.

The duty was Terephthalic acid and Ethylene Glycol at +200°C (+393°F), however the seals water cooling jacket and flush arrangement serve to reduce the temperature dramatically.

The seal is currently working with no reported problems.

For further details see AESSEAL® drawing No. 6468376 and Z Ref 5533.

CASE No. 1025 I

In August 1999, in a Chemical plant in Holland, a 127mm (5.000") Mixmaster IV™ double mixer seal with Titanium Grade 2 wetted parts was fitted to a Lightnin 97N37 Mixer. The duty was various chemicals operating at 400 degrees F (204°C), at 20 bar (290 psi) with a shaft speed of 100 rpm.

The seal faces were SIC/Car//Car/SIC with Kalrez® elastomers.

The customer was previously using a competition Double seal. The seal faces were C/SIC//C/SIC with Kalrez® elastomer inboard and outboard.

See Z5508 and AESSEAL® Drawing 6468288 for further details

CASE No. 1026 I

In June 1999, AESSEAL® supplied several CDMSC's, with Integral cooling jackets for a major new Chemical processing plant to be constructed in the USA.

Seals were supplied in the following sizes;

1.250" - to suit a Philadelphia Agitator, models AG-3115 and AG-3215.
See Z Ref 5037, Drg. 6465593.

2.000" - to suit a Philadelphia Agitator, models AG-1301, 1410, 1450, 2131, 3120, and 3210.
See Z Ref 5041, Drg. 6465617.

2.000" - to suit a Philadelphia Agitator, model AG-2510.
See Z Ref 5041, Drg. 6466222.

2.500" - to suit a Philadelphia Agitator, model AG-1310.
See Z Ref 5042, Drg. 6465671.

3.000" - to suit a Philadelphia Agitator, model AG-2110.
See Z Ref 5043, Drg. 6465768.

4.500" - to suit a Philadelphia Agitator, model AG-1451.
See Z Ref 5044, Drg. 6465788.

The seals were supplied with various seal faces and elastomer combinations to suit process applications of up to 200°C (393°F).

CASE No. 1249J

In a pharmaceutical plant a 2.000" ESM™ with CAR/SIC faces and EPR 'O' rings was fitted to a Chimineer mixer, model 2-HTNS-2.

The product being pumped is Acetone with a temperature of 60°C (140°F). The pump operates at 25 rpm under dry running conditions.

See Z7094 for further details.

CASE No. 1273J

In a PEEK plant where AESSEAL® is the unofficial preferred supplier, a new reaction vessel with a Plenty mixer type 3809-PTM-16.3 was installed in October 1999. The mixer was fitted with a 5" Mixmaster IV™, Z-reference 5315 and AS15-2 system,

See Z5333 for further details.



ENVIRONMENTAL CONTROL SUPPORT SYSTEMS

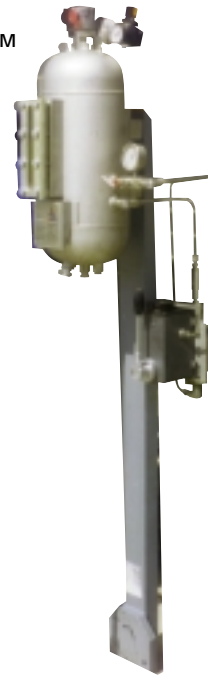


SSE10™ SYSTEM



SD SYSTEM™
(Patent Pending)

ASME VIII SYSTEM

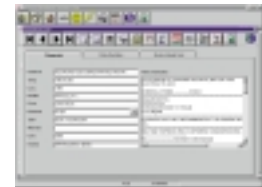
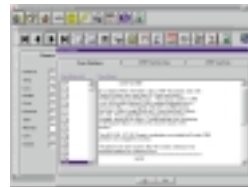
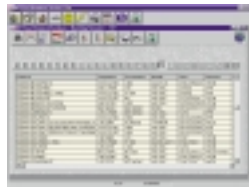


PUMPPAC™ SYSTEM



A.E.S. Engineering Ltd. offer:

- A wide range of modular seal support systems to complement all AESSEAL® mechanical seal designs.
- 24 hour telephone & on-site assistance in all areas of environmental sealing.
- Comprehensive on-site seal management programs.



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.



INVESTOR IN PEOPLE

USE DOUBLE MECHANICAL SEALS
WITH HAZARDOUS PRODUCTS.
ALWAYS TAKE SAFETY
PRECAUTIONS

- GUARD YOUR EQUIPMENT
- WEAR PROTECTIVE CLOTHING



WARNING

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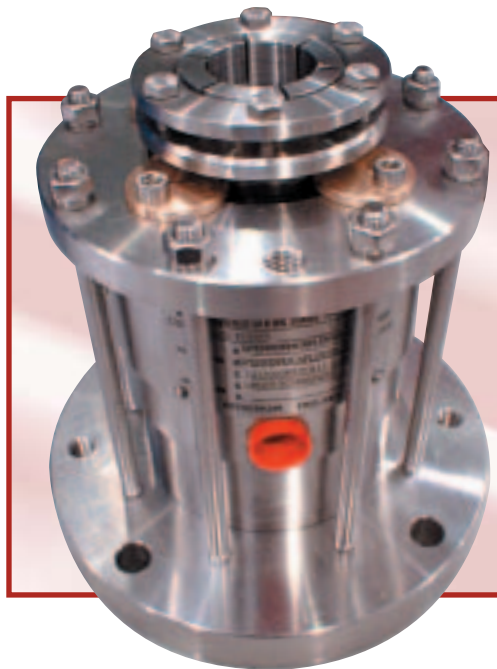
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ENVIRONMENTAL TECHNOLOGY

