



A Global Service for

All Brands of Engineered Mechanical Seal

www.nashseal.com

NASH in Ireland

- ▶ Your known supplier
- ▶ Global expertise in engineered mechanical seals
- ▶ A formal partnership
- ▶ The best solution for your needs

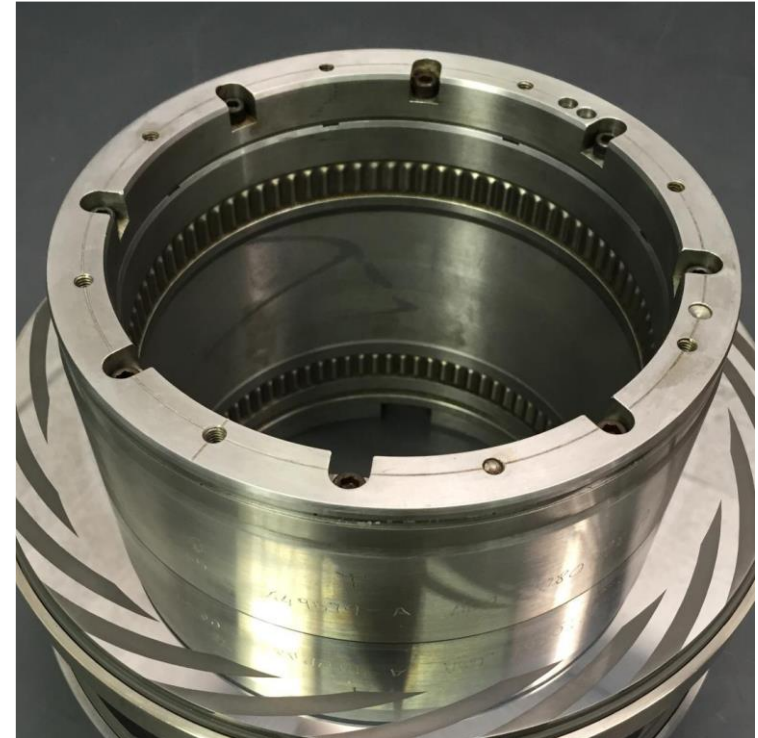


SMIDDY
(IMSC) Ltd

*Environmental
Focused Solutions*

Engineered Mechanical Seals Explained

- ▶ Niche - top 5% of Mechanical Seals
- ▶ Utilised on High Dependency Pumps, Mixers, Dryers, Turbomachinery etc
- ▶ Normally $> 70\text{mm}$ Shaft Diameter
- ▶ Single Seals, Split Seals, Double Seals
- ▶ Wet and Gas Lubricated



The Aftermarket for Standard Mechanical Seals

- ▶ Seals are more often replaced than repaired
- ▶ Short lead times – seals are often held on stock
- ▶ There are many seal OEMs and stockists
- ▶ Seal users have choices & are often well served

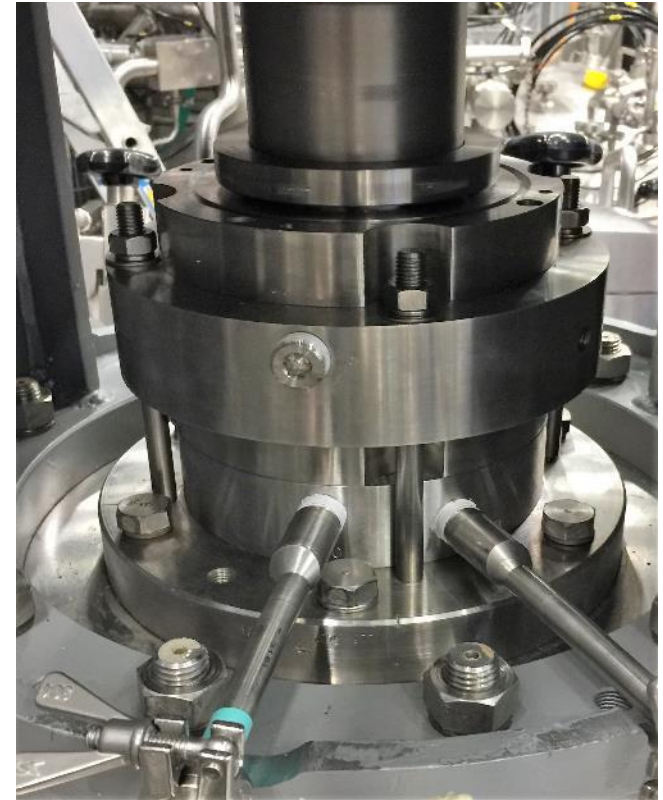


Buyers market – seal users have the power

The Aftermarket for Engineered Mechanical Seals

- ▶ Engineered seals are more often repaired than replaced
- ▶ Repair lead times are often extended
- ▶ 80% of installed base is from 3 multinational seal OEMs
- ▶ These OEMs repair only their own seals
- ▶ Seal users have little or no choice

