

The Metco transaction in the context of the Group strategy

Eisenach, November 6, 2014

Dr. Brice Koch, CEO Oerlikon Group

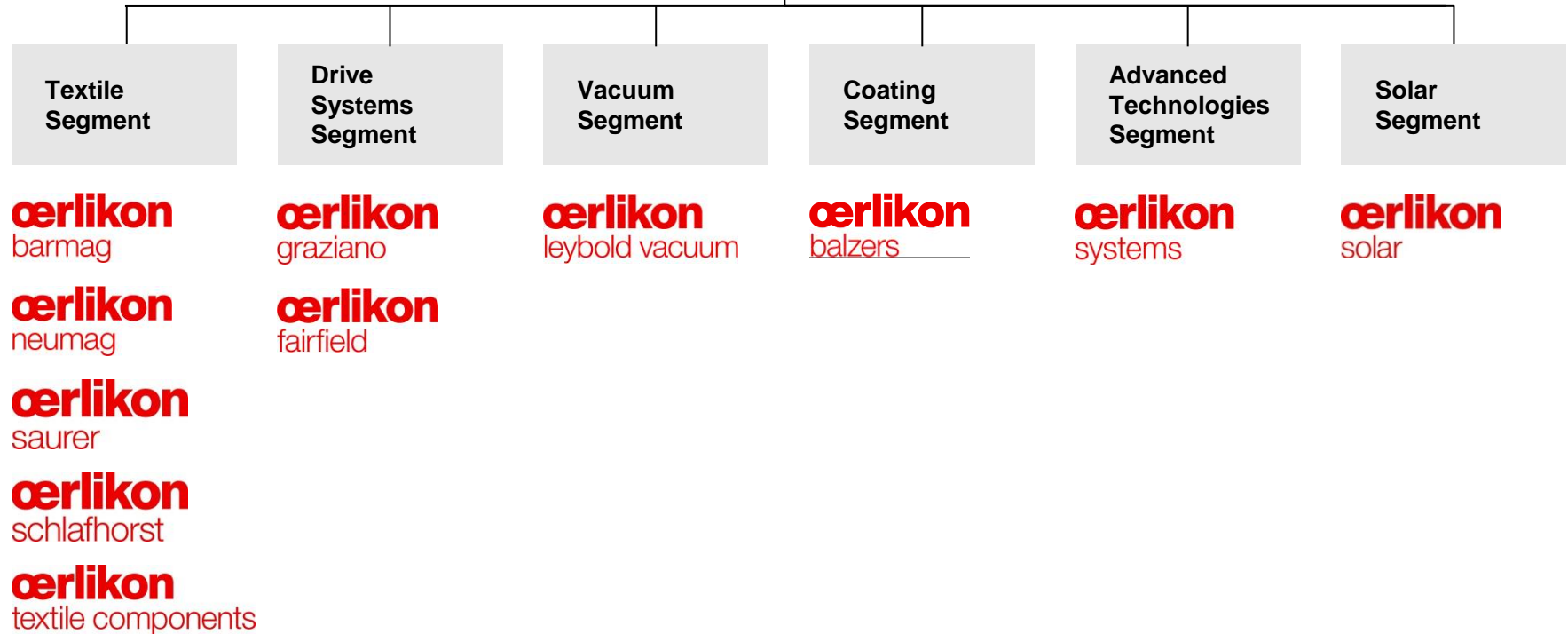


- 1** Current status
- 2 Roadmap for the Segments
- 3 Positioning of the Group

The Oerlikon Group has undergone a major transformation in the past three years



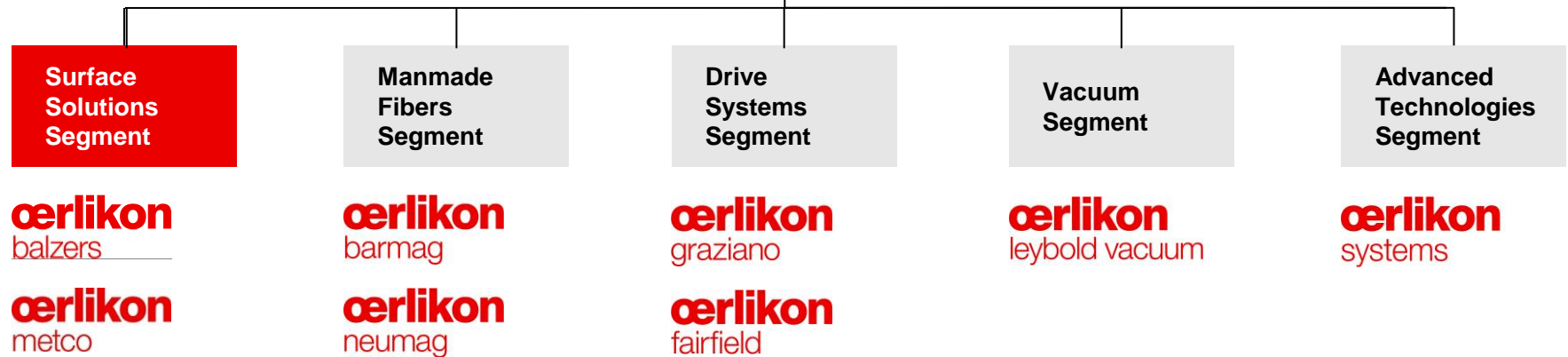
Starting point



The Oerlikon Group has undergone a major transformation in the past three years

Today

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Additional structural measures:

- Carding and Melco business sold (former Textile Segment)
- Footprint optimization in Drive Systems Segment
- Rox acquisition (regrinding business) in Surface Solutions Segment

Today's structure and performance is the result of...



Streamlining of portfolio

- Divestment of non-operating assets
- Reduction of cyclicality, volatility and complexity



Operational & financial restructuring

- Reduction of break even costs
- Operational excellence initiatives to sustainably increase profitability



Repositioning of balance sheet

- Syndicated credit line and three Swiss bonds
- Unleveraged balance sheet to maintain financial flexibility



Investment in organic and inorganic growth

- Disciplined use of cash and balance sheet capacity as premise for all actions
- Metco as first major transaction in the context of strengthening around core competencies

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Challenge

- Approaching end of the current 5-year plan (FYP) in China
- Orders normalizing after the peak levels in 2013



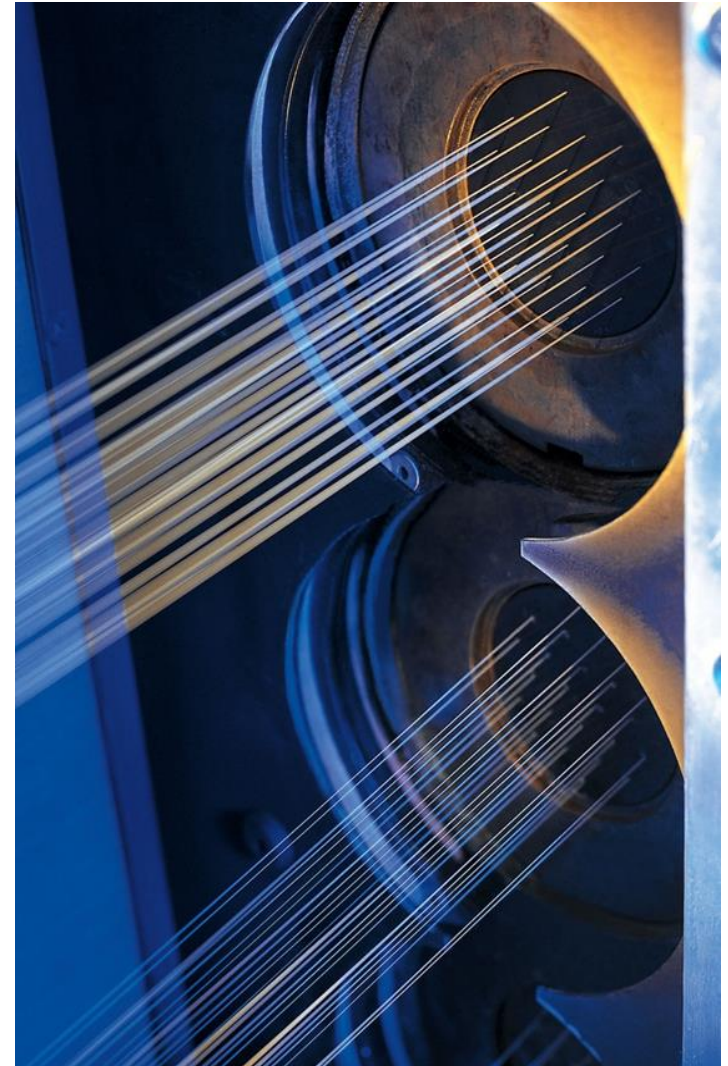
Opportunities

- Increased installed base
- Preliminary indications on potential content of 13th Chinese FYP*:
 - Chemical fibers (high- and new-tech fibers)
 - Develop substitutions for natural fibers
 - Industrial textile proportion in textile industry to exceed 30 % (25 % in 12th FYP)



Areas of action

- Increase service/ after sales business
- Leverage regions outside China
- Expand value chain around core competencies
- Accelerate innovations



* Source: EAC International Consulting: „Early Indications on China’s 13th Five Year Plan“



Challenge

- End market performance (agriculture, mining, gas fracking)
- Operational performance



Opportunities

- Hybridization and E-Drives
- Start of production of 3rd plant in India in 2015 to address local demand



Areas of action

- Streamline organization (integration)
- Further reduce cost base
- Focus product portfolio
- Increase value added
- Leverage global footprint





Challenge

- End market development (i.e. process industry)
- Profitability
- Scale/ volume



Opportunities

- High-tech applications for vacuum technologies and solutions
- New applications in new industries



Areas of action

- Innovation
- Operational excellence
- Service and distribution network



Roadmap for Advanced Technologies Segment



Challenge

- Strong market consolidation
- Adoption of new technologies (nanotechnology)



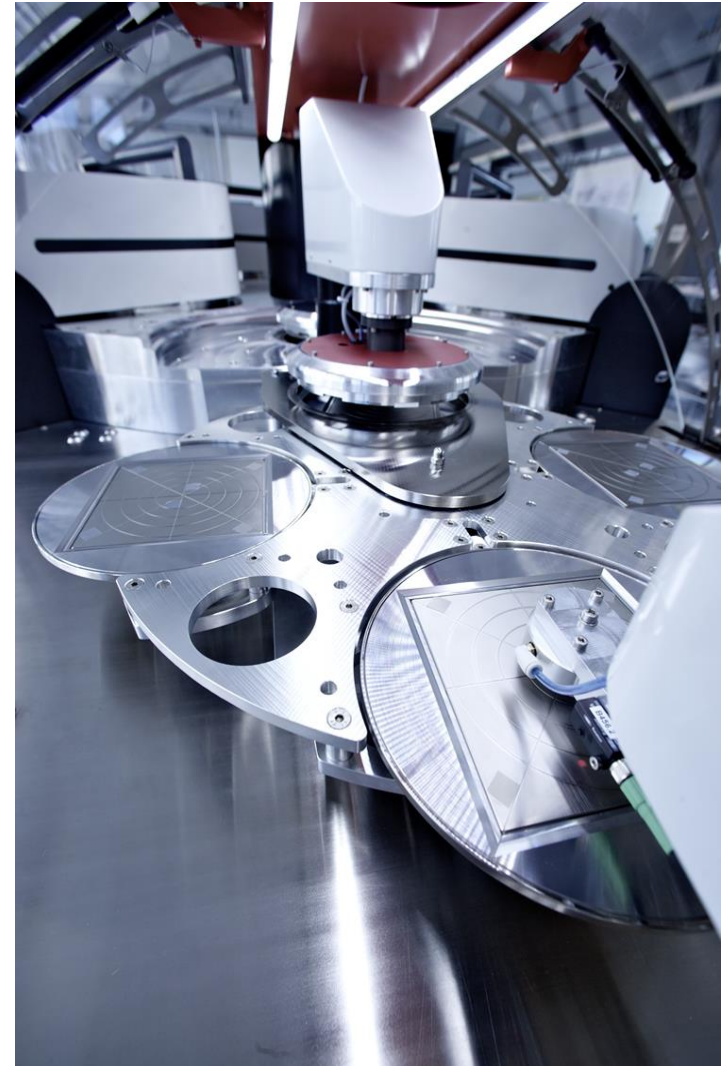
Opportunities

- Internet of things
- Digitalization



Areas of action

- Innovation
- Cost discipline





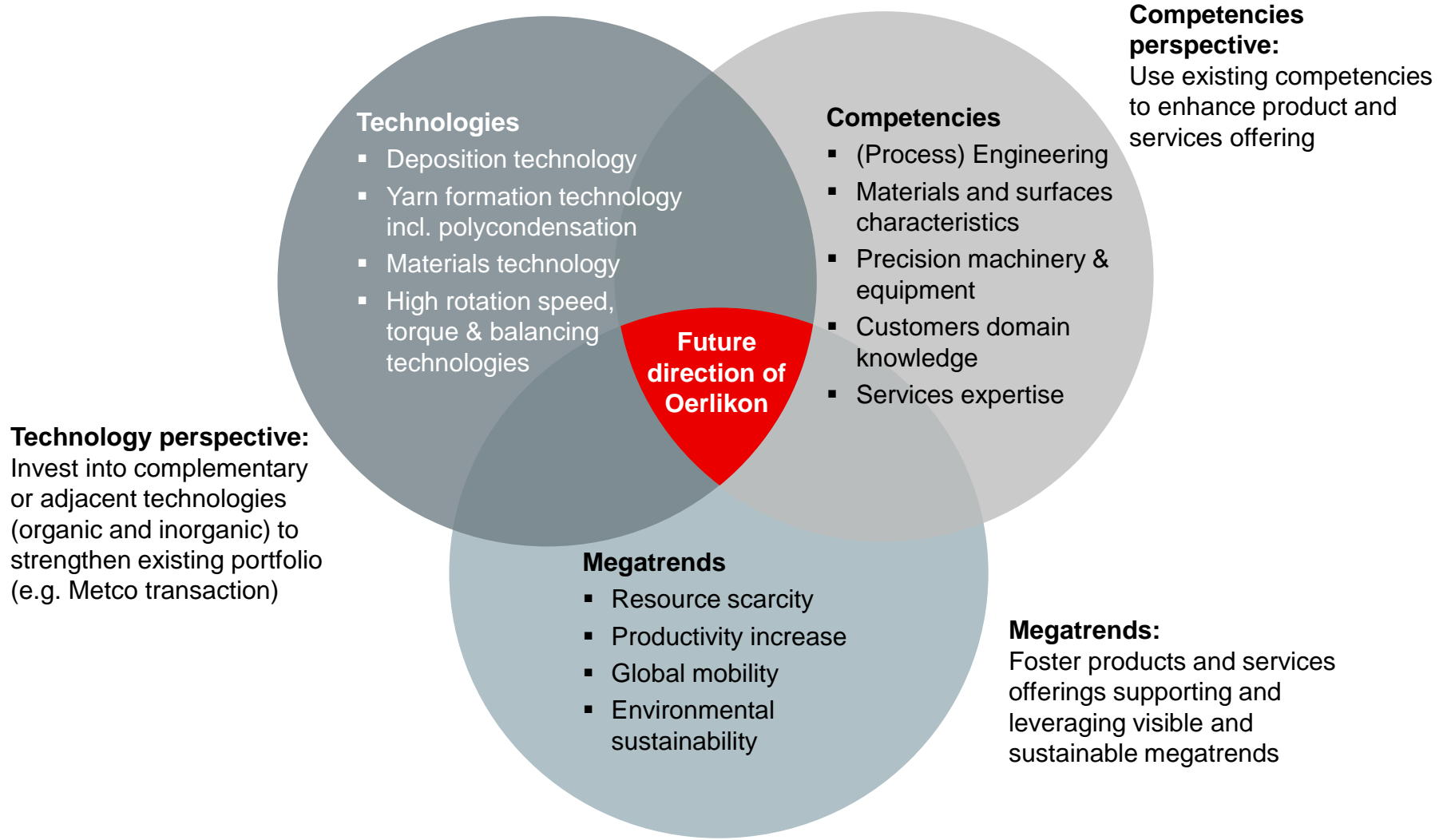
Today's agenda

- Key end markets and applications
- Major technologies incl. future development
- Update on the Metco integration incl. first customer successes
- Mid-term expectations for the Surface Solutions Segment
- Site visit

