Mello 2019 Investor event

16 May 2019

Philip Kirkham, CEO
Peter Davenport, Finance Director

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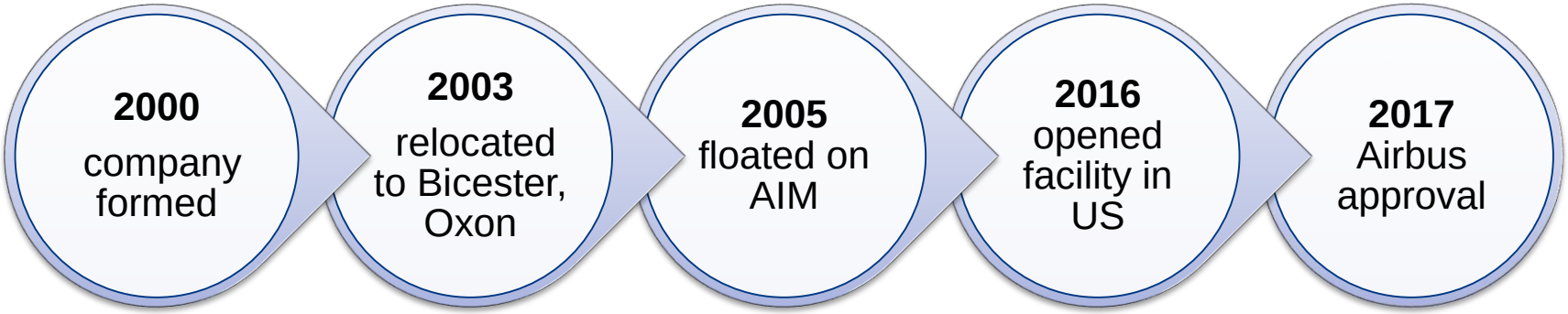
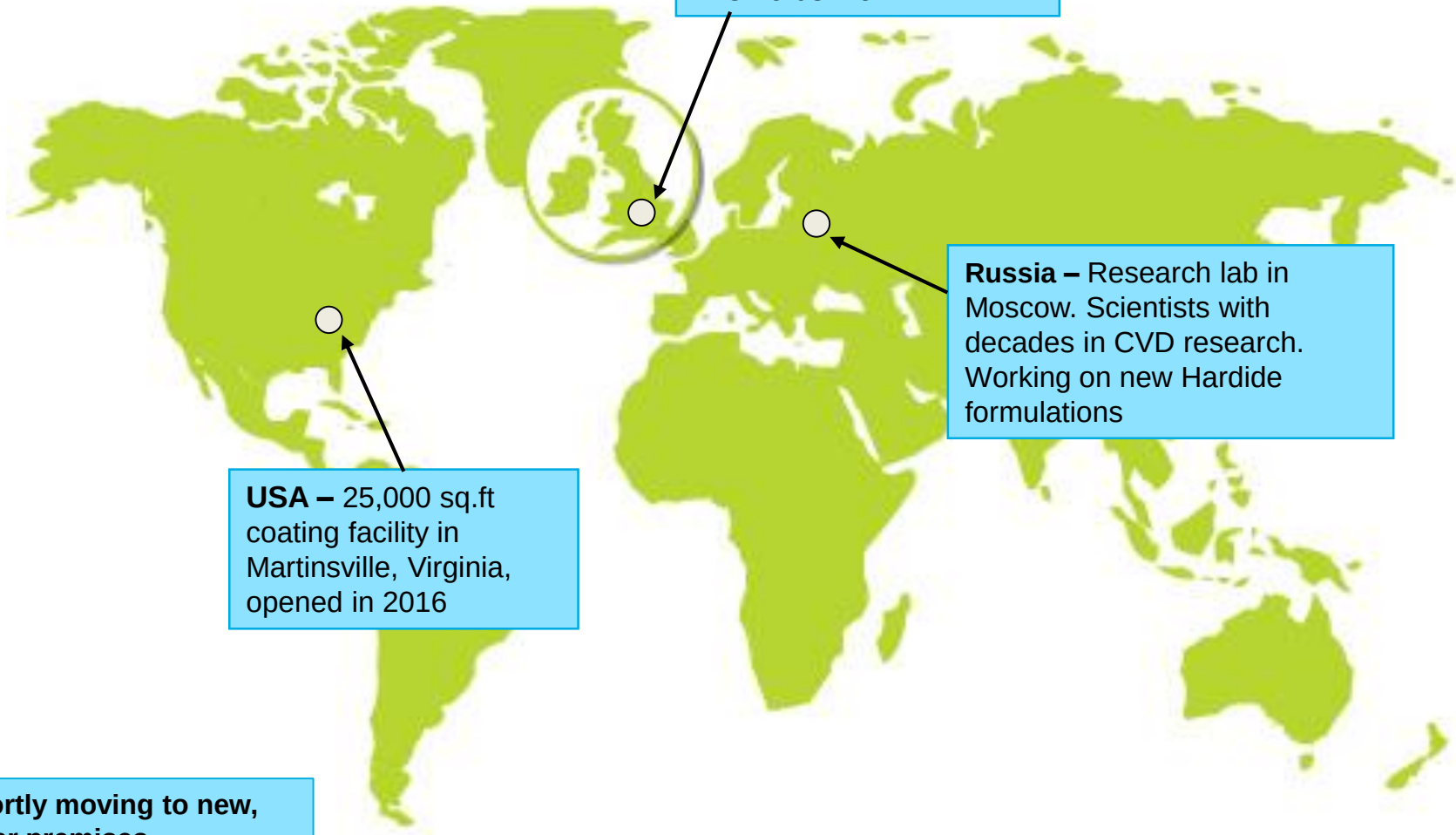
History of Hardide

