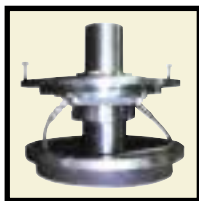




ENVIRONMENTAL TECHNOLOGY

## Mechanical Seals & Support Systems for SCREENS



- INNOVATIVE SEAL SOLUTIONS FOR SCREENS
- PROBLEMS WITH SCREENS
- SEAL DESIGN PHILOSOPHY
- SPECIFIC EQUIPMENT MODELS
- SEAL SCREEN CASE HISTORIES



ENVIRONMENTAL TECHNOLOGY

## MECHANICAL SEALS AND SUPPORT SYSTEMS FOR SCREENS

### Introduction

*Throughout the entire Pulp & Paper process, Screening and cleaning of the pulp is continuously conducted to ensure that the paper stock is free from undesirable knots, fibrous and non-fibrous materials or any foreign debris.*

*This Screening and cleaning process requires a series of dedicated pieces of rotating equipment which are generally robust in construction and incorporate mechanical seals to prevent the stock from attacking bearings and drive mechanisms.*

*There are numerous types of Screens and Screen manufacturers encountered in the marketplace.*

*AESSEAL® have a number of Screen seal designs to suit most of the commonly encountered Screen equipment found in the industry.*

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**PLEASE CONTACT AESSEAL® FOR FURTHER INFORMATION  
ON STOCK CODES AND FACE MATERIALS FEATURED IN THIS BOOKLET.**

AESSEAL®

SCREEN SEALS

L-UK/US-SCREENS-04

IN 4457 - 06/2003

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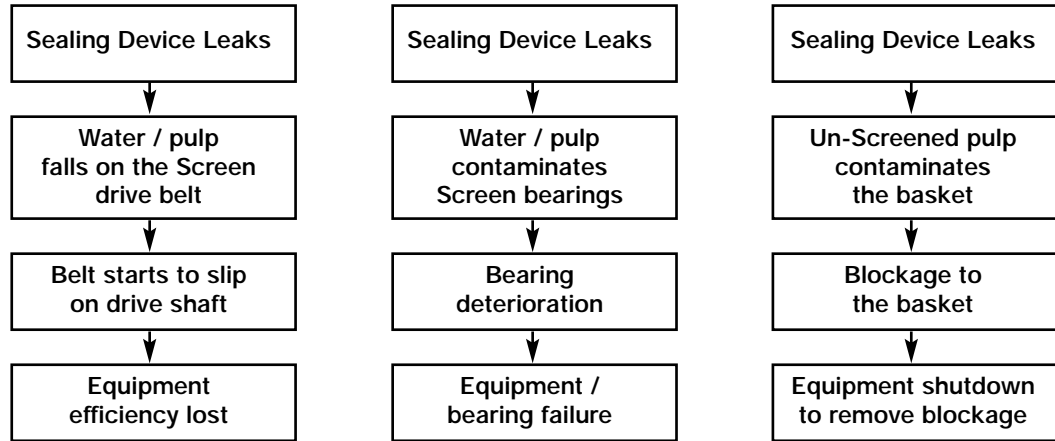


**PROBLEMS WITH SCREENS**

Unlike some pieces of rotating equipment, Screens suffer from several problems, most of which are a direct result of poor sealing.

**SCREEN SEALS*****Screens operating in the Pulp Mill***

If the Screen seal leaks, the effects to the pulp mill process can be disheartening, to say the least. The following are some typical scenarios;

***How do you un-block the Basket?***

Some Screens are not small. They often weigh hundreds of kg's (thousands of lbs), and therefore Screen maintenance / strip down often requires the use of heavy, cumbersome lifting equipment.

The following process is typical:

- Remove securing devices on the top plate / lid
- Remove the lid using a Crane or similar lifting equipment
- Remove the basket
- Wash down the equipment
- Remove and replace the sealing device
- Re-assemble equipment in the reverse order to disassembly

Needless to state, the elimination or minimization of such a procedure is seen as advantageous to on site personnel. The use of a mechanical seal can help the situation.

**SCREENS FEEDING THE PAPER MACHINE**

If the Screen seal leaks, the effects to the paper machine are often worse than above. The following explains why:

As above, if the Screen sealing device leaks, stock and water can contaminate Screen bearings, or make Screen drive belts slip. In extreme conditions such drive belts can deteriorate or even fall off.

Problems at this stage can cause major process disruptions. If a Screen sited particularly near to the head box or fan pump breaks down, or permits poor stock supply to such equipment, it could result in stock flow interruptions to the headbox. This may lead to breaks in the finished paper product, which must be avoided at all cost.

# The AESSEAL® Seal Design Philosophy for Screens

The AESSEAL® design philosophy for mechanical seals fitted to Screens is as follows:

## Modular Design:

In all AESSEAL® designs, modularity is of prime importance as this allows the company to provide service at an affordable cost. The seal faces are often the longest lead time item for any mechanical seal, and therefore adapting the "metalwork" around the standard "off-the-shelf" seal faces often makes technical and commercial sense.

## Robust Construction:

Screens are robustly constructed items of rotating equipment as they have to stand up to various levels of foreign debris including knots, fibrous & non-fibrous materials and contraries. The mechanical seal has often got to be able to stand up to such demands including "misuse" where appropriate.

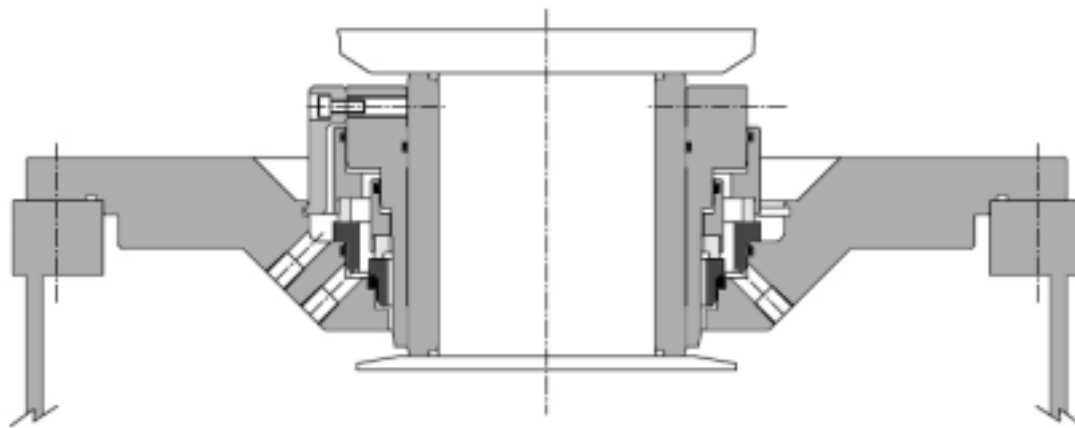
## Change the Seal Environment:

A mechanical seal is only as good as the environment in which it is installed. All AESSEAL® seal designs are optimized (where possible) to improve the seal environment, thereby helping to extend seal life.

## Easy to Install:

Installing Screen seals can often be problematic due to the position of the equipment and the accessibility of the equipment fixings. For this reason, AESSEAL® (where possible) provide cartridge or clipped mechanical seal designs, where the seal faces are factory set and tested before dispatch. This is often extremely advantageous when the seal is large in diameter.

The diagram below shows a typical Screen seal arrangement:



Traditionally, the seal gland is manufactured from a one-piece component, straddling the diameter of the bearing support bracket. This often means that the gland component is expensive, particularly in the event of seal repairs.

The AESSEAL® approach to such equipment can be seen on the next page in the Hooper / Impco seal design.

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SCREEN SEALS

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**AESSEAL®**  
ENVIRONMENTAL TECHNOLOGY

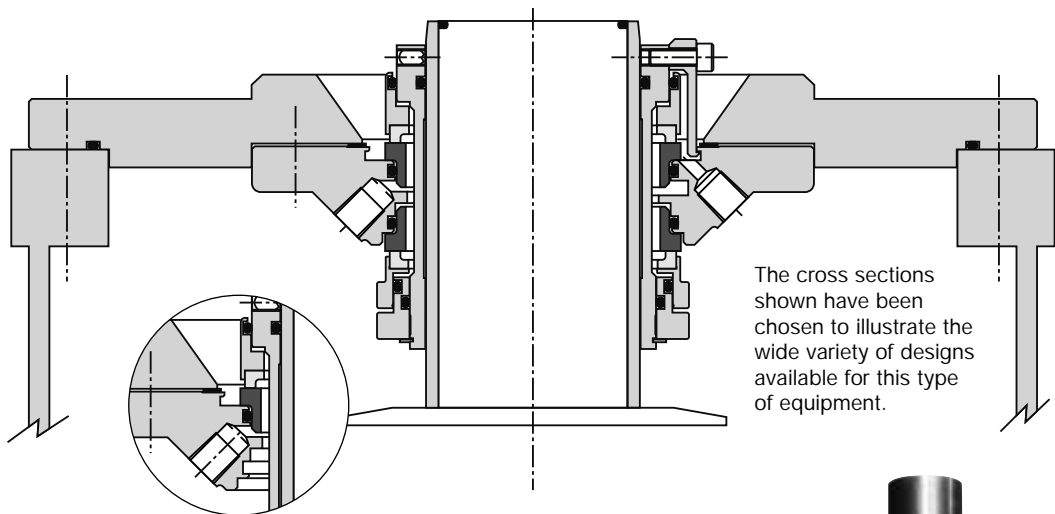
## **AESSEAL® SEAL DESIGNS TO SUIT HOOPER / IMPCO PRESSURE SCREENS**

AESSEAL® have designed a range of Screen and Knotter seals designed specifically to suit the Impco HI-Q Knotters and Impco HI-Q Fine Screen ranges, models 208, 210, 212, 300 and 400.

The mechanical seal Screen design incorporates a separate adapter plate, thereby reducing the gland costs for repair. Furthermore, the modular approach allows the same seal to be offered for a variety of different Screen models, with only the need to change the adapter plate. An example of this is shown in the table below. Note the same seal Z Reference, whilst varying the adapter plate Z Reference to suit different equipment models.

Furthermore, the modular approach allows the customer to select either a double or single seal within the same modular gland configuration. This reduces inventory, whilst improving availability from the AESSEAL® factory.

This has proven COST savings, as described in case history 1210. Further case histories include 700, 703 and 705.



The cross sections shown have been chosen to illustrate the wide variety of designs available for this type of equipment.

Single Seal option  
(remove outboard seal faces)

OUTBOARD ROTARY FACE  
OUTBOARD STATIONARY FACE  
INBOARD STATIONARY FACE  
INBOARD ROTARY FACE

ELASTOMER MATERIAL

AZA4422 CSSC K 01

C = CARBON  
S = SILICON CARBIDE  
T = TUNGSTEN CARBIDE  
A = CERAMIC  
X = 316 S/S CrOx.

V = VITON  
E = EPR  
A = AFLAS  
K = KALREZ 4079

01 = 316 Stainless Steel  
Exotic materials available on request

### **Z Reference Details**

Model	Shaft Size	Seal Size	Z Ref - Seal	Z Ref - Adapter Plate	Drawing Number
Hi-Q Fine	-	3.500"	Z8351	-	7114013
Hi-Q Fine	-	3.500"	Z8460	Z8460	7114616
Hi-Q Fine	-	3.500"	Z9027	Z9027	7121187
PSV2600	4.000"	4.125"	Z4422	Z4423	6462045
PSV400 'C'	4.000"	4.125"	Z4422	Z4597	6462850
Hi-Q Fine	-	85mm	Z4855	-	6464344

See case histories 700, 703 and 705.



## **AESSEAL® IADC™-FC & IADC™-K DOUBLE SEALS TO SUIT HOOPER MODEL PSV- 2600 PRESSURE SCREEN**

### *Installation Guidelines*

These pressure Screens are often sealed with a specific model of competitor's seal, or with a multiple lip seal / grease arrangement, neither of which work very well. The stuffing box area usually has one line going from the bottom of the bearing assembly, up through the upper bearing assembly which brings water or grease to the seal area. In order to install the AESSEAL® double seal, it is necessary to install another line 180° opposite to the line mentioned above. The IADC™-FC is a double seal, and needs to have barrier water going in and out of the seal. The Mill machine shop should drill the bearing housing for this second line and install a length of stainless tubing, threaded at both ends, long enough for the bearing assembly.

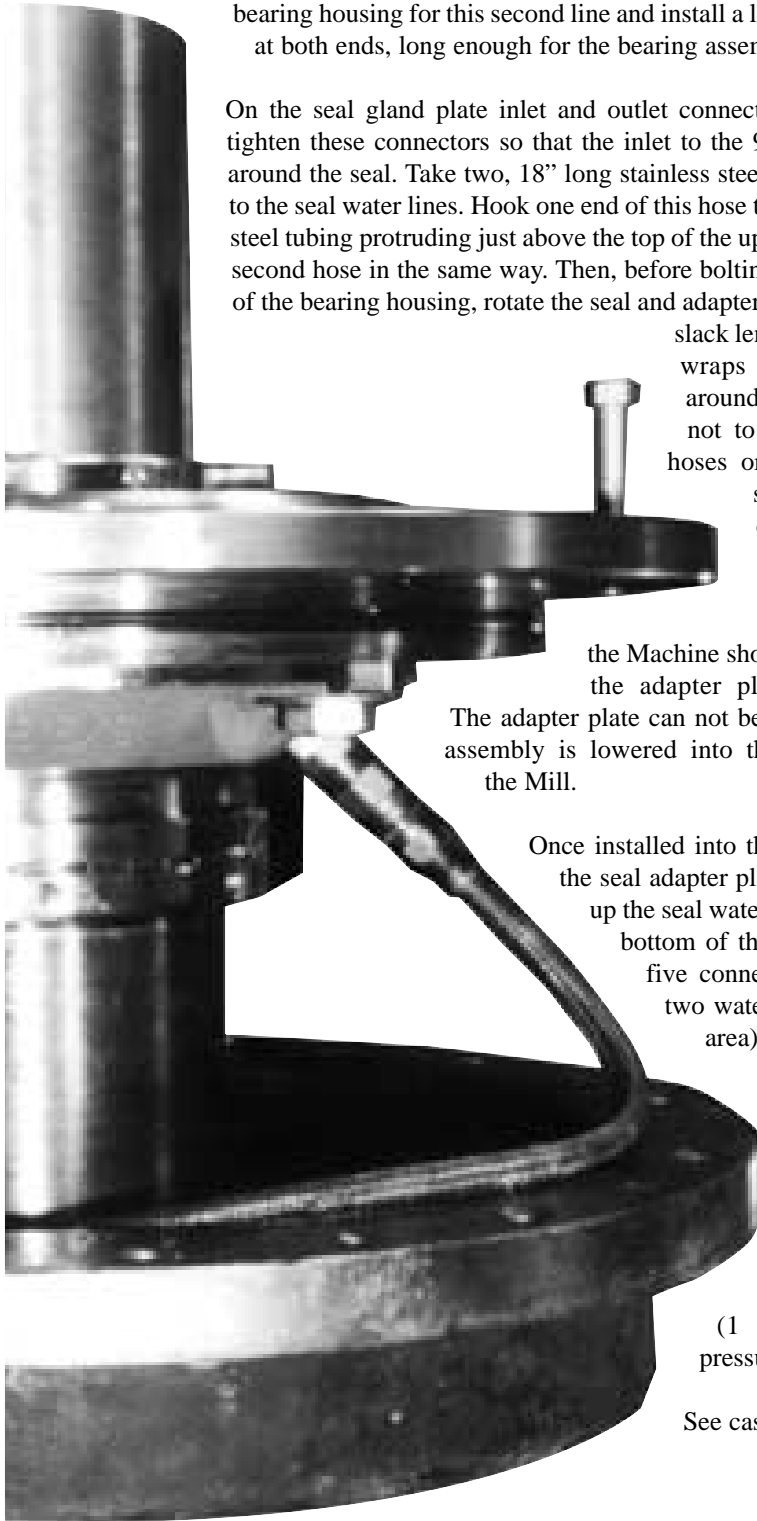
On the seal gland plate inlet and outlet connections, install 90° connectors, and tighten these connectors so that the inlet to the 90° connector is pointing radially around the seal. Take two, 18" long stainless steel braided hoses and connect them to the seal water lines. Hook one end of this hose to the threaded end of the stainless steel tubing protruding just above the top of the upper bearing housing. Hook up the second hose in the same way. Then, before bolting the seal adapter plate to the top of the bearing housing, rotate the seal and adapter plate so as to take up some of the slack length of both seal water hoses. This wraps the seal hoses radially around the shaft. Care should be taken not to wind so tight as to stretch the hoses or make the hoses touch/rub the shaft. Then push the adapter plate down on the bearing housing.