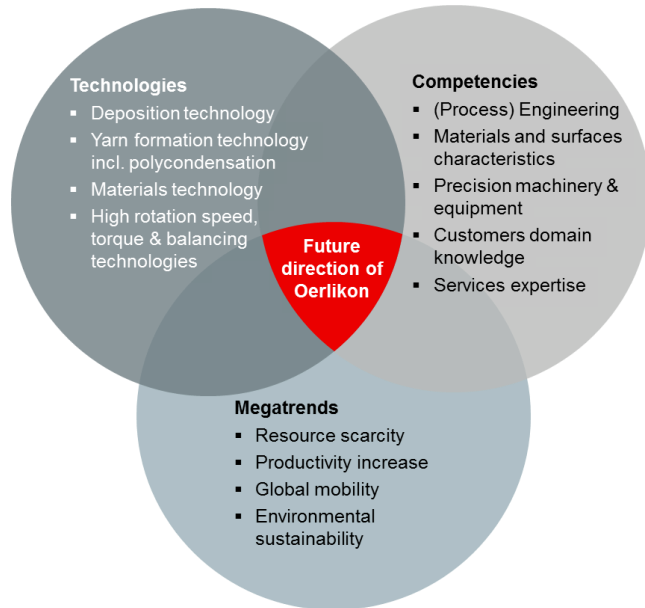


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Looking at future development of Oerlikon from three different perspectives



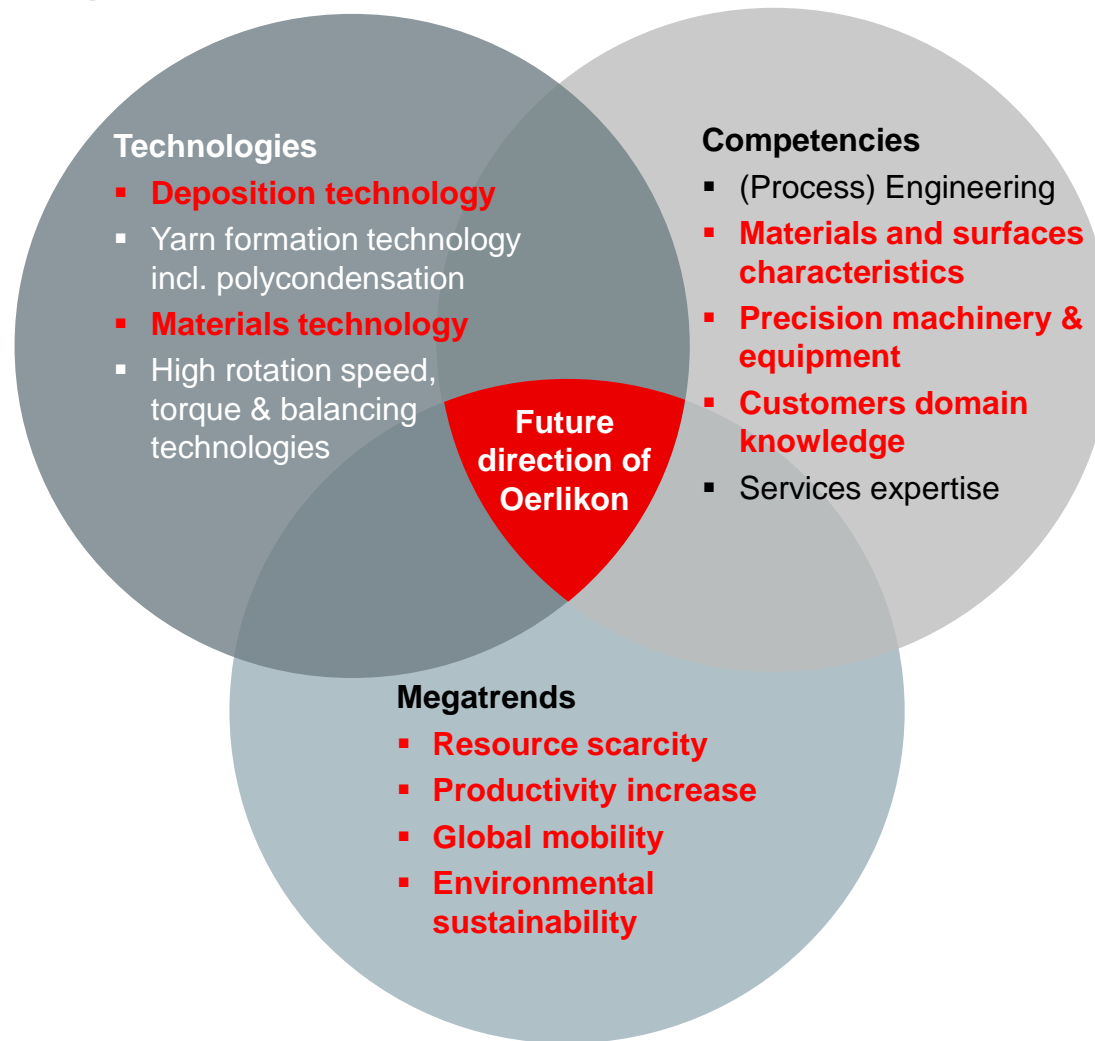
What does this mean for Oerlikon?



Oerlikon will:

- ... leverage and strengthen Best-in-Class businesses
- ... improve businesses which are not yet Best-in-Class
- ... leverage attractive end-markets
- ... balance market exposure (regions and end-markets)
- ... further strengthen its core competencies
- ... further reduce cyclical and volatility
- ... use its cash in a disciplined and value accretive way

Metco transaction in the context of the Group strategy



The Metco acquisition strengthens Oerlikon from a technological, competencies and megatrends exposure point of view!

Oerlikon Balzers and Oerlikon Metco – A perfect match

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Thank you.



Surface solutions market

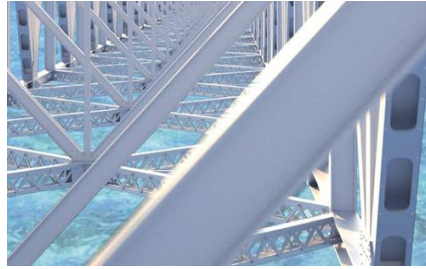
Dr. Roland Herb, CEO Surface Solutions Segment

Howard Lang, Head Sales & Marketing Oerlikon Metco

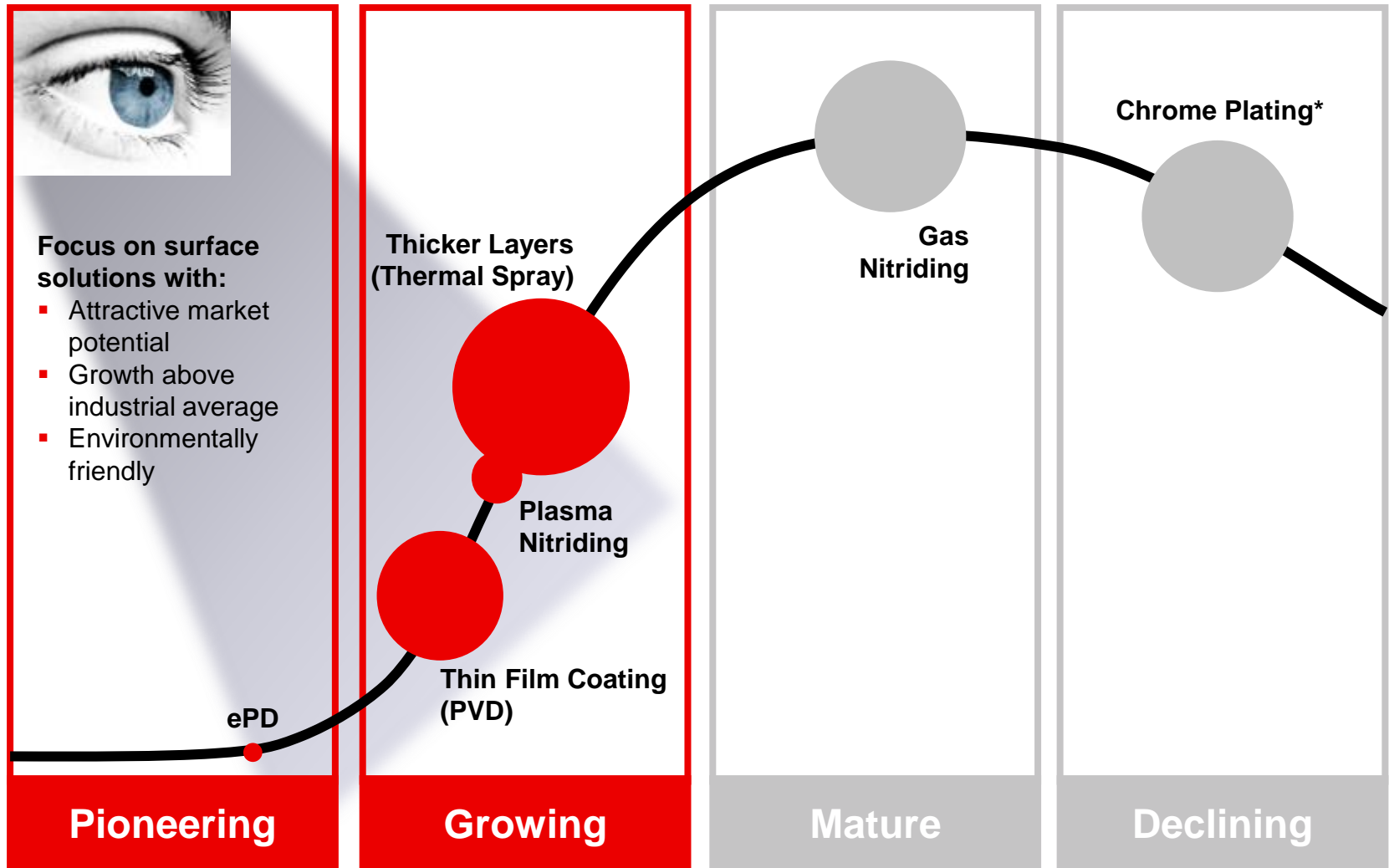


Surface solutions are needed everywhere...

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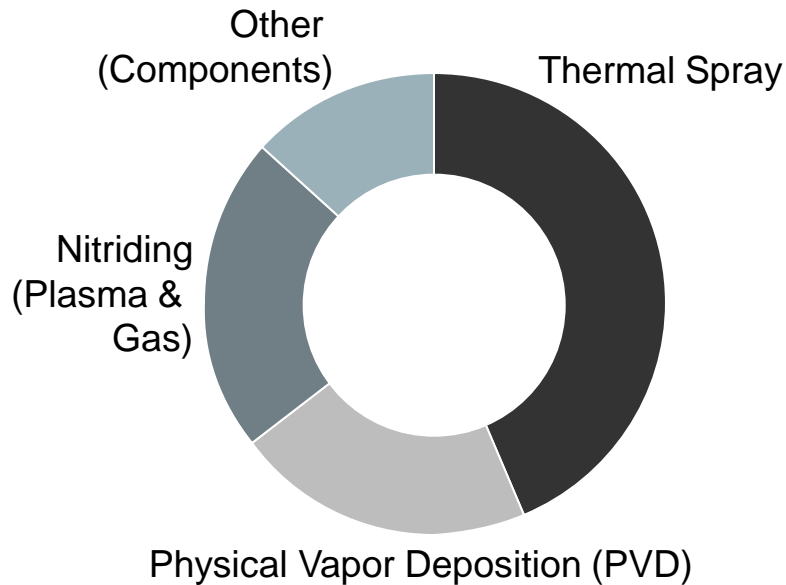
One focus: Environmentally friendly, fast growing surface solutions



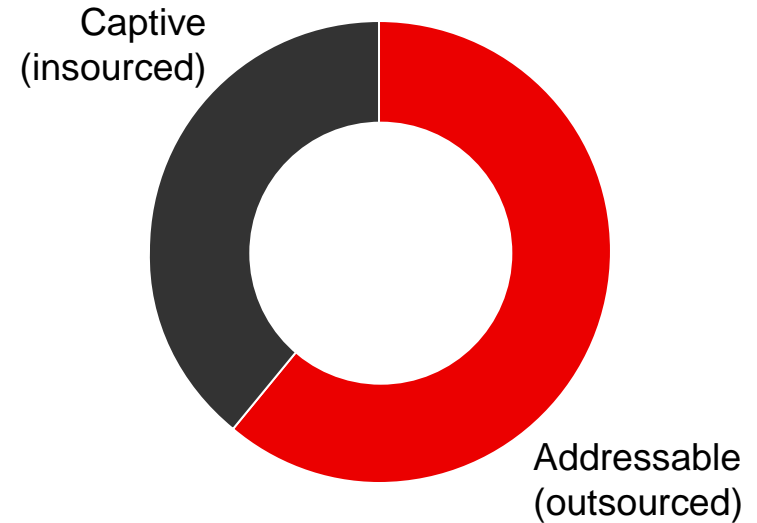
* Hazardous production process

Total surface solutions market (excl. CVD) is ~ CHF 13.5 billion in 2014

Total market (excl. CVD) by technology



Total market by sourcing

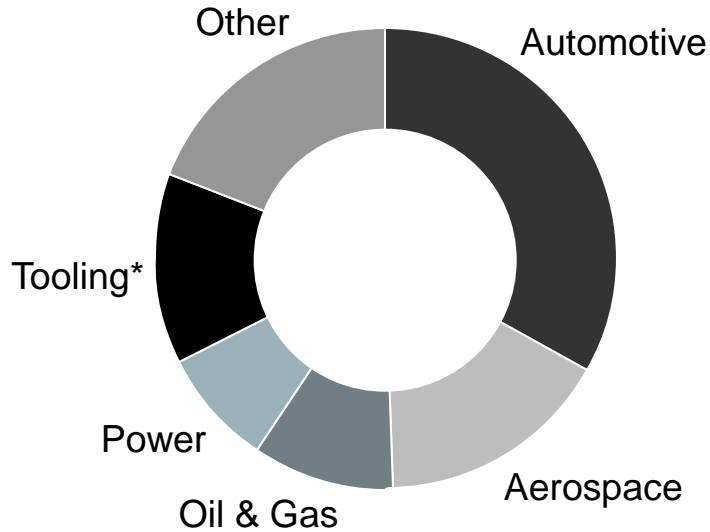


- Total market of CHF ~13.5 billion in 2014
- Biggest market in Thermal Spray is the service business, followed by materials and equipment
- PVD and Nitriding are mainly a service business (limited equipment sales)