We apply patented, advanced surface technology nano-structured coatings to industrial metal components, using the gas-phase technology Chemical Vapour Deposition (CVD). This significantly increases the working life of the components



- Leading global innovator and developer of advanced Tungsten Carbide based metal coatings
- Strong IP portfolio: 5 patents registered since incorporation
- New patent pending for coating of turbine blades

Hardide group facilities



UK – Head office and 10,000 sq.ft coating facility in Oxfordshire*

Russia – Research lab in Moscow. Scientists with decades in CVD research. Working on new Hardide formulations

USA – 25,000 sq.ft coating facility in Martinsville, Virginia, opened in 2016

***Shortly moving to new, larger premises**

Key facts of FY18

Turnover c. £4.6m

Patented coating technology

Head office and main facility in Bicester, Oxfordshire

Group headcount c. 45

US coatings facility in Martinsville, Virginia opened 2016

Developing markets: aerospace, power generation, precision engineering

Strong balance sheet

Visibility of near term EBITDA break even

Current major markets Oil & Gas and Flow Control: downhole components, pumps and valves

3 year sales growth: 47% CAGR

Approved supplier to BAE and Airbus

Leonardo Helicopters full approval in progress

High margins:

- Variable margin: >70%
- Gross margin: > 50%
- High operational gearing

Key Markets

Oil & Gas

- Used by leading oil & gas service providers – downhole, well stimulation and subsea
- Coating of industrial diamonds

Flow Control

- Severe service pumps & valves for demanding environments

Precision Engineering

- Power generation, plastics extrusion, baggage X-ray machines, silicon wafer production
- Steam turbine blade applications

Aerospace

- BAE and Airbus approved, Leonardo approval in progress, multiple applications with global aero players

Technology

Nano-structured tungsten carbide, metallurgical coatings that significantly extend the life of critical parts and tools. A CVD (Chemical Vapour Deposition) process creates an extremely hard, tough and thin layer with a number of advantages over competitor processes.

