

Bearing Protection

Eliminate over 50% of bearing failures



the AESSEAL® group of companies

designers and manufacturers of mechanical seals,
bearing protectors and seal support systems
which maximize rotating equipment up-time.

LabTecta®66 — Save Your Bearings

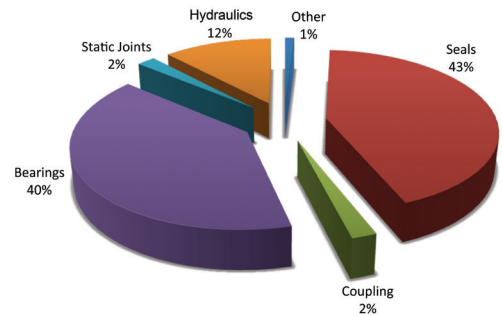
Research* shows that 52% of bearing failures are due to contamination of the bearing oil. These represent 20.8% of all rotating equipment failures. Save your bearings and improve your reliability with LabTecta®66.

Research into Bearing Failures

Reliability by numbers: 52% of bearing failures. A study into equipment reliability conducted at a major refinery has published statistics on causes of equipment failure. They concluded that 40% of overall rotating equipment failures (pumps, mixers, etc) were due to bearing failure.

They further estimated that 48% of all bearing failures were due to particle contamination and a further 4% were due to corrosion (caused by liquid in the oil). Therefore **52%** (total contamination cause) **of 40%** (bearing failures) = **20.8% of all rotating equipment failures** are caused by contamination of the bearing oil.

Cause Categories Equipment Failure



LabTecta®66 has achieved...

Ingress Protection code rating

The premier third-party standard for Ingress Protection.

Level 6 Protection against solids

Defined as "No ingress of dust; complete protection against contact."

Level 6 Protection against water

Defined as "Water projected in powerful jets (0.5" / 12.5mm nozzle) against the enclosure from all practicable angles shall have no harmful effects". Tested with at least 26 US gallons (100 litres) per minute for at least 3 minutes, while equipment is both static & rotating.

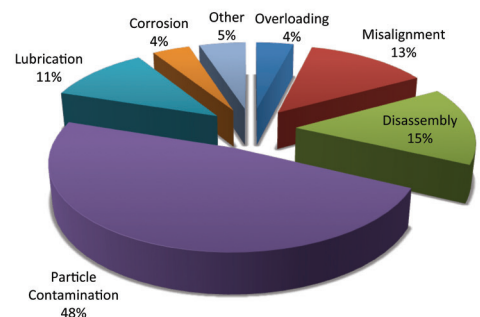


Bearing-oil Contamination is Preventable

LabTecta®66 is a labyrinth design bearing-protector seal with an innovative design improvement, the LabTecta®66 shut-off valve, which we believe to be the secret to the product's phenomenal success.

The effectiveness of LabTecta®66 has been verified in third-party tests by the Ingress Protection Code. **LabTecta®66 has achieved a rating of IP66: proving its effectiveness in protecting your bearings from contamination failures.**

Causes of Bearing Failure



* Bloch, Heinz; "Pump Users Handbook: Life Extension" 2011.

Global

Customer service is provided from 230 locations in 104 countries, including 9 manufacturing and 58 repair locations, with more than 300 customer service representatives who visit industrial plants every day.

Canada - Cariboo Pulp & Paper Company

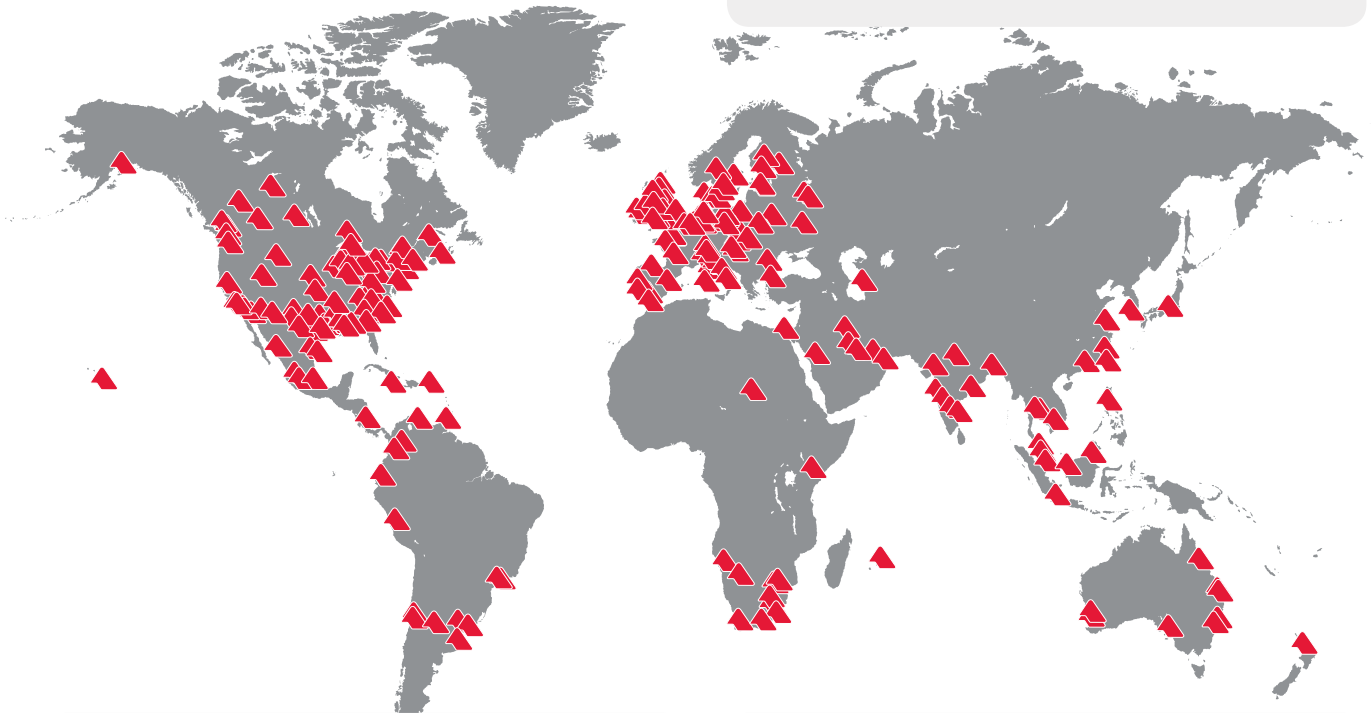
"I have tested most of the available bearing isolation devices on the market today and found the AESSEAL LabTecta to provide the best performance and overall value."