MIXMASTER VII™

**Range of Mixer, Agitator, Reactor & Dryer
Seals for Dry Running Applications**



- **AVAILABLE IN A COMPLETE RANGE OF INCH AND METRIC SIZES**
- **PATENT PENDING DRY RUNNING DESIGN FEATURES**
- **AVAILABLE TO SUIT DIN 128 138 PARTS 1 & 2**
- **NON-METALLIC INVENTORIED DESIGNS WITH GLASS ENAMELLED FLANGES TO DIN 28 137 PART 2**
-  **ATEX II 2 GD AVAILABLE AS STANDARD**
(ATEX IS A EUROPEAN SAFETY STANDARD FOR EXPLOSIVE ENVIRONMENTS)



Mixmaster Range of Cartridge seals for Mixers

This brochure covers the range of AESSEAL® Mixmaster mechanical seals designed for Mixers, Agitators, Reactors and Dryers operating in Dry Running Environments.

Mixing applications vary from simple blending or solid dissolution to the more exacting standards of solids suspension, gas dispersion or containing/promoting chemical reactions.

Various applications, such as horizontal drying, preclude the use of a liquid barrier fluid due to process contamination possibilities. In such applications, the attraction of an inert non-contaminating barrier fluid is clearly advantageous.

By far, the largest demand for gas barrier systems is in the FDA and Pharmaceutical industries. As such, AESSEAL® has developed a range of dry running mechanical seals and seal support systems for such applications and industries.



Development Background

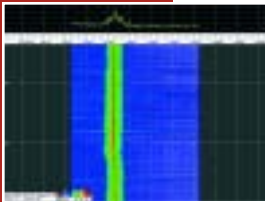
The AESSEAL® Mixmaster VII range has been developed following an extensive performance evaluation test program over an 18 month period.

The product range has been benchmarked in association with ATEX, the European safety standard for explosive environments. As such it can be certified as a category II GDC T6 upon request.

The dry running seal technology, specifically the seal face geometry, damper and close coupled devices, have been created using the latest Computer Aided Design, Manufacture and simulation software.

The product range has been verified and performance optimized using sound level metering, spectrum analysis, gas flow and temperature instrumentation and continuous data logging software.

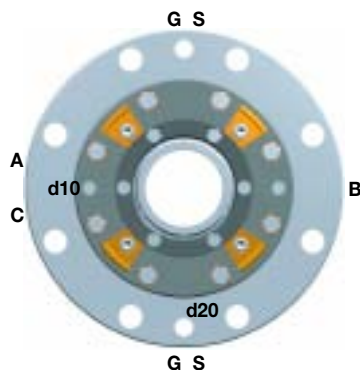
The result is a range of inventoried, patent pending mechanical seals, which extend the boundaries of conventional products, allowing wider application of the technology and benefits.



The seal range is offered with the following design features:

- Designed for mixers, agitators, reactors and dryers.
- Specifically for Dry Nitrogen applications to 10 barg (150 psig).
- Double hydraulically balanced seal faces
- Available with non-metallic wetted components
- Cartridge seal with integral load carrying bearing to DIN 28 138 parts 1 and 2
- No shaft fretting and available to suit any shaft (within the size range)

Specifications Mixmaster VII™



- A** = Barrier IN
- B** = Barrier OUT
- C** = Leakage to Atmosphere
- G** = Grease Port
- S** = Stationary Cooling Port
- d10** = Lifting Threads
- d20** = Jacking Threads

MIXMASTER VII™ Load Carrying Capabilities			
ØD3	DIN 28 159 Max Loads		
	40mm (1.500")	1,562 N	351 lbs
50mm (2.000")	3,468 N	779 lbs	
60mm (2.375")	6,640 N	1492 lbs	
80mm (3.125")	17,289 N	3886 lbs	
100mm (4.000")	34,820 N	7827 lbs	
125mm (5.000")	44,188 N	9933 lbs	
140mm (5.500")	38,147 N	8575 lbs	
160mm (6.250")	60,185 N	13530 lbs	

The Mixmaster VII™ Range of Mixer Seals conform to the following relevant DIN Specifications:

- DIN 28 138 part 1** - Stainless Mixer Seal
- DIN 28 138 part 2** - Glass Lined
- DIN 28 138 part 3** - Screwed Connection Designation & Position
- DIN 28 137 part 2** - Glass Lined Mounting Flanges
- DIN 28 141** - Stainless Steel Mounting Flanges
- DIN 28 154 & 159** - Shaft Dimensions

AESSEAL® - Better by Design



There are two main strategies in the supply of dry running mechanical seals;

- The use of non-contacting seal face technology
- The use of contacting seal face technology

There is a growing awareness amongst plant engineers that non-contacting seal face designs employing hydrodynamic gas lift technology, are particularly prone to premature seal failure. The failure modes of such designs are well-documented and include,

- inconsistent gas supply,
- unfiltered, dirty gas leading to clogging of the gas lift grooves, and
- equipment/seal misalignment or installation errors.