Superior wear & erosion resistance

Outperforms hard chrome by factor of 12 and cemented tungsten carbide by factor of 3

Chemical Resistance

Virtually pore-free structure provides very high protection against a range of corrosive and aggressive chemicals

Internal Surfaces and Complex Shapes

Gas-phase deposition process allows uniform coating to form on internal surfaces and complex designs. This is not possible for HVOF, Plasma Spray, D-Gun or PVD Coating technologies

Toughness and Flexibility

Follows contours of substrate and has high flexibility – substantially reducing the risk of cracking under deformation

Tailored Hardness

Gas phase of process allows precise control over hardness. Micro hardness of up to 4000HV can be achieved

Ease of Finishing

Only polishing required in contrast to expensive grinding with other technologies - especially with complex shapes

Coating Thinness

CVD process requires no binder, creating a less bulky structure than alternative technologies

Accreditations

Hardide coating sites are accredited to various international standards:-

- Aerospace quality management system: **AS9100 RevD**
- **Nadcap*:*** the global aerospace accreditation (*currently UK site only)*
- Quality management system: **ISO 9001:2015**
- Environmental standard: **ISO 14001:2015** (*currently UK site only)*


CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

Hardide Coatings Ltd
11 Wedgewood Road,
Bicester, Oxfordshire
United Kingdom

has been approved by Lloyd's Register Quality Assurance to the following Quality Management System Standards:

ISO 9001:2008

The Quality Management System is applicable to:

Manufacture and deposition of hard coating for metal and non metallic components.


LRQA

CERTIFICATE OF APPROVAL

This is to certify that the Environmental Management System of:

Hardide Coatings Ltd
Unit 11, Wedgewood Road,
Bicester, Oxfordshire
United Kingdom

has been approved by Lloyd's Register Quality Assurance to the following Environmental Management System Standard:

ISO 14001: 2004

The Environmental Management System is applicable to:

Manufacture of hard coatings for metal and non-metal components


CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

Hardide Aerospace Coatings Ltd
11 Wedgwood Road,
Bicester, Oxfordshire
United Kingdom

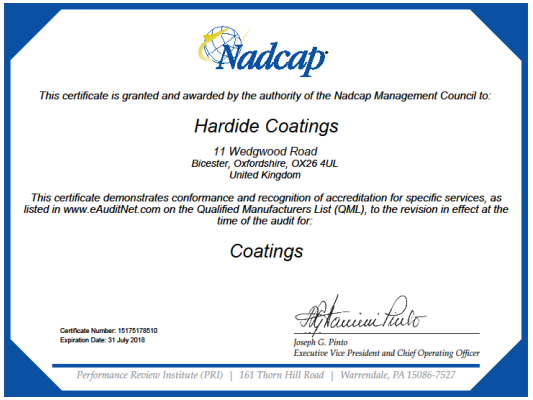
has been approved by Lloyd's Register Quality Assurance Limited, Birmingham, UK to the following Quality Management System Standard:

AS 9100C
(technically equivalent to EN 9100:2009)

This certification has been performed in accordance with the requirements of EN 9104-001:2013

The Quality Management System is applicable to:

Manufacture and deposition of hard coating for metal and non-metallic components.


Nadcap

This certificate is granted and awarded by the authority of the Nadcap Management Council to:

Hardide Coatings

11 Wedgwood Road
Bicester, Oxfordshire, OX26 4UL
United Kingdom

This certificate demonstrates conformance and recognition of accreditation for specific services, as listed in www.eAuditNet.com on the Qualified Manufacturers List (QML), to the revision in effect at the time of the audit for:

Coatings

Certificate Number: 15175178510
Expiration Date: 31 July 2018

Joseph G. Pinto
Executive Vice President and Chief Operating Officer

Performance Review Institute (PRI) | 161 Thorn Hill Road | Warrendale, PA 15086-7527