Since the bearing housing is usually manufactured/repared in the Machine shop, insert several bolts and nuts on the adapter plate to hold the seal in place. The adapter plate can not be tightened fully until the bearing assembly is lowered into the pressure Screen assembly in the Mill.

Once installed into the Screen assembly, fully tighten the seal adapter plate. Also, be very careful to hook up the seal water to the correct connections on the bottom of the bearing assembly. As there are five connectors in total, (three grease and two water connections in a very confined area), be sure to mark / identify each connector properly. This is best done before installing the bearing assembly into the pressure Screen.

Verify that the seal water flow is going in and out of the seal, and adjust the pressure to 15 psig (1 bar) higher than the Screen pressure, then start Screen.

See case histories 700, 703 and 705.



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SCREEN SEALS

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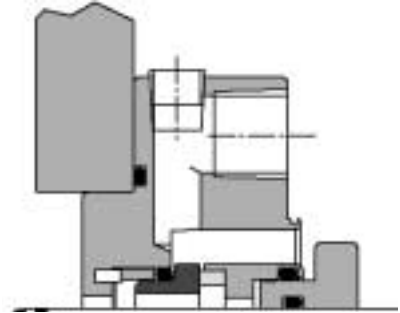
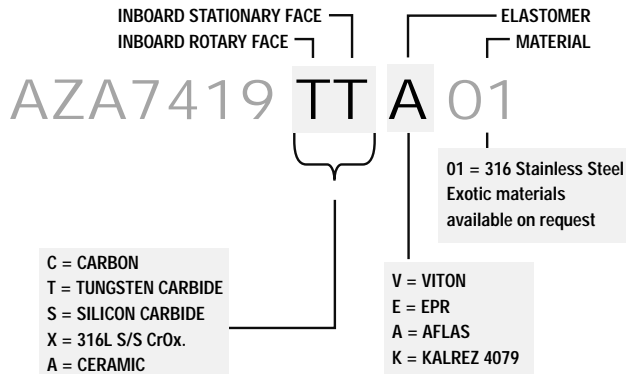
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**AESSEAL® SEAL DESIGNS TO SUIT  
BLACK & CLAWSON ULTRA SCREENS**

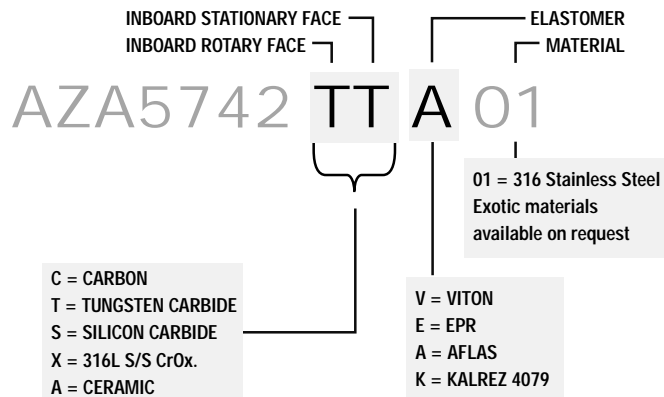
*Z Reference Details*

Model	Shaft	Z Ref	Drawing Number
676 Ultra	100mm	Z7419	7107454
Ultra	3.500"	Z7510	7108441
Ultra	80mm	Z8892	7119098
Ultra	3.625	Z9372	7125401



**AESSEAL® SEAL DESIGN TO SUIT  
BLACK & CLAWSON 300 ULTRA H SCREEN (5.500")**

5.500" IASC™ to suit a Black & Clawson 300 Ultra H Screen  
AESSEAL® Reference: Z5742  
AESSEAL® Drawing  
Number: 6469547





AESSEAL® have designed and supplied clipped single mechanical seals, 5.500" IASC™, to suit a Black & Clawson 300 Ultra-H Horizontal Screen.

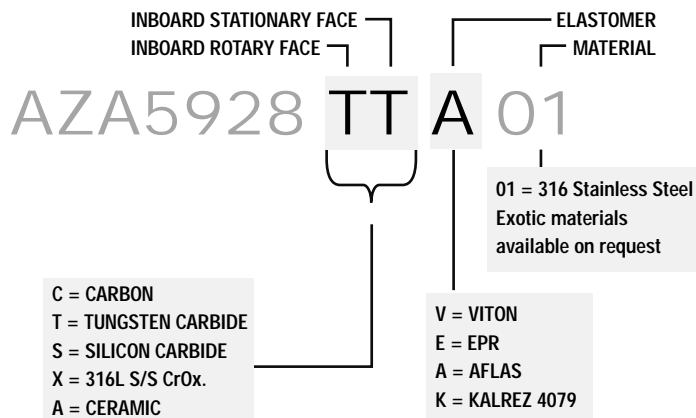
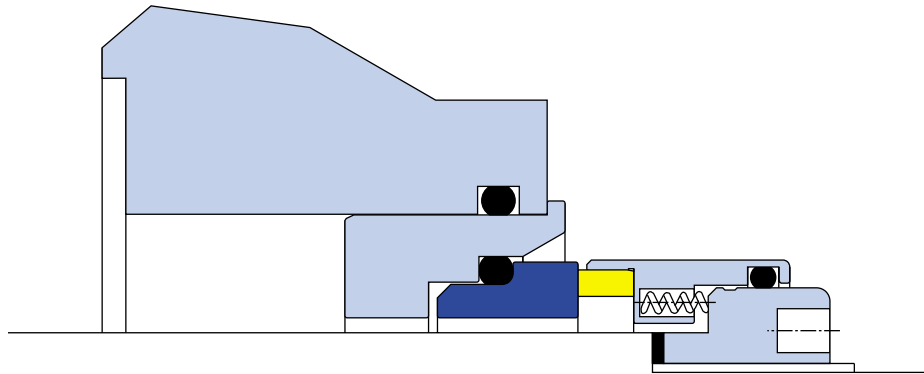
The gland has been designed to align with the existing flush holes in the equipment, whilst the volume around the seal faces has been maximized to facilitate seal face cooling.

The stationary has been designed using the AESSEAL® standard, patented self aligning seat technology, and the sleeve has been extended to seal inside the hub of the rotor.

For further information, see Z Reference 5742 and AESSEAL® general arrangement 6469547.

**AESSEAL® SEAL DESIGN TO SUIT  
BLACK & CLAWSON SCREEN (62/55mm)**

62/55mm Special SAI™ and Stationary to suit a  
Black & Clawson Screen  
AESSEAL® Reference: Z5928  
AESSEAL® Drawing  
Number: 6470610



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## **AESSEAL® SEAL DESIGN TO SUIT BLACK & CLAWSON P24 SCREEN**

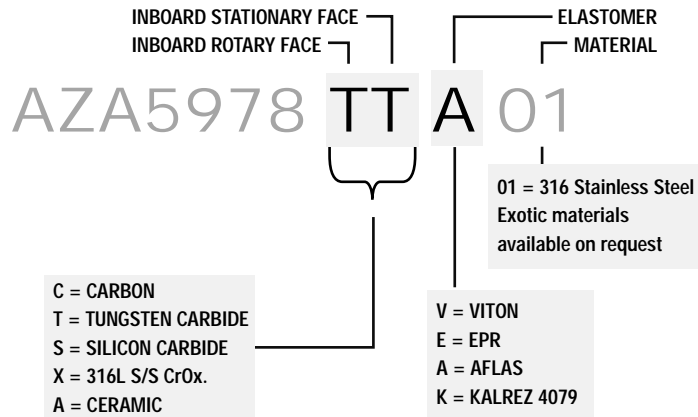
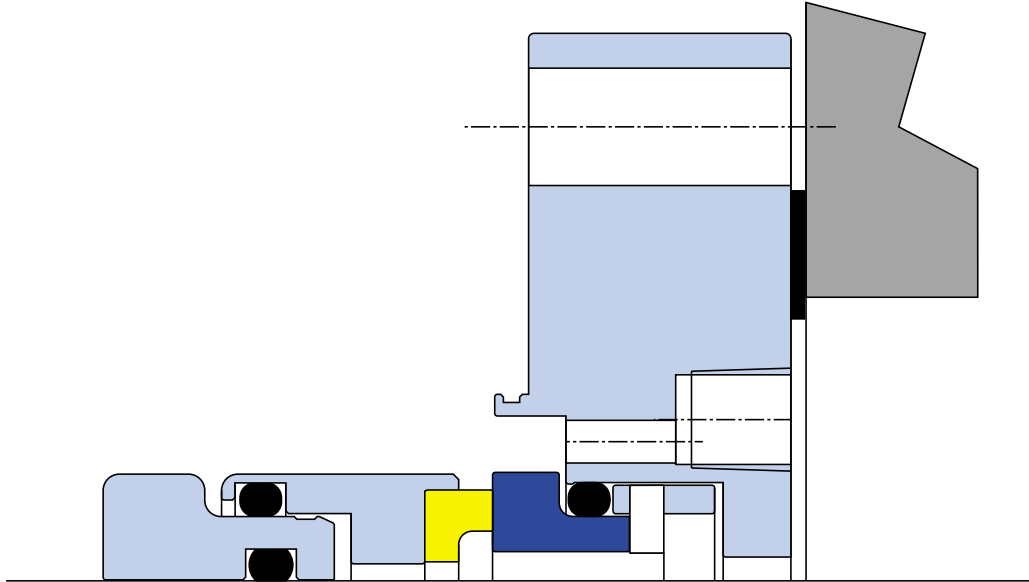
80mm IASC™ to suit a Black & Clawson P24 Screen  
AESSEAL® Reference: Z5978  
AESSEAL® Drawing  
Number: 6470703

SCREEN SEALS

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**AESSEAL® SEAL DESIGNS TO SUIT  
AHLSTROM PRESSURE SCREENS**

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SCREEN SEALS

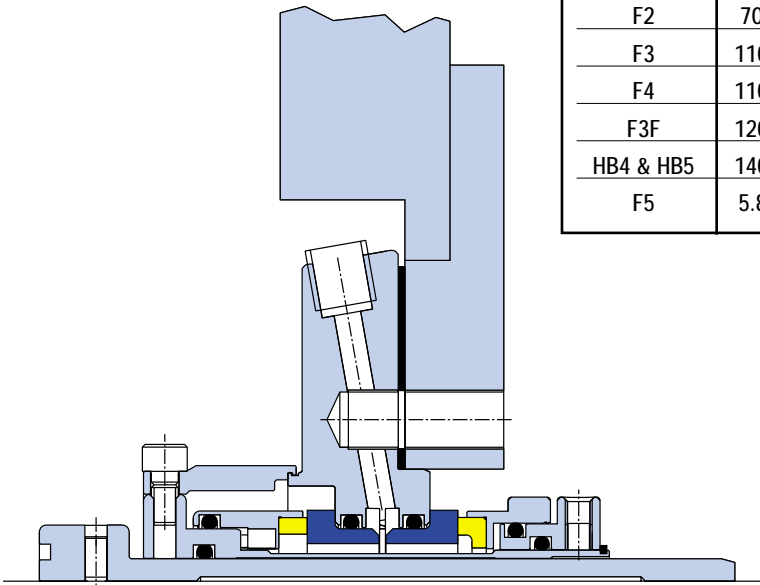
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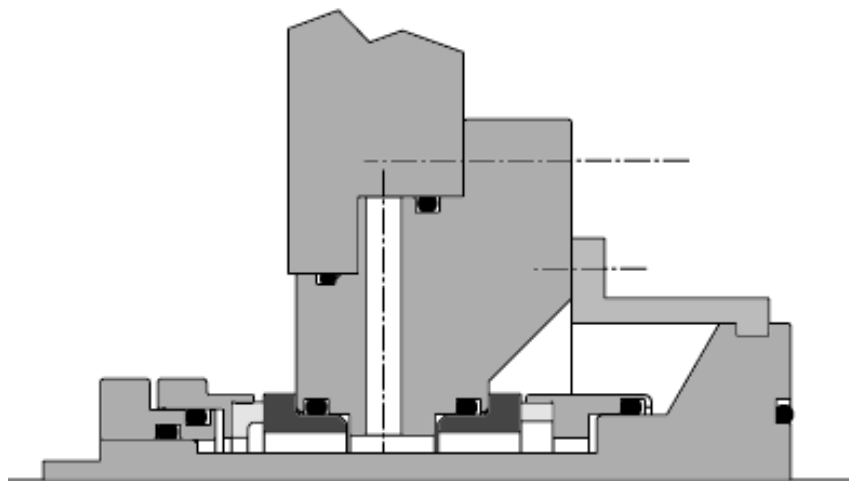
11

**Z Reference Details**

Model	Shaft	Z Ref	Drawing Number
F1	55mm	-	6462874
F2	70mm	Z9004	7120935
F3	110mm	Z4143	6460904
F4	110mm	Z4143	6460904
F3F	120mm	Z8934	7119672
HB4 & HB5	140mm	Z8749	7117311
F5	5.875"	Z8619	7115842



The cross sections shown have been chosen to illustrate the wide variety of designs available for this type of equipment.



OUTBOARD ROTARY FACE  
OUTBOARD STATIONARY FACE  
INBOARD STATIONARY FACE  
INBOARD ROTARY FACE

ELASTOMER MATERIAL

AZA4143 CSSC K 01

C = CARBON  
S = SILICON CARBIDE  
T = TUNGSTEN CARBIDE  
A = CERAMIC  
X = 316 S/S CrOx.

V = VITON  
E = EPR  
A = AFLAS  
K = KALREZ 4079

01 = 316 Stainless Steel  
Exotic materials available on request

For a similar Valmet Tempella Screen design see case history 1209 for further details.