- Addressable market of ~ CHF 9 billion
- Service ~50 % of the addressable market
- Thermal Spray and PVD services are mainly outsourced
- Majority of the Nitriding services insourced – Gas Nitriding seen as a simpler heat treatment process

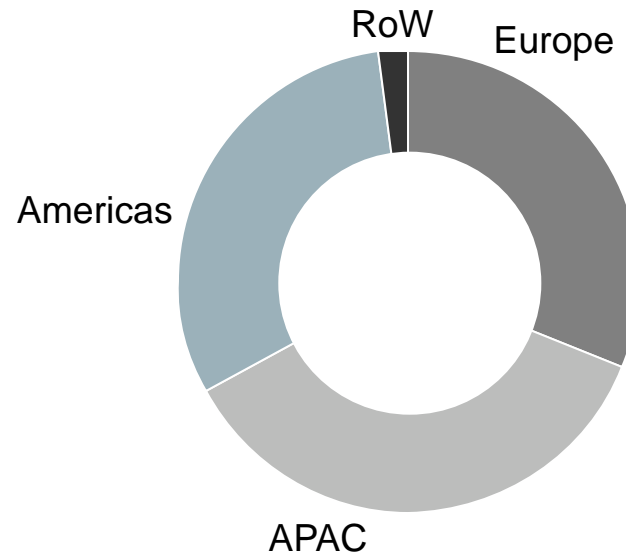
Surface Solutions Segment with an addressable market of ~ CHF 9 billion

By end market



* Majority of tools used in other mentioned end markets

By region



- Five industries reflect >3/4 of overall coating demand
- Main applications for PVD today are in Auto and Tooling; Turbines and Oil & Gas provide attractive growth potential
- Thermal Spray with good penetration in every end market except Tooling (not suitable)

- Global market
- Large global customers require footprint and service in all key regions
- Strong market development in Asia in recent years, driven by China

Surface Solutions Segment with the potential to outperform underlying industry growth



CAGR: ~6 %

Aviation



CAGR: ~5 %

Automotive



CAGR: ~4 %

Oil & Gas



CAGR: ~5 %

Tooling



CAGR: ~5 %

Power Generation



CAGR: ~4 %

General Industry

Global GDP growth: around 3 %



Automotive industry
CHF 2.7 billion addressable market
Industry growth ~5 % CAGR

Large number of applications for surface solutions to produce ~ 90 million vehicles p.a.

Engine applications



- PVD & Thermal Spray coating of key engine parts
- Established applications: Piston rings, fuel injectors etc.
- Emerging applications: Cylinder bores, pistons, valves, tappets, springs, crankshaft, camshaft etc.

Components



- Surface solutions to enhance performance and improving reliability
- Established applications: Synchronizer rings, suspension ball pins etc.
- Emerging applications: Brake discs, sensors etc.

Cutting & Forming tools



- PVD coatings to extend cutting tool life and reduce of machining time
- Coating of forming tools to extend life/ maintain dimensional accuracy

Design parts

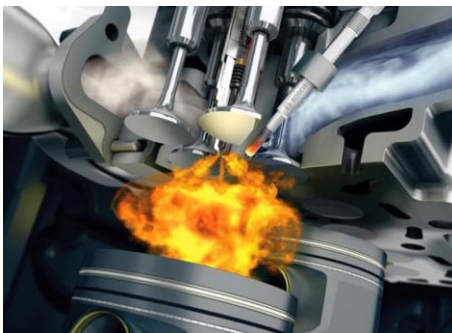


- Environmentally friendly replacement for traditional processes
- Established applications: Interior parts
- New applications: Exterior parts e.g. mirror housings, decorative trims etc.

→ Established applications with a revenue potential of ~CHF 70 per car*

*Approximate value of surface solutions in latest generation diesel cars with a 5 speed dual-clutch transmission (DCT)

Surface solutions help address the core goals of the automotive industry – exciting times



Trends / Needs

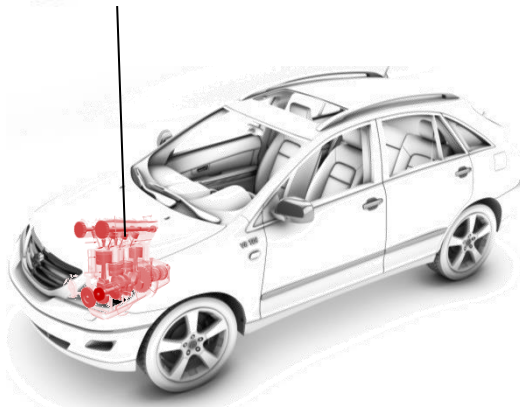
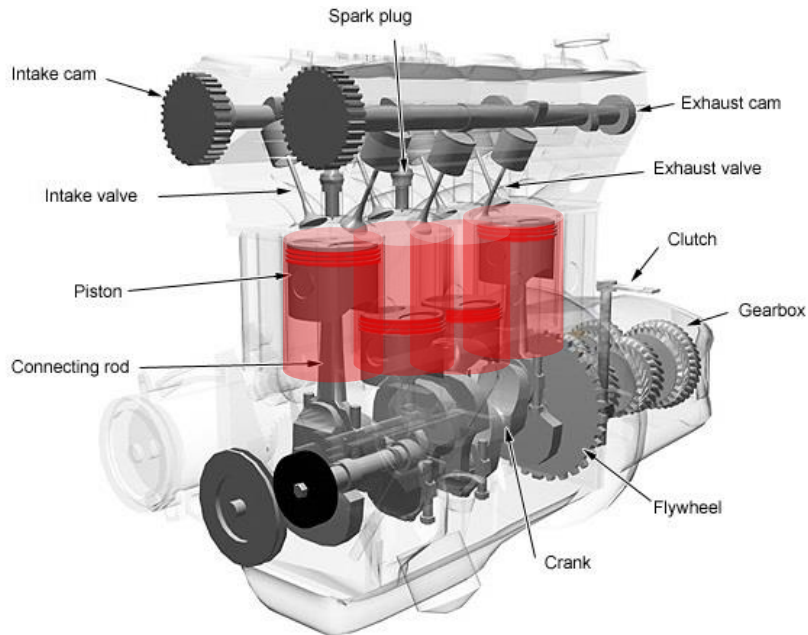
- EU/ US/ China limits on CO₂ driving numerous developments for weight and fuel consumption reduction
- E.g. EU car manufacturers' fleets must reduce CO₂ per kilometer -40 % by 2021 (from 2007 level)
- Weight reduction is very effective to reduce consumption

Key drivers for surface solutions:

- Engine downsizing (e.g. using less cylinders under higher pressure) causes **higher stress** on smaller parts
- More **corrosion** issues from exhaust gas recycling, start-stop systems, turbo-chargers
- **Higher torque transmissions** with more gears (therefore more synchronizer rings)
- Reducing **friction** and mechanical losses
- More **environmentally friendly** solutions e.g. replacing Chrome 6

→ **Focus on fuel consumption, emissions and weight reduction drives the penetration of surface solutions**

Application example: Combining PVD and Thermal Spray expertise for engines



Challenge:

- Increase fuel efficiency and downsize engines
- Reduce weight by directly coating the aluminum engine block (no liners)

Oerlikon's solution:

- Piston rings coated with PVD combining wear resistance and lowest friction
- Cylinder walls plasma coated with Metco's SUMEBORE™ for low friction and corrosion resistance

Combined solution benefits:

- Reduces fuel consumption by 2-4 %
- Mechanical losses piston group -30 %
- Oil consumption -30 %
- 12 % engine block weight reduction



Oil & Gas industry
CHF 0.8 billion addressable market
Industry growth ~4 % CAGR

Oil & Gas industry equipment exposed to high wear and aggressive environments

Down Hole Tools

Drill String, Bottom Hole Assembly



- Thermal Spray on drilling motor rotors & mandrels to replace hard chrome and protect against wear
- Weld Overlay coatings on drill collars (abrasion)
- Laser Cladding on stabilizers and measurement tools to prevent damage to sensitive parts

Pumps

Multi-Stage, Fracking, Seawater Injection, Feed, Slurry



- Thermal Spray coatings on impellers, wear rings, pump shafts and bearing sleeves
- PVD and thermal spray coatings on mechanical seals

Valves

Engineered, High Pressure, Sub-Sea



- Thermal Spray, Laser Cladding and PVD coatings on valves to protect against wear, corrosion and galling
- PVD on valve actuators to reduce friction

Drill Bits

Directional Drilling, Rotary



- Thermal Spray and Overlay Welding coatings on drill bits to protect against abrasion, impact and corrosion
- PVD for mechanical seals



Trends / Needs

- Unconventional gas/ oil requires 50x more wells than conventional oil and more horizontal drilling – increased friction and wear on drill string
→ >3 500 drilling rigs currently in operation (all time high)¹
- Reliable valve actuation on critical sub-sea valves and blowout-preventers (BOP) becomes even more critical – must be maintenance free on the sea bed
- Unconventional gas/ oil and sub-sea are highest growth areas of the industry (~14 % CAGR to 2017²)
- Hard chrome still widely used for new parts although being replaced due to ease of re-coating and lifetime issues in aggressive environments (drilling fluids, sour gas etc..)
- Thermal Spray and Laser Cladding are being adopted in the industry as hard chrome and conventional welding replacements. Growing use of PVD especially Diamond Like Carbon (DLC)
- **Technical challenges with shale gas, deep water, subsea and high cost of failure driving the penetration of surface solutions**

Source: ¹ Baker Hughes Rig Count Data; ² IEA world energy investment outlook report

Application examples: working together with key oilfield equipment customers



Drill pipe coating

Challenge:

Reduce friction and wear between drill pipe and well casing. Major challenge especially for directional drilling with abrasive slurry

Oerlikon's solution:

- Developed specially formulated coating material together with major oilfield OEM
- 5x service life and 2x less casing wear

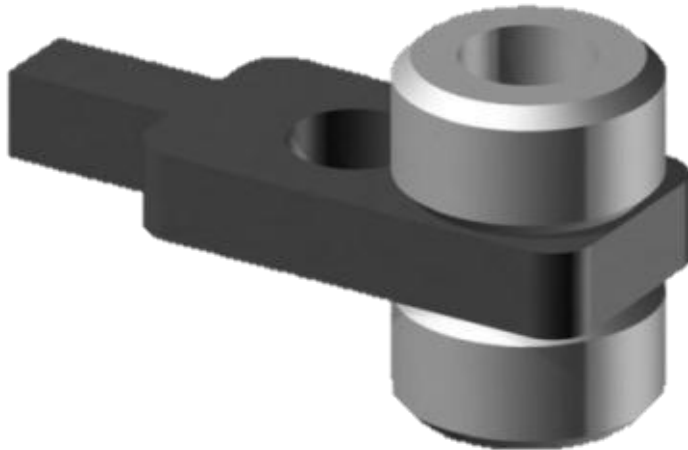
Sub-sea valves

Challenge:

Extreme reliability requirements for critical sub-sea valves

Oerlikon's solution:

Combination of a gas tight, corrosion resistant Thermal Spray coating with ultra low friction wear resistant PVD (DLC – Diamond-Like Carbon) coating on-top





Power Generation industry
CHF 0.7 billion addressable market
Industry growth ~5 % CAGR

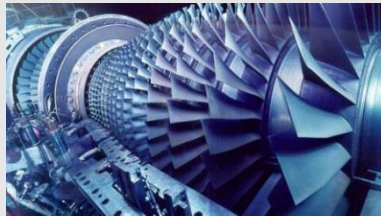
Surface solutions for the power generation industry

Gas Turbine Combustors, Blades and Vanes



- Thermally sprayed Thermal Barrier Coatings (TBC) on gas turbine combustor walls, blades and vanes facilitate higher combustion temperatures and push thermal efficiency

Gas Turbine Compressor and Steam Turbine Rotor Blades



- PVD coatings protect gas turbine compressor blades from damage by solid particle erosion and steam turbines from liquid droplet erosion

Hydro Turbine Runners



- Thermally sprayed carbide coatings protect hydro turbines from accelerated wear by silt erosion and cavitation

Fuel Cell Interconnects



- Coatings on Solid Oxide Fuel Cell (SOFC) plates act as effective diffusion barriers. Extending the life and power output of fuel cells

Trends & needs in the Power Generation industry

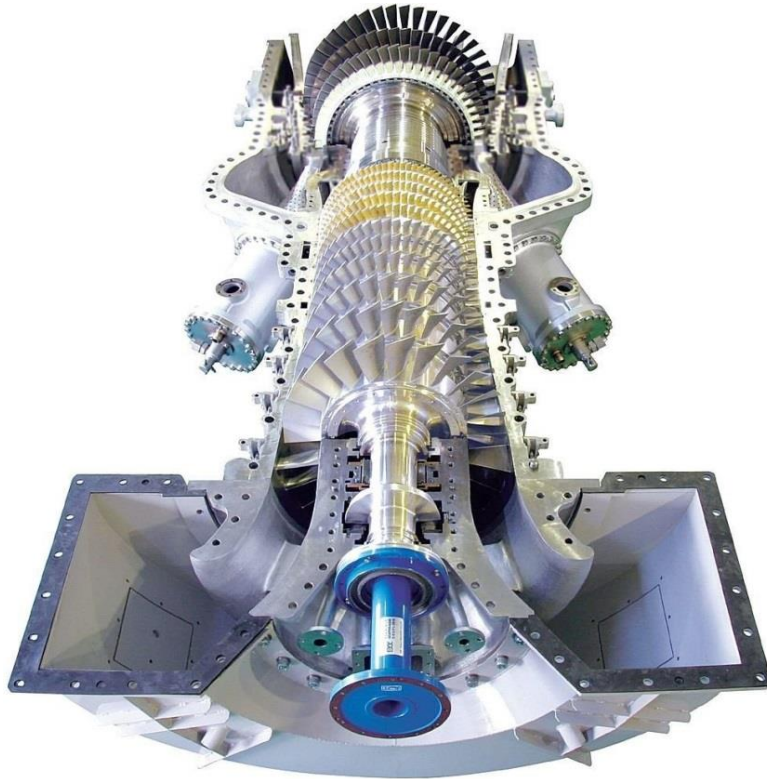


Trends / Needs

- Gas turbine industry pushing gross thermal efficiency beyond 60 %, inlet temperatures $>1\ 600\text{C}^{\circ}$
- Key technology topics are higher temperature combustion, further enhanced gas path sealing and increased time between maintenance
- 0.5 % efficiency improvement* can be achieved by fitting the steam turbine units of a 1 000 MW coal fired power station with abradable seals results in US\$ 1.6 million fuel savings p.a. Existing steam turbines can be upgraded on-site
- Thermal Spray coatings on hydro turbines extend the time between overhaul by factor 3-7 in aggressive high silt regions (Asia)
- New coating applications developing also on wind (large bearings and ring coatings), fuel cells and for energy storage
- **Focus on fuel consumption, emissions and time between overhaul drives the penetration of surface solutions**