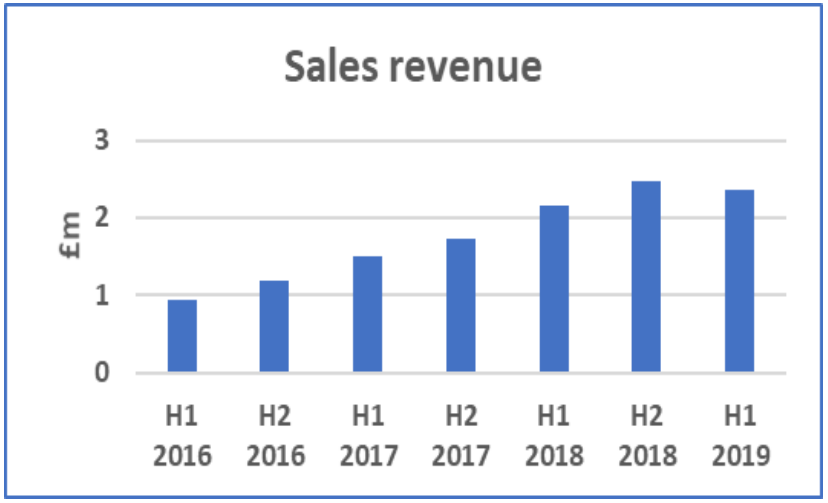
FY19 – interim results

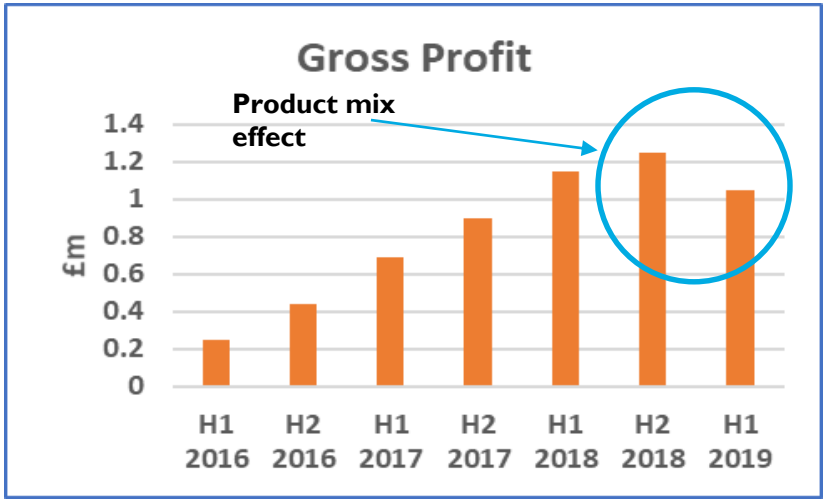
Half year ending 31 March 2019: comparison with H1 FY18

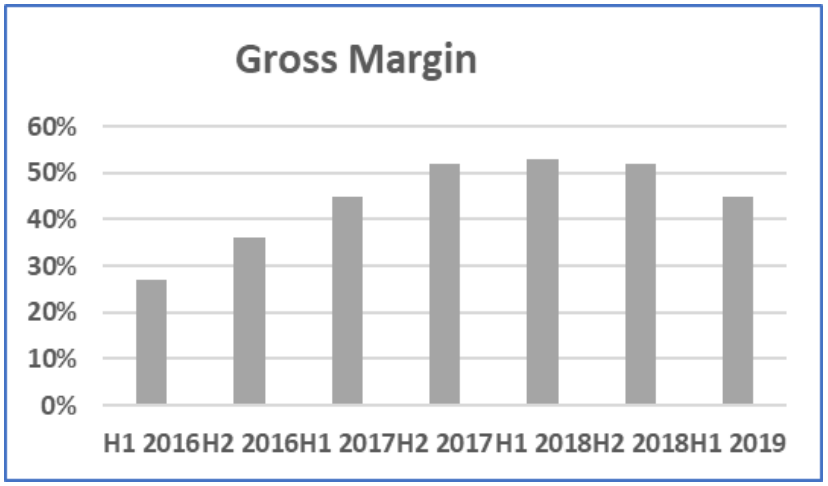
- Record first half revenue of £2.35m: increase of 9%
- Continuing strategy of customer diversification:
  - over half H1 revenues from customers new within last 3 years
- Sales to North America - increase of 32%
- Sales to Flow Control customers- increase of 52%
- Gross profit £1.05m – lower by £0.1m – temporary adverse product mix in H1
- Ebitda loss of £0.44m – £0.30m higher loss
- Successful fundraise of £3.6m to fund long-term development
- Cash at bank of £5.35m