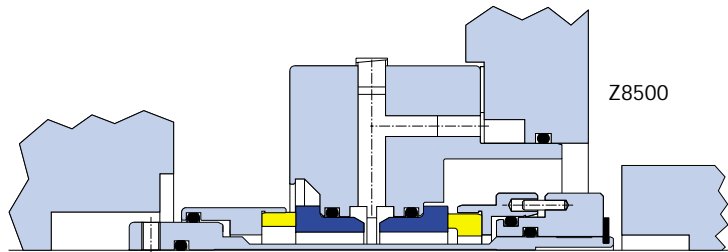
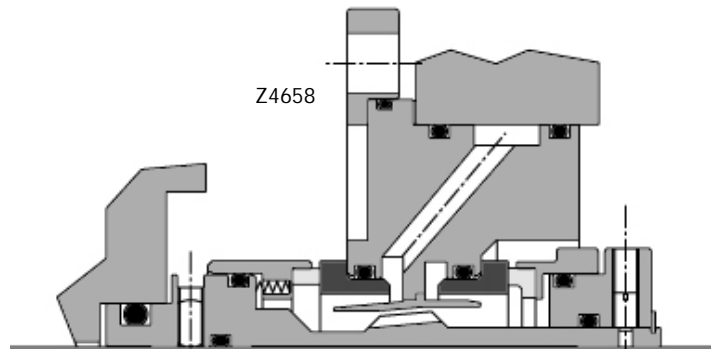
## **AESSEAL® SEAL DESIGN TO SUIT** **VALMET SCREENS**

SCREEN SEALS

L-UK/US-SCREENS-04

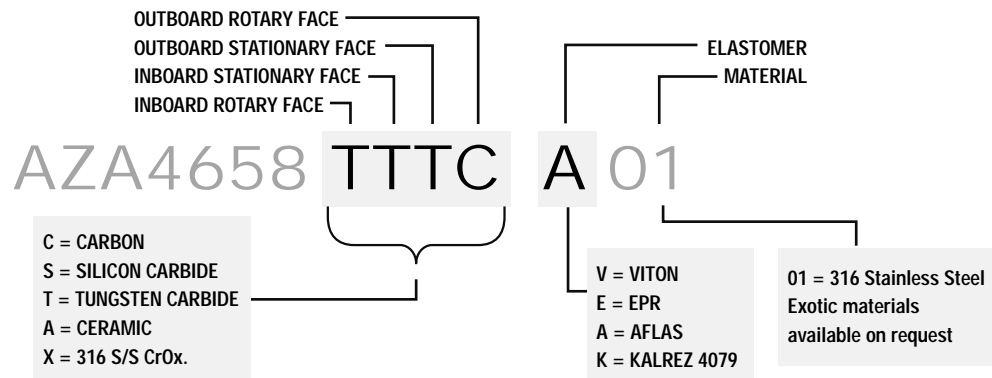
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### **Z Reference Details**

Model	Shaft	Z Ref	Drawing Number
TL450/TL600	150mm	Z8500	7114799
TP100	80mm	Z4658	6463079



The double mechanical cartridge seal shown above incorporates a highly efficient PATENT PENDING pumping scroll, with deflector and is specifically designed to fit the 80mm Valmet TP100 Screen.

With growing environmental concerns and plant focus on water usage, AESSEAL® elected to install a "pumping" mechanical seal with SSE25 (25 litres, 6.6 US gallons) Jumbo pot, shown in the inset photo above.

Barrier fluid enters the gland, is directed to the inboard seal faces, then circulated past the outboard faces, until finally exiting through the "out" port. This ensures continuous fluid replacement at the seal faces, effectively removing heat into the barrier system.

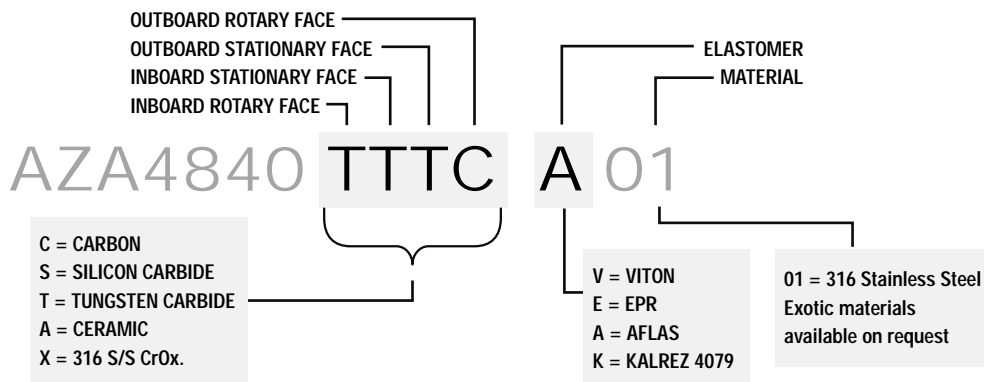
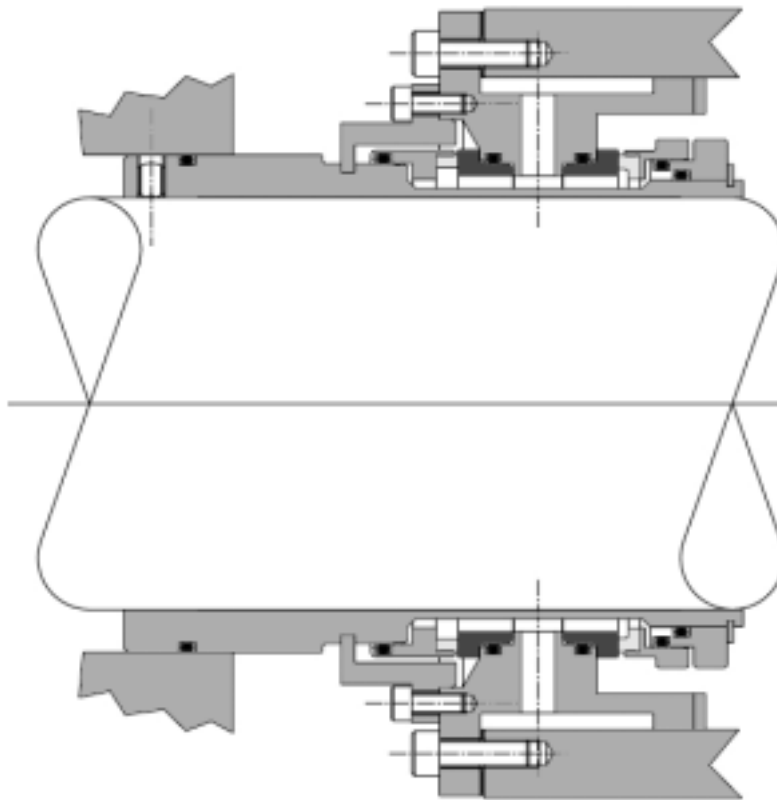
The seal was balanced towards the barrier fluid, as the process pressure varied from an operating pressure of 2 bar (29 psi) to 4 bar, (58 psi) depending on whether or not the basket was blocked or Jet washed.

The inboard seal faces were positioned within a "large volume" of product fluid, thereby helping to dissipate inboard seal face heat.

For further information, see Z Reference 4658, case history 1205, and AESSEAL® general arrangement 6463079.

**AESSEAL® SEAL DESIGN TO SUIT  
VADLMET TAMPELA SCREEN (120mm)**

120mm Double Screen Seal to suit Valmet Tampela Screen  
 AESSEAL® Reference: Z4840  
 AESSEAL® Drawing Number: 6464264



The double mechanical cartridge seal shown above is specifically designed to fit the 120mm Valmet Tampela Screen.

The seal is supplied with a fully machined gland, which allows the barrier in and barrier out ports on the Screen to be "aligned" with slots in the gland. The sleeve is undercut to maximize the volume of barrier fluid under the seal faces, whilst a "heavy duty" setting clip design helps to ensure that the seal is robustly set during the installation process.

All seal faces supplied are modular to the AESSEAL® Standard CDSA™ range of mechanical seals.

For further information, see Z Reference 4840, case history 1209 and AESSEAL® general arrangement 6464264.

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SCREEN SEALS

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## **AESSEAL® SEAL DESIGN TO SUIT RECARD REFINER (80mm, 85mm & 105mm)**

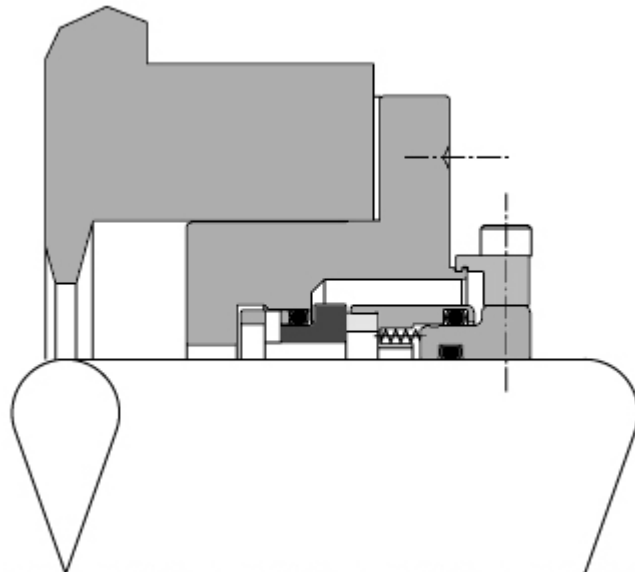
80mm / 85mm / 105mm IASC™ to suit a Recard Refiner  
 AESSEAL® References: Z5807 / Z5808 / Z6002  
 AESSEAL® Drawing Numbers: 6469857 / 6469433 / 6470845

SCREEN SEALS

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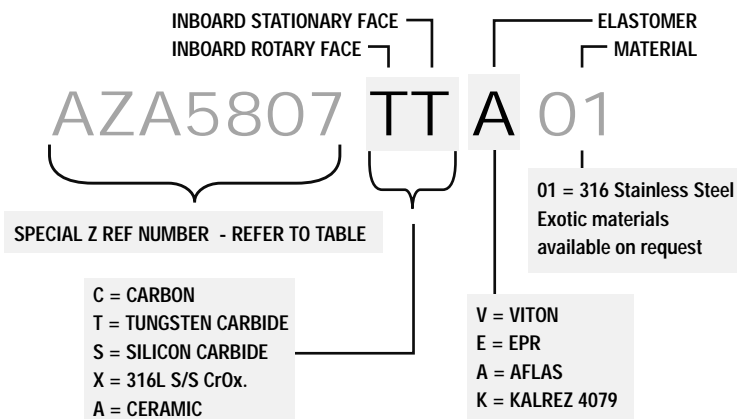
14



The cross sections shown have been chosen to illustrate the wide variety of designs available for this type of equipment.

### **Z Reference Details**

Shaft	Z Ref	Drawing Number
80mm	Z6002	6470845
85mm	Z5807	6469857
105mm	Z5808	6469853



AESSEAL® have designed and supplied single clipped mechanical seals for three of the Recard Refiner Screen models, 80mm, 85mm and 105mm.

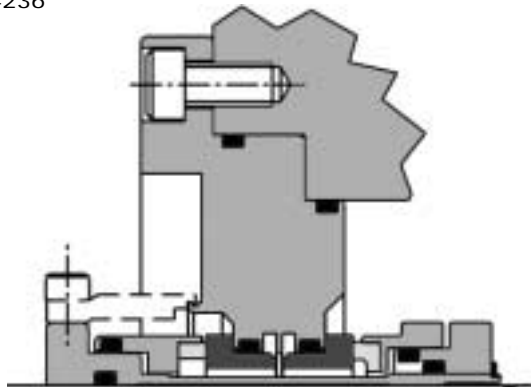
Once again the gland has been designed to align with the existing flush holes in the equipment, whilst the volume around the seal faces has been maximized to facilitate seal face cooling.

The stationary is designed with the AESSEAL® standard, patented self-aligning seat technology.

For further information, see Z Reference 6002, 5807 and 5808, and AESSEAL® general arrangements 6470845, 6469857 and 6469853 respectively.

**AESSEAL® SEAL DESIGN TO SUIT MODUSCREEN**

125mm IADC™ Seal to suit a Ahlstrom Moduscreen F3/F4  
 AESSEAL® Reference: Z7113  
 AESSEAL® Drawing Number: 7104236



OUTBOARD ROTARY FACE  
 OUTBOARD STATIONARY FACE  
 INBOARD STATIONARY FACE  
 INBOARD ROTARY FACE

ELASTOMER MATERIAL

AZA7113 TTXC E 01

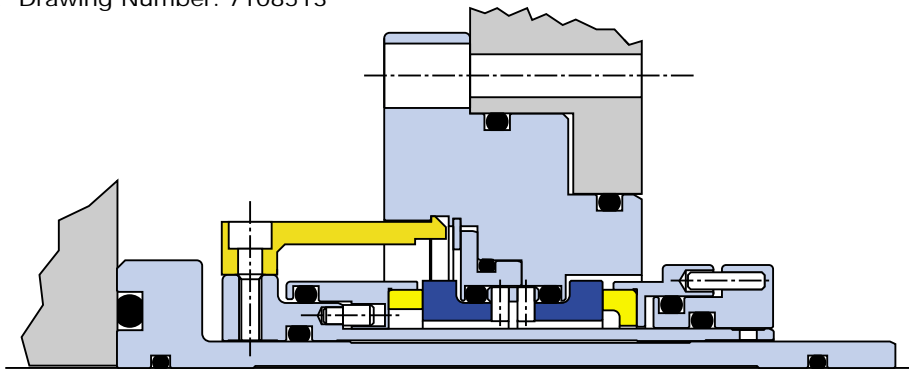
C = CARBON  
 S = SILICON CARBIDE  
 T = TUNGSTEN CARBIDE  
 X = 316 S/S CrOx.