Ben Staats
Reliability Engineer
Machine Shop Supervisor

UK - Sulzer Pumps

AESSEAL provided a non-contacting bearing seal solution for a number of Sulzer MS double-ended pumps destined for a project in the Middle East.

The API610 9th Edition between-bearings pumps (BB3) rotate at 6,000rpm with Michell Four Lobed bearings, operating in a forced oil lubrication system. After passing the OEM tests on the Sulzer test bay in the UK, three double-ended API610 BB3 pumps complete with the innovative LabTecta designs, were delivered to the end user plant in the Middle East.



USA - Fraser Papers Inc

"Managing a machine shop in the paper industry provides opportunities to evaluate how products perform under extreme conditions. Having had prior outstanding results with LabTecta seals installed on Falk gear reducers, I found it necessary to give it the ultimate test. For years, we have experienced failures on our hydro pulper gearboxes primarily due to contamination and infiltration of paper stock and water entering these vertical shaft units.

We converted from labyrinth to lip seals with no success. With AESSEAL support, we modified our top seal-housing chamber to accept a LabTecta-TE. This conversion occurred back in August 2006 and it surpassed our previous remedies and expectations. Several more hydro pulper gearbox conversions will be performed as they reach our repair shop, and all will have LabTecta-TE installed."

Daniel Dionne
Machine Shop Supervisor

Netherlands - Zeeland Refinery BV

Zeeland refinery BV asked AESSEAL to install LabTecta type STAX bearing protectors in one of its steam turbines without making modifications to the existing equipment.

The installation had to take place during a scheduled plant shut down in June 2009. No detailed drawings of the bearing housing were available – so the LabTecta designs would have to be measured, designed, manufactured and installed all within this narrow window.

The standard STAX (Steam turbine axial-movement) design had to be re-engineered to fit into the existing groove of the OEM labyrinth seals with a very short outboard length of less than 0.25" (6.35mm), to fit around existing steam-deflectors and oil fingers. The custom LabTectas were delivered within one week of taking measurements and the steam-turbine's reliability issues have been solved – running perfectly since June 2009.

LabTecta®66 Bearing Protectors

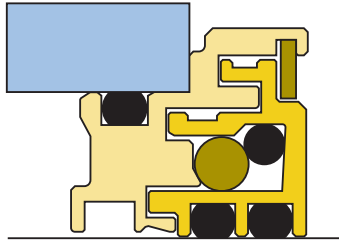
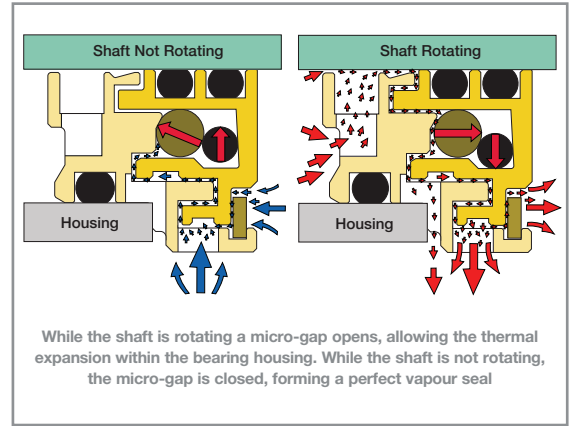
A true non-contacting labyrinth design with a shut-off design that really works.

- **Verification Tested contacting & non-contacting bearing seal designs**

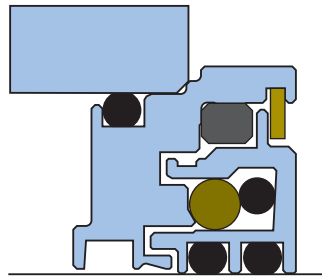
- Proven to increase equipment reliability in pumps, electric motors, fans, pillow blocks, steam turbines and gearboxes
- IP66 certified designs that conform to IEEE Std. 841-2001
- No shaft wear. Retrofittable on shafts previously worn by lip seals
- Easily rebuildable with no special tools, chemicals or equipment



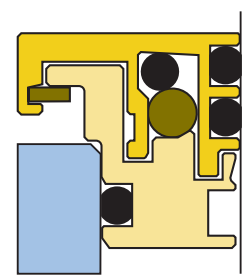
Water contamination on a continuous digester prior to a LabTecta®66 being installed
(Case Ref: 3232)