* Source: Leading steam turbine OEM

Coatings push efficiency of gas turbines for electric power generation



Challenge:

Reduce emissions, push efficiencies and extend time between overhaul

Solution:

- Push firing temperatures beyond 1 600 °C
- Seal hot and cold gas path
- Protect turbine hardware from damage by hot corrosion and erosion

Oerlikon's contribution:

- Thermal barrier coatings (TBC) on hot section components
- Coatings to seal the cold and hot gas path
- Thin Film coatings protect against solid particle erosion
- Special wear coatings to protect flanges from fretting damage
- 2 % improvement in efficiency of a 530 MW gas turbine power plant using Thermal Barrier Coating (TBC) technology results in fuel savings of US\$ 3.4 million p.a. and 29 000 tons less CO₂



Aerospace industry
CHF 1.3 billion addressable market
Industry growth ~6 % CAGR

Surface solutions used on 'mission critical' applications in the aerospace industry

Engine Gas Path Seals



- Sealing between rotating and stationary parts boosts engine efficiency
- Range of Thermal Spray abrasion-resistant coatings and honeycomb seals for different temperature zones

Thermal Barrier & Wear Coatings



- Thermal barrier coatings (TBC) on blades & vanes allow for higher temperature in the turbine
→ more efficient jet engines
- Thermal Spray and PVD coatings to prevent sliding wear, fretting and erosion

Hydraulic Actuators / Piston / Guides / Fasteners



- PVD coatings to prevent fretting and sliding wear
- Replacement of hard chrome and cadmium

Landing Gears



- New generation aircraft (from A380 onwards) changed from hard chrome to Thermal Spray
- PVD applications include landing gear bolts, pivot pins, bearings

Surface solutions support the achievement of key industry fuel burn and emission goals

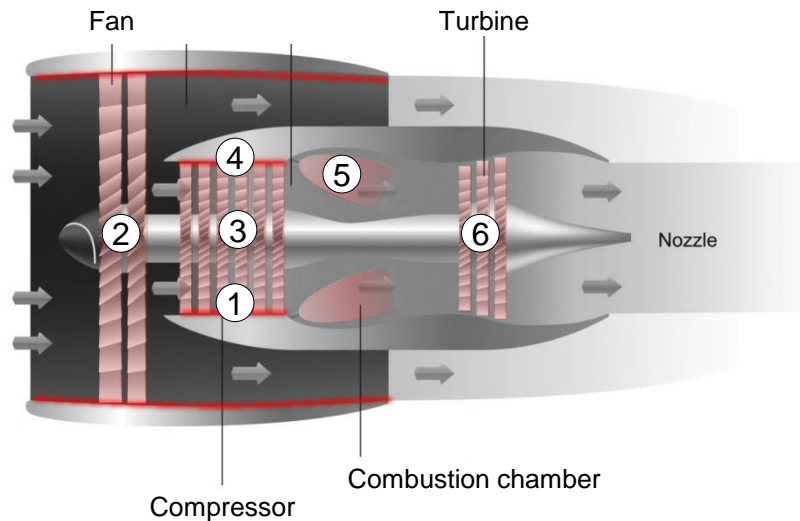


Trends / Needs

- Airbus global market forecast predicts doubling of air travel traffic over next 15 years. 31 000 new aircraft between 2014-2033
 - 2020 goals driving industry (80 % NO_x reduction, 50 % CO₂ per passenger reduction, noise reduction, -20 % fuel burn)
 - ~CHF 125 000 of coating work on each new and overhauled engine
 - Engine trends: Lighter weight materials, higher temperature combustion, further enhanced gas path sealing
 - Surface solutions required for new materials, e.g. ceramic matrix composites (CMCs), new titanium alloys
 - PVD coatings required on compressor blades and blisks to protect against particle erosion (sand)
 - All landing gear changing from hard chrome to Thermal Spray for environmental reasons. Currently A380, B787
- **Focus on fuel consumption, emissions and weight reduction drives the penetration of surface solutions**

NO_x: Oxides of nitrogen

The combination of PVD and Thermal Spray provides complete solution for jet engines



- ① Abradable seal coatings (TS) on casing
- ② Wear protection coatings (TF & TS) of blades
- ③ Erosion resistance coatings (TF) of compressor blades
- ④ Blade tip and fire barrier coatings of compressor casing (TS)
- ⑤ Thermal barrier coatings (TS) of combustion chamber and turbine blades (TS)
- ⑥ Corrosion / oxidation protection coatings of turbine blades (TS)

Challenge:

Reduced fuel consumption by higher efficiency

Solution:

- Increase combustion temperature
- Clearance control
- Erosion protection

Oerlikon's contribution:

- Thermal Barrier Coating (TBC) allows for higher temperature
- Sealing of airflow against rotating blades by abradable coatings or honeycombs
- PVD coatings to protect compressor blades against airborne particles
- 2 % improvement in engine overall efficiency by using compressor abradable seals saves more than 4 800 million liters of fuel, worth ~US\$ 4 billion, and avoids 12.3 million tones of CO₂ p.a. for the global fleet of civil aircraft

Our customers include the world's leading engineering companies



Automotive



Oil & Gas



Power Generation



Aerospace

- BMW
- Bosch
- Getrag
- Toyota
- Volkswagen
- ZF

- Baker Hughes
- Cameron
- FMC
- GE Oil & Gas
- NOV
- Sulzer Pumps

- Alstom
- Andritz
- GE Power & Water
- Mitsubishi/Hitachi
- Siemens
- Solar Turbines

- GE Aviation
- IHI
- MTU
- Pratt & Whitney
- Rolls-Royce
- Snecma

Key customers' feedback to the formation of the Surface Solutions Segment



**Sourcing Manager
European Automotive OEM**

“We are very positive to the merger as both Metco and Balzers are key suppliers in their respective areas. We now can benefit from one source of coating services for engine components (Thermal Spray and Thin Film).”



**Head of R&D
Global oilfield technology OEM**

“The adoption of surface technologies like Thermal Spray and DLC is accelerating rapidly in this industry – we can no longer rely on traditional methods.”



**Engineering Manager
Global IGT manufacturer**

“Now everything in surface treatment is together in one strategic company: With this as the largest division, I expect great things from the focus and investment in coating technology.”



**Head of Production
Leading Aero Engine MRO**

“Metco has always been a reliable, innovative partner providing valuable support for our challenges. We plan to extend this cooperation now to the Thin Film applications.”

- We focus on growing technologies (Thin Film, Thermal Spray and Plasma Nitriding)
 - Environmentally friendly → replacing e.g. hard chrome
- Addressable market of ~ CHF 9 billion
- Focus markets growing beyond underlying GDP
- Penetration of surface solutions further driven by key industry trends:
 - Automotive: fuel consumption, weight, emissions reduction
 - Oil & Gas: technical challenges with shale gas, subsea. Cost of failure
 - Power: thermal efficiency, alternative energy and future storage
 - Aerospace: fuel burn reduction, oxides of nitrogen (NO_x)
- Collaboration with the world's leading companies in these industries
- Unique customer proximity, global footprint, technical collaboration and breadth of the product portfolio

Energy efficient and environmentally friendly solutions

Thank you.



Combining leading surface technologies

Dr. Helmut Rudigier, CTO Oerlikon Balzers

Dr. Richard Schmid, CTO Oerlikon Metco



We provide our customers with surface solutions

Examples of Surface Mechanisms

- Thermal Protection
- Sticking
- Friction & Wear
- Electrical Insulation/ Conductivity
- Oxidation
- Corrosion
- Clearance Control
- Decorative Enhancement



Illustrations of advantages of surface solutions

Oil & Gas

Reliability

Safe, lifelong, sealing for subsea valves

Mining

Cost saving

20 fold increase in mine dewatering pumps and tar sand screens life

Tools

Productivity

Coatings enable a 10 % p.a. increase in productivity

Aerospace

Energy efficiency

1 million liters of fuel saved per hour, globally

Power generation

Increased lifetime

Over 25 000 hours of operation between service

Automotive

Environmental friendly

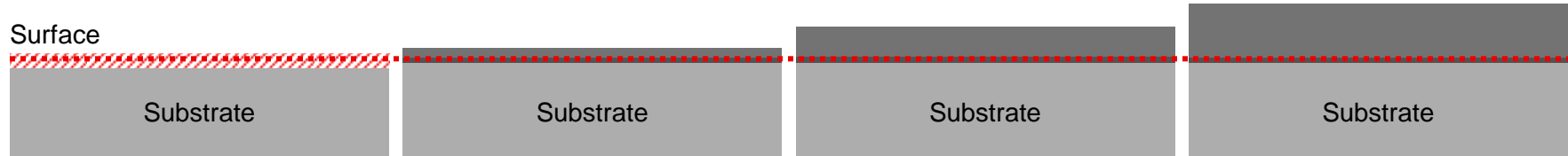
Enabling up to 5 % fuel savings through reduction of friction for heavy duty diesel engines*



* Source: DEER 2007, Diesel Engine-Efficiency and Emissions Research Conference, Detroit

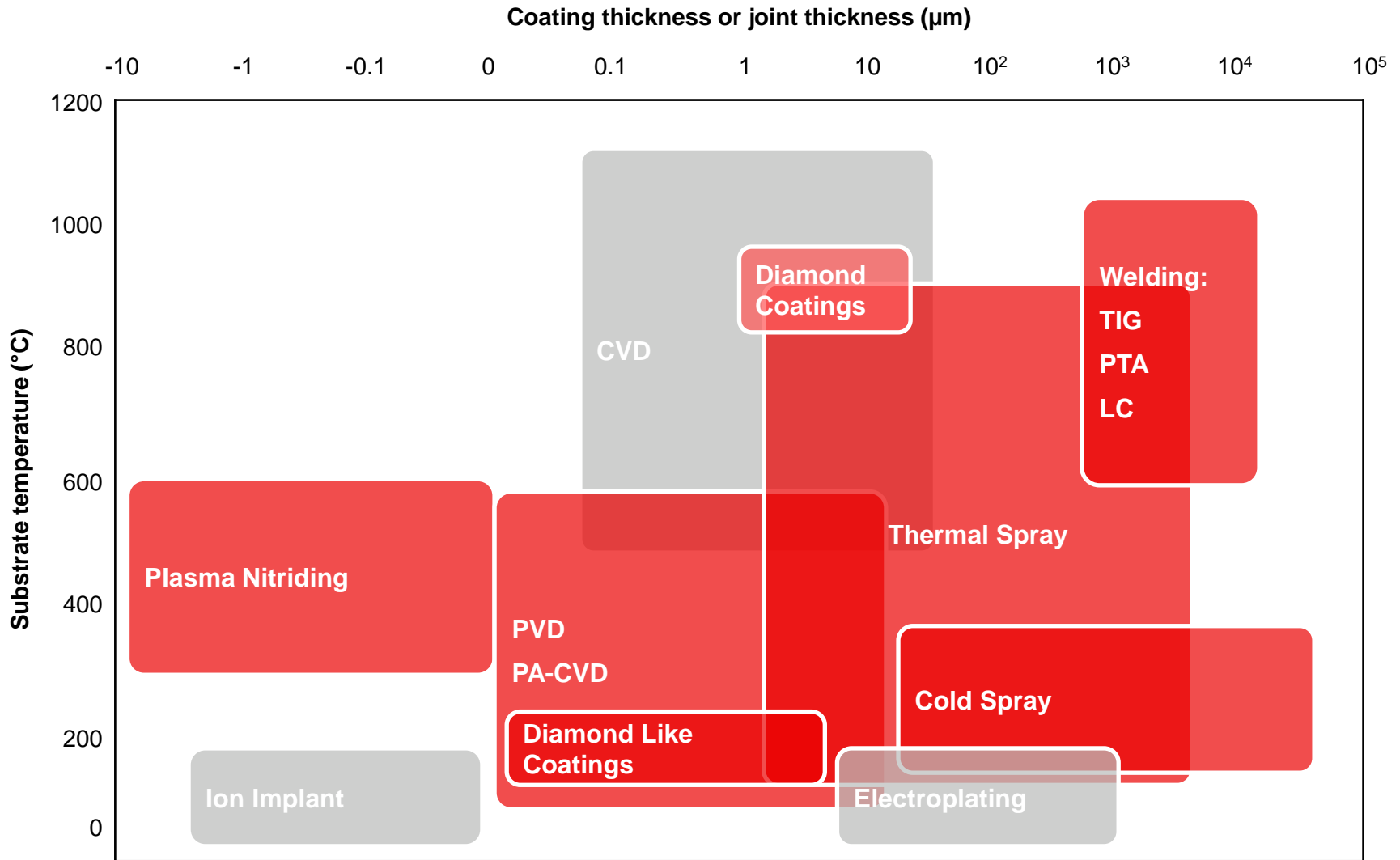
Broad range of surface solutions for different applications

Nitriding	Thin Film	Thicker Layer	PTA / Weld Hardface
			
<ul style="list-style-type: none"> ▪ Altering surface chemistry ▪ Depth of 0.005 – 0.8 mm 	<ul style="list-style-type: none"> ▪ Adding layers of material ▪ Depth of 0.1 – 50 µm 	<ul style="list-style-type: none"> ▪ Adding layers of material ▪ Depth of 20 µm – 10 mm 	<ul style="list-style-type: none"> ▪ Adding layers of material ▪ Depth of 1 – 20 mm
<ul style="list-style-type: none"> ▪ Plasma Nitriding ▪ Gas Nitriding 	<ul style="list-style-type: none"> ▪ PVD ▪ PA-CVD ▪ Diamond-like Coatings ▪ Diamond Coatings 	<ul style="list-style-type: none"> ▪ Thermal Spray ▪ Cold Spray 	<ul style="list-style-type: none"> ▪ Welding: <ul style="list-style-type: none"> ▪ Tungsten Inert Gas (TIG) ▪ Plasma Transferred Arc (PTA) ▪ Laser Cladding



PVD: Physical Vapor Deposition; PA-CVD Plasma Activated Chemical Vapor

The desired surface properties and substrate temperature define the right technology



CVD: Chemical Vapor Deposition LC: Laser Cladding PVD: Physical Vapor Deposition
 Friction: Carbon Friction Layers PACVD: Plasma Assisted CVD PTA: Plasma Transferred Arc
 TIG: Tungsten Inert Gas

Oerlikon Technology

Not in Oerlikon Portfolio

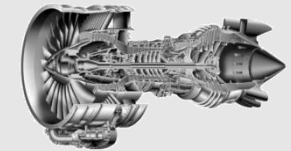
Thermal Spray (TS) technology – Leading in equipment, process and materials

Surface solutions technology

- Thermal Spray portfolio covers all technologies, e.g. Atmospheric Plasma, High Velocity Oxy-Fuel, Electric Arc Wire, Cold Spray, Combustion Wire/Powder
- Broad range of powder manufacturing technologies matching deposition processes
- System solutions