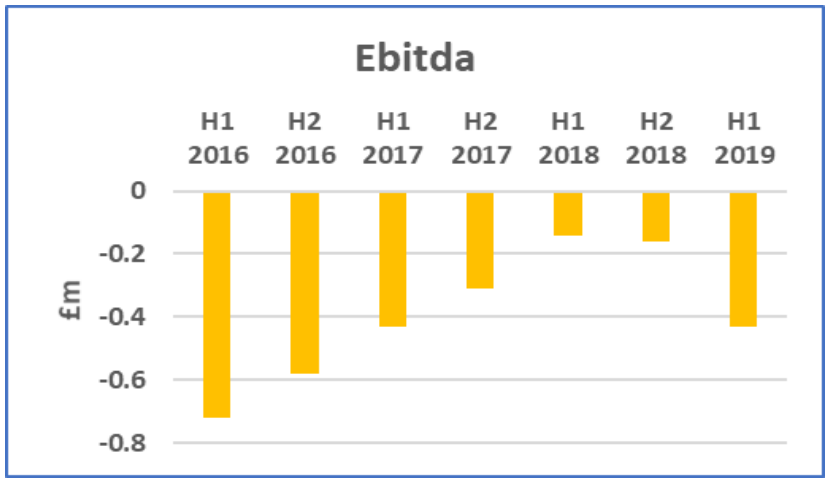
❖**14 May – announced selection by Airbus for coating flap pads on A380**

Financial trends









Year on Year comparison

Sales grew strongly over the past three years (47% per year) but gross profit grew nearly twice as fast (87% per year) and fixed costs (production overheads + admin costs) grew at only 16% per year.

£m	2015/16	2016/17	2017/18	CAGR
Sales	2.14	3.24	4.61	47%
Variable Gross Margin %	67%	75%	73%	
Fixed costs of sales	0.75	0.85	0.97	14%
Gross Profit	0.69	1.58	2.41	87%
Gross Profit %	32%	49%	52%	
Overheads	1.99	2.33	2.71	17%
EBITDA	(1.31)	(0.74)	(0.30)	
'Fixed' costs	(2.74)	(3.18)	(3.68)	16%

Business development

Airbus	➢ Selected for wing flap pad components on A380 and multiple other components at final stage of approval
Leonardo Helicopters	➢ Final stages before part approval on transmission system
Other Aerospace	➢New interest from US aerospace companies - trials with Triumph Aerospace and others ➢Parts in flight testing with a global MRO
Oil & Gas	➢Two new major supply contracts in place ➢Three new major customer applications
Flow Control	➢Additional high volume components from the major pump customer
Precision Engineering	➢Continuing demand for x-ray baggage screening machine parts ➢Power generation turbine blade opportunities
North America	➢Additional business development manager appointed ➢Now 68% of Group turnover

UK site expansion plans

- UK revenue potential constrained by size of current premises
- Successful recent fundraising of £3.6m for relocation and new equipment
- Moving to new 20,000 ft^2 factory unit on prestigious business park in Bicester
- Doubling UK productive capacity
  - 3 new coating reactors, including one larger unit for turbine blades
- Move to be competed by September 2020

Investment proposition

- **A unique coating technology that fills a major gap in the range of competitors' coatings**:-
- coats uniformly where others cannot:
  - complex shapes
  - internal as well as external surfaces
- coating facilities in UK and USA
- new, larger UK premises planned for 2020
- doubling UK coating capacity and increased capability

- Strong revenue growth
- Large market size
- Solid position in oil & gas sector
- On verge of significant breakthroughs in aerospace markets: Airbus, Leonardo Helicopters and others
- Selected by Airbus for A380 components
- Power generation turbine blade market opportunities are huge – development supported by EDF

We will continue to grow Hardide by investing in business development and production capability. We see this as the best way to maximise shareholder value

Thankyou for listening!

Questions?