LabTecta®66
(Full Phosphor Bronze Construction)

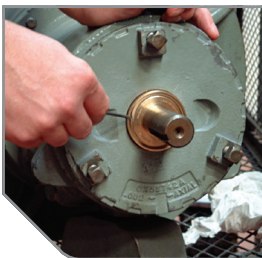


LabTecta®66SS
(Full Stainless Steel Construction)



LabTecta®66TE
(Top Entry)

Field Repairable in Just Three Minutes for Minimal Cost



The LabTecta®66 is field repairable in three minutes for the cost of an inexpensive spares kit. No special disassembly tools are required, just one small conventional screwdriver and/or an 'O' Ring extraction tool.



No press / special tools needed for repair



No torches / heat needed for repair

MagTecta™ Contacting Face Seals

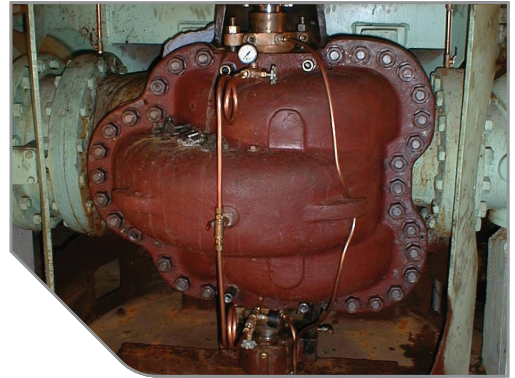
Magnetically energized bearing protectors.

- Installed in tens of thousands of applications worldwide
- Dual-face magnetically attracted bearing seals
- Magnets out of the lubrication media and atmosphere
- Fits where a lip seal or labyrinth seal fits

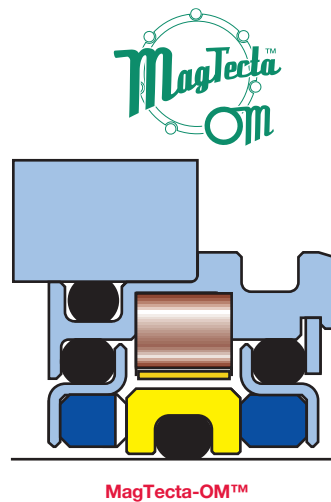
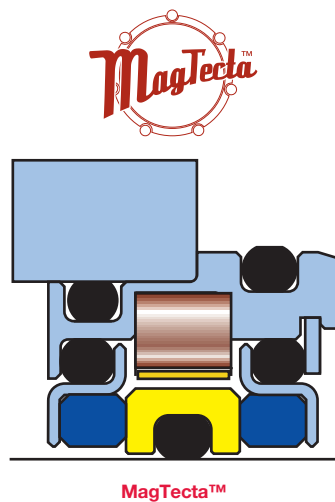
Splash and flooded lubrication ✓

Oil mist lubrication ✓

Grease packed ✓



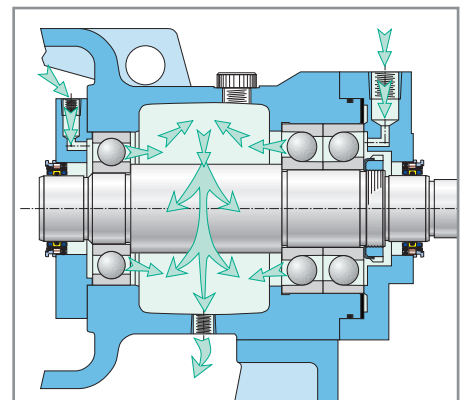
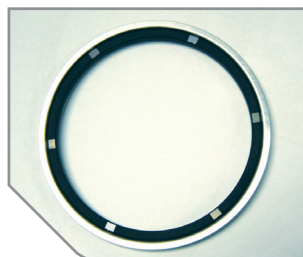
Vertical pump with MagTecta™ seals installed in a water pumping station (case Ref: 1436)



Innovative Technology

The MagTecta-OM™ is a face seal that prevents oil mist pollution and has been applied to **thousands of pieces of equipment** in the hydrocarbon processing industry.

The unique inboard face of the MagTecta-OM™ (shown right) allows oil mist to enter through its face grooves. Once inside, the oil mist liquefies to provide an oil splash environment at the external seal faces. This provides seal face lubrication, making the MagTecta-OM™ ideally suited for this environment.

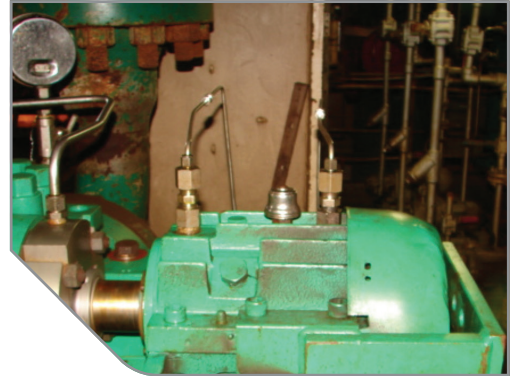
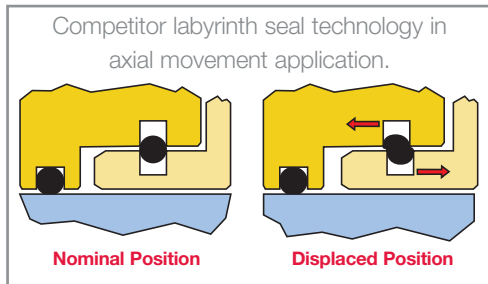


API preferred oil mist lubrication arrangement

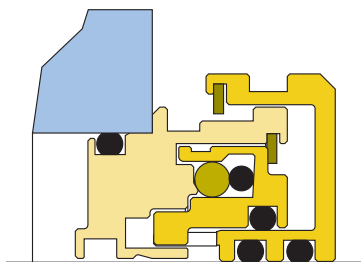
Axial Shaft Movement

Bearing protector designs that are engineered to accommodate axial shaft movement.