When the hydrodynamic non-contacting design fails to create enough lift to separate the counter opposed seal faces, massive heat generation will result.

The problems encountered in the field with non-contacting seal face technology have seen many engineers consider the wider use of contacting seal face technology.

Contacting seal face technology means the two counter opposed seal faces run dynamically against one another. In marginal lubrication and/or dry gas applications this dynamic contact can lead to environmentally unacceptable noise levels, increased seal face wear and high heat generation.

The AESSEAL® dry running seal range, deals with each of these through the application of innovative design principles, pioneered after many thousands of hours of testing and evaluation. These features are described below;

Noise Generation - Patent Pending Solution

Noise is energy generated as the seal rotary member resonates at a specific frequency. Following extensive tests it was noted that seal face temperatures rose during periods of high noise.

AESSEAL's patent pending solution to resolve this issue is to provide torsional damping to the rotary seal members. This solution reduces the resulting noise and corresponding seal face temperature excursions.

Seal Face Wear - Less than any published data on a comparable product.

Seal face wear occurs as a result of a number of variables including seal face hydrostatic balance, seal face width, spring closing force, amount of seal face leakage and the grade of seal face materials employed.

Again, after many thousands of hours testing, AESSEAL® have standardized on, what they consider the optimum set of variables for agitator and mixing applications. This is somewhat verified when viewing the gas leakage graph benchmarked against published competitor data and the seal life graph shown.

Heat Generation

All contacting seal faces will generate heat. For any given seal face design and geometry, heat generated is a function of seal face rotating velocity and closing force pressure.

The heat created by the seal faces, is dissipated through the associated parts in the seal design. Seal face elastomers can act to insulate the seal faces, preventing effective heat dissipation into heat sink areas such as the gland member.

AESSEAL® have developed “close-coupled” technology which address heat build up in the stationary seal. This modular design employs the same components as the cooled seat design, therefore allowing the optimum product selection to be made for the application.

A further design option of the Mixmaster VII™ range is the use of the AESSEAL® CLIPSEAL™ on the outboard side of the seal.

The graph below illustrates the respective performance of each heat dissipating design with respect to ATEX.

The innovative solutions and techniques employed by AESSEAL® have led to an extension of the operating performance of contacting dry gas seals in a number of design configurations as shown overleaf.

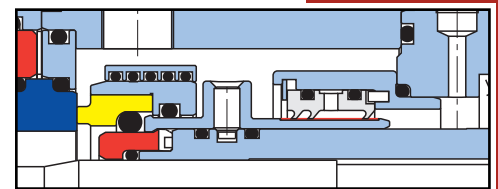
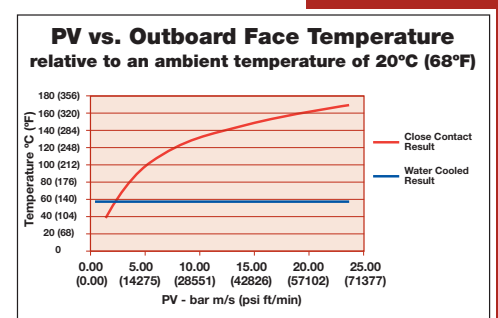
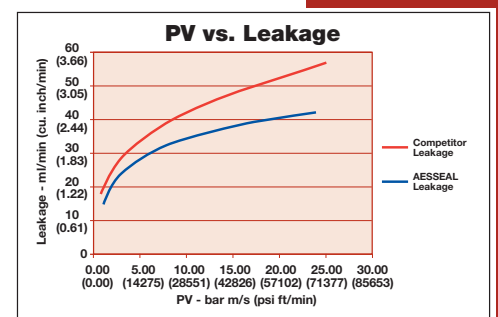
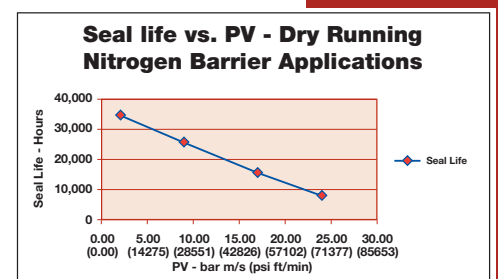