Sellers market – seal users have limited power



The Aftermarket for Engineered Mechanical Seals

Some end users are known to have the following experiences...

- ▶ Slow response / long lead times
- ▶ High prices
- ▶ Forced to hold & maintain expensive spares
- ▶ Frustration – no alternative
- ❑ *What experiences do you have?*



Disrupting the Status Quo

- ▶ NASH chose not to be just another seal manufacturer
- ▶ NASH services all brands of engineered mechanical seal – and so is
 - Uncompromised by the need to sell or defend any given brand
- ▶ NASH removes your dependency on the seal OEMs
- ▶ We exist because you deserve a choice

The Global Service

UK HQ



Service Distributors in
Belgium, Czech Republic, Denmark, Egypt, Germany,
Ireland, Israel, Netherlands, Norway, Spain, Sweden,
UAE, UK



NASH – well established

- ▶ UK based / Founded 1966
- ▶ 50+ years dedicated to Mechanical Seal excellence
- ▶ ISO 9001:2015 & ISO/IEC 80079-34:2018 (ATEX)
- ▶ Global network of performance partners
- ▶ Big enough to cope, small enough to care
- ▶ A single source for engineered seal services



Focused on Seal Performance

- ▶ Fast turnaround repair
- ▶ Inspection & failure analysis
- ▶ Upgrade & performance improvement
- ▶ Reduce lifetime costs
- ▶ Replace – only when necessary

Typically over 750 visual and dimension inspections per engineered seal



Comprehensive Inspection Reports

Inspection Report

Job: 63301 RO: 2752-1 Your Ref:

Part No. 005322X Serial No. Description: MECH SEAL - LOW-SERVE MIXER/PAC 250/2420

FLCV2552H250DCKGG-DGWOR0322X

Barrier:	#2	Barrier P.:	4.3m
Equipment:	55 Combur Dryer	Pressure:	$1.6 \times 10^2 \text{ bar}$
Product:		Site:	
Speed:	20 rpm	Temp.:	125°C to 75°C

Part No.	Qty	Condition	Replace	Repair	Replace Missing
001 005322X-005322X	1	Hang to seal. Part of the face was chipped with approximately 1mm hole. Deposits of product were very sticky deposits of product were trapped on the face. It was necessary to prep good condition with light face wear.	0	0	0
002 00220Y-0616-FT12	1	Product side had PMG gaskets and bare. Aided wear marks in the places in the face. Exchange for carbon rings.	1	0	0
003 00220Y-0616-FT12	8	Good condition.	0	0	0
004 00220Y-0616-FT12	1	Good condition. Very light wear marks on the bearing face.	0	0	0
005 120204-0053-1000	1	Good condition.	0	0	0
006 00220Y-0616-FT12	1	Good condition.	0	0	0
007 00220Y-0616-FT12	1	Good condition. Light face wear.	0	0	0
008 00220Y-0616-FT12	1	Good condition. The balance diameter on the product side was good. The product sleeve had some black deposits on the inner surface. These were removed in a moderate condition with light face wear.	0	0	0
009 00220Y-0616-FT12	1	Good condition. Light face wear.	0	0	0
010 00220Y-0616-FT12	1	Good condition. Very light wear marks on the bearing face.	0	0	0
011 00220Y-0616-FT12	1	Good condition.	0	0	0
012 00220Y-0616-FT12	1	Good condition.	0	0	0
013 00220Y-0616-FT12	1	Good condition.	0	0	0
014 00220Y-0616-FT12	1	Good condition.	0	0	0
015 00220Y-0616-FT12	1	Good condition.	0	0	0
016 00220Y-0616-FT12	1	Good condition.	0	0	0
017 00220Y-0616-FT12	4	Good condition. Light face wear marks on the bearing face.	0	0	0
018 00220Y-0616-FT12	4	Good condition.	0	0	0

www.nashseal.com Uncompromised Integrity in Mechanical Seal Services Page 2 of 6

Inspection Report

Job: 63301 RO: 2752-1

Fig 1 The seal assembly as received.