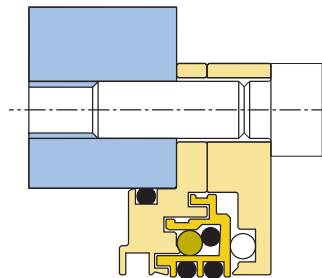
- **No axial sliding movement on the shaft means the rotary drive integrity is not compromised**
- Superior protection against contamination ingress as the rotor to stator seal integrity is not affected by the axial movement
- Standard LabTecta®66AX design accommodates $\pm 0.100"$ ($\pm 2.5\text{mm}$) of axial movement; however, it can be designed to take any amount of movement that the application dictates
- Unique dual rotor design with drivelock for superior reliability



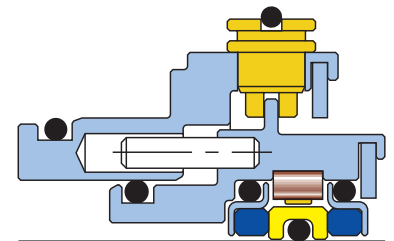
Sulzer MSD BB3 pump with MagTecta-OM-AX™ in Brazil
(Case Ref: 3453)



LabTecta®66AX



LabTecta®66AXX

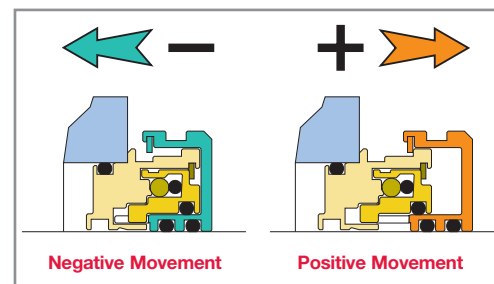


MagTecta-AX™

Innovative Technology

The LabTecta®66AX design uses a unique sliding rotor that allows the seal to absorb axial movement internally. With this rotor design no axial sliding movement on the shaft exists that can cause shaft damage, drive-ring damage or allow contamination to pass under the drive 'O' ring.

The LabTecta®66AX provides superior reliability by utilizing double drive rings to provide a secure grip on the shaft, reducing the chance of shaft slip and a dual-rotor design with a secure drivelock to ensure both rotors continuously follow the shaft.



Angular Shaft Misalignment

Bearing protectors that are engineered to accommodate angular shaft movement.

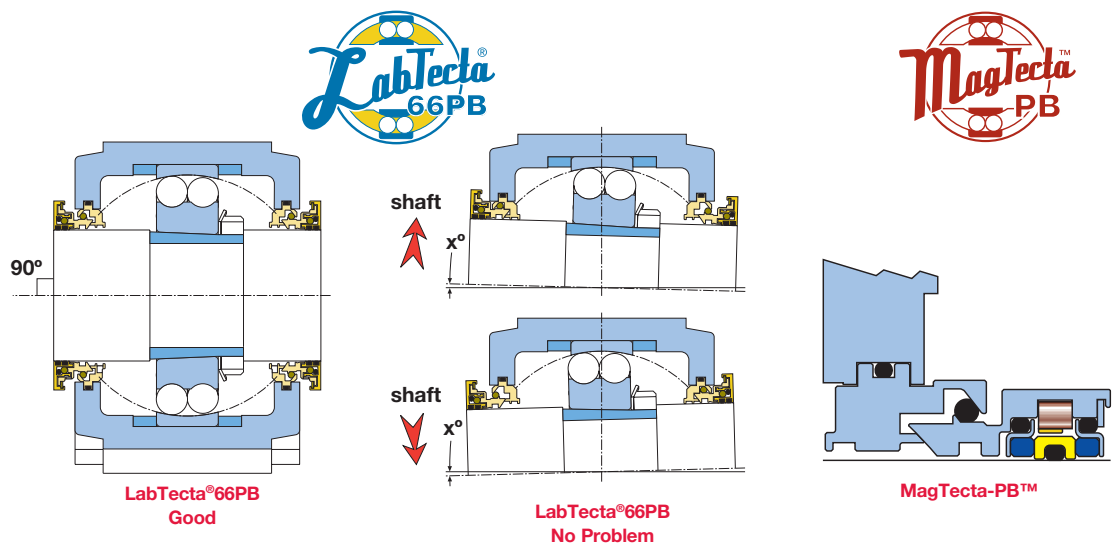
- **Engineered to absorb the angular misalignment of pillow / plummer bearing blocks**
- Accepts the same degree of angular misalignment as **any** standard bearing offered by the OEM; one solution fits all
- Extended bearing and equipment life from better protection against bearing contamination
- Reduced lubrication requirements through better lubricant retention and preventing contamination