Figure above shows inboard Damper and Outboard Clipseal™ configuration



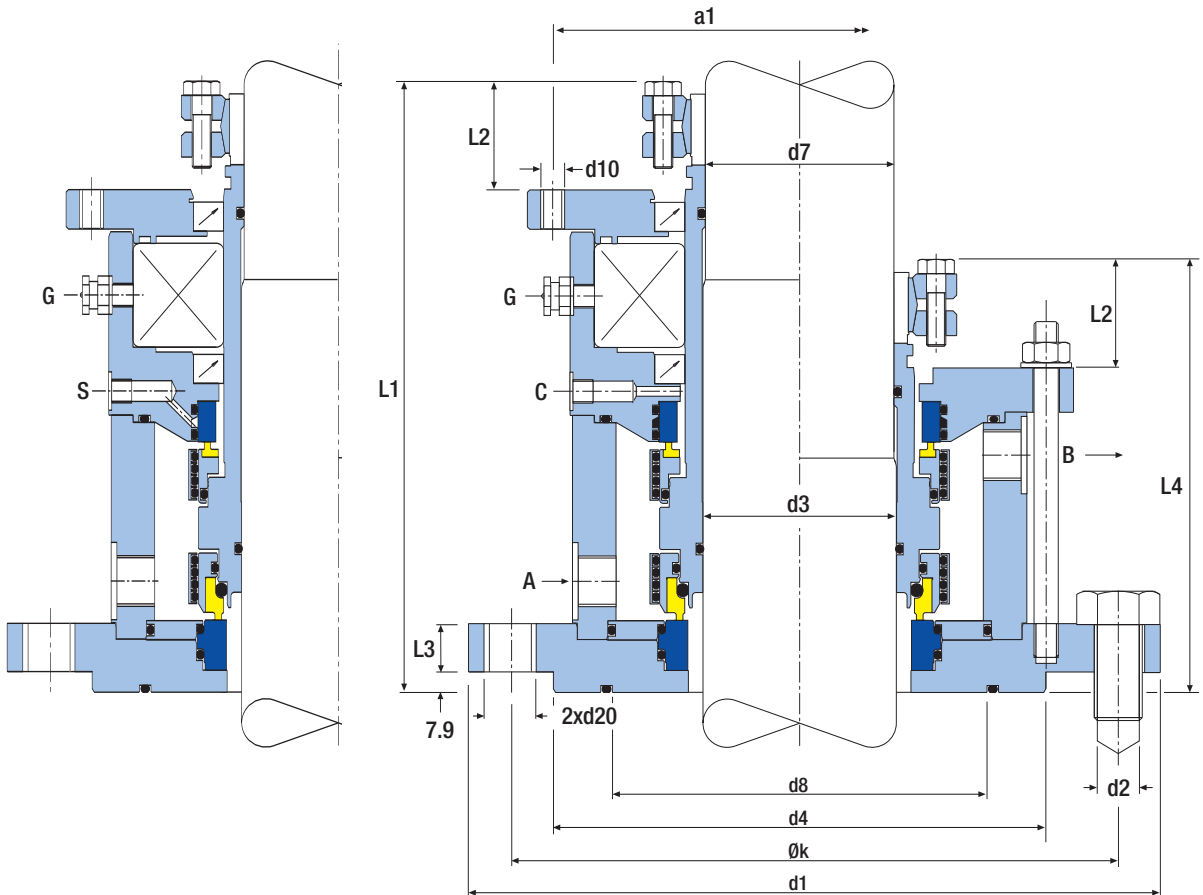


Mixmaster VII™ & Mixmaster VII-D™

Mixmaster VII-D™
Double seal with Bearing & Outboard Cooled Stationary.

Mixmaster VII™
Double seal with Bearing & Outboard Close-coupled Stationary.

Mixmaster VII™
Double seal without Bearing & with Outboard Close-coupled Stationary.



Mixmaster VII™ Stainless Steel Size Chart (mm)

d3	d7	d1	nxd2	d4	d8	Øk	L1	L2	d10	d20	A,B	C	S	L3	L4	a1
40	38	175	4x18	110	92	145	208	32	M12	M16	G3/8	G1/8	G1/8	15	149	132
50	48	240	8x18	176	136	210	213	32	M12	M16	G3/8	G1/8	G1/8	17	152	155
60	58	240	8x18	176	140	210	217	32	M12	M16	G3/8	G1/8	G1/8	17	155	164
80	78	275	8x22	204	155	240	253	45	M16	M20	G1/2	G1/8	G1/4	20	179	204
100	98	305	8x22	234	187	270	256	45	M16	M20	G1/2	G1/8	G1/4	20	179	215
125	120	330	8x22	260	213	295	293	46	M20	M20	G1/2	G1/8	G1/4	20	200	275
140	135	395	12x22	313	251	350	306	46	M20	M20	G1/2	G1/8	G1/4	20	208	285
160	150	395	12x22	313	251	350	306	46	M20	M20	G1/2	G1/8	G1/4	25	208	292

Dimensional information on larger sizes is available on request.

Mixmaster VII™ Imperial size information

The Modular design of the Mixmaster VII™ enables the product to be offered to suit ANY shaft size. The table below shows the inch size range. Larger sizes up to 300mm (12.000") are designed to order.