V = VITON  
 E = EPR  
 A = AFLAS  
 K = KALREZ 4079

01 = 316 Stainless Steel  
 Exotic materials  
 available on request

**AESSEAL® SEAL DESIGN TO SUIT MODUSCREEN F1**

65mm IADC™ Seal to suit a Ahlstrom Moduscreen F1  
 AESSEAL® Reference: Z7522  
 AESSEAL® Drawing Number: 7108513



OUTBOARD ROTARY FACE  
 OUTBOARD STATIONARY FACE  
 INBOARD STATIONARY FACE  
 INBOARD ROTARY FACE

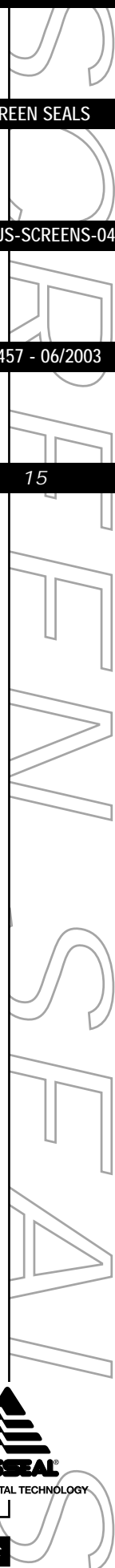
ELASTOMER MATERIAL

AZA7522 TTXC E 01

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 K = KALREZ 4079

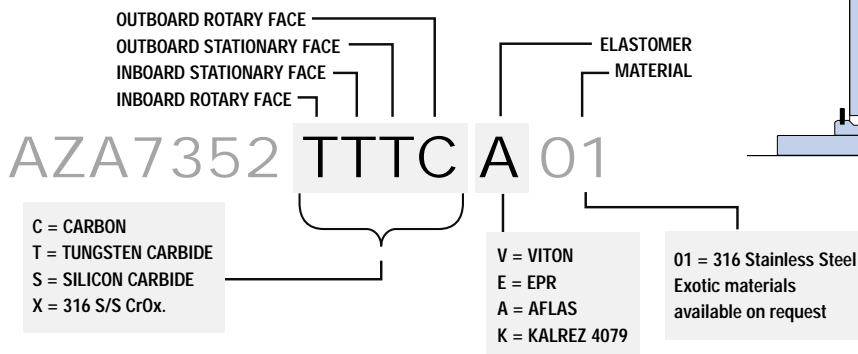
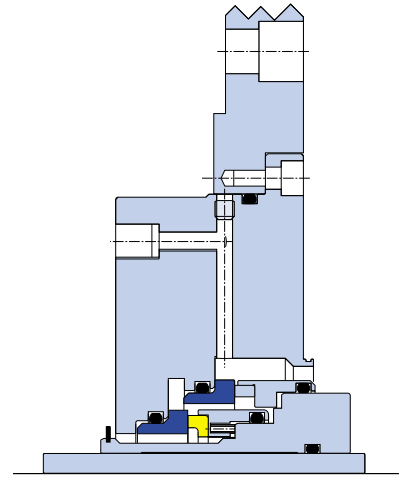
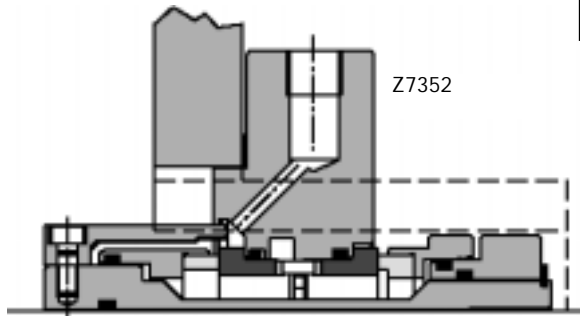
01 = 316 Stainless Steel  
 Exotic materials  
 available on request



**AESSEAL® SEAL DESIGN TO SUIT BELOIT**

**Z Reference Details**

Model	Shaft	Z Ref	Drawing Number
30A	3.000"	Z9070	7121682
B80	5.500"	Z7352	7106443



**AESSEAL® SEAL DESIGN TO SUIT BELOIT JONES LOW PULSE SCREEN M18, M24, M28, M32, M44, M50 AND M58**

3.125", 4.000" and 5.500"  
 Component Screen Seal to suit  
 Beloit Jones Low pulse Screens  
 AESSEAL® Reference: Z8358,  
 Z5693 and Z7166  
 AESSEAL® Drawing Number:  
 7114055, 6469433 and 7104921

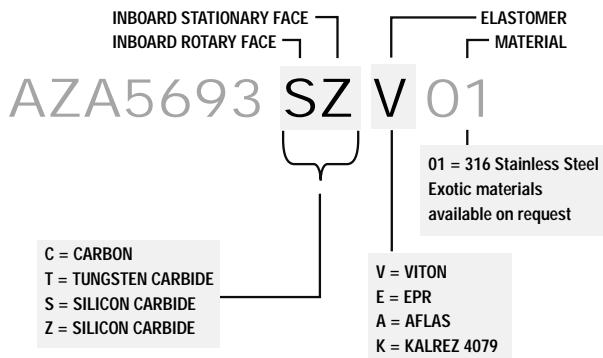


AESSEAL® have designed and supplied  
 a single component mechanical seal for  
 the 3.125" , 4.000" and 5.500" Beloit  
 Jones Low pulse Screen sizes M44,  
 M32, M50, M58, M18, M24 and M28.

The seal has been designed as a  
 stationary seal (with springs mounted in  
 the stationary member) and has both  
 seal faces in the standard AESSEAL®  
 monolithic (one-piece) design, for  
 improved temperature performance.

For further information, see Z Reference  
 8358, 5693, 7166 and AESSEAL®  
 general arrangement 6469433, 7104921  
 and 7114055.

The cross sections shown have been  
 chosen to illustrate the wide variety of  
 designs available for this type of equipment.



**Z Reference Details**

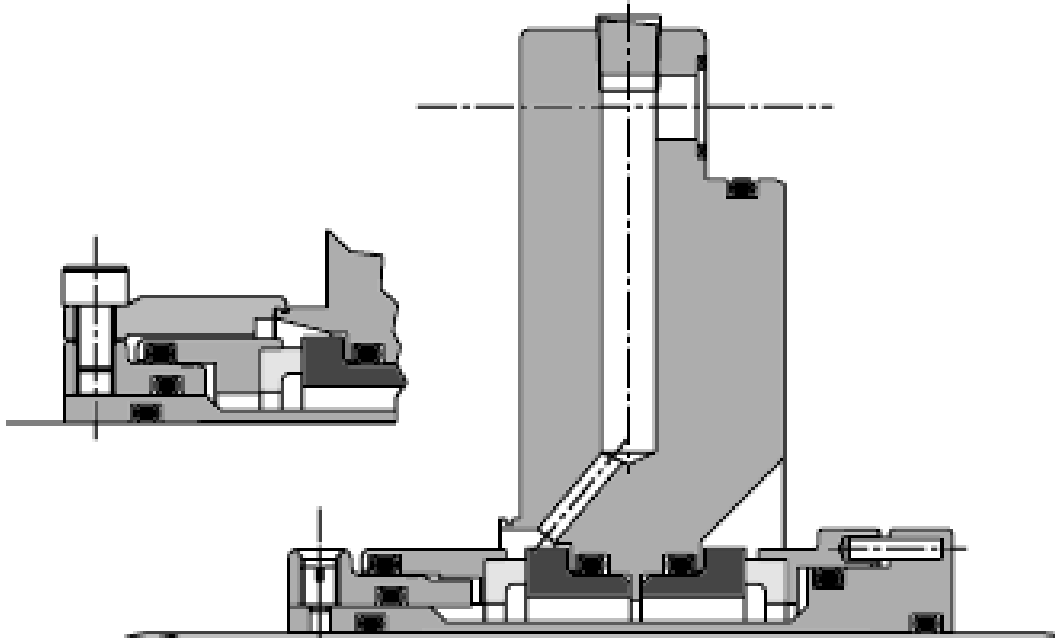
Model	Shaft	Z Ref	Drawing Number
M18/M24/M28	3.125"	Z8358	7114055
M44/M32	4.000"	Z5693	6469433
M50/M58	5.500"	Z7166	7104921





**AESSEAL® SEAL DESIGN TO SUIT  
HEINRICH FIELDER SCREEN (90mm)**

90mm IADC™ to suit a Heinrich Fielder Screen  
 AESSEAL® Reference: Z5664  
 AESSEAL® Drawing Number: 6469213



OUTBOARD ROTARY FACE  
 OUTBOARD STATIONARY FACE  
 INBOARD STATIONARY FACE  
 INBOARD ROTARY FACE

AZA5664

CSSC

K 01

ELASTOMER  
 MATERIAL

C = CARBON  
 S = SILICON CARBIDE  
 T = TUNGSTEN CARBIDE  
 A = CERAMIC  
 X = 316 S/S CrOx.

V = VITON  
 E = EPR  
 A = AFLAS  
 K = KALREZ 4079

01 = 316 Stainless Steel  
 Exotic materials  
 available on request

AESSEAL®

SCREEN SEALS

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**AESSEAL® SEAL DESIGNS TO SUIT**  
**MDC™ - SUNDS JYLA SCREENS**

MDC™ - 75mm, 100mm Sunds Jyla Screen  
 AESSEAL® References: Z3840 / Z3615  
 AESSEAL® Drawing Numbers: 6459736 / 6458574

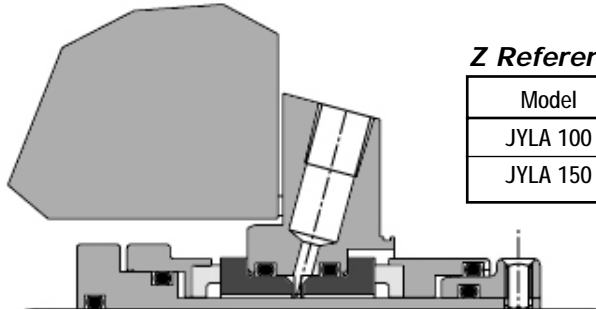
The cross sections shown have been chosen to illustrate the wide variety of designs available for this type of equipment.

SCREEN SEALS

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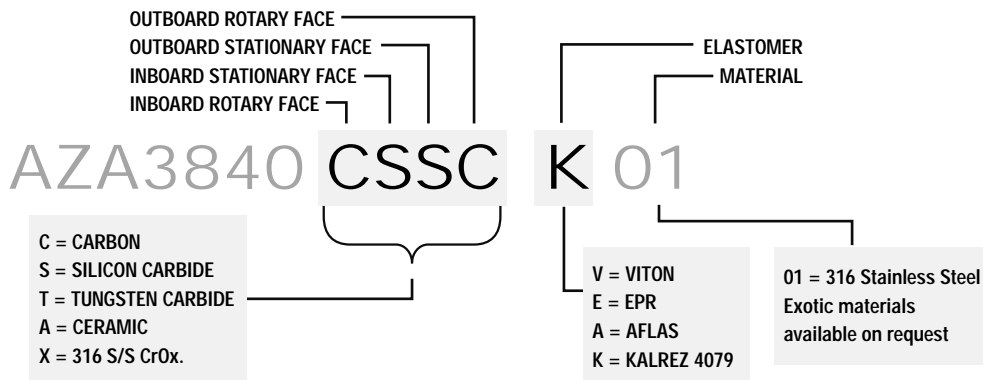
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**Z Reference Details**

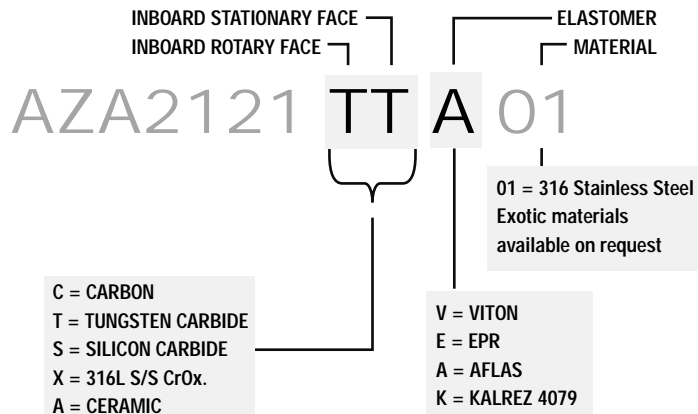
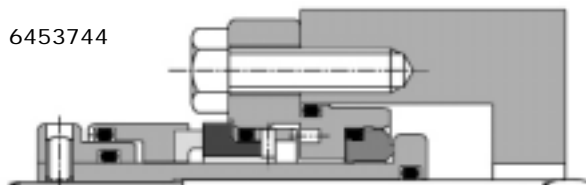
Model	Shaft	Z Ref	Drawing Number
JYLA 100	75mm	Z3840	6459736
JYLA 150	100mm	Z3615	6458574



See case histories 1206 and 1207 for further details.

**AESSEAL® SEAL DESIGN TO SUIT**  
**SCREEN (MODEL 25)**

Screen (Model 25) 90mm/91mm  
 AESSEAL® Reference: Z2121  
 AESSEAL® Drawing Number: 6453744



## **AESSEAL® SEAL DESIGNS TO SUIT BIRD SCREENS**

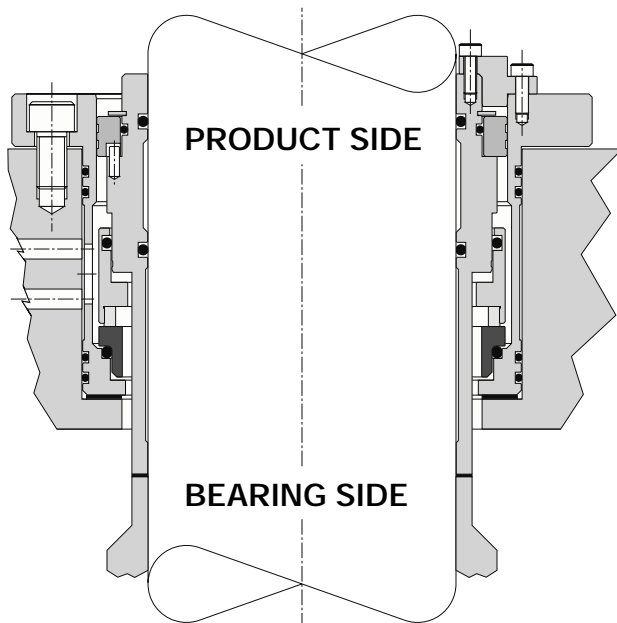
Again, employing the modular design philosophy, AESSEAL® have developed various Screen seals designs to suit BIRD models. The design for a Bird Screen 50 is shown below.

These pieces of equipment are commonly packed, therefore converting them to use a mechanical seal is generally a function of the packing arrangement previously employed. The bore of the packed box is usually worn and scored by the packing. Therefore, the surface finish of the box bore is one which is not conducive to elastomer sealing.

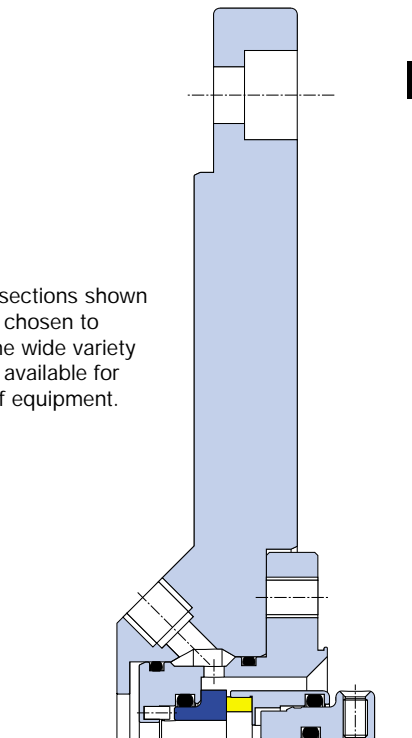
The seal design shown employs a gasket at the bottom of the box bore and several O-rings to ensure sealing on the bore diameter. Flush water enters the lower housing connection over the seal faces, and exits through the upper housing connection.

A floating restriction bush at the top of the seal prevents flush water escaping whilst preventing the ingress of stock. This makes the application little more than a water seal application. The whole seal unit is supplied in a cartridge format with setting clips, ensuring accurate and fast installation with minimum process disruption.

See case histories 224, 273, 706, 723 and 1208.