Oerlikon's strength

- Principal technology in gas turbines for reduced fuel burn and increased up time
 - Airlines save 1 million liters per hour
 - 25 000 hours up time
- Environmentally friendly and economical process for thick coatings on widely varying substrate sizes
- Wide range of patented materials and equipment



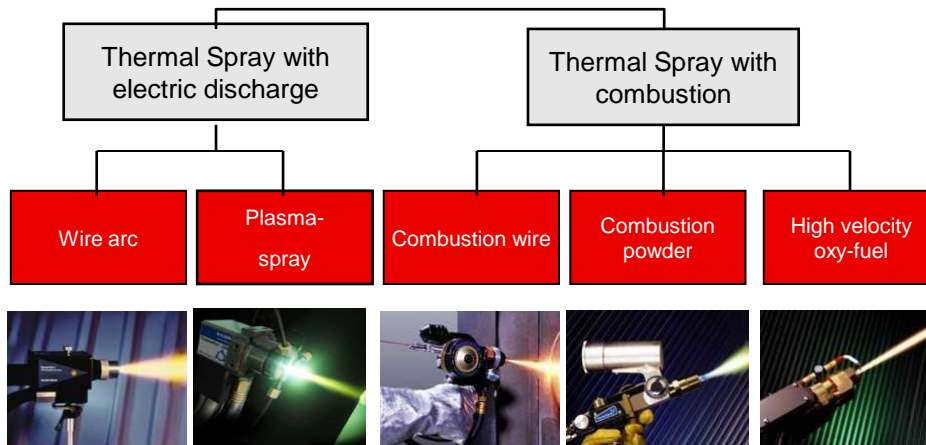
Coating equipment: Industry leading core components and integrated systems for TS

Surface solutions technology

- Industry leader in largest segments of Plasma, High Velocity Oxy-Fuel and Vacuum Thermal Spray
- IP protected spare parts
- Advanced modelling tools for process development
- Unique non-line of sight deposition process

Oerlikon's strength

- All spray technologies
- Modular core equipment
- New cascade plasma gun portfolio can increase productivity by up to 300 %
- High productivity customer specific systems



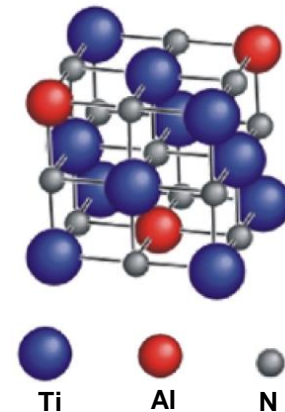
Coating equipment: PVD – Setting the standard in the industry

Surface solutions technology

- Leading Cathodic Arc Evaporation technology for tool coating
- Plasma Assisted Chemical Vapor Deposition technology for components
- Sputtering for functional high end decorative parts

Oerlikon's strength

- Proprietary high performance core modules
- S3p™: Industrialized approach to combine advantages of Arc Evaporation and Sputtering
- Standardized platforms and components
- Feedback from coating service guides equipment development



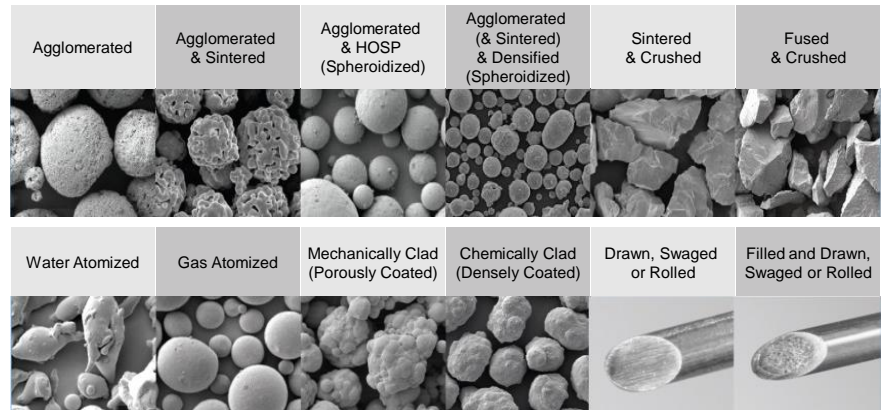
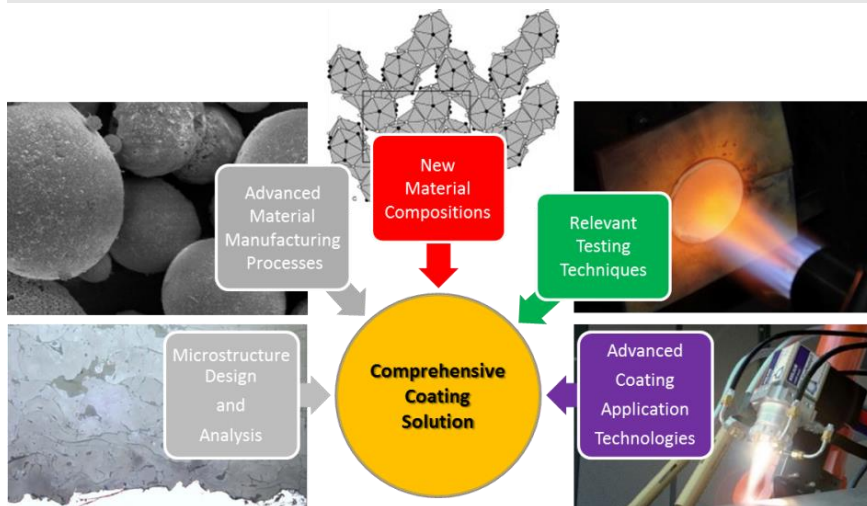
Coating materials: Full range for all key applications and spray processes

Surface solutions technology

- Ability to manufacture all material types and structures
- R&D facilities for rapid tailoring of novel materials for new applications and improved performance
- Application relevant in-house and institute testing of coating properties

Oerlikon's strength

- Five years on wing and continued increase in power and fuel efficiency of aero turbines
- Ability to quickly tailor and scale to production for new applications
- Bespoke manufacturing technologies
- Everything from metals, composites, cermets to ceramics
- Industry leader in abrasives



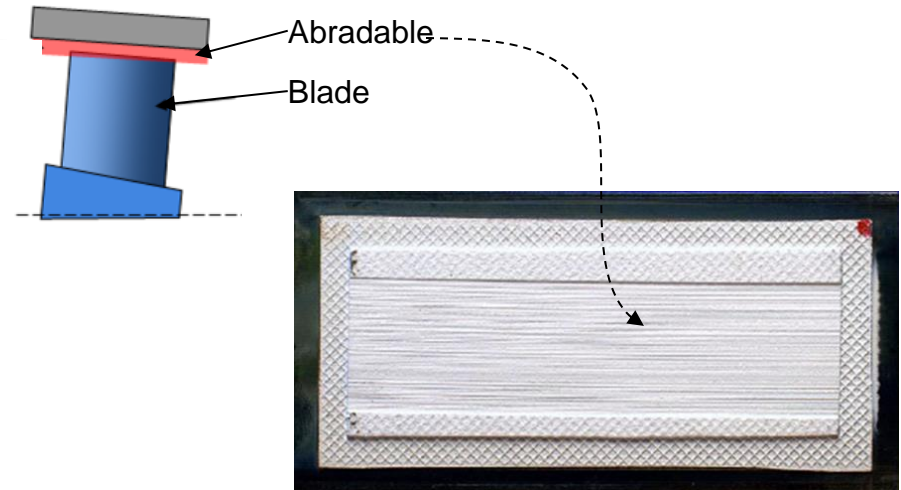
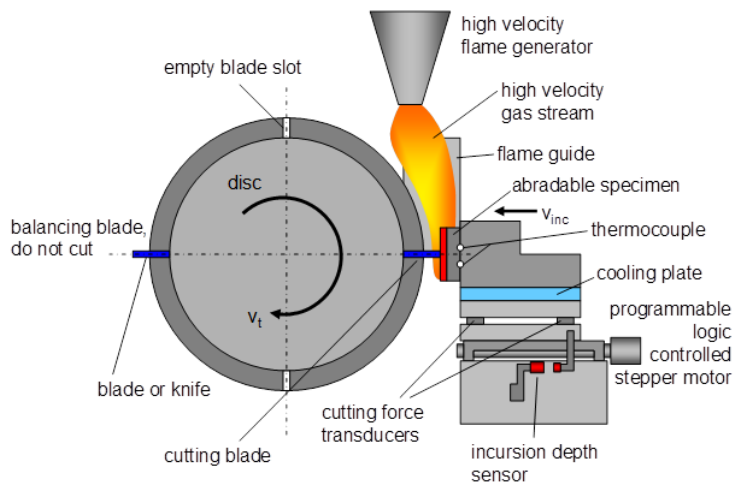
Abradable Seal Coatings – Blade tip sealing for increased efficiency and surge margin

Surface solutions technology

- Unique composite material manufacture capabilities
- Complex ceramics development and manufacture
- Industry standard testing facilities for abrasability, thermal cycling and erosion resistance
- Close collaboration with leading OEMs

Oerlikon's strength

- Complete range of sealing materials from -50° to 1 300°C
- Industry leading performance of balance between erosion resistance and low blade wear
- 0.5 % to 4 % increased stage efficiency with reduced surge margin
- Easy stripping and recoating



Embedded PVD (ePD) – a clean alternative to electroplating for chrome looking design parts

Surface solutions technology

- Environmentally friendly production process, no Cr6+ ions, no nickel
- In-line production technology, cycle time of 70 seconds
- Coating of flexible structures enables security-relevant applications (e.g. airbag emblem)

Oerlikon's strength

- Pioneering technology
- Distinct product advantages over electroplated parts (colors, additional functionalities: e.g. radar transparency, backlighting options)
- Mud corrosion resistance: better than chrome plating technology



Cr6+ : hexavalent chromium, considered as carcinogenic

Turbine Components (ELDIM)

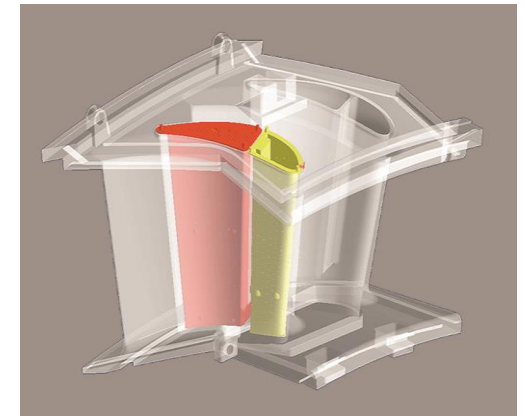
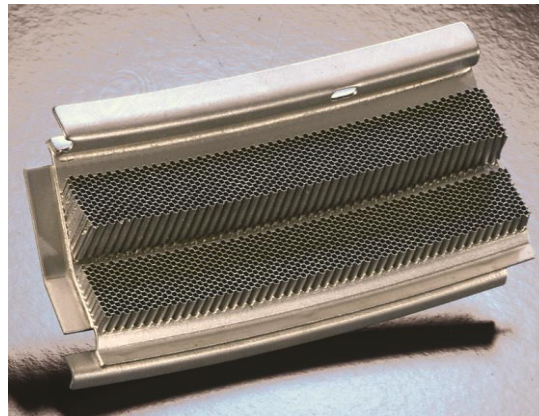
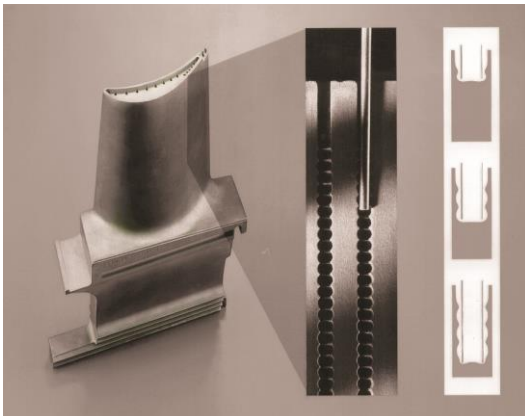
Sealing and cooling of gas turbines

Surface solutions technology

- Deep turbulated hole drilling
- Brazing/ diffusion/ heat treatments
- Non conventional machining competence (Electro-discharge machining, Electro-chemical machining and Laser)
- Conventional machining including hydraulic and excentric pressing
- Additive manufactured components
- Honeycomb components for gas turbine labyrinth seals

Oerlikon's strength

- One-stop-shop for machining of high temperature resistant turbine alloys
- Partner for component manufacturability
- High heat transfer cooling channels and inserts
- Co-design on cooling patterns



Services: Laser Cladding

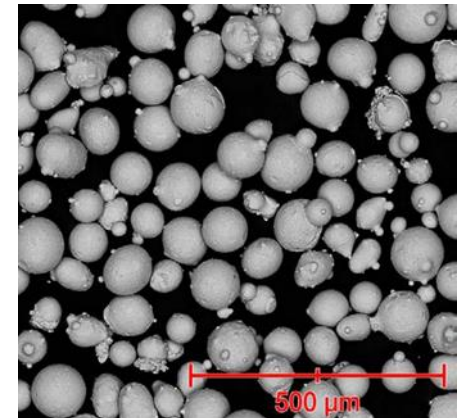
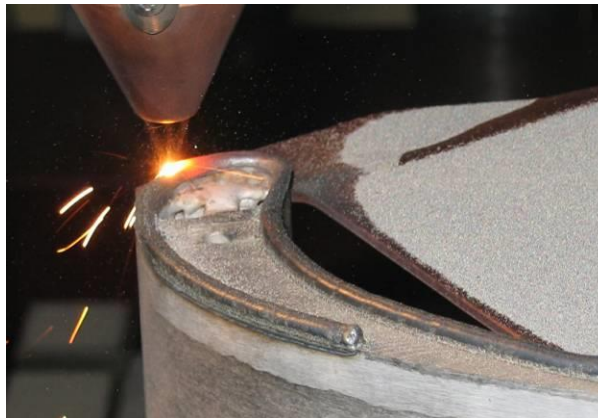
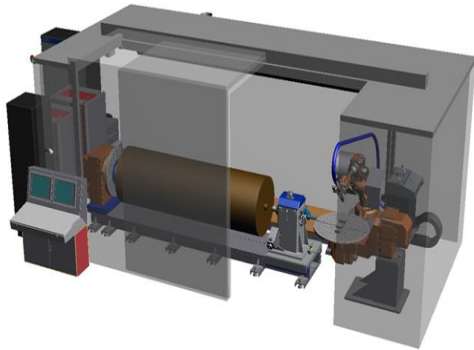
Over 25 years experience in weld repairs

Surface solutions technology

- Industry leading knowledge of the Laser Welding process resulting in optimized materials and low thermal input
- Wear and corrosion-resistant coatings for Oil & Gas and other demanding environments
- Nickel, Cobalt and Iron based clad materials
- Robot controlled systems

Oerlikon's strength

- Can combine material, equipment and application know-how like nobody else in the market
- Experience in advanced laser deposits for high-value parts in gas turbines and general industry
- OEM, modification and repair of critical high wear components that are exposed to highly abrasive and corrosive environments