Mixmaster VII™ Stainless Steel Size Chart (inches)

d3	d7	d1	nxd2	d4	d8	Øk	L1	L2	d10	d20	A,B	C	S	L3	L4	a1
1.125" - 1.500"	-	6.890"	4 x 0.700"	4.33"	3.62"	5.71"	8.19"	1.26"	M12	M16	G3/8	G1/8	G1/8	0.59"	5.87"	5.20"
1.625" - 1.875"	-	9.450"	4 x 0.700"	6.93"	5.35"	8.26"	8.38"	1.26"	M12	M16	G3/8	G1/8	G1/8	0.67"	5.98"	6.10"
2.000" - 2.375"	-	9.450"	4 x 0.700"	6.93"	5.51"	8.26"	8.54"	1.26"	M12	M16	G3/8	G1/8	G1/8	0.67"	6.10"	6.46"
2.500" - 3.125"	-	10.830"	8 x 0.875"	8.03"	6.10"	9.45"	9.96"	1.77"	M16	M20	G1/2	G1/8	G1/4	0.79"	7.05"	8.03"
3.250" - 4.000"	-	12.000"	8 x 0.875"	9.21"	7.36"	10.63"	10.10"	1.77"	M16	M20	G1/2	G1/8	G1/4	0.79"	7.05"	8.46"
4.125" - 5.000"	-	13.000"	8 x 0.875"	10.24"	8.38"	11.61"	11.54"	1.81"	M20	M20	G1/2	G1/8	G1/4	0.79"	7.87"	10.83"
5.125" - 5.500"	-	15.550"	12 x 0.875"	12.32"	9.88"	13.78"	12.05"	1.81"	M20	M20	G1/2	G1/8	G1/4	0.79"	8.19"	11.22"
5.625" - 6.250"	-	15.550"	12 x 0.875"	12.32"	9.88"	13.78"	12.05"	1.81"	M20	M20	G1/2	G1/8	G1/4	0.98"	8.19"	11.50"

Dimensional information on larger sizes is available on request.

Mixmaster VII™ & VII-D™ Exotic & Non-metallic Designs



Non-metallic Mixmaster VII™

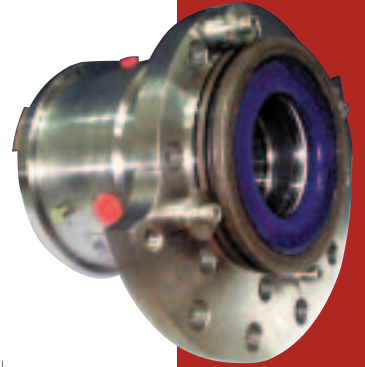
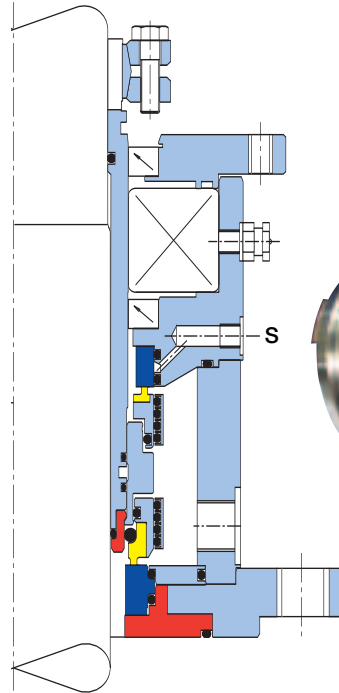
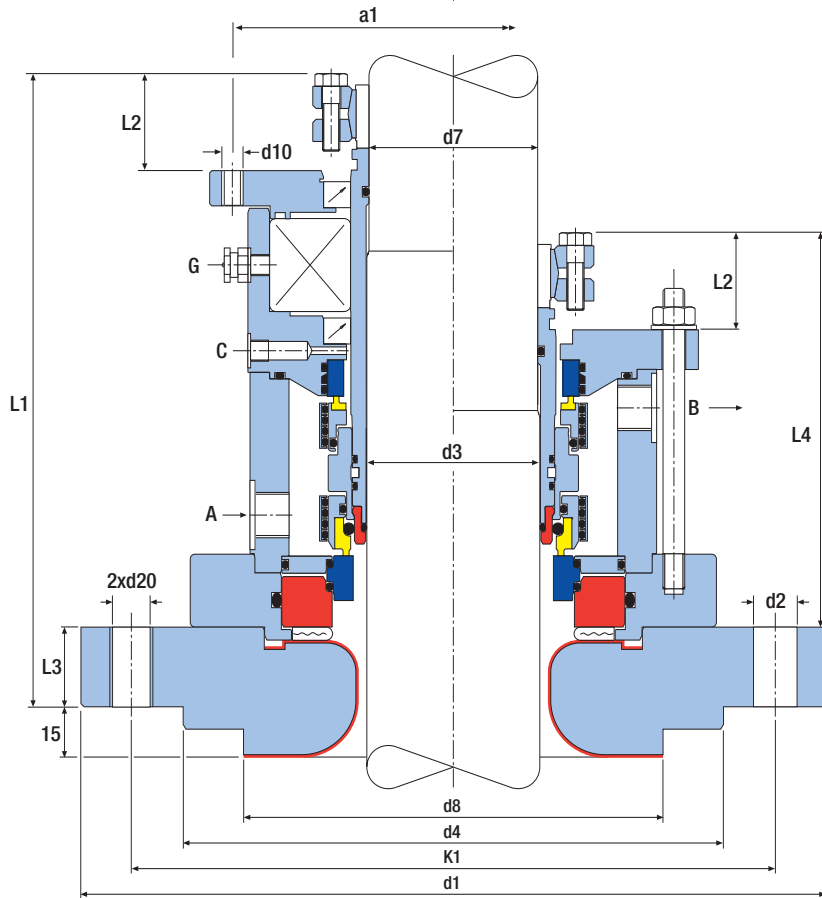
Double seal with Bearing & Outboard Close-coupled Stationary.