Pillow block without LabTecta®66PB technology
(Case Ref: 3217)



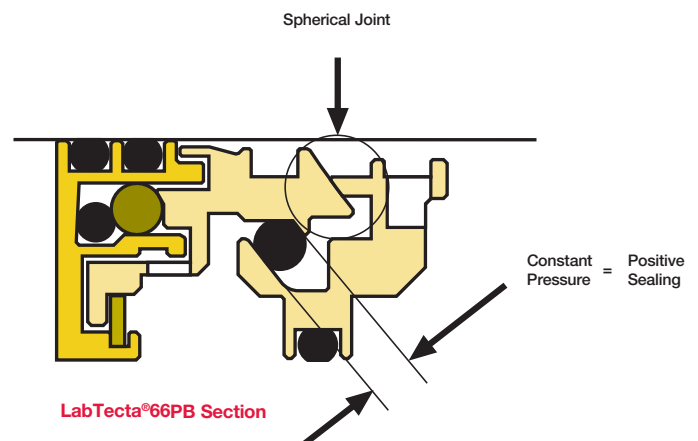
SKF pillow block with LabTecta®66PB in a pulp and paper plant
(Case Ref: 3217)



Innovative Technology

The LabTecta®66PB utilizes a unique two-piece stator design that provides a self-aligning joint that allows the seal to align both to the bearing block and to the shaft.

The joint also provides constant pressure on the static elastomer to provide positive sealing throughout the range of motion.



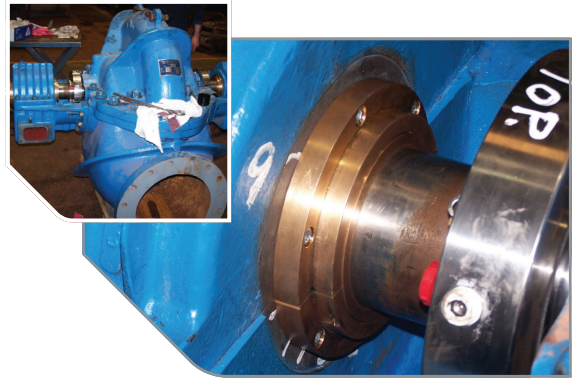
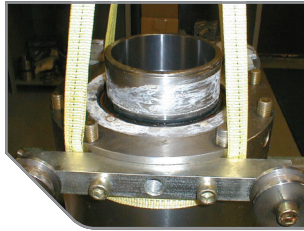
Radially Divided Seals

The only radially divided bearing protector available with rotor / stator static sealing technology as standard.

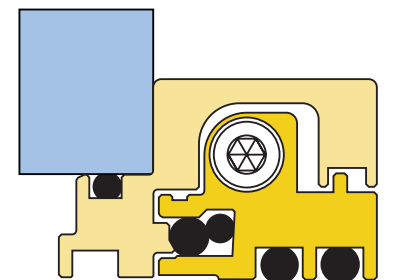
- Extend the bearing life of large, high maintenance cost equipment
- Reliable protection against contamination ingress and lubricant egress
- Easy installation - Radially split design
- Positive lubricant retention throughout the life of the equipment
- No shaft wear or damage to equipment



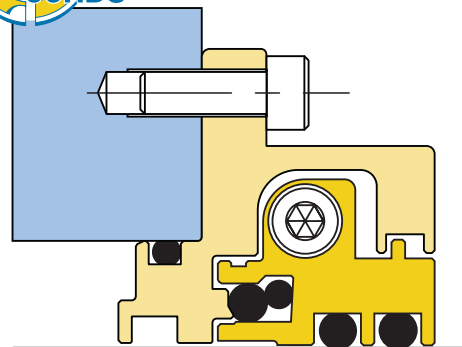
\$50,000 mixer bearing destroyed by rainwater penetrating a \$20 lip seal
(Case Ref: 3459)



Flange mounted LabTecta®66RDS installed on a double-ended pump in an alumina plant (Case Ref: 3304)



LabTecta®66RDS



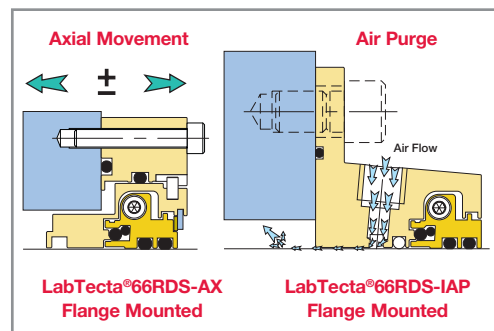
LabTecta®66RDS Flange Mounted



Poppet 'O' ring technology

Innovative Technology

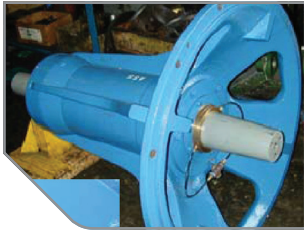
The LabTecta®66RDS is available in several configurations including flange mounted, axial movement and internal air-purge, giving even greater flexibility and tailored to suit your specific application.