Fig 2 Seal unit partially disassembled showing yellow/green oil pooled up in the bottom flange recess.

Fig 3 Bottom flange showing oil pooled up in the recesses.

Fig 4 Top cover plate showing crown water droplets between the lip seals.

Fig 5 Partially disassembled rotary unit showing hung up and cooked product side carbon rotary seal ring.

Fig 6 Seal sleeves showing product deposits on the product side bearing diameter.

www.nashseal.com Uncompromised Integrity in Mechanical Seal Services Page 2 of 6

Inspection Report

Job: 63301 RO: 2752-1

Fig 7 Product side rotary carbon seal ring showing hard product deposits on the sliding diameter together with sticky deposits.

Fig 8 Product side carbon rotary seal ring showing light face wear.

Fig 9 Atmosphere side carbon rotary seal ring showing light face wear.

Fig 10 Product side sleeve bush showing wear and grooving.

Fig 11 Product side sleeve bush showing wear.

Fig 12 Atmosphere side sleeve bush showing wear and grooving.

www.nashseal.com Uncompromised Integrity in Mechanical Seal Services Page 6 of 6

NASH – a safe pair of hands

- ▶ ISO 9001:2015 & ISO/IEC 80079-34:2018
- ▶ Qualified & experienced Mechanical Seal Engineers & Technicians
- ▶ JOBSCOPE - fully integrated business system
- ▶ Certified static & dynamic pressure testing
- ▶ 100% traceability of all parts & materials



Static Pressure Test Certificate

Customer:	
Customer Order No:	P116525
Assembly Description:	Mech Seal DDI MDL 125mm IM06
Customer Item Ref / Serial No:	N/A
Nash Job No:	63595
Nash Part No:	003511X
Test Medium:	Air
Test Pressure:	26 psi
Test Duration:	5 Minutes
Pressure Gauge No:	N4PG

We certify the equipment has been successfully tested as outlined above and Procedures.

Signature:

Name: Roland Cosley
Position: Senior Mechanical Technician
Date: 14/01/2019

NASH Mechanical Seal Services Ltd
11a Street, Bishops Cleeve, Leics, LE3 8DU, England
Registered no. 1593327

1-44 (0) 3204 263 020
1-44 (0) 3204 263 041
enquiry@nashseal.com
www.nashseal.com

Director
B.D. Hoyle M
B.E. Hoyle
M.L. Corker MSc



Uncompromised Integrity
in Mechanical Seal Services

F-8021 (Rev 0)
November 2018

Certificate of Conformity

Customer:	
Customer O/No:	P116525
Customer Item Ref / Serial No:	N/A
Receiving No:	3019
Job No:	63595
Despatch Date:	14/01/2019

We certify that all the items on the above order have been manufactured/serviced in accordance with the requirements of your order, to original specification or better (where applicable), in accordance with Directive 2014/54/EU and associated guidelines (where applicable), in accordance with FDA Code of Federal Regulations (where applicable), in accordance with GMP regulations (where applicable), have passed our inspection procedure in accordance with our Quality Manual and conform to your requirements.

M.L. Corker
M.L. Corker
Quality Representative
Date: 18/01/2019

NASH Mechanical Seal Services Ltd
11a Street, Bishops Cleeve, Leics, LE3 8DU, England
Registered no. 1593327

1-44 (0) 3204 263 020
1-44 (0) 3204 263 041
enquiry@nashseal.com
www.nashseal.com

Director
B.D. Hoyle M
B.E. Hoyle
M.L. Corker MSc

Case Study – Oil & Gas Industry

- ▶ Eagle Burgmann SHFV-D1/140-E2
- ▶ Sulzer Pump, Norway Offshore
- ▶ HC Condensate
- ▶ 3450rpm, 18 barg, 15°C
- ▶ Pump OEM looking for more responsive, economical support than via the OEM



Case Study – Oil & Gas Industry

- ▶ John Crane T8610/100
- ▶ Sulzer DB DB34 8X8X11 Pump, Africa
- ▶ Produced Water
- ▶ 4850rpm, 208 barg, 80°C
- ▶ Pump OEM looking for more responsive, economical support than via the OEM