Application case studies
Customer testimonials

Eurofighter Typhoon

Richard Goldie, Senior Designer - Eurofighter Typhoon

BAE Systems

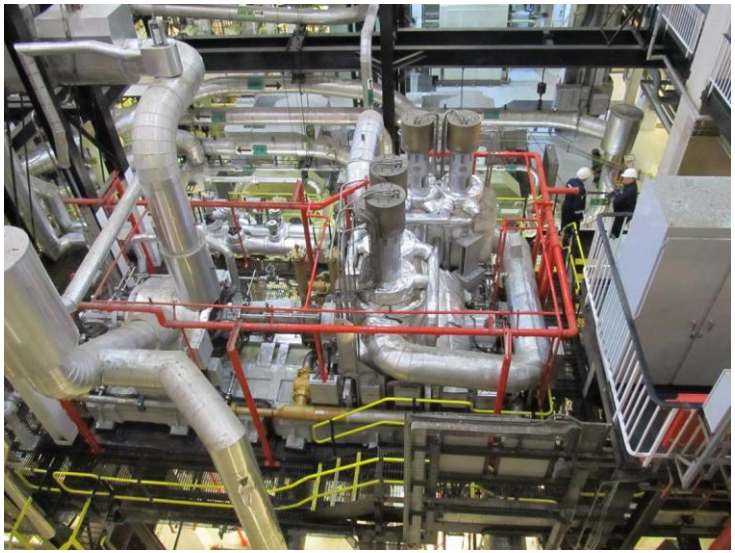
"Hardide has developed a unique coating technology which **addressed a specific challenge being faced on Typhoon**. We **worked together** with Hardide **to engineer a solution which was tested extensively and proven successful** for the required application. The initial testing and development of the coating, which led to a new Typhoon specification, was successful due to effective communication and the ability of both companies to react accordingly during the testing phase."

Hardide coated aerospace bushes

EDF Energy Nuclear Generation

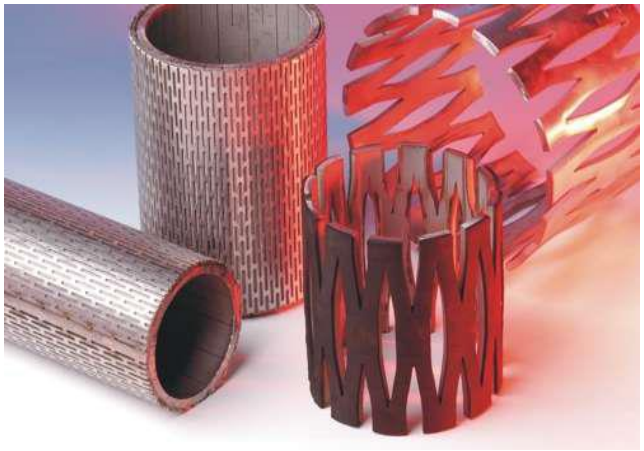
Graham Young , Steam & Rotating Plant Engineer, EDF Energy Nuclear Generation Ltd, owner and operator of Hinkley Point B nuclear power station:

“Hardide offered a very cost-effective, high-performance solution to extend the life of the 15MW boiler feed pump steam valves in the plant at Hinkley Point B. There were technical challenges in applying the coating process to the large Stellite 6 valve covers and Hardide provided excellent troubleshooting support and delivered the parts in time so as not to affect the availability of the power plant equipment. Spare valve cover guide sleeves have also been ordered and these will be deployed onto the other unit in the near future. We are also evaluating Hardide for other applications within EDF Energy.”



Hinkley Point B 15MW Main Boiler Feed Pump & Turbine Plant

Weatherford: Bearing Pins for Expandable Tooling



"The expansion tooling is required to function under a harsh loading environment to expand both slotted and solid base pipe. The rollers are required to function smoothly and effectively over a potentially long, continuous string of ESS®. Therefore the bearing within the rollers must have high strength but low friction capabilities.

The Hardide Chemical Vapour Deposition (CVD) coating applied to the roller pins has provided a significant contribution in tool reliability to allow completions to be run in deep wells and also over long production zones of over 2000ft of continuous ESS®."