Services: Plasma Nitriding

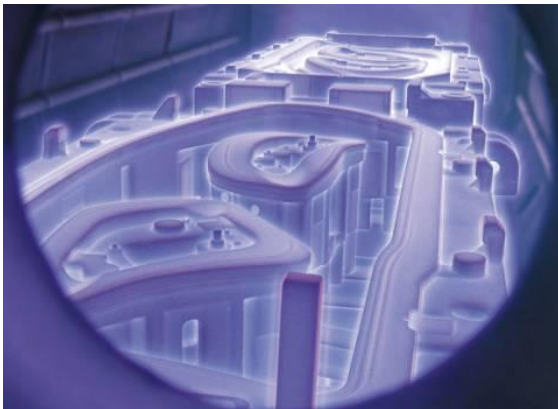
Performance of tools and components enhanced

Surface solutions technology

- Surface hardness increases by diffusing nitrogen into metal surface
- Low process temperature to treat high alloyed steels (380°C) and to minimize distortion of treated metal parts
- Most common processes: Plasma Nitriding, Plasma Nitrocarburizing
- Combination with PVD Thin Film coatings to further enhance surface hardness

Oerlikon's strength

- Environmentally friendly process: no hexavalent chromium, no nickel
- PPD (Pulsed Plasma Diffusion): Cost of ownership advantage for the customer up to 60 % over the lifetime of the tool
- Patent protected combination with surface oxidation process for corrosion protection: 25 million ball pivots per year ("IONIT OX")
- Broad application know-how



Services for Tools (PVD)

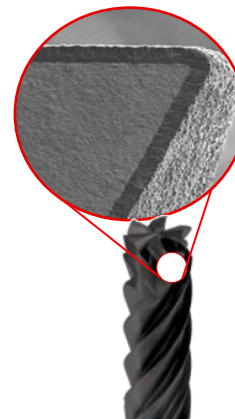
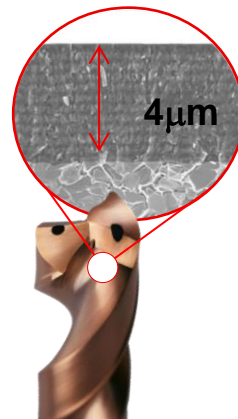
BALINIT® Coatings: Benchmark in industry

Surface solutions technology

- Broad portfolio of nitride based hard coatings for machining and forming applications
- Diamond coating for CFRP machining
- Application specific pre- and post-treatment technologies
- Regrinding technology

Oerlikon's strength

- Exceptional performance of coatings in many applications, productivity increase 10 % p.a.
- Strong R&D base linked to customers and acknowledged universities
- Internal testing and analytics capabilities
- Strong patent portfolio



CFRP: Carbon Fiber Reinforced Plastic, a high strength-to-weight ratio material

Services: Diamond-Like Carbon (DLC)

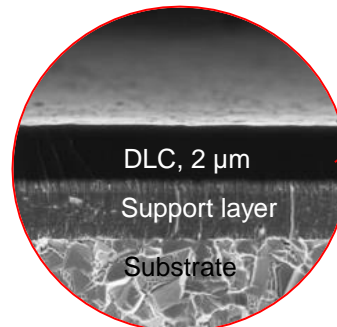
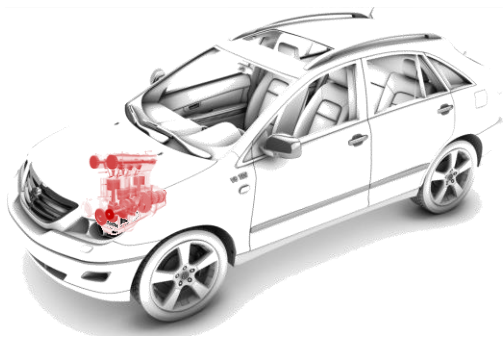
Enabling fuel efficiency and reduced emissions

Surface solutions technology

- Enabling Diamond-Like Carbon technology to
 - reduced friction of moving parts >7x
 - downsize engines
 - direct gas and diesel injection
- In-house developed dedicated production technology based on Plasma Assisted Chemical Vapor Deposition (PACVD) technology

Oerlikon's strength

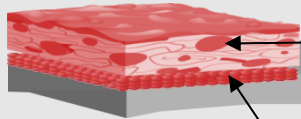
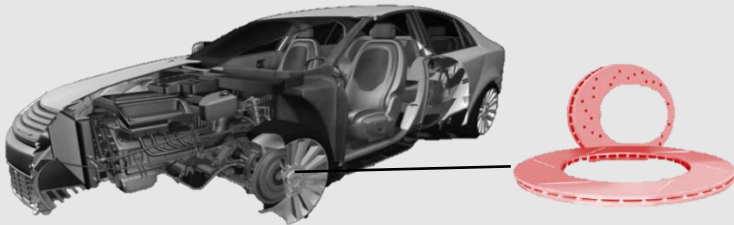
- Custom tailored carbon based coating solutions (DLC) to optimize tribo systems
- Fully automated high efficient production line (> 1 million piston pins/ month)
- Strong link to tier 1 automotive development departments – next generation material in test phase to achieve T stability beyond 250°C



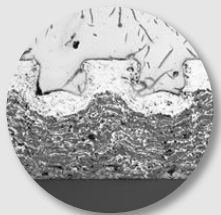
Thin Film and Thicker Layer combined

Brake discs

- Thermal Spray advantage:
No corrosion, longer service life, less noise



Thermal Spray metal/
ceramic mixture to
reduce cracks due to
thermal shock

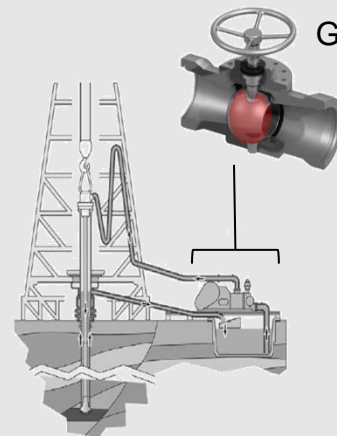


PVD IONIT OX to
prevent coating
spallation because of
under corrosion

Coating cross-section after
successful testing trials

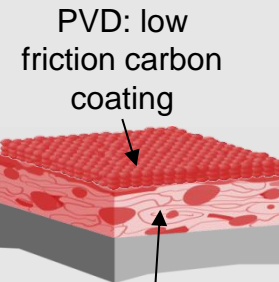
Oil & Gas Safety valves

- Combination of Thermal Spray and PVD solves
multidimensional customer requirements



Gate valves

Gas tight corrosion protection,
gas tight (Thermal Spray)



PVD: low
friction carbon
coating

Thermal spray
WC/CoCr: ~ 200 μ m



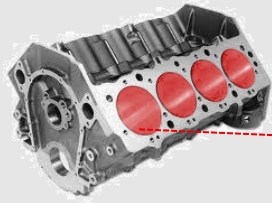
Wear protection
(PVD)

Low friction
(PVD)

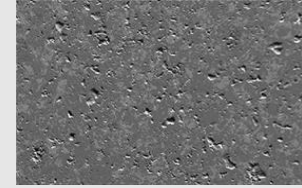
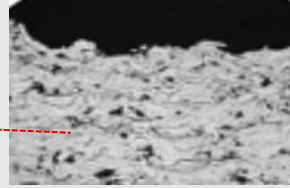
Advantage of complimentary technologies

Multiple benefits for engine systems

Thermal Spray solution



Thick (250 μm) iron based Thermal Spray coating on inner surfaces



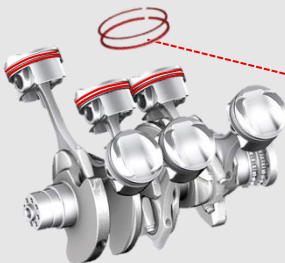
- Tighter spacing between bores leads to weight reduction
- 30 % less lubricant required
- Thick films compensate for manufacturing tolerances

Difficult to coat inner surfaces with PVD

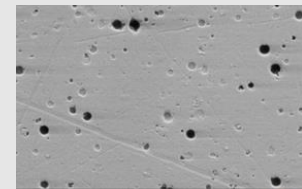
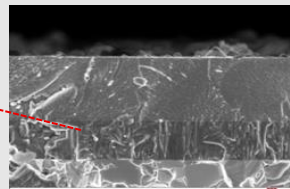
Best system performance through matched PVD and TS coatings

After treatment of coatings: Both technologies exhibit a naturally structured surface topology providing reservoirs for lubricant

PVD solution

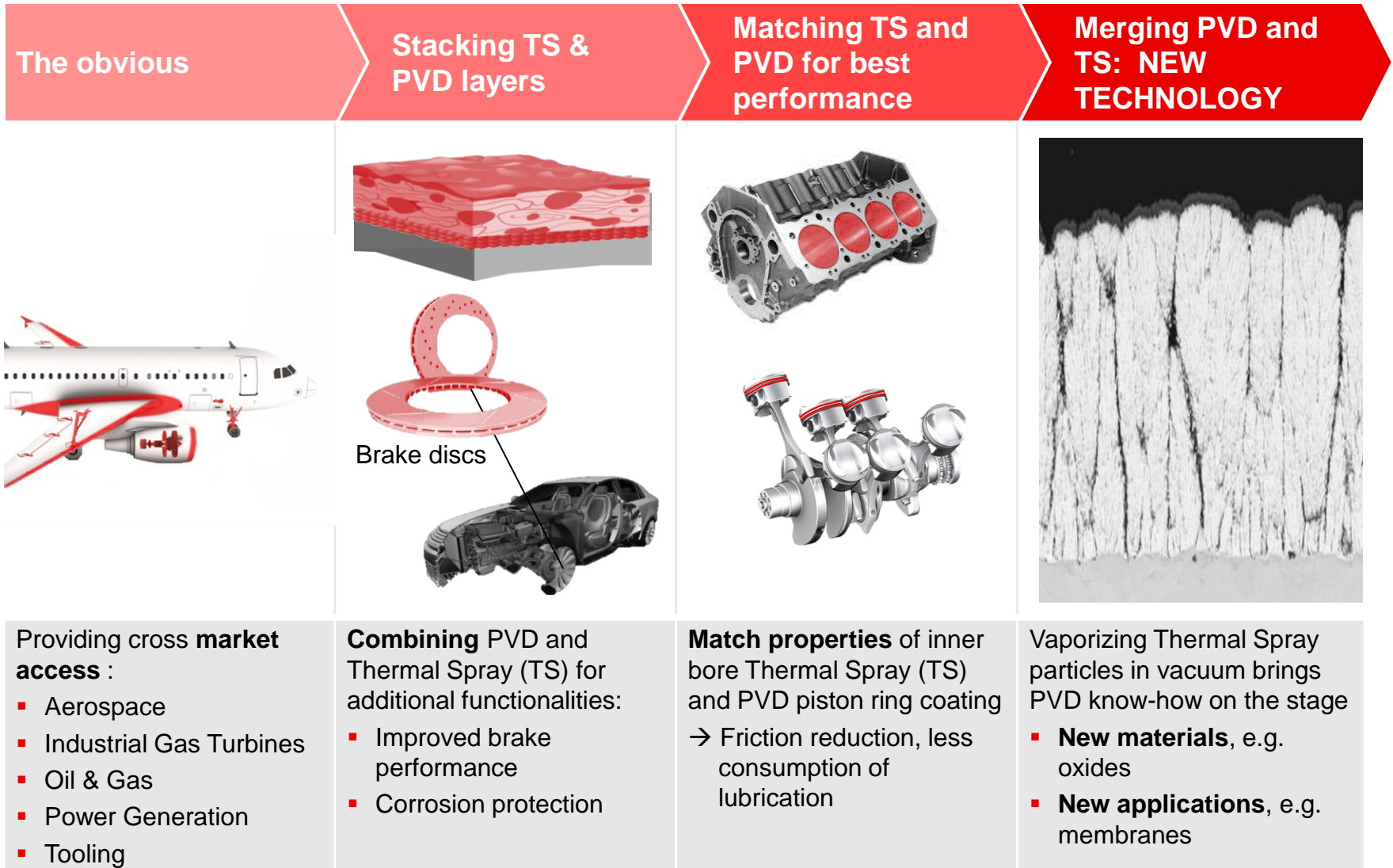


New material, PVD outer surfaces



- Lower friction as compared to Diamond-like Carbon (DLC)
- Stable at high temperatures
- Precise Thin Film to maintain tolerances

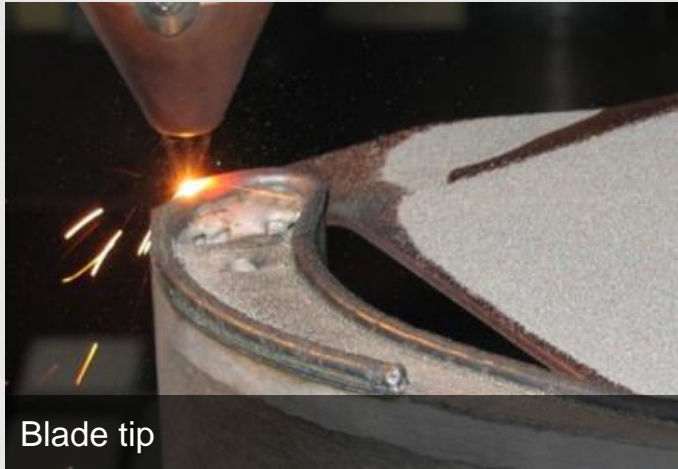
From the obvious to combined technology – Roadmap



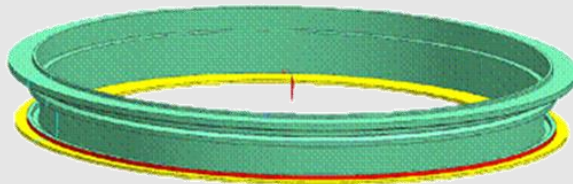
Materials, Laser Cladding and ELDIM bridging into additive manufacturing (AM)

Current situation: an ideal starting point

- Powder fed Laser Cladding systems and process know-how



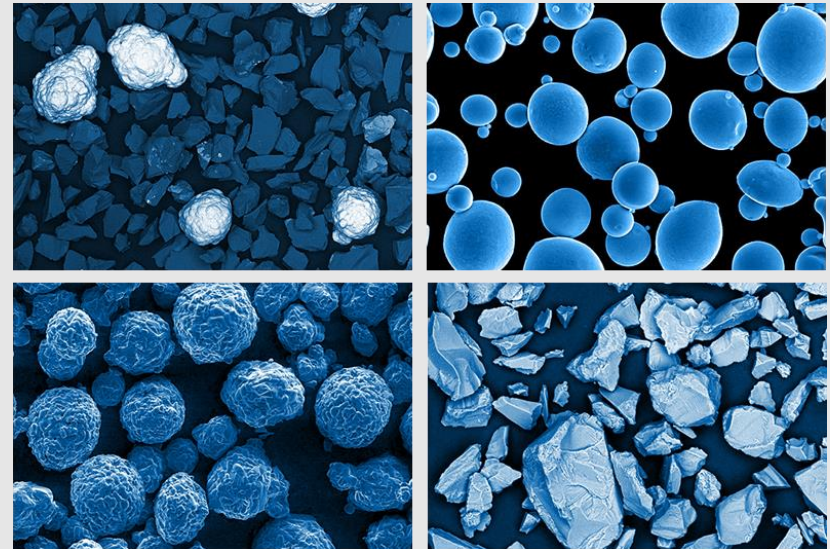
- ELDIM already exploring additive manufacturing



Seal Carrier Concept

Powder materials are key for AM

- Metco already sells powder into the AM market:
 - Strong position for nickel (Ni) and iron (Fe) based powders
- Powder technology as a key differentiating factor for AM



- Surface Solutions Segment's technology portfolio enabling
 - Energy efficiency
 - Eliminate environmentally hazardous substances
 - Increase productivity and safety

- Combining advantages of Thermal Spray and PVD under one roof creates new business opportunities in growth areas such as Automotive, Oil & Gas, Aerospace and Industrial Gas Turbines

- Merging PVD and Thermal Spray on an atomic level will create a new dimension for material properties and processing

- Surface Solutions Segment bridging into metal additive manufacturing

Thank you.