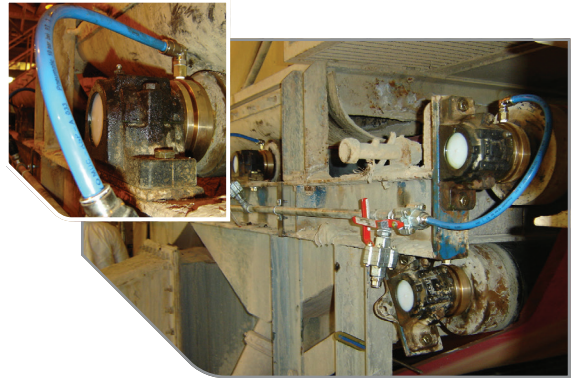
Air Purge Designs

By changing the seal environment, even the most challenging applications can be reliably sealed.

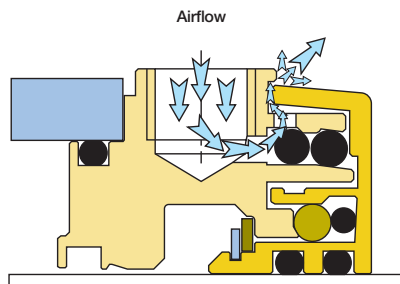
- Dramatically improve the equipment life in demanding applications
- Prevent contamination across the seal
- Maximize reliability with no heat generation, vibration or lubrication



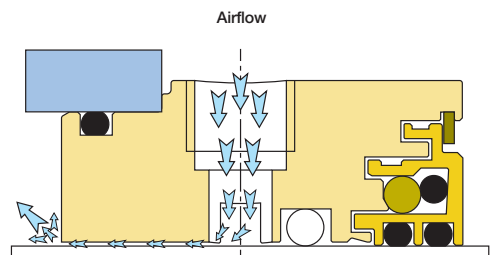
LabTecta®66TE-OAP installed on a hydropulper gearbox in a pulp mill (Case Ref: 3327)



Multiple LabTecta®66PB-OAP installed on a conveyor belt in the mining industry (Case Ref: 3317)



LabTecta®66OAP (Outboard Air Purge)



LabTecta®66IAP (Inboard Air Purge)

The LabTecta®66OAP is specifically designed for use in extreme environments and applications where contamination may completely cover the seal / equipment. The unique design uses a positive air purge to enhance the performance of the labyrinth, with AESSEAL® mechanical seal pressure balancing technology to maximize the performance of the seal and minimize air consumption.



LabTecta®66OAP installed on a powder application (pre-start up) in Argentina (Case Ref: 3220)

LabTecta®66OAP after three months running. Note: Air purge keeps the dust away from the stator to rotor interface

Flooded Applications

Three decades of mechanical seal experience applied to seal flooded bearing applications correctly.

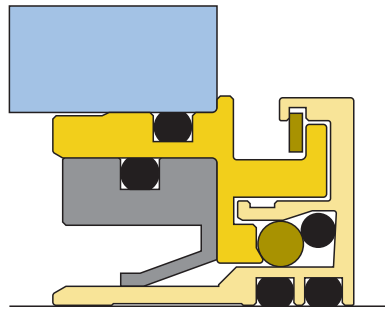
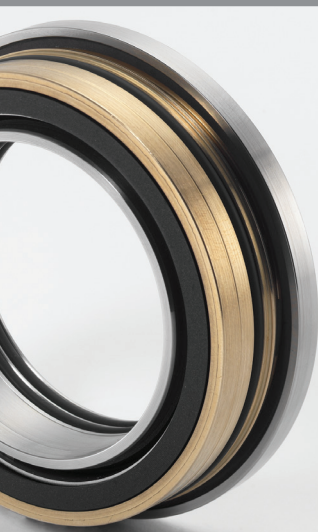
- Range of bearing seals which operate in a totally flooded / submerged environment
- Clipped and unitized designs for ease of installation



MagTecta-FS™ solved a continuous oil leak on a gearbox in Brazil (case Ref:3494)

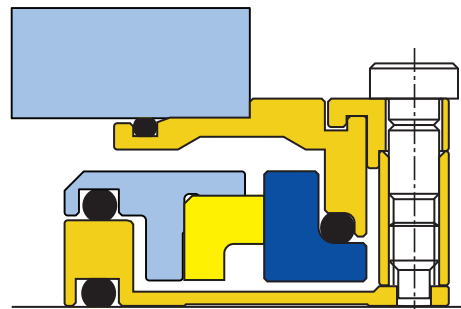


Archimedean screw fitted with AESSEAL® bearing seals in a UK sewage plant (Case Ref:1348)



LabTecta®66FS

High performance PTFE lipseal & IP66 rated LabTecta®66 all in one



MagTecta™FS™

Mechanical seal face technology (spring energized)

“ I firmly conclude this ingenious field-repairable isolator will prove highly cost effective and lead to demonstrable equipment failure reductions. ”

Heinz P .Bloch P.E.

Independent Professional Engineer

Steam Turbine designs – LabTecta®66ST, LabTecta®66STAX

Process steam turbines present a unique challenge for bearing protection.