(Weatherford)

Severe Service Valves: Heap & Partners

Peter Burnett, Business Development Manager, Heap & Partners:

“ Hardide has an excellent reputation as a high-performing coating for severe service metal-seated ball valves and seats. We began design and testing of the coating in 2011 and it is now being used on 2” to 4” balls and seats in our new PHASE range of high pressure, side-entry ball valves which are designed for high criticality oil and gas applications.”

Hardide coated ball valves and seats

Hardide Triples Life of Severe Service Valves

Flowserve tested Hardide coating on McCANNA metal seated ball valve. Hardide-coated 316 stainless ball and seats were compared to Stellite ball valve in an abrasive slurry:

- Stellite failed in 29,000 cycles
- Hardide-coated stainless valve was still in working conditions after 70,000 cycles, tests stopped without valve failure

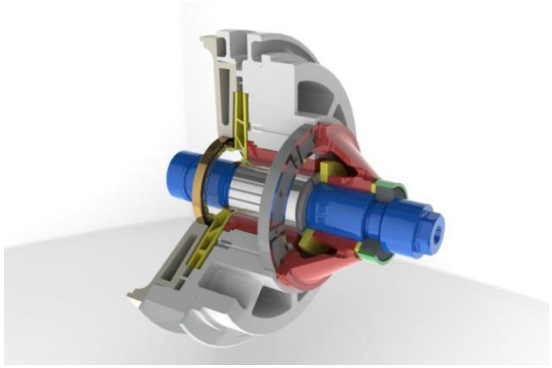
The use of Hardide has enabled Flowserve to offer 316 Stainless steel as the base metal for use in severe service applications that require metal to metal seating, including abrasive and slurry applications.

Customer Testimonials

Jeff Rutland, Director of Engineering, D Tech Drilling

“**Hardide allows a level of design flexibility that we have not found in other coatings**. This means that we can easily revise designs and increase component complexity in the knowledge that **Hardide can be applied exactly where we want it**.”

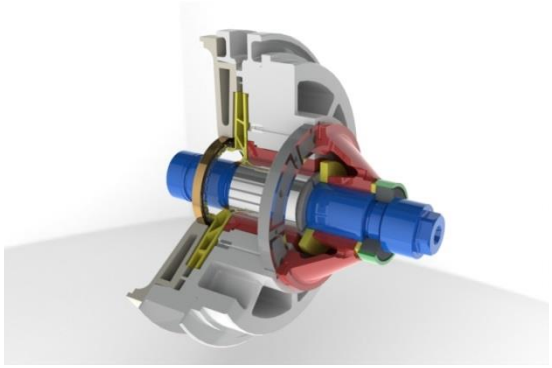
Centrifugal Pump Bearings: Field Tests



Pump non-drive end Bearing

- **Alfred Conhagen, Inc. tested CVD coating on hydrodynamic/hydrostatic radial and thrust bearings in eight-stage and six-stage high-performance centrifugal pumps in high temperature refinery service**.
- Product temperature of 450ºF, when both the octane and diesel have poor lubricity, **with entrained solids**: pipe scale and some coke fines, and occasionally catalyst carryover which can quickly destroy fine clearances.
- The Hardide-coated bearings have been **in service for three years** during which time they have experienced some moderate-to-severe solid ingestion, yet the coated bearing surfaces **remain in excellent working condition** and were re-used in the refurbished pump.
- The substrate is 410 stainless steel to match the coefficient of thermal expansion of the other parts to maintain close clearance over a range of temperatures. With the CVD Tungsten Carbide coating there has been no galling or cracking of the coated surfaces.

Centrifugal Pump Bearings: Field Tests



Pump non-drive end Bearing

Dennis Bowman, Consulting Engineer, Alfred Conhagen, Inc. :

“For years we have struggled with the design of unique pump components, trying to strike a balance between performance and manufacturability. The **Hardide process allows us to finish machine the intricate geometry then add a precise thickness** of the Hardide matrix to produce a part with **great wear characteristics and low coefficient of friction**. Recently, a customer suffered a system upset and introduced a large amount of ceramic bead catalyst to the pumpage and destroyed all of the 8-3stage pump internals except the Hardide-coated components. The **Hardide-coated components were re-used in the refurbished pump**.”