Case Study – Oil & Gas Industry

- ▶ Flowserve GU 3.437/3.250
- ▶ DB Bingham 6X10X14 LHCD Booster, UK Offshore
- ▶ Crude Oil
- ▶ 3650rpm, 9 barg, 48.9°C
- ▶ End user looking for more responsive service and technical support



Case Study – Oil & Gas Industry

- ▶ Flowserve UHTW 4.250/4.437
- ▶ DB 4x6x10 1/2 C MSD, UK Offshore
- ▶ Crude Oil
- ▶ 6000rpm, 88.9 barg, 49°C
- ▶ End user looking for more responsive service and technical support



Case Study – Oil & Gas Industry

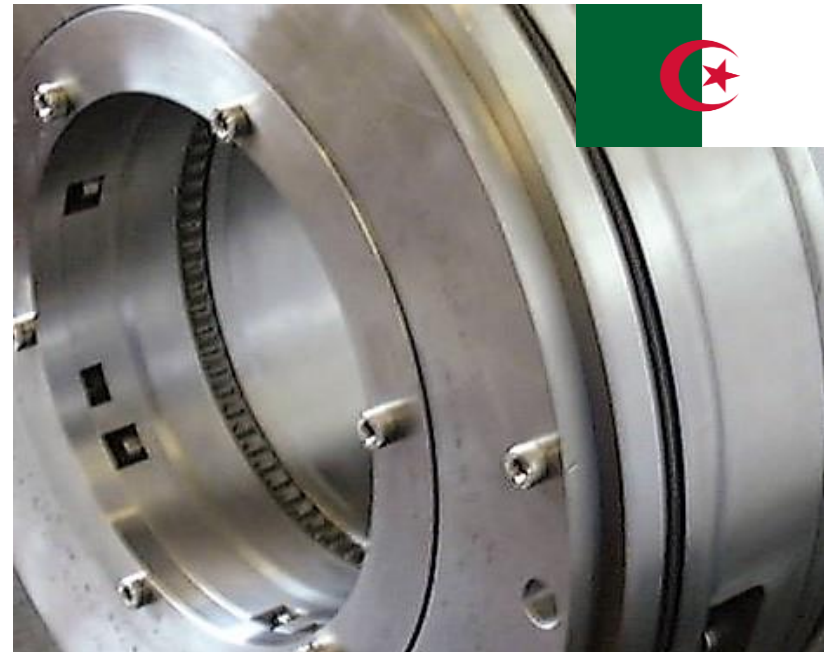
- ▶ John Crane (Flexibox) DRSP 0900
- ▶ Vertical Pump, UK Offshore
- ▶ HC Condensate
- ▶ 6000rpm, 90 barg
- ▶ End user looking for more responsive service and technical support



Case Study – Turbomachinery

- ▶ John Crane T28AT/7.300" Dry Gas Seal
- ▶ Nuovo Pignone PCL603 Compressor, Algeria
- ▶ Natural Gas Pipeline
- ▶ 6,500rpm, 1070 psi, 58°C
- ▶ Provided alternative to OEM. Solution included comprehensive inspection and RCA, cost effective repair and recommendations to improve start up procedure to minimise oil migration through barrier seal and improve seal gas

filtration



Case Study – Turbomachinery

- ▶ Kaydon K-CBS/4.500"
- ▶ Solar C40 Compressor, Austria
- ▶ Gas Production & Storage
- ▶ 10,441rpm, N₂ @ 18 psi, 58°C
- ▶ One of 2 spare separation seals received for inspection and pressure test ahead of receiving a further 4 seals for repair



Case Study – Turbomachinery

- ▶ Kaydon K-MOS/4.625" Oil Seal
- ▶ Stork Delaval (Siemens) Compressor, Finland
- ▶ Hydrogen Recycle
- ▶ 12,713 rpm max, 5.2 barg, 20°C
- ▶ One of 2 face and bushing oil seals repaired and dynamically tested for a refinery



Case Study - Power Generation Industry

- ▶ John Crane RRSP/1450
- ▶ Sulzer HPT-300-630 Pump, UK Power Plant
- ▶ Boiler Feed Water
- ▶ 3000rpm, 12.5 barg, 160 to 175°C
- ▶ NASH inspection/assessment confirmed premature failure caused by previous repairer fitting solid PTFE o rings rather than peroxide cured EP