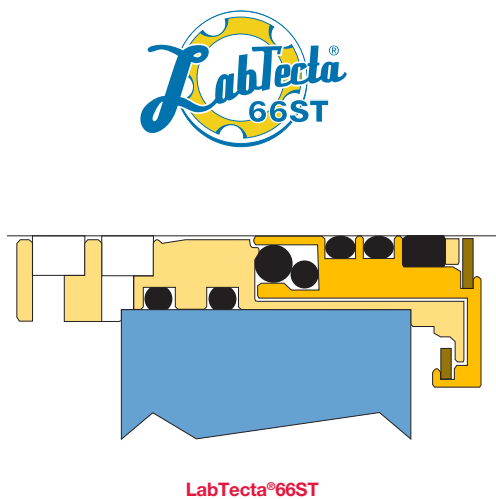
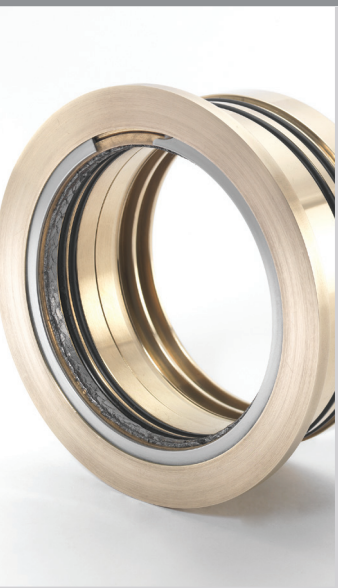
As the carbon rings containing the steam wear, high temperature / high velocity steam travels down the shaft directly at the bearing seal. Standard OEM labyrinth seals have proven to be ineffective preventing steam ingress.

AESSEAL® has developed LabTecta®66 designs specifically designed for steam turbine applications. These designs feature:

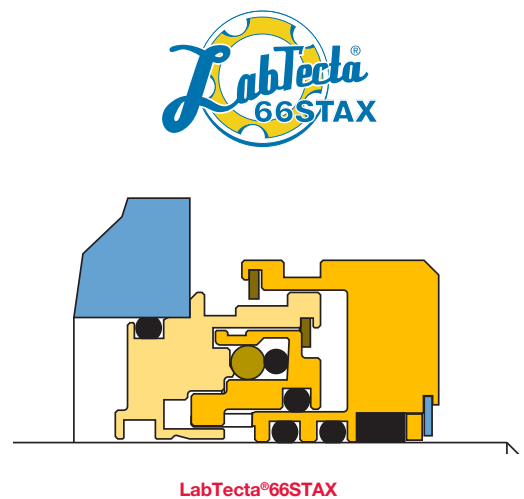
- High temperature static shaft seal
- Steam deflector / Flinger
- Aflas® 'O' rings as standard
- Internal shut-off valve
- Extra clearances for thermal expansion

For smaller steam turbines, the LabTecta®66ST design provides excellent protection in a compact package. For larger steam turbines, the LabTecta®66STAX provides easy installation with the capability to accommodate large axial shaft movement.

Standard designs are available for common steam turbines models like the Elliott® YR series. Specific designs can be manufactured at no additional charge.



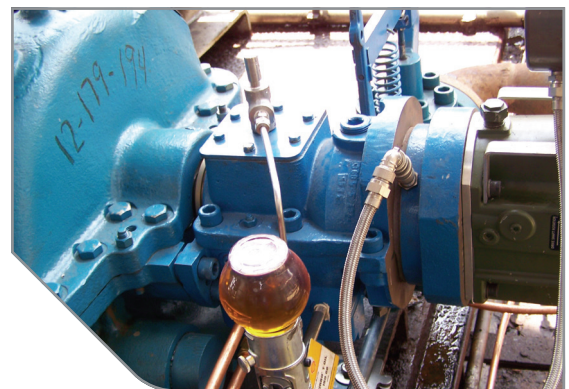
LabTecta®66ST



LabTecta®66STAX

The single most cost-effective upgrade to steam-turbine reliability

Multiple refineries in the USA have upgraded steam turbines from the existing OEM labyrinth to the LabTecta®66ST. The existing OEM Labyrinths allowed the steam leaking out the carbon rings to pass through the labyrinth and contaminate the oil. It is not uncommon to drain 'cups' of water from the oil in many refinery applications. This causes extremely short bearing life. Since installing the LabTecta®66ST these problems have been solved.



LabTecta®66 installed on steam turbine in a USA refinery
(Case Ref: 3495)

Our purpose is to give our customers such exceptional service that they need never consider alternative sources of supply.