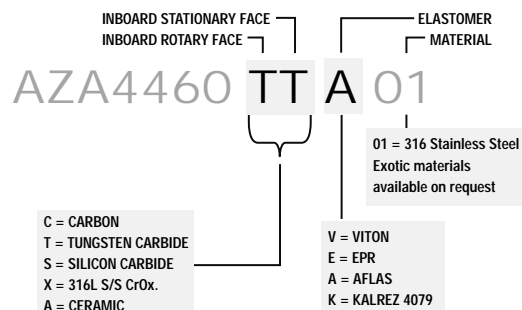


The cross sections shown have been chosen to illustrate the wide variety of designs available for this type of equipment.



### **Z Reference Details**

Model	Shaft	Z Ref	Drawing Number
400	3.000"	Z5755	6469586
14	3.750"	Z7644	7109521
14B	3.750"	Z9034	7121614
50	3.848"	Z4460	6462135
80	4.724"	Z4267	6461080



The 3.000" Bird Screen model 400, has been sealed with a IADC™, extremely similar in design to the Impco principle shown previously. The IADC™ is a double seal.

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**AESSEAL® SEAL DESIGN TO SUIT  
BIRD SCREEN**

SCREEN SEALS

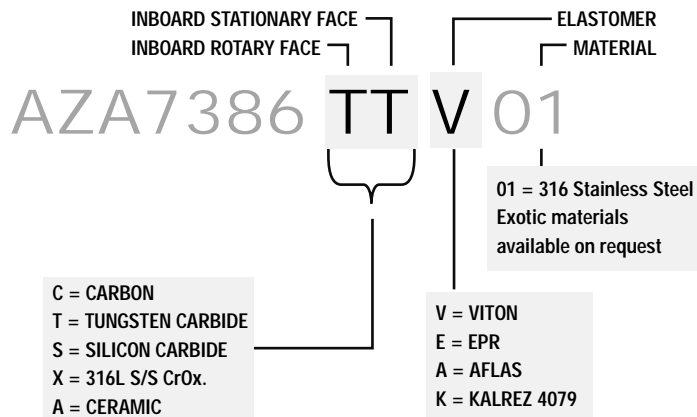
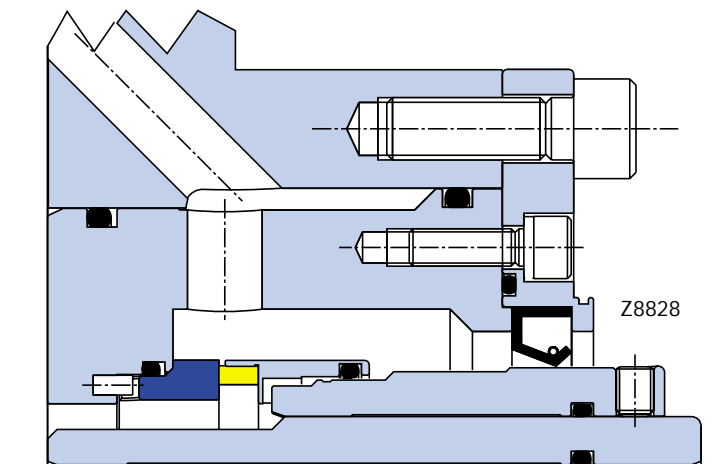
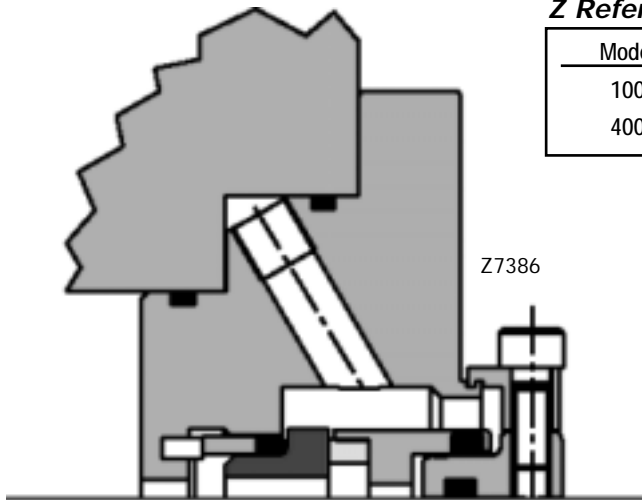
L-UK/US-SCREENS-04

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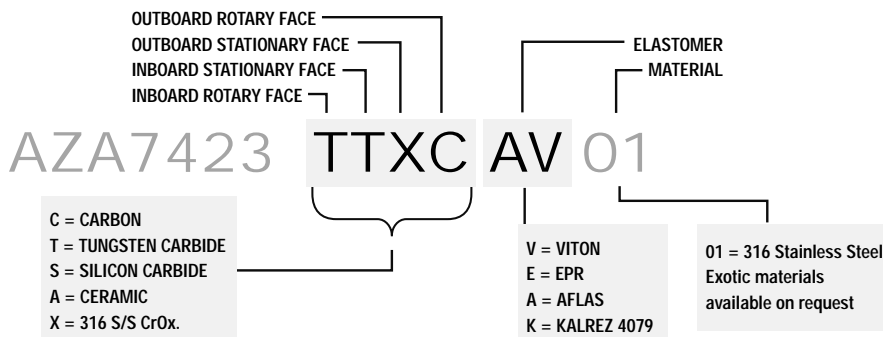
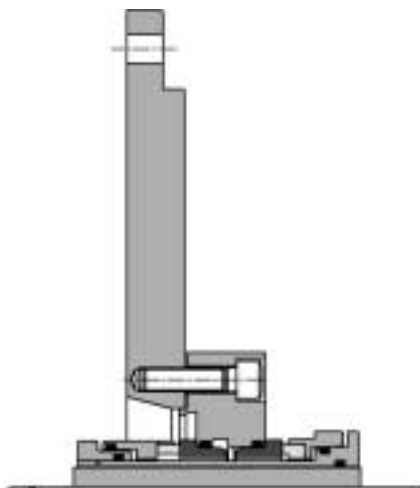
**Z Reference Details**

Model	Shaft	Z Ref	Drawing Number
100	1.750"	Z8828	7118395
400	85mm	Z7386	7107036



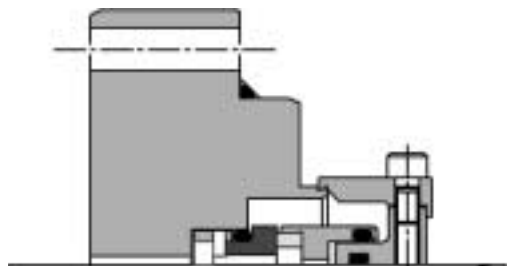
**AESSEAL® SEAL DESIGN TO SUIT**  
**BIRD CENTRISCREEN CN70**

5.500" IADC™ SEAL to suit a Bird  
 Centriscreen CN70  
 AESSEAL® Reference: Z7423  
 AESSEAL® Drawing Number: 7107509

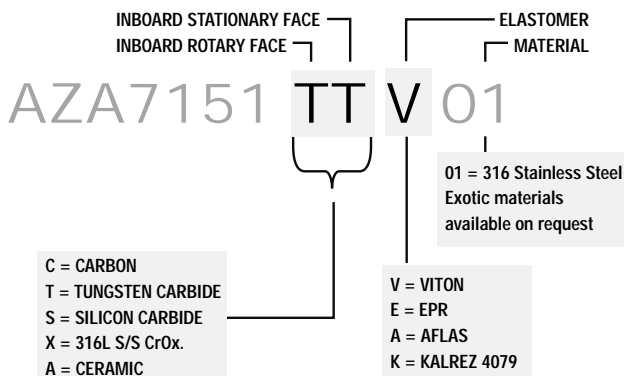


**AESSEAL® SINGLE SEAL DESIGN TO SUIT**  
**LAMORT SCREEN**

40mm, 50mm and 90mm IASC™ to suit a LAMORT SCREEN  
 AESSEAL® Reference: Z7151, Z7577 and Z7638  
 AESSEAL® Drawing Number: 7104674, 7108949 and 7109462



The cross sections shown  
 have been chosen to  
 illustrate the wide variety  
 of designs available for  
 this type of equipment.



**Z Reference Details**

Model	Shaft	Z Ref	Drawing Number
SPN4	40mm	Z7638	7109462
-	50mm	Z7577	7108949
-	90mm	Z7151	7104674



**AESSEAL® DOUBLE SEAL DESIGN TO SUIT  
LAMORT SCREENS**

SCREEN SEALS

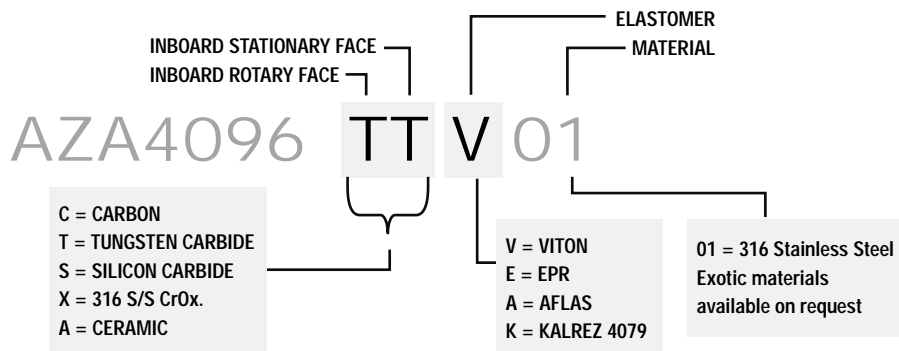
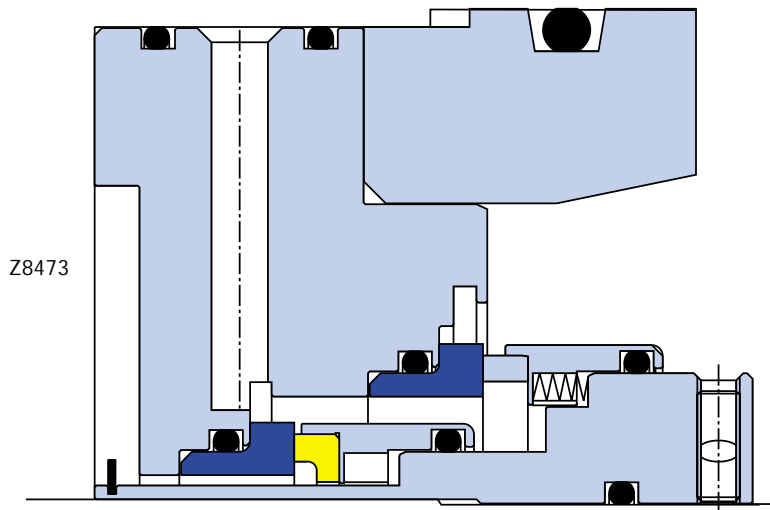
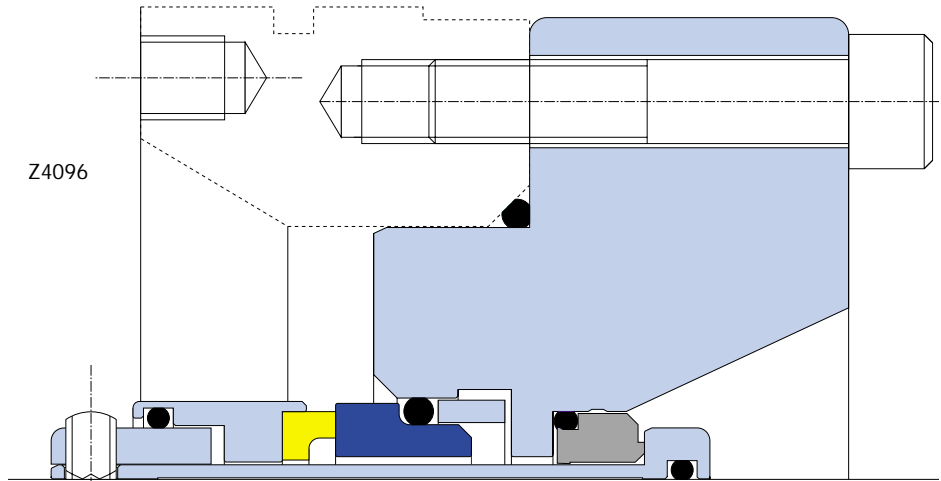
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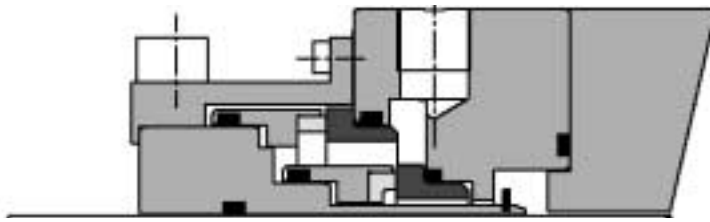
*Z Reference Details*

Model	Shaft	Z Ref	Drawing Number
SP1200	90mm	Z8473	7114661
SPN800	60mm	Z4096	6460759



**AESSEAL® DOUBLE SEAL DESIGN TO SUIT  
LAMORT SCREEN**

100mm DOUBLE CONCENTRIC SEAL to suit a LAMORT SCREEN  
 AESSEAL® Reference: Z7152  
 AESSEAL® Drawing Number: 7104706



OUTBOARD STATIONARY FACE  
 OUTBOARD ROTARY FACE  
 INBOARD STATIONARY FACE  
 INBOARD ROTARY FACE

ELASTOMER MATERIAL

AZA7152 **TTCX** **V** 01

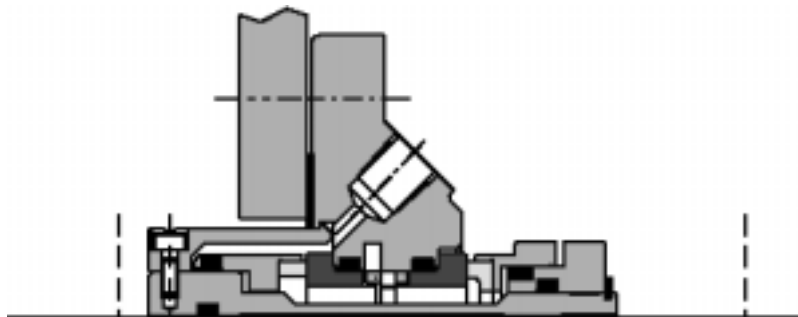
C = CARBON  
 T = TUNGSTEN CARBIDE  
 S = SILICON CARBIDE  
 X = 316 S/S CrOx.  
 A = CERAMIC

V = VITON  
 E = EPR  
 A = AFLAS  
 K = KALREZ 4079

01 = 316 Stainless Steel  
 Exotic materials  
 available on request

**AESSEAL® SEAL DESIGN TO SUIT  
JYLHAVAARA SCREEN**

100mm IADC™ c/w. FMG. Screen Seal to suit a Jylhavaara Screen  
 AESSEAL® Reference: Z7129  
 AESSEAL® Drawing Number: 7104494



OUTBOARD ROTARY FACE  
 OUTBOARD STATIONARY FACE  
 INBOARD STATIONARY FACE  
 INBOARD ROTARY FACE

ELASTOMER MATERIAL

AZA7129 **TTTC** **AV** 01

C = CARBON  
 S = SILICON CARBIDE  
 T = TUNGSTEN CARBIDE  
 A = CERAMIC  
 X = 316 S/S CrOx.