Case Study - Power Generation Industry

- ▶ Burgmann SHF11-E3/135mm
- ▶ CEZ Power Plant
- ▶ Boiler Feed Water
- ▶ 4670rpm, 1.43 MPa, 175°C
- ▶ NASH provided a more responsive, cost effective repair than the seal OEM



Case Study - Power Generation Industry

- ▶ Flowserve HTT/83mm
- ▶ CEZ Power Plant
- ▶ Boiler Feed Water
- ▶ 1480rpm, 2.5 MPa, 120°C
- ▶ NASH provided a more responsive, cost-effective repair than the seal OEM



Case Study - Power Generation Industry

- ▶ EagleBurgmann SAPI1/155mm
- ▶ Torishima MHB/3WX Pump, UAE
- ▶ Boiler Feed Water
- ▶ 5480rpm, 28.8 barg, 80°C
- ▶ One of a pair of seals repaired for a power plant in Saudi Arabia via our partner in the UAE. NASH was able to provide significantly reduced cost of repair compared to the seal OEM



Case Study – Pharmaceutical Industry

- ▶ Flowserve Mixerpac 2552/125
- ▶ Comber Filter Dryer, Republic of Ireland
- ▶ Lercanidipine
- ▶ 1 to 15 rpm, 15 – 70°C, -1 to 2 barg, 4 barg N2 barrier gas
- ▶ Seals repaired and rotary faces upgraded to a carbon grade specifically designed for dry nitrogen applications. Average seal life increased from 9 months to 3 years



Case Study – Pharmaceutical Industry

- ▶ John Crane 5282GD/60mm, Gas Lubricated
- ▶ GL Filter Dryer, Israel
- ▶ Pharmaceuticals
- ▶ 5 to 25 rpm, 15 – 70°C, -1 to 4 barg, 6 barg N2 barrier
- ▶ Seals were being repaired locally, but regularly failed within months. Working with NASH, MTBF is now +3 yrs. We recently introduced a service exchange unit at NASH to minimise process down time



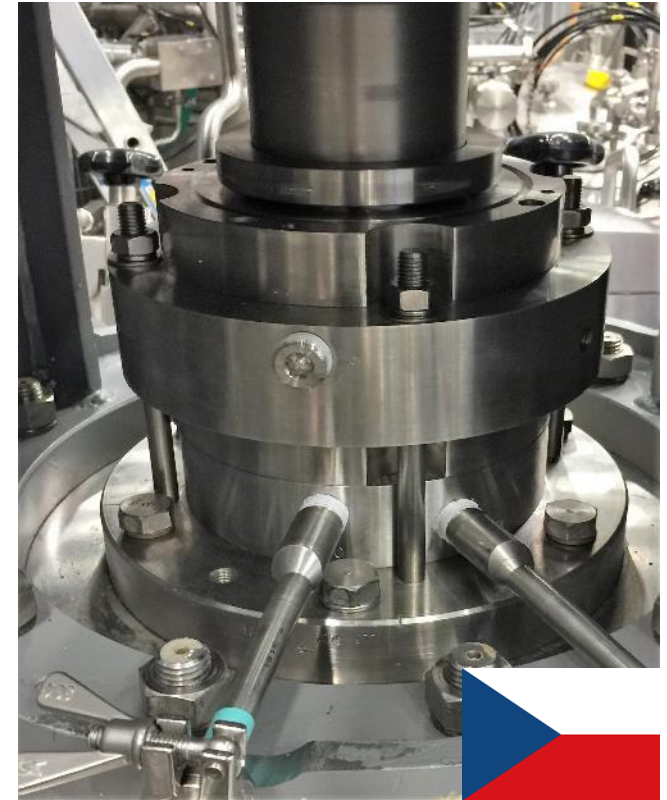
Case Study – Pharmaceutical Industry

- ▶ Pfaudler Double Seal Cartridge 140mm
- ▶ Pfaudler VSO Glass Lined Reactor, Scotland
- ▶ Pharmaceuticals
- ▶ 90 rpm, 100°C, 3 barg, 5 barg barrier
- ▶ NASH provides Pfaudler UK with an exclusive aftermarket repair service for their entire range of vessel seals. This service is also available to end users through all our partners in EMEA



Case Study – Pharmaceutical Industry

- ▶ John Crane T7700/90mm, Gas Lubricated
- ▶ Stainless Steel Vessel, CZ
- ▶ Pharmaceuticals
- ▶ 80 rpm, 130°C, 3 barg, 4 barg N2 barrier
- ▶ Seals were originally liquid lubricated and being repaired in house, but regularly failed within months. Working with NASH, seal was converted to gas lubricated configuration and MTBF is now +3 yrs.