Integration of Oerlikon Metco

Dr. Roland Herb, CEO Surface Solutions Segment

Dr. Uwe Böhlke, Chief Integration Officer Surface Solutions Segment





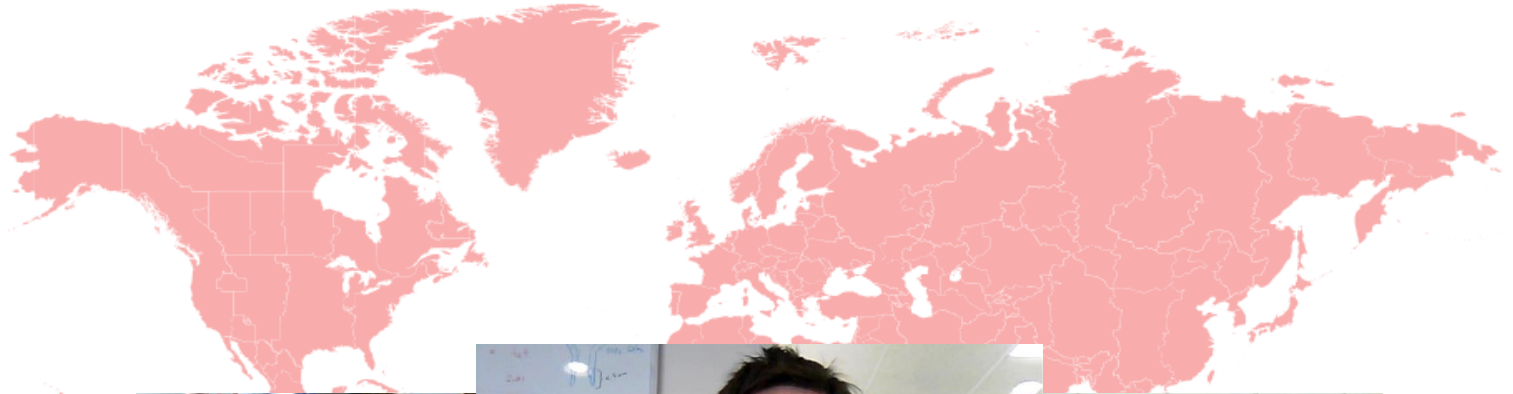
Creating a world technology leader in surface solutions

- Around 6 000 employees
- CHF 1.2 billion in sales (pro-forma 2013)
- Unique global footprint: more than 130 facilities with over 110 coating centres in 35 countries
- Broad product and solution portfolio with all major clean Thin Film and Thicker Layer surface solutions
- Services provided to a wide range of industries
- Strong combined R&D competence

June 6th – Warm welcome to the new colleagues **oerlikon** ... global virtual welcome party with 6 274 colleagues

Creating the world technology leader
in surface solutions – under one roof.

oerlikon **oerlikon**
balzers metco

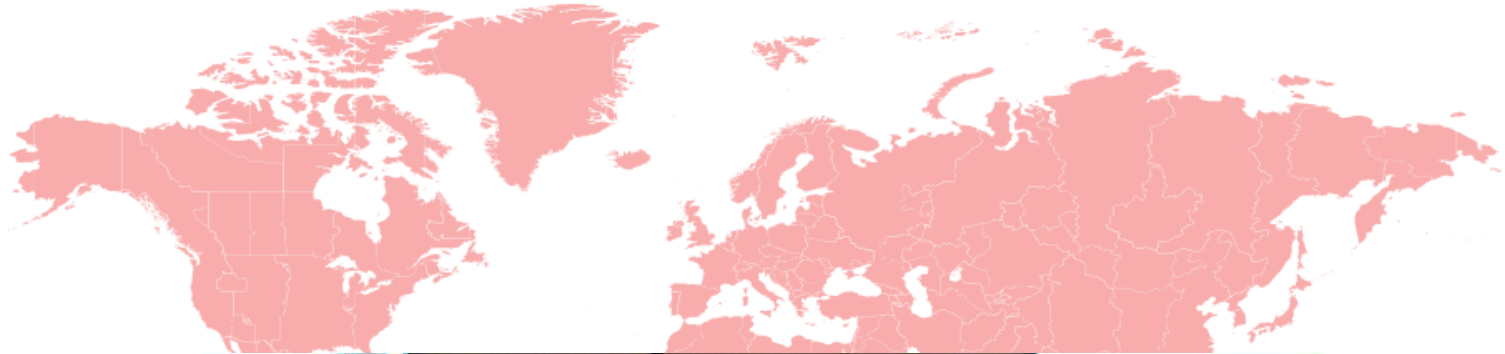


June 23rd - Joint Management workshop with more than 50 global leaders cross Metco & Balzers

oerlikon

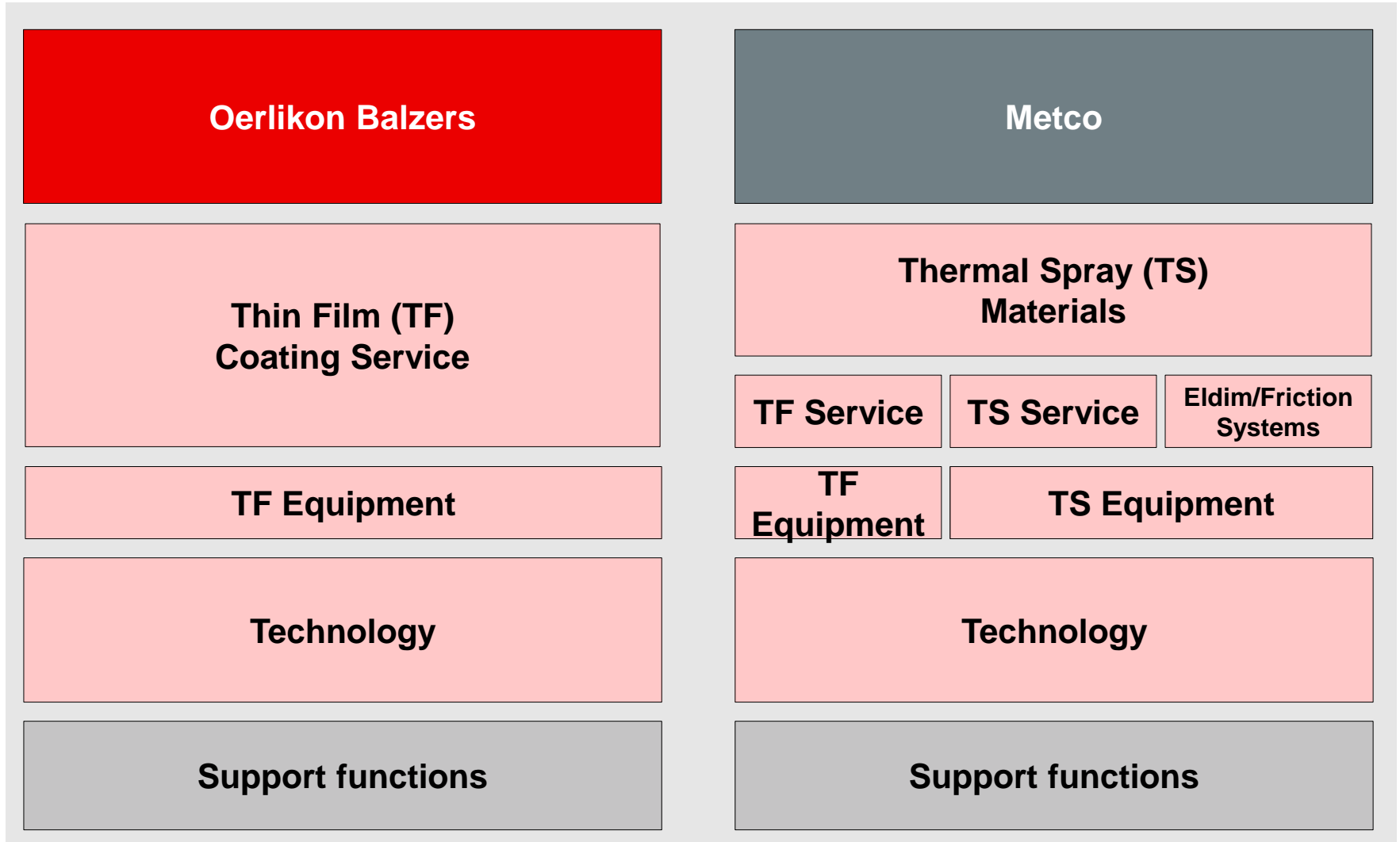
Creating the world technology leader
in surface solutions – under one roof.

oerlikon **oerlikon**
balzers metco



Integration targets on two complementary businesses, based on one strong platform under one roof

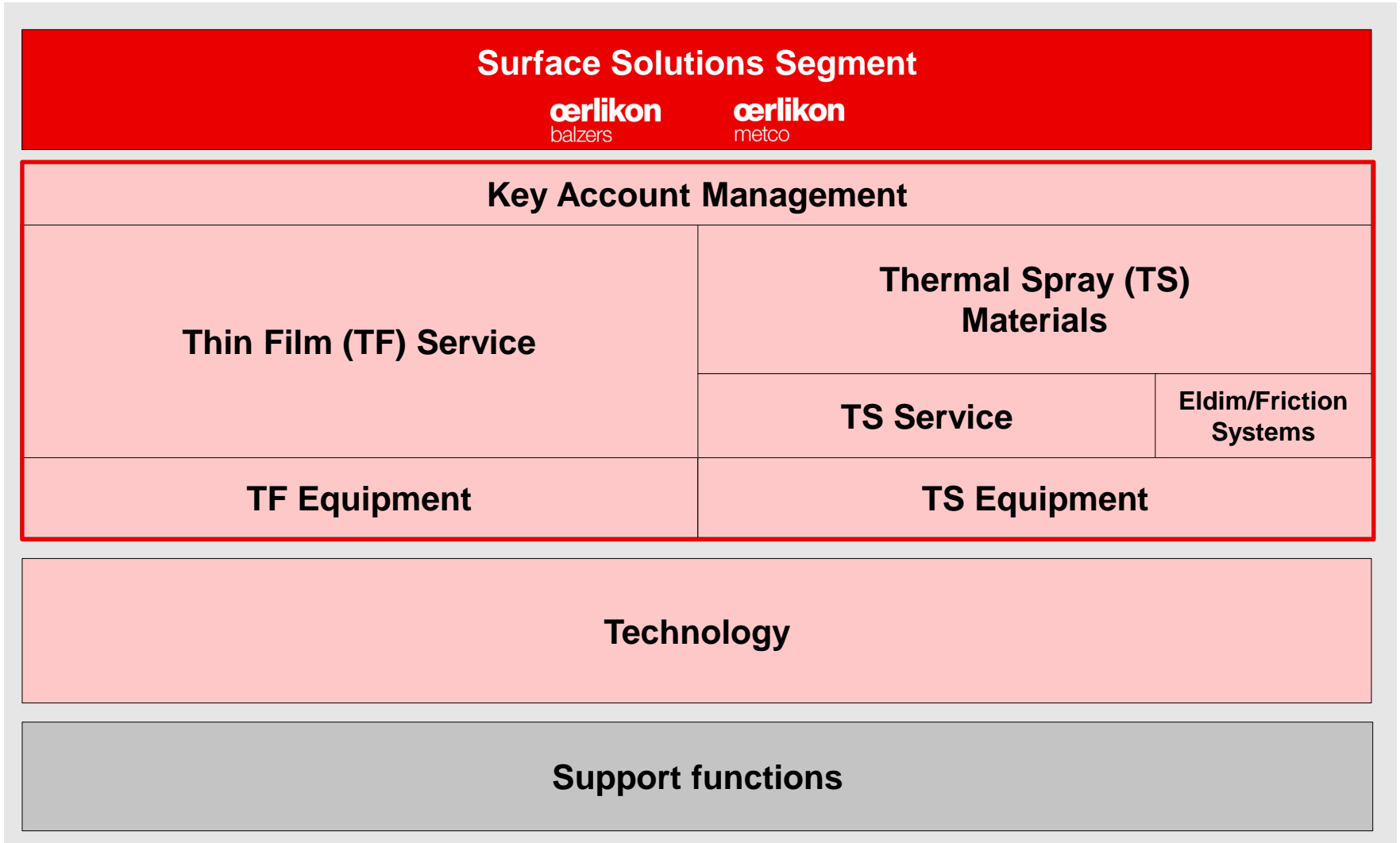
BEFORE INTEGRATION



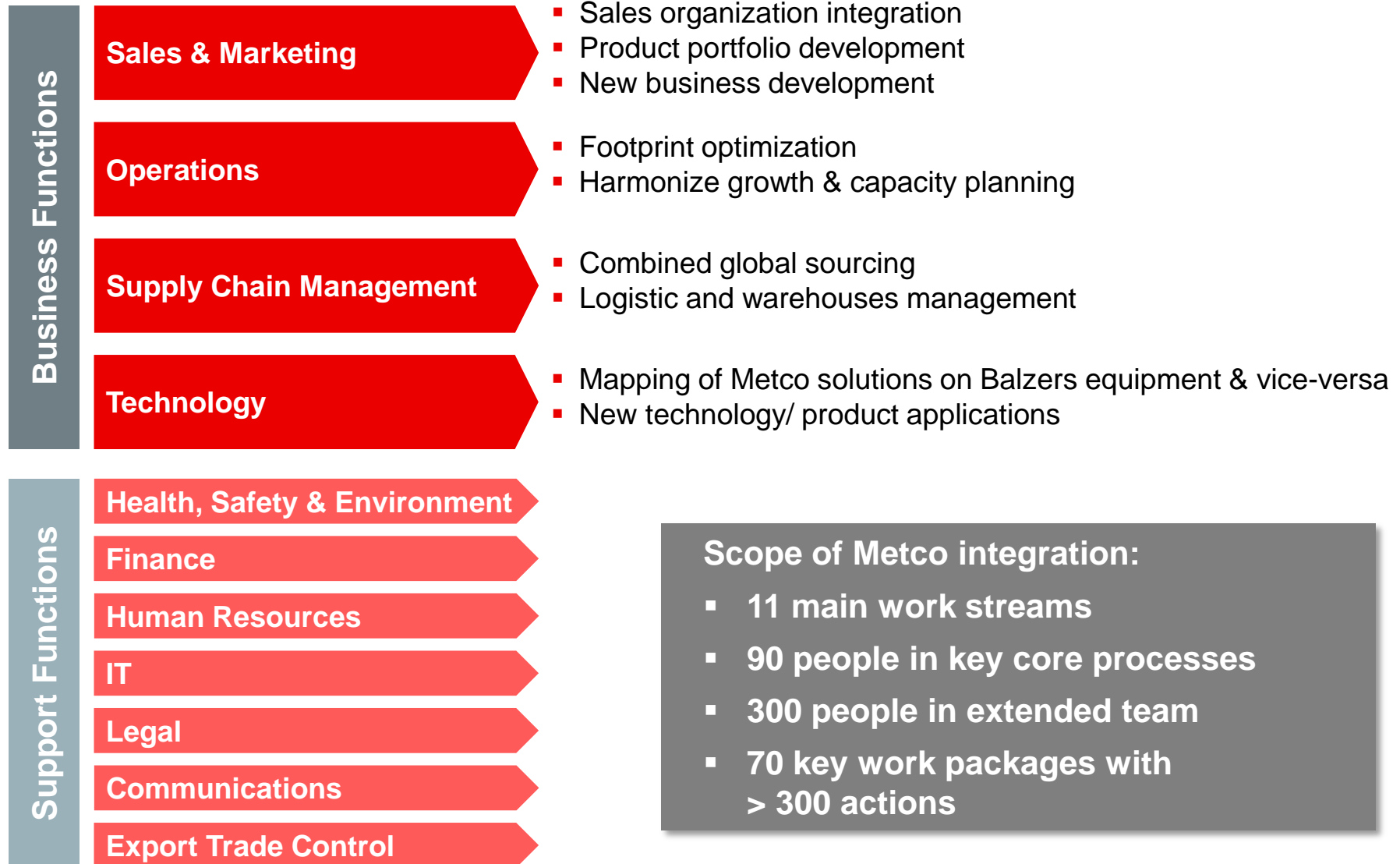
Integration targets on two complementary businesses, based on one strong platform under one roof