Non-metallic Mixmaster VII™

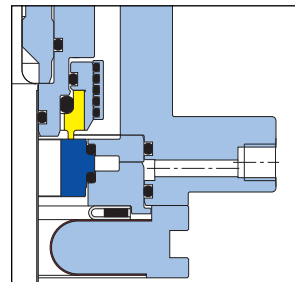
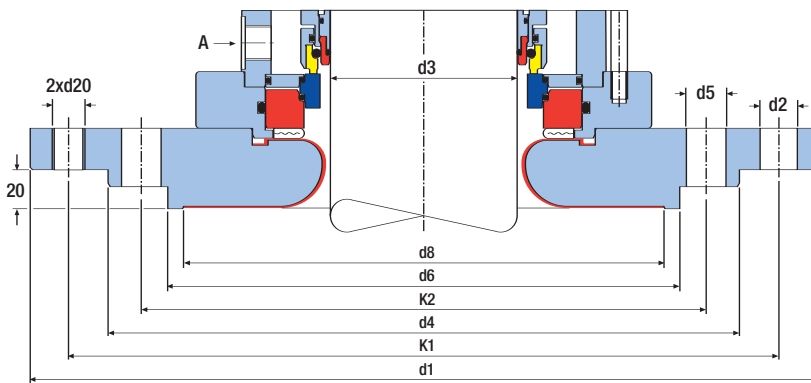
Double seal without Bearing & with Outboard Close-coupled Stationary.

Exotic Mixmaster VII-D™

Double seal with Bearing & Outboard Cooled Stationary.



E700-E901 Flange Nominal Diameters



Exotic Mixmaster VII-DD™
Double seal with bearing & cooled stationary seats.

Mixmaster VII-BG™ Size Chart (mm)

d3	d7	d1	nx d2	d4	nx d5	d6	d8	d10	d20	a1	L1	K1	K2	L3	L2	L4	A,B	C	S	NFD
40	38	175	4x18	110	-	-	102	M12	M16	132.5	225	145	-	20	33	146	G3/8	G1/8	G1/8	E125
50	48	240	8x18	176	-	-	138	M12	M16	155	236	210	-	25	33	152	G3/8	G1/8	G1/8	E200
60	58	275	8x22	204	-	-	188	M12	M16	164	240	240	-	25	34	155	G3/8	G1/8	G1/8	E250
80	78	305	8x22	234	-	-	212	M16	M20	204	280	270	-	30	45	181	G1/2	G1/8	G1/4	E300
100	98	395	12x22	313	-	-	268	M16	M20	215	283	350	-	30	45	181	G1/2	G1/8	G1/4	E500
125	120	505	4x22	422	12x22	320	306	M20	M20	275	319	460	350	30	46	202	G1/2	G1/8	G1/4	E700
140	135	505	4x22	422	12x22	320	306	M20	M20	285	332	460	350	30	52	210	G1/2	G1/8	G1/4	E700
160	150	505	4x22	422	12x22	320	306	M20	M20	292	328	460	350	30	52	210	G1/2	G1/8	G1/4	E900
160*	150	565	4x26	474	12x22	370	356	M20	M20	292	328	515	400	30	52	210	G1/2	G1/8	G1/4	E901

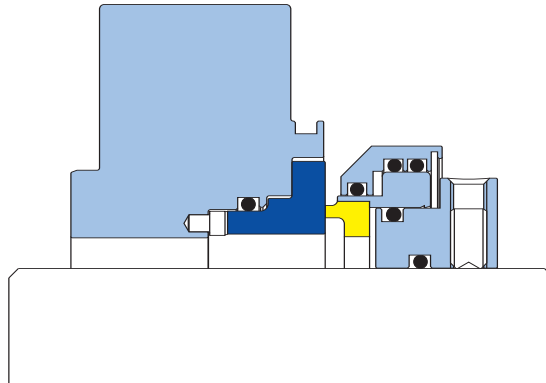
* Nominal size 161

Dimensional information on larger sizes is available on request.



Other AESSEAL® Dry Running Seal Designs

Since the late 1990's, AESSEAL® have developed and installed a full range of dry running contacting seal designs. These range from the simple clipped external seals employed on top entry mixers to the more exacting non-metallic axial movement dual seals with twin bearings employed on horizontal drying equipment. Examples of such products are shown below;



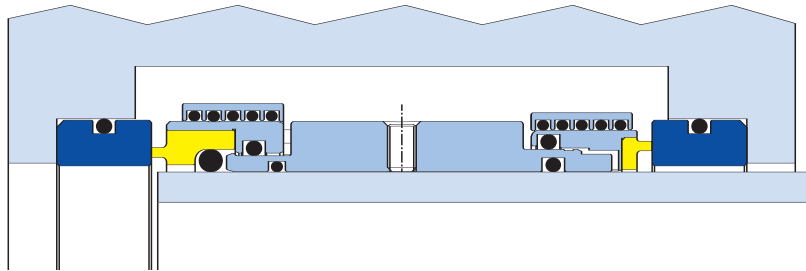
Dry running NCM™ design

AESSEAL® entry-level dry running technology starts with the external single component clipped seal, with rotary damper and hybrid seal face technology.