	AESSEAL plc, Rotherham, UK	Tel: +44 (0) 1709 369966	rotherham@aesseal.com
	AESSEAL plc, Derby, UK	Tel: +44 (0) 1332 366738	derby@aesseal.co.uk
	AESSEAL plc, Middlesbrough, UK	Tel: +44 (0) 1642 245744	northops@aesseal.co.uk
	AESSEAL plc, Upminster, UK	Tel: +44 (0) 1708 256600	se@aesseal.co.uk
	AESSEAL plc, Pontypridd, UK	Tel: +44 (0) 1443 844330	pontry@aesseal.co.uk
	AESSEAL (MCK) Ltd, Lisburn, UK	Tel: +44 (0) 28 9266 9966	salesmck@aesseal.co.uk
	AESSEAL Ireland Ltd, Lisburn, UK	Tel: +44 (0) 28 9266 9966	sales.ireland@aesseal.co.uk
	AESSEAL Ireland Ltd, Co Cork, Eire	Tel: +353 (0) 214 633477	sales.ireland@aesseal.com
	AESSEAL Inc. Rockford, TN, USA	Tel: +1 865 531 0192	usa@aesseal.com
	AESSEAL Inc. Kingsport, TN, USA	Tel: +1 423 224 7682	kportadmin@aesseal.com
	AESSEAL Inc. Marion, IA, USA	Tel: +1 319 377 0170	midwest@aesseal.com
	AESSEAL Inc. Fairfield, ME, USA	Tel: +1 207 453 6915	neadmin@aesseal.com
	AESSEAL Inc. Longview, WA, USA	Tel: +1 360 414 0118	nwadmin@aesseal.com
	AESSEAL ALAA, Jubail, Saudi Arabia	Tel: +966 3 361 7461	info@aesseal.com.sa
	AESSEAL COJ sarl, Alger, Algeria	Tel: +213 (0)555 033247	contact@aescoj-dz.com
	AESSEAL Argentina SA, Buenos Aires, Argentina	Tel: +54 11 4721 0875	aesseeal@aesseal.com.ar
	AESSEAL Australia Pty Ltd, Seventeen Mile Rocks, Australia	Tel: +61 7 32791144	customer.service@aesseal.net.au
	AESSEAL Benelux BV, Breda, Holland	Tel: +31 (0) 76 564 9292	seals@aesseal.nl
	AESSEAL Brasil Ltda, São Paulo, Brazil	Tel: +55 11 5891 5878	aesseealbrasil@aesseal.com.br
	AESSEAL Canada Inc, Surrey, B.C., Canada	Tel: +1 604 535 7512	canada@aesseal.com
	AESSEAL Caribbean Ltd, Trinidad W.I	Tel: +1 868 483 7881	caribbean@aesseal.com
	AESSEAL Chile SA, Providencia Santiago, Chile	Tel: +56 2 2343022	aesseeal@aesseal.cl
	AESSEAL China Ltd, Ningbo, China	Tel: +86 (0) 574 8823 2888	service@aesseal.com.cn
	AESSEAL China Ltd. Shanghai, China	Tel: +86 (0) 21 60761081	service@aesseal.com.cn
	AESSEAL China Ltd. Nanjing, China	Tel: +86 (0) 25 68139838	service@aesseal.com.cn
	AESSEAL China Ltd. Dalian, China	Tel: +86 (0) 411 83729851	service@aesseal.com.cn
	AESSEAL Colombia S.A., Bogota, Colombia	Tel: +57 (1) 634 9095	info@aesseal.com.co
	AESSEAL Czech sro, Brno, Czech Republic	Tel: +420 543 212 489	aesseeal@aesseal.cz
	AESSEAL Danmark, A/S, Koge, Denmark	Tel: +45 56 64 14 00	mail@aesseal.dk
	AESSEAL Deutschland AG, Kronau, Germany	Tel: +49 (0) 7253 8090	info@aesseal.de
	AESSEAL Deutschland AG, Sauerlach, Germany	Tel: +49 (0) 8104 639607	info@aesseal.de
	AESSEAL Finland OY, Muurame, Finland	Tel: +358 1433 84500	aesseeal@aesseal.fi
	AESSEAL France SAS, Nieppe, France	Tel: +33 320 172850	contact@aesseal.fr
	AESSEAL India Pvt. Ltd, Pune, India	Tel: +91 2113 302222	aesseeal@aesseal.in
	AESSEAL India Pvt. Ltd, Chennai, India	Tel: +91 44 2481 7786	chennai@aesseal.in
	AESSEAL Coldweld Pvt. Ltd, Vasai (East), Thane, India	Tel: +91 250 645 6884	mail@aescoldweld.com
	AESSEAL Italia Srl, Gallarate, Italy	Tel: +39 0331 799 952	info@aesseal.it
	AESSEAL Malaysia, SDN BHD, Selangor, Malaysia	Tel: +603 806 21233	aesseeal@tm.net.my
	AESSEAL Malaysia, SDN BHD, Pahang, Malaysia	Tel: +609 583 6133	aesseeal@tm.net.my
	AESSEAL Malaysia, SDN BHD, Johor, Malaysia	Tel: +607 388 8323	aesseeal@tm.net.my
	AESSEAL Mexico, S de RL de CV, Mexico City, Mexico	Tel: +52 5553845070	info@aessealmx.com
	AESSEAL Middle East FZE, Dubai, U.A.E.	Tel: +9714 884 9301	sales@aesseeal.ae
	AESSEAL Norway AS, Oslo, Norway	Tel: +47 2273 6849	info@aesseeal.no
	AESSEAL Polska Sp. z O.O. Bielsko-Biala, Poland	Tel: +48 33 818 4135	aesseeal@aesseeal.com.pl
	AESSEAL Univeda LDA, Lisbon, Portugal	Tel: +351 217 969212	geral@aesseeal.pt
	AESSEAL Russia, Koroliov City, Moscow, Russia	Tel: +7 495 777 4011	info@aesseeal.ru
	AESSEAL Pty Ltd, Durban, South Africa	Tel: +27 (0) 31 903 5438	durban@aesseeal.co.za
	AESSEAL Pty Ltd, Johannesburg, South Africa	Tel: +27 (0) 11 466 6500	admin@aesseeal.co.za
	AESSEAL Ibérica SL, Tarragona, Spain	Tel: +34 977 55 43 30	info@aesseeal.es
	AESSEAL Sweden AB, Stockholm, Sweden	Tel: +46 (0) 8 55602870	kundservice@aesseeal.se
	AESSEAL Vo Lee Ltd, Kaohsiung County, Taiwan	Tel: +886 7 371 3990	aesseeal.volee@msa.hinet.net
	AESSEAL Turkiye, Istanbul, Turkey	Tel: +90 (0) 216 304 0237	info@aesseeal.com.tr
	AESSEAL Uruguay, Montevideo, Uruguay	Tel: +598 2 924 7252	sealteplc@aesseeal.com.uy

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