V = VITON  
 E = EPR  
 A = AFLAS  
 K = KALREZ 4079

01 = 316 Stainless Steel  
 Exotic materials  
 available on request

AESSEAL®

SCREEN SEALS

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**AESSEAL® SEAL DESIGNS TO SUIT VOITH SCREENS**

AESSEAL® have a number of Screen seal designs to suit most of the commonly encountered Screen designs found in the industry.

**SCREEN SEALS**

The illustration below indicates the AESSEAL® design to suit the Voith (OS) Screen range.

This seal employs standard, modular, inventoried AESSEAL® components, with a seal gland which has integral flow breakers, optimising conditions at the seal faces.

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The seal gland is also designed to catch the product fluid (stock) when the Screen basket is emptied. This prevents the seal faces (Tungsten Carbide v Tungsten Carbide) from dry running when the equipment is started and the basket is being filled. Dry running conditions are often extremely destructive to seal faces, particularly when two hard seal faces are run together. This simple but effective solution is one approach which AESSEAL® have introduced to help extend seal life.

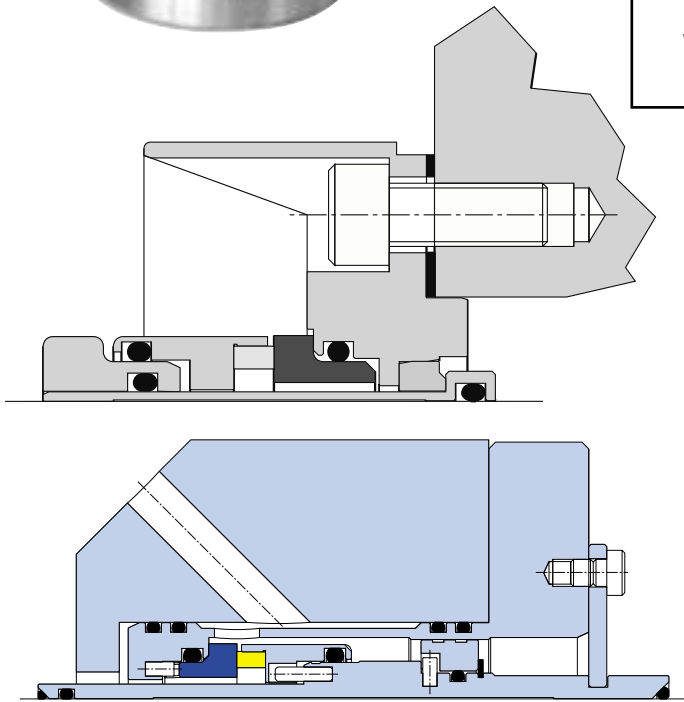
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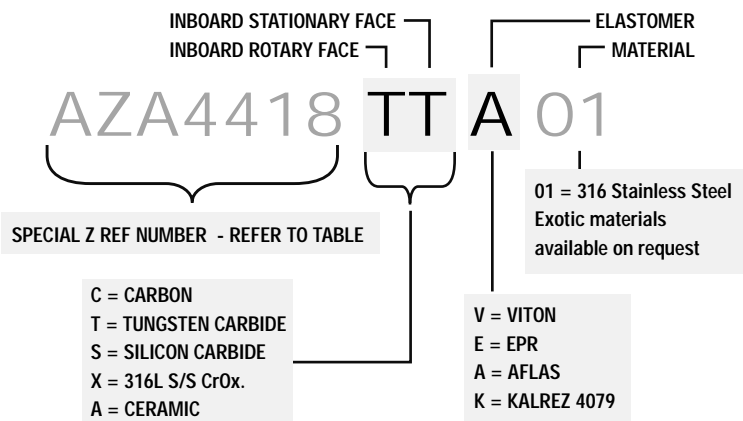


**Z Reference Details**

Model	Shaft	Z Ref	Drawing Number
GR12	60mm	Z8931	7119576
OS2	70.0mm	Z4418	-
OS4	80.0mm	Z4419	-
OS8	90.0mm	Z4420	-
VH01T	95mm	Z8733	7117000
VS5	2.125"	Z8933	7119667



The cross sections shown have been chosen to illustrate the wide variety of designs available for this type of equipment.





**AESSEAL® SEAL DESIGN TO SUIT**  
**VOITH SCREENS 94MM, 101MM AND 130MM**

IADC™ Seal to suit a Voith Screen MSS 08/05, MSS 10/06, MSS 12/12, and MSS 15/15  
 AESSEAL® Reference: Z7280, Z7277, and Z7278  
 AESSEAL® Drawing Number: 6470880, 6470881, 6470890 and

AESSEAL®

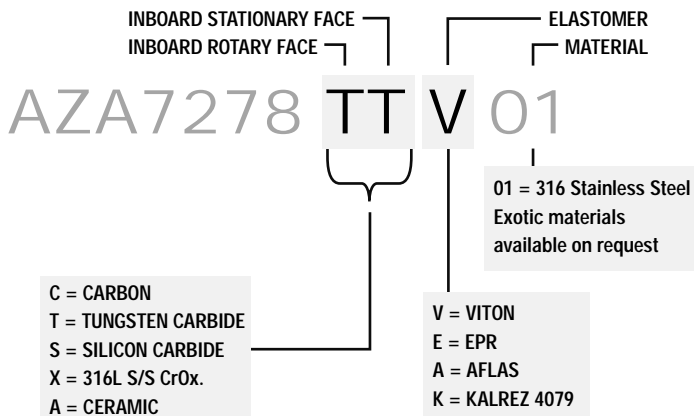
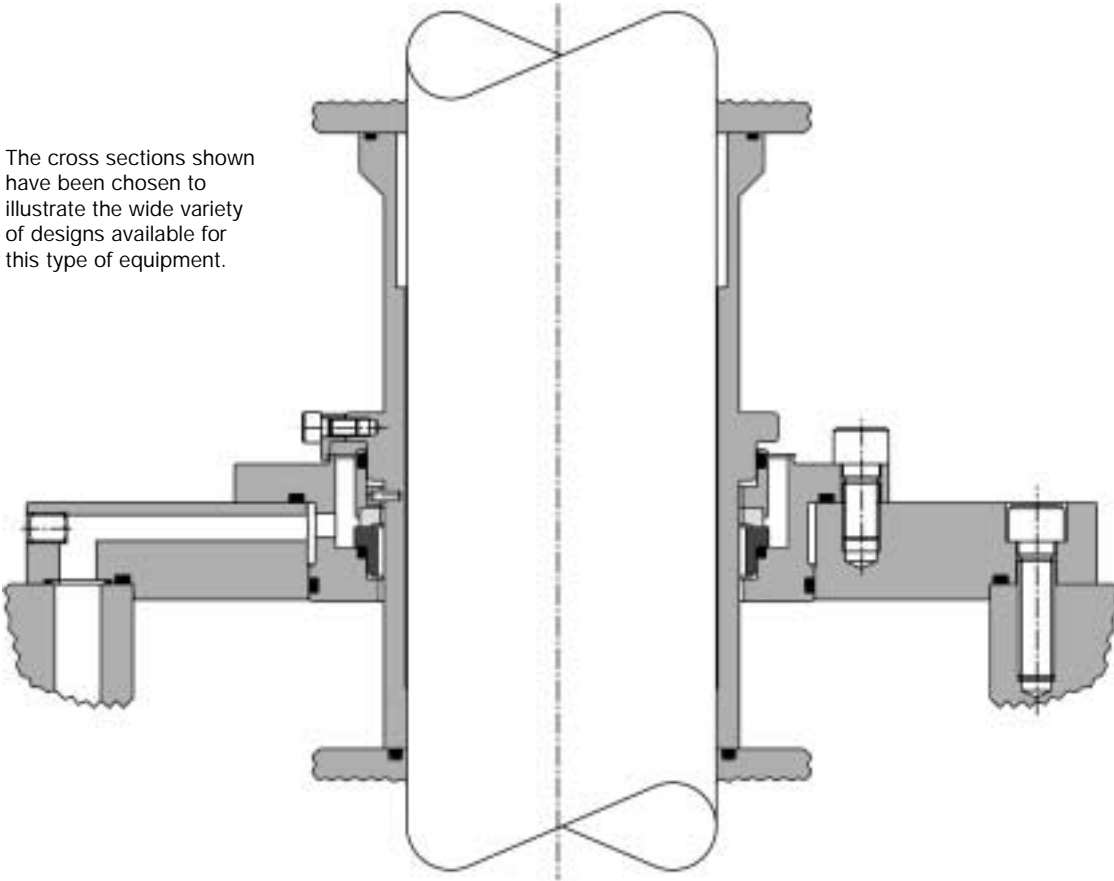
SCREEN SEALS

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The cross sections shown have been chosen to illustrate the wide variety of designs available for this type of equipment.



**Z Reference Details**

Model	Shaft	Z Ref	Drawing Number
MSS 08/05 MSS 10/06	94mm	Z7280	6470880
MSS 12/12	101mm	Z7277	6470881
MSS 15/15	130mm	Z7278	6470890



AESSEAL®

# **AESSEAL® SEAL DESIGN TO SUIT OMEGA SCREENS**

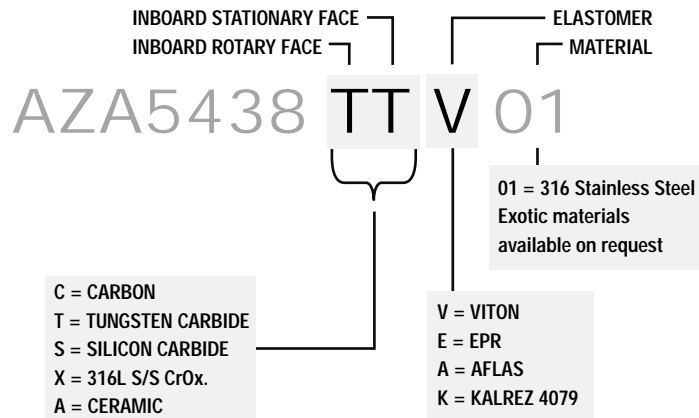
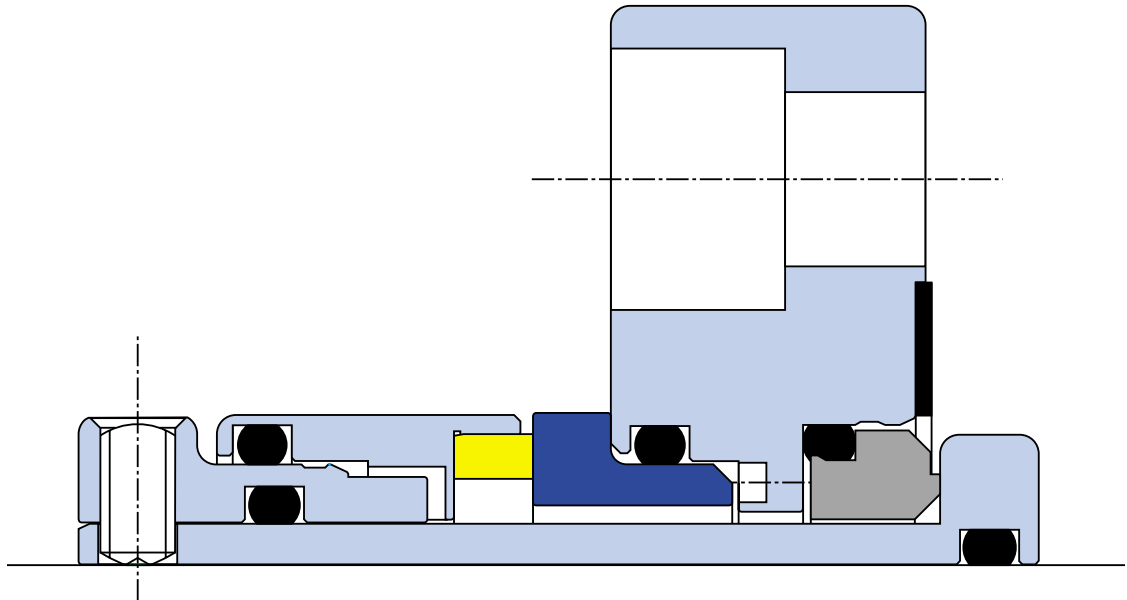
60 mm IASC™ Seal to suit a Omega Screen  
AESSEAL® Reference: Z5438  
AESSEAL® Drawing Number: 6468137

SCREEN SEALS

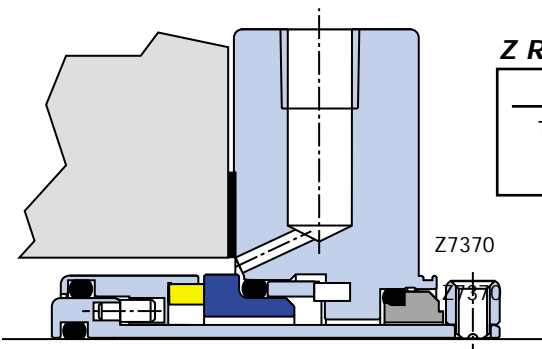
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**AESSEAL® SEAL DESIGN TO SUIT  
SUNDS SCREENS**



**Z Reference Details**

Model	Shaft	Z Ref	Drawing Number
T9-CURC	100mm	Z7883	7111145
T9	100mm	Z7370	7106736

INBOARD STATIONARY FACE  
INBOARD ROTARY FACE

ELASTOMER MATERIAL

**AZA7370 TT A 01**

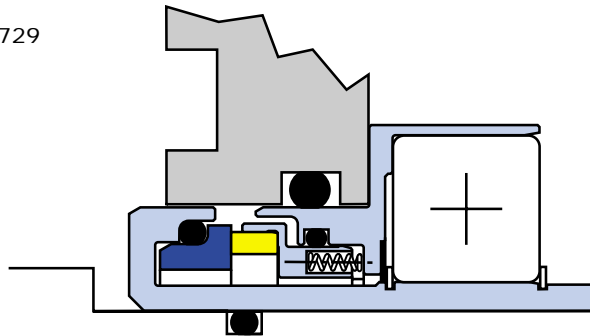
01 = 316 Stainless Steel  
Exotic materials available on request

C = CARBON  
T = TUNGSTEN CARBIDE  
S = SILICON CARBIDE  
X = 316L S/S CrOx.  
A = CERAMIC

V = VITON  
E = EPR  
A = AFLAS  
K = KALREZ 4079

**AESSEAL® RM6000 SCREEN SEAL**

42mm RM6000 Screen Seal  
AESSEAL® Reference: Z8153  
AESSEAL® Drawing Number: 7112729