This design is applicable to seal vapour on low-duty top entry mixing vessels.

Back to Back dry running design

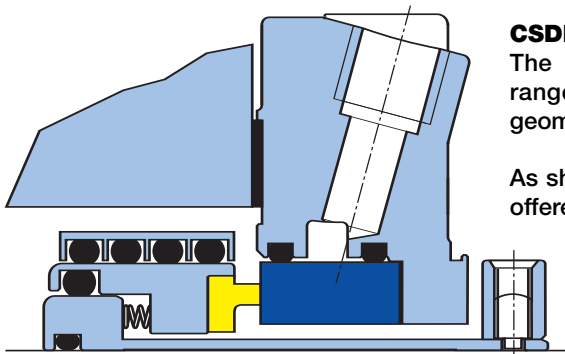
The next level in the dry running component seal range is the back to back design. This is offered with a double hydraulically balanced inboard rotary, non-fretting hydraulically balanced outboard rotary and damper, with hybrid dry running seal face technology.



CSDR™ - Close Coupled seat single cartridge seal

The CSDR™ is the entry level single cartridge seal range, offered with rotary damper and hybrid face geometry and a close-coupled stationary seal face.

As shown to the left, the CSDR-C™ is the sister design offered as standard with a cooled stationary seal face.

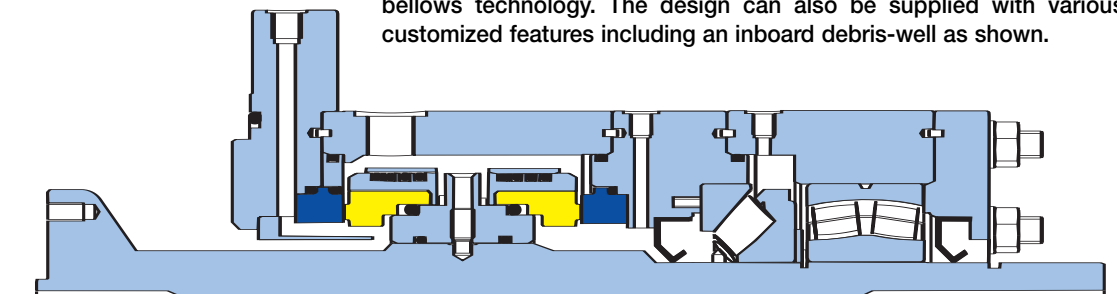


The AESSEAL® dry running mechanical seal product range is diverse and far reaching, offering the full compliment of sealing solutions for practically all mixing, agitating, reacting and drying applications.

The Mixmaster VII™ is typically inventoried in DIN 28-138 shaft designs and flange configurations. Seals for popular equipment vessels and models are also inventoried. Other design variants shown are usually configured to suit customer requirements and are typically on a longer lead-time.

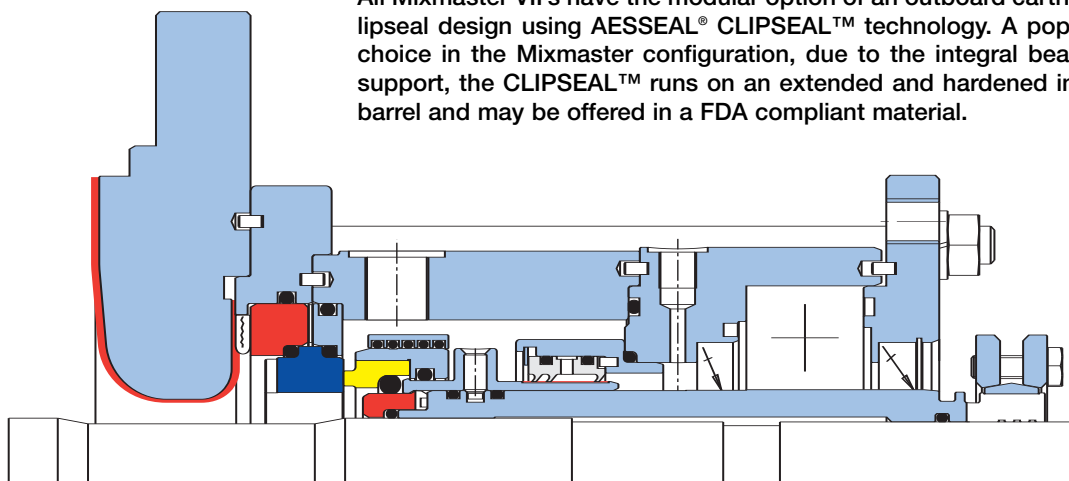
Dual Mixmaster with dampers

Special Mixmaster VII's and VII-D's, with stainless, exotic or non-metallic wetted parts and dual-bearing arrangements can be configured to accommodate large amounts of axial shaft movement. This is achieved using sliding keyway or axial compensating rolled metal bellows technology. The design can also be supplied with various customized features including an inboard debris-well as shown.