Case Study - Coatings & Inks Industry

- ▶ Netzsch GRD/80
- ▶ Netzsch LME 60 Bead Mill, Malaysia
- ▶ Offset Ink
- ▶ 360 to 710rpm, 90°C, 0.9 to 1.5 barg
- ▶ NASH partner arranged for seal to be sent to NASH after x3 premature failures. Seal inspection confirmed reverse pressure caused by cleaning process



Case Study - Coatings & Inks Industry

- ▶ Burgmann MR1S1F/24/90mm
- ▶ Drais DCP 170 Bead Mill, UK
- ▶ Heavy Pigmented Solvent Based Paint
- ▶ 350 to 750rpm, 60°C, 2 barg, Glycol Barrier @ 6 barg
- ▶ One of many cartridge units successfully repaired over the past 25 yrs for a global paint company producing paint for car manufacturers



Case Study - Coatings & Inks Industry

- ▶ Buhler Seal & Bearing Cartridge/100mm
- ▶ Buhler Cobra Bead Mill, Netherlands
- ▶ Serptane PW 25-28H Ink
- ▶ 487rpm, 110°C, 3 barg, Glycol Barrier @ 6 barg
- ▶ One of many Buhler Cobra Seal & Bearing Cartridges repaired for a European ink manufacturer that could not obtain good prices and service from the OEM



Case Study – Chemical Industry

- ▶ Flowserve 2564/180mm
- ▶ Alloy Mixer, Leverkusen, Germany
- ▶ Additive for Paper Manufacture
- ▶ 60rpm, 120°C, 2 barg, Water Glycol Barrier
- ▶ User unhappy with poor service and high prices from the seal OEM. NASH partner arranged for seal to be sent to NASH in the UK for repair with spares kit also supplied



Case Study - Chemical Industry

- ▶ De Dietrich MDL140mm
- ▶ De Dietrich Reactor, Netherlands
- ▶ Styrene & Pentane
- ▶ 85 rpm, 130°C, 10.5 barg, Oil Barrier @ 11.5 barg
- ▶ Seals were being repaired by the OEM, but lead times were up to 16 wks. Working via our partner in the Netherlands, we reduced average lead times to 3-4 wks and we are helping to improve MTBF



Case Study – Chemical Industry

- ▶ John Crane T151/3.500"
- ▶ Alloy Mixer, United Kingdom
- ▶ Methyl Methacrylate
- ▶ 115rpm, 100°C, 2.5 barg, Glycerol Triacetate @ 3.5barg
- ▶ User unhappy with poor quality repairs from seal OEM leading to premature failures – incorrect o ring material and inboard wedge dimensionally incorrect causing stationary seal ring to crack



Case Study – Chemical Industry

- ▶ John Crane T151/140mm
- ▶ Alloy Mixer, Scotland
- ▶ Agrochemicals
- ▶ 90rpm, 100°C, 2 barg, Mineral Oil @ 4 barg
- ▶ One of many engineered seals repaired via one of our OEM Mixer partners for a global agrochemicals manufacturer



Case Study – Paper and Pulp Industry

- ▶ Safematic SAB/140mm
- ▶ Vertical Pulper, Scotland
- ▶ Paper Pulp
- ▶ 280rpm, 50°C, 2 barg, Water Barrier
- ▶ Spare seal sent to NASH first for inspection and pressure test as had been on shelf for 5+ yrs. Used seal also subsequently repaired and returned to site stores



Case Study – Paper and Pulp Industry

- ▶ EagleBurgmann LP-D/135mm
- ▶ Sunds Difibrator Refiner, UK
- ▶ Pulp for Board
- ▶ Water Barrier
- ▶ One of many seal cartridges of this type refurbished for a UK board manufacturer



Working with NASH – Next Steps

Challenge NASH

- ▶ Request a budget quotation
- ▶ Send an engineered seal for repair
- ▶ Ask us for technical support
- ▶ Book a mechanical seal workshop



Contact: info@smiddy.ie **Phone:** 00353 830805464