INBOARD STATIONARY FACE  
INBOARD ROTARY FACE

ELASTOMER MATERIAL

**AZA8153 TT V 01**

01 = 316 Stainless Steel  
Exotic materials available on request

C = CARBON  
T = TUNGSTEN CARBIDE  
S = SILICON CARBIDE  
X = 316L S/S CrOx.  
A = CERAMIC

V = VITON  
E = EPR  
A = AFLAS  
K = KALREZ 4079

AESSEAL®

SCREEN SEALS

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# **AESSEAL® SEAL DESIGN TO SUIT TOSCHI SCREENS**

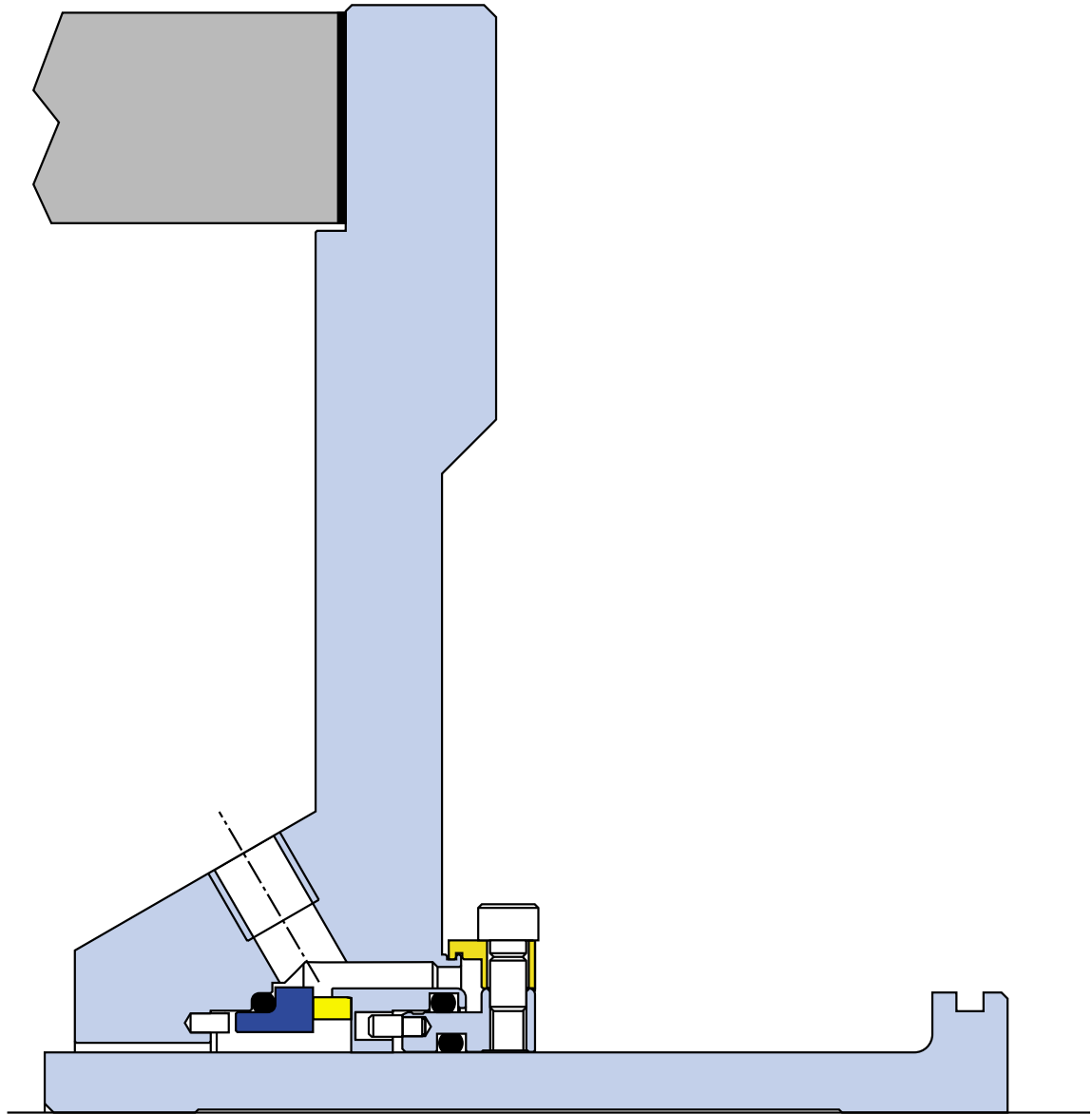
120mm IASC™ Seal arrangement to suit a Toschi ECT4 screen  
AESSEAL® Reference: Z7519  
AESSEAL® Drawing Number: 7107388

SCREEN SEALS

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INBOARD STATIONARY FACE  
INBOARD ROTARY FACE

ELASTOMER  
MATERIAL

AZA7519 TT V 01

01 = 316 Stainless Steel  
Exotic materials  
available on request

C = CARBON  
 T = TUNGSTEN CARBIDE  
 S = SILICON CARBIDE  
 X = 316L S/S CrOx.  
 A = CERAMIC

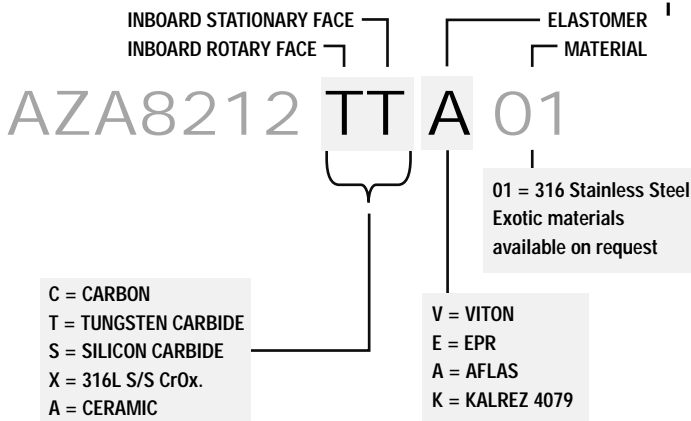
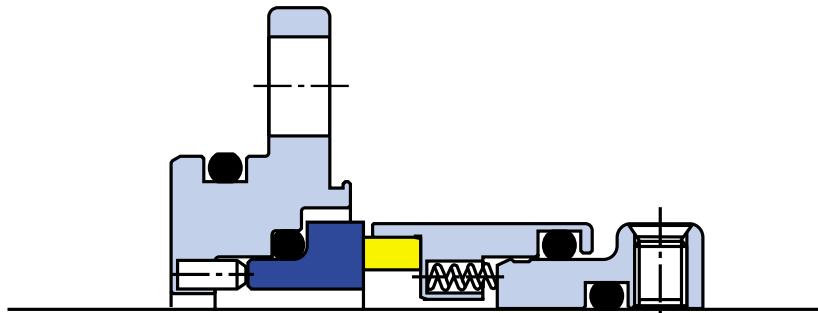
V = VITON  
 E = EPR  
 A = AFLAS  
 K = KALREZ 4079



ENVIRONMENTAL TECHNOLOGY

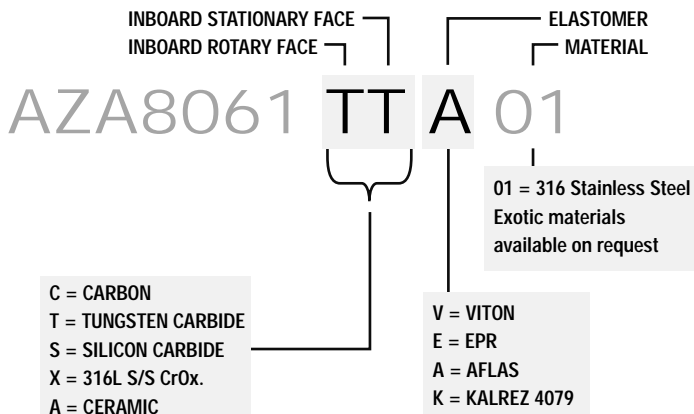
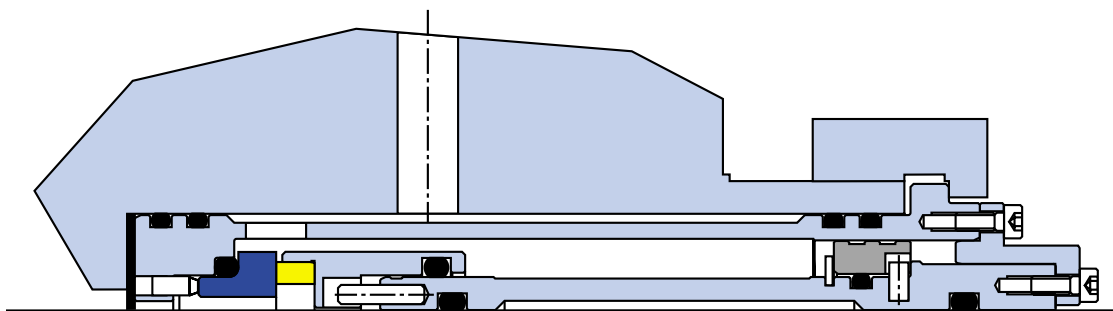
**AESSEAL® SEAL DESIGN TO SUIT  
FINCKH SCREENS**

3.5625 IASC™ seal arrangement to suit a Finckh GR2 screen  
 AESSEAL® Reference: Z8212  
 AESSEAL® Drawing Number: 7113102



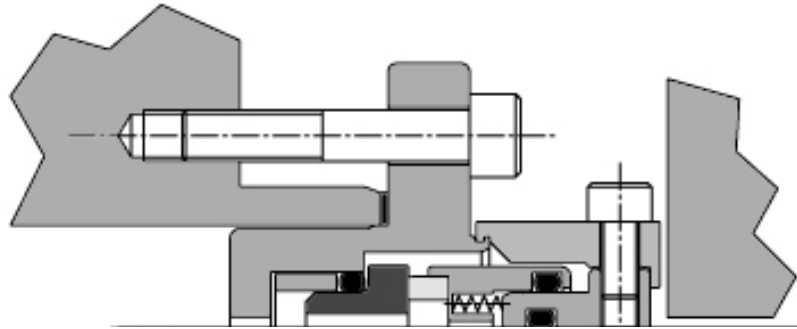
**AESSEAL® SEAL DESIGN TO SUIT  
JYLHAVAARA SCREENS**

100mm USFC™ seal arrangement to suit a Jylhavaara 150 screen  
 AESSEAL® Reference: Z8061  
 AESSEAL® Drawing Number: 7112057



**FURTHER SCREEN SEAL DESIGNS**

100mm IASC™ to suit Sands Pressure Screen - Arjo Wiggins  
 AESSEAL® Drawing Number: 6470062



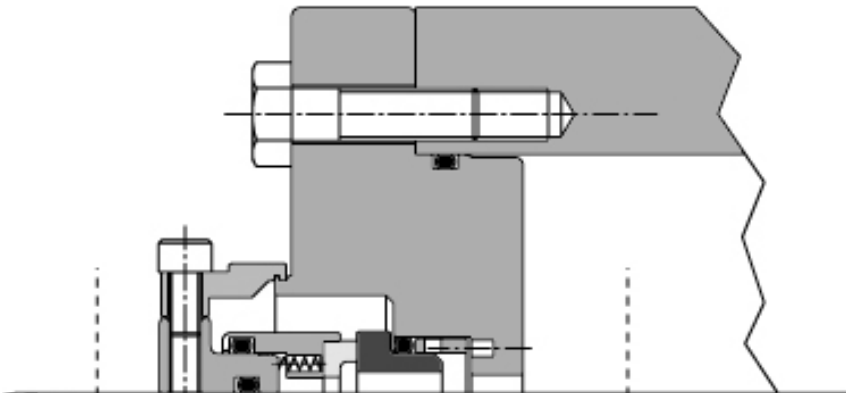
SCREEN SEALS

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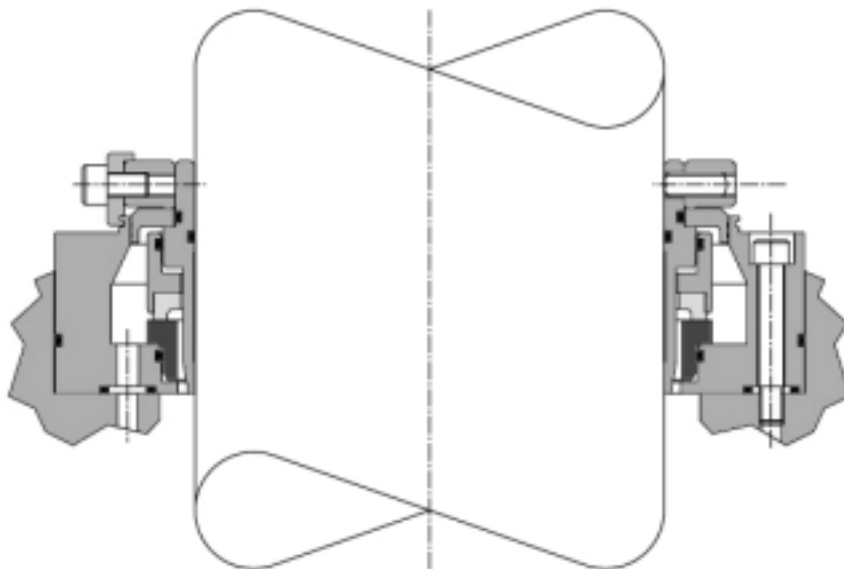
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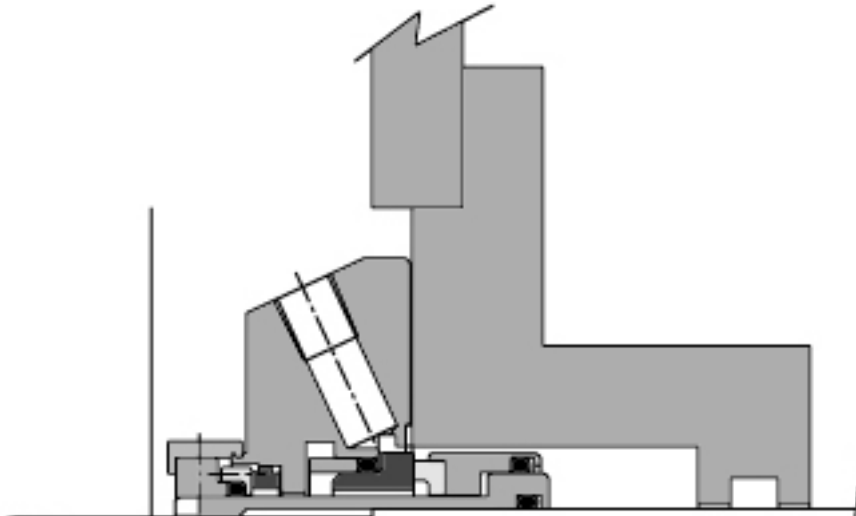
90mm IASC™ to suit a Heinrich Fielder Screen  
 AESSEAL® Drawing Number: 6467456



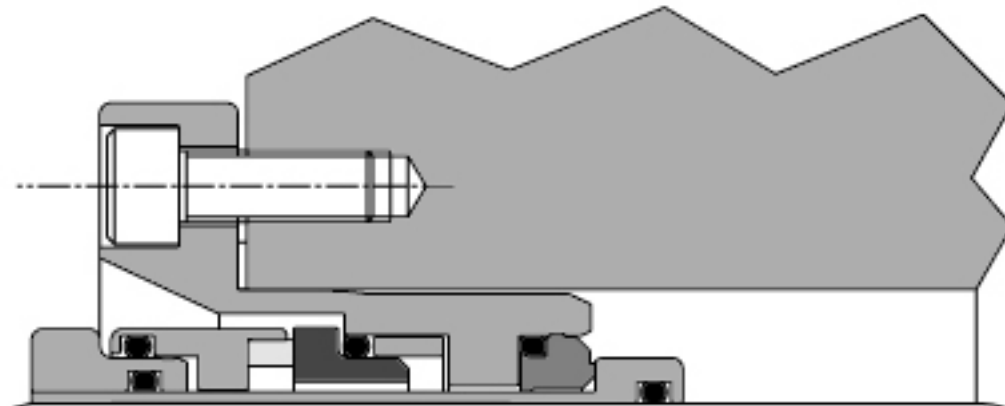
7.374" Screen Seal to suit Lamort SPM1900 Stock Screen  
 AESSEAL® Drawing Number: 6461781



100mm CURE to suit Finckh Cyclo Screen (model 2)  
AESSEAL® Drawing Number: 6462943



AESSEAL® Bird Screen design  
AESSEAL® Drawing Number: 6459757



## **SUMMARY**

The above examples illustrate a small selection from the Screen sealing experience of AESSEAL® on a worldwide level, covering many of the commonly encountered types of Screens found in the marketplace.