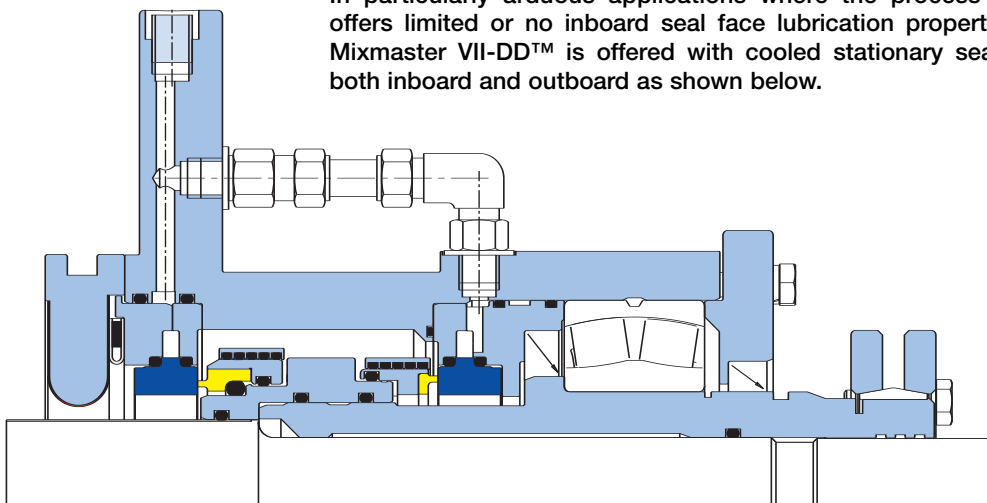
Glass lined Mixmaster with Clipseal on the outboard

All Mixmaster VII's have the modular option of an outboard cartridge lipseal design using AESSEAL® CLIPSEAL™ technology. A popular choice in the Mixmaster configuration, due to the integral bearing support, the CLIPSEAL™ runs on an extended and hardened inner barrel and may be offered in a FDA compliant material.



Mixmaster with inboard and outboard cooled seat

In particularly arduous applications where the process vapour offers limited or no inboard seal face lubrication properties, the Mixmaster VII-DD™ is offered with cooled stationary seal faces both inboard and outboard as shown below.



AESSEAL® - GAS16-P1™ Support System

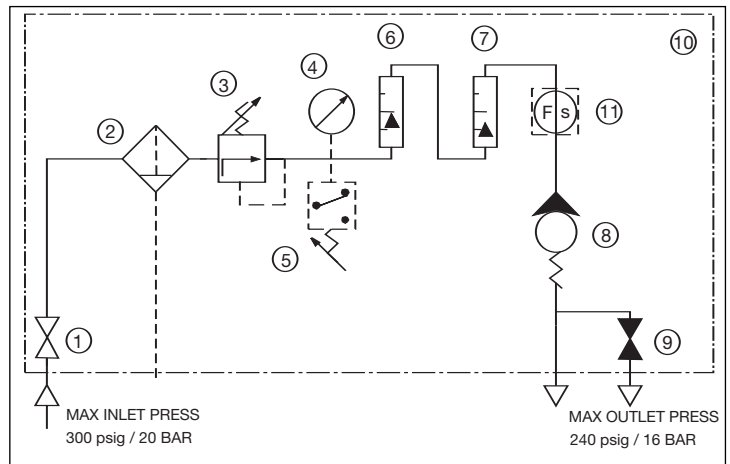
As with all AESSEAL® mechanical seal product ranges, the AESSEAL® Dry Running seal range is supported with a full compliment of seal support systems for humidified or dry nitrogen duties. The Patent Pending GAS16-P1™ Support System is offered with many design features including:

- Inlet Pressure 20 Bar (300 psig)
- Working Pressure Max 16 Bar (240 psig)
- Polyester Instrument Cabinet
- Isolating Valve
- Drain Valve
- Non-return Valve
- Pressure Gauge and Regulator
- Coalescing Filter
- High and Low Flow Meters
- Push-in Pipework
- Optional Instrumentation



Above: All instruments are inside the cabinet

Item	Description
1	Isolating Valve
2	Coalescing Filter
3	Pressure Regulator
4	Pressure Gauge
5	Pressure Switch
6	Flow Meter - Low
7	Flow Meter - High
8	Non-return Valve
9	Drain Valve
10	Cabinet
11	Flow Switch (optional)



As the system design is modular, the basic unit can be adapted to suit most on-site specifications and requirements. Possible adaptations include a pressure switch and high/low level indicators.

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® Seals and Systems are ATEX compliant.

USE DOUBLE MECHANICAL SEALS WITH HAZARDOUS PRODUCTS. ALWAYS TAKE SAFETY PRECAUTIONS:

- GUARD YOUR EQUIPMENT
- WEAR PROTECTIVE CLOTHING



WARNING

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