In most instances, with the installation of AESSEAL® products, seal performance and equipment life have been extended by the use of innovative and “common sense” approaches to Screen sealing. Furthermore, seal cost savings have been realized in the majority of applications covered.

AESSEAL® is also committed to providing customer service through modular design and high levels of component inventory.

For further information on any of the products covered or any other Screen application, contact your nearest AESSEAL® sales and technical support team.

AESSEAL®

SCREEN SEALS

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# Case History

## INDEX OF SPECIFIC APPLICATIONS

### Seal Type

BIRD Screen Seal:	706
IADC™:	700, 703, 705, 1205, 1208, 1209, 1210
IASC™:	221, 397, 716, 722
SAI™/USL™:	004, 224, 723
SAI™/O SEAT:	273
CDSA™:	291
MDC™:	1206, 1207

### Equipment

Ahlstrom Karhula Bird Centriscreen:	224, 273
Bird Centriscreen:	723, 1208, 706
Black & Clawson 30 P Screen:	397, 716
Black & Clawson Omega Screen:	221
Black & Clawson PS 36 Screen:	722
Black & Clawson Selectifier Screen:	397
Finckh Screen:	004
Hooper Pressure Screen:	700, 703, 705
Voith:	291
Valmet TP100:	1205
Valmet Tampella:	1209
Sunds Jyla:	1206, 1207
Beloit HI-Q- Fine Screen:	1210

### Case No. 004B

In a Paper Recycling Plant, an AESSEAL® 91mm SAI™/USL™ seal was fitted to a Herman Finckh Screen, which is a rotating vertical Screen.

This extracts the sand and grit particles from the paper pulp and rotates at 1,500 rpm. The input pressure is 2.5 bar gauge and the outlet pressure is 1.8 bar gauge. Previously, the bearing cartridge in the middle of the assembly was sealed with packing. This got embedded with the sand and grit, and rapidly became ripped and leaked into the bearings. The unit had to be adjusted on a weekly basis, which involved an almost complete strip-down.

The Carbon/Chrome Oxide seal combination, with Viton® 'O' rings was fitted in December 1987 and lasted 18 months.

See drawing number 6447977A for a general arrangement of the equipment modifications.

### Case No. 221C

In a Paper Mill, an AESSEAL® 60mm cartridge seal with solid Tungsten Carbide faces and Viton® 'O' rings was installed in a Black and Clawson Omega Screen. The Screen rotates at 980 rpm. and removes clumps of undigested paper and other foreign matter from the paper stock. The paper stock is at 30° C and below 10 bar pressure. The Screen was fitted with a single spring type seal which proved difficult to install due to the screw clamp arrangement for tightening the stationary onto the rotating element of the machine. Many breakages were experienced.

The AESSEAL® seal installed was a machined gland CURC™ where the seal elements are mounted into the unit in a reverse direction.

This IASC™ was installed in August 1990 and is working well.

Due to the seal design, a new plain shaft and seal 'pedestal' as per the AESSEAL® drawing were required.



*Case No. 224C*

In a Paper Mill, AESSEAL® 95mm SAI™ / USL™ seals with Solid Tungsten Carbide faces and Viton® 'O' rings were installed into Ahlstrom Karhula Bird Centriscreens. The Screens rotate at 1,477 rpm and screen the stock from the top fan pumps prior to it reaching the machine. The stock is at 2% and 50°C and a pressure of 15psi.

The Screens were previously sealed using Lip Seals which gave very poor service life due to the abrasive nature of the product, and which allowed the stock into the bearing assembly.

The AESSEAL® SAI™/USL™ seals were installed in October 1990 and are working satisfactorily.

The USL™ body is O-ring mounted and has a pin anti-rotation device.

*Case No. 273C*

In a Paper Mill, AESSEAL® 5 1/2" SAI™s and 'O' ring mounted stationaries with Carbon/Chrome Oxide faces and Viton® 'O' rings were installed in an Ahlstrom Karhula Bird Centriscreen. The unit rotates at 16.7 revs/second and removes clumps of paper from the stock prior to it entering the machine. The product is at 40°C and 60 m/hd pressure. Previously the Screen was sealed using an expensive multi-sprung seal which gave a six month maximum seal life.

The AESSEAL® units were installed in January 1990 and are working leak-free.

*Case No. 291C*

In a Paper Mill, AESSEAL® 125mm CDSA™ seals with Solid Tungsten Carbide inboard faces and Viton® 'O' rings were installed in Voith Turbo Separators AJS31. The shafts rotate at 450 rpm. and are used to clean recycled raw paper stock. The product is at 30°C, 2 bar gauge pressure and includes staples and bailing wire. The pumps were previously packed using a Kevlar material. This required repacking every two weeks and caused extreme sleeve wear and product ingress to the bearings. The bearings required changing every three to six months.

The AESSEAL® CDSA™ seals, with water barrier fluid at 2.5 bar supplied by an AESSEAL® SSE10 vessel, were installed in April 1991 and are still operating leak-free.

See drawing number 6449158 for seal design and installation.

*Case No. 397E*

In a Paper Mill, an AESSEAL® 2 1/8" IASC™ seal with Solid Tungsten Carbide faces and EPR O-rings was installed in a Black and Clawson P30 Selectifier Pressure Screen. The unit rotates at 900 rpm and removes clumps of paper fibres from 3%-5% stock. The product is at 30°C and 3 bar gauge pressure. The unit was previously sealed with the manufacturer's seals which were difficult to install and only gave a six month average life.

The AESSEAL® IASC™ seal was installed in July 1991 and is still operating leak-free.

Seal type is Z784.

*Case No. 700G*

In February 1998, AESSEAL® supplied and installed two 4.125" IADC™, TC/TC//TC/CAR double seals with Aflas® elastomers for a PSV 400"B" Hooper Pressure Screen application, in a Paper Mill in the USA.

An adapter plate was designed to fit directly onto the Screen vessel, so that the seal could be bolted from the bearing side.

The seal primarily seals Screened paper stock, at an ambient temperature and a pressure of 80 psi (5.5 bar). The seals were installed and have no reported problems to date. See Z4422 for the seal, and Z4596 for the adapter plate, and AESSEAL® drawing G.A. number 6462849 for further details.

*Case No. 703G*

In December 1997, AESSEAL® supplied and duly installed two 4.125" IADC™, TC/TC//TC/CAR double seals with Aflas® elastomers for a PSV 2600 Hooper Pressure Screen application, in a Paper Mill in the USA.

An adapter plate was designed to fit directly onto the Screen vessel, so that the seal could be bolted from the bearing side.

The seal primarily seals Screened paper stock, at an ambient temperature and a pressure of 80 psi (5.5 bar). The seals were installed and have no reported problems to date. See Z4422 for the Seal, and Z4423 for the adapter plate, and AESSEAL® drawing G.A. number 6462045 for further details.

In February 1998, the plant ordered 3 more identical seal units for a Hooper pressure Screen model PSV 400, see case histories 700 and 705.

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*Case No. 705G*

In February 1998, AESSEAL® supplied and installed one 4.125" IADC™, TC/TC//TC/Car double seal with Aflas® elastomers for a PSV 400°C" Hooper Pressure Screen application, in a Paper Mill in the USA.

An adapter plate was designed to fit directly onto the Screen vessel, so that the seal could be bolted from the bearing side.

The seal primarily seals Screened paper stock, at an ambient temperature and a pressure of 80 psi (5.5 bar). The seals were installed and have no reported problems to date. See Z4422 for the seal, and Z4597 for the adapter plate, and AESSEAL® drawing G.A. number 6462850 for further details.

*Case No. 706G*

In September 1997, AESSEAL® supplied and installed one 4.724" (120mm) Bird Screen, TC/TC single seal with Aflas® elastomers for a Bird Centriscreen model 80, in a Paper Mill in the USA.

The seal replaced a Sealol 676 (special) unit, and primarily Screened paper stock at an ambient temperature (mill water) and a pressure of 80 psi (5.5 bar). The seals were installed and have no reported problems to date. See Z4267 for the Seal, and AESSEAL® drawing G.A. number 6461080 for further details.

*Case No. 716G*

In July 1991, a Paper Mill in Northumberland, England was fitted with 2.125" IASC™ single seals installed on Black & Clawson 30P Screens. In October 1997 one was changed due to machine repair (not seal failure). A new seal was installed and all units are running (to date). Reference Z784.

*Case No. 722G*

In a Recycling Mill in the South of England, several IASC™ Screen seals were fitted on BLACK & CLAWSON PS 36 Screens. The seals supplied by AESSEAL® replaced Ropac R32 Slurry stationary seals, and were installed in November 1993. One failed in July 1997. This was replaced and all are still running, since November 1997.

*Case No. 723G*

In a Recycling Mill in the South of England, 6 off SAI™'s and CURC™ Stationaries have been installed on BIRD Screens. Slight modifications were made to the machine in November 1993, when AESSEAL® replaced the OEM Garlock Clipper seal. Since November 1997 no failures have been reported.

*Case History 1205H*

In April 1998, a double mechanical cartridge seal with pumping scroll was fitted to a Valmet TP100 Screen on the secondary broke stage in a recycling fibre plant in the UK.

With growing environmental concerns and plant focus on water usage, AESSEAL® elected to install a "pumping" mechanical seal with SSE25 (25 UK litres, 6.6 US gallons) Jumbo pot.

Operating pressures were around 2 to 4 bar, (29-58 psi) depending on whether or not the basket was blocked or Jet washed. The seal lasted 12 months and was replaced in April 1999 with an improved design, which could maintain higher product to barrier fluid differentials.

The current seal is installed on the same SSE25 pot, and runs around 48°C (119°F), and 1200 rpm.

The seal is currently installed and working without any problems.

For further information, see Z Reference 4658, and AESSEAL® general arrangement 6463079.

*Case History 1206H*

In 1998, a 100mm MDC™ double mechanical cartridge seal was fitted to a Sunds Jyla 150 Screen in a plant in Sweden.

The seal is currently installed and working (for 81 weeks to date) without any problems.

For further information, see Z Reference 3615 and AESSEAL® general arrangement 6458574.

*Case History 1207H*

In 1996, a 75mm MDC™ double mechanical cartridge seal was fitted to a Sunds Jyla 100 Screen in a plant in Sweden.

The seal is currently installed and working (for 163 weeks to date) without any problems.

For further information, see Z Reference 3840 and AESSEAL® general arrangement 6459736.

### Case History 1208H

In December 1999, a double mechanical cartridge seal (IADC™) was designed and dispatched to be fitted to a Bird Screen Model 400 for a pulp & paper plant in the USA.

The seal was fitted on a Black Liquor process with operating temperatures of around 180°F (82°C).

For further information, see Z Reference Z5755 and AESSEAL® general arrangement 6469586.

### Case History 1209H

In August 1998, a double mechanical cartridge seal (IADC) was designed and fitted to a Valmet Tampella Screen for a Pulp & Paper plant in the USA.

The 120mm seal replaced a Safematic SAF-120-QREG-303373, and was supplied with TC/TC//TC/Car seal faces and Aflas elastomers.

For further information, see Z Reference Z4840, and AESSEAL® general arrangement 6464264.

### Case History 1210H

In a Paper Mill in the USA, 7 off AESSEAL® 85mm IADC's TC/TC//TC/CB with Aflas 'O' rings were installed on a Beloit model 210 Hi-Q Fine Screens. These seals were installed on a mill outage as part of a project upgrade to the Screens. Installations occurred on August 29th 1998 and are still operational to date. The purchase cost savings were \$2000 compared to the competitor seals previously installed.

The seal water line was installed using an inverted P-Trap configuration and the seals did not fail when the mill lost its entire mill water supply due to a broken water line soon after start-up.

The inverted P-trap water supply maintained enough water to provide an adequate fluid film to the seal in spite of the fact that there was no mill water for a period of time.

For further information, see Z Reference 4855 and AESSEAL® general arrangement 6464344.

### **NOTE:**

Due to AESSEAL's policy of continuous improvement the following seal types have been upgraded.:-

*SCI upgraded to SCUSI  
CSAI upgraded to CURC  
CAPI upgraded to CURC  
CAPO upgraded to CRCO  
CMDS upgraded to CDSA  
CMDS upgraded to CDSA & DMSF*

The original products evolved into more modern seals which were designed to enhance application performance. The product model reference in the case study is the most modern design, even if at the time of installation the actual installation was the predecessor model.

All information featured in these case histories has been obtained directly from Plant Engineers.

Although we have confidence in the accuracy of this information, it is not offered as a guarantee for seals manufactured by AESSEAL®

Any prospective user of our product should verify the information stated to their own satisfaction.

Further information is available on all the case histories contained in this booklet upon request.

Issue 'A' on a case history refers to information which was current on the 31st. January, 1989.

Issue 'B' refers to information which was current on 31st. January, 1990.

Issue 'C' refers to information which was current on 31st. January, 1991.

Issue 'D' refers to information which was current on 31st. January, 1992.

Issue 'E' refers to information which was current on 31st. January, 1993.

Issue 'F' refers to information which was current on 31st. January, 1995.

Issue 'G' refers to information which was current on 31st. January, 1998.

Issue 'H' refers to information which was current on 31st. October, 1999.

Issue 'I' refers to information which was current on 31st. March, 2000.

Issue 'J' refers to information which was current on 31st. November, 2000.

Where the statement 'the seals are still working' is made, this means that the customer is or was still using AESSEAL® mechanical seals at the time the case history was updated: as denoted by either Issue 'A', Issue 'B', Issue 'C', Issue 'D', Issue 'E', Issue 'F', Issue 'G', Issue 'H', Issue 'I' or Issue 'J'.

For more detailed information, please contact our Applications Department.

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ALWAYS TAKE SAFETY PRECAU-  
TIONS**

- GUARD YOUR EQUIPMENT
- WEAR PROTECTIVE CLOTHING



**WARNING**

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