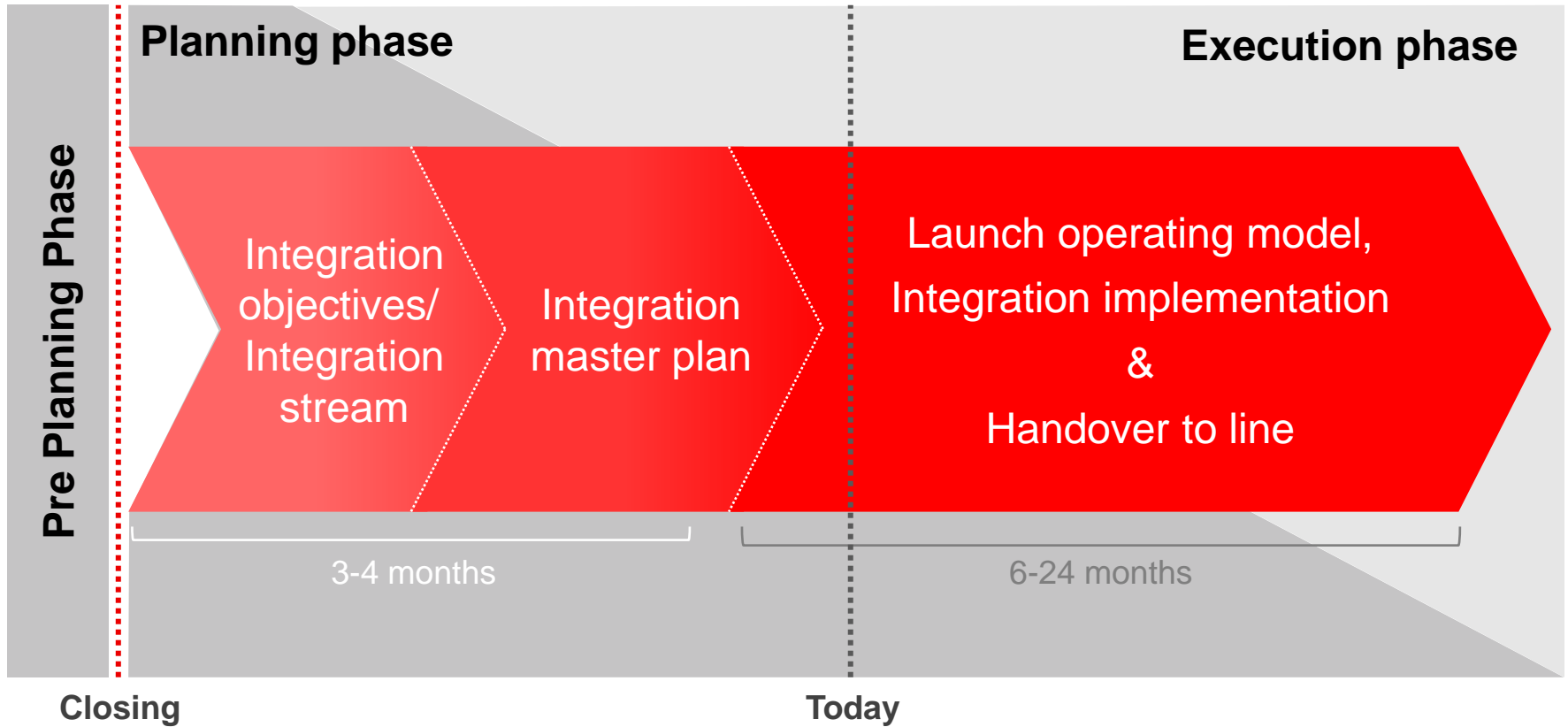
AFTER INTEGRATION



Our integration process has a clear structure – we address entire Metco & Balzers



Our integration process has a clear time line – We are on track



Integration of the Thin Film businesses included a review of the product offering

Portfolio strategy

Services



- **Management of joint Surface Solutions portfolio (>60 coatings)**
 - Ensure business continuation
 - Best coatings considered in the future portfolio
- **Focus on single brand strategy for Thin Film service under the brand of Balzers**

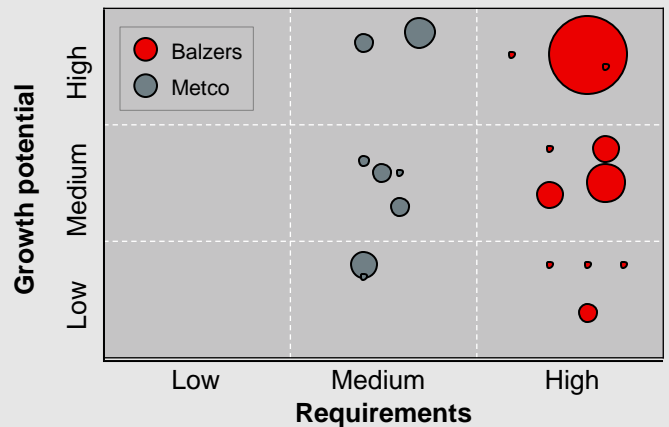
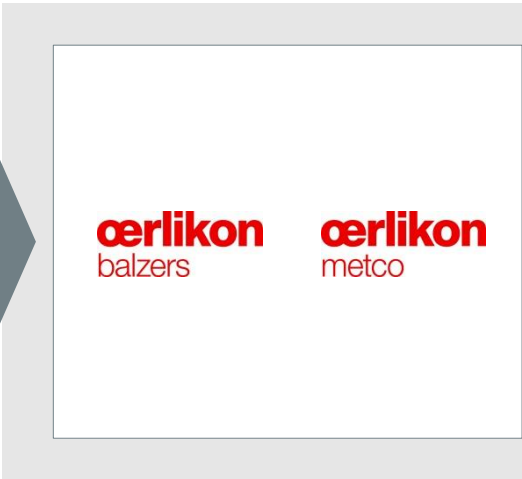
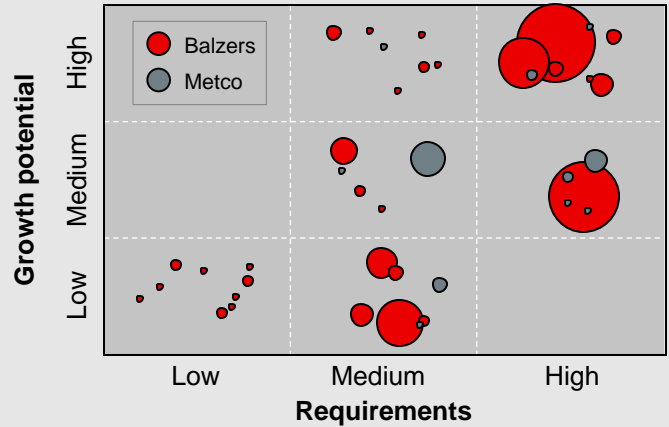
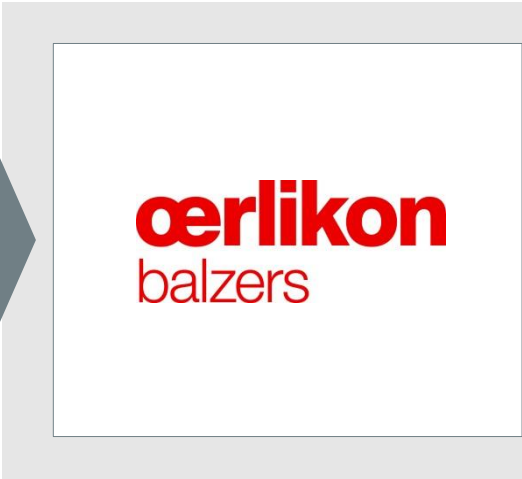
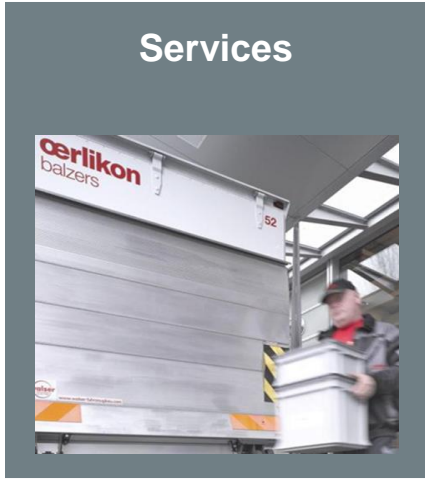
Equipment



- **Continuation of dual brand strategy for Thin Film equipment**
 - Addressing a broader requirement spectrum
- **Preparation of technology combinations**
 - Derive/ develop future offerings

Integration of the Thin Film businesses included a review of the product offering

Portfolio strategy



Top line synergies – Combining leading surface technologies

Key rationale – Creating a global technology leader in Surface Solutions

- Combined with the leading position in Thin Film Coating
- Merged with the leading position in Thermal Spray
- Advanced technologies create a unique global product and service portfolio
- Customers will be able to develop the most surface solution with the right partner / F&E team
- Disruptive access to general industry and markets the synergies and power generation using Metro's applications knowledge
- Combined network of over 100 coating centers worldwide
- Globally balanced footprint
- Leverage strategic relationships in the US
- Existing established position in China and able to support market access for Metro



Combined Thin Film coating solutions from Metco and Balzers enable entry into new markets/ applications

- Metco has strong Diamond Like Carbon (DLC) portfolio which is complementary to Balzers coating portfolio
- Cross fertilization of Metco coating solutions to Balzers equipment and processes

⇒ i.e. improve market penetration in the racing segment

Top line synergies – Leverage the business model

Key rationale – Creating a global technology leader in Surface Solutions



- Combine with the leading position in Thin Film Coating
- Merge with the leading position in Thermal Spray
- Advanced technologies create a unique global product and service portfolio
- Customers will be able to develop the next surface solution with the right partner / F&E team
- Disrupting access to general industry and markets like aerospace and power generation using Oerlikon's applications knowledge
- Extensive established position in China and India to support market access for Balzers

Page 6 | ©2013 Oerlikon | New Leader Oerlikon

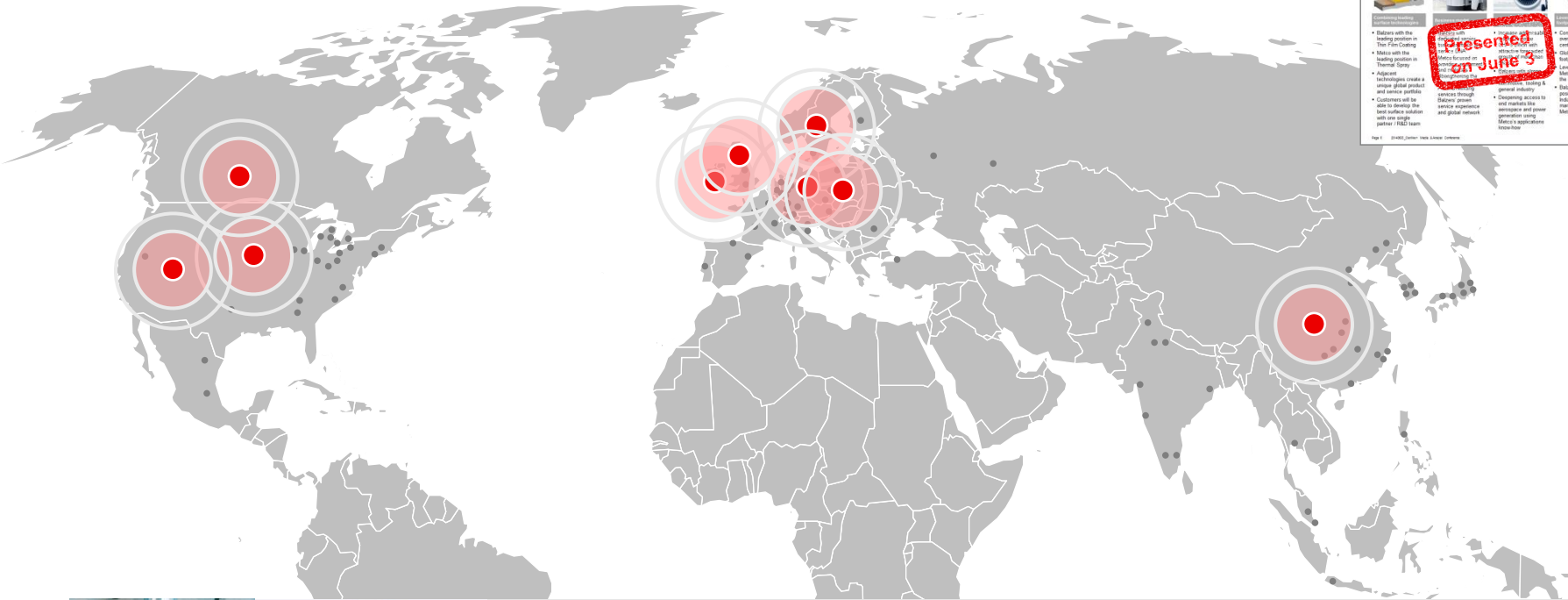


Accelerate Thermal Spray coating service

- Leverage Balzers' footprint and service business setup to increase service offering

⇒ First new Thermal Spray service hub in operation already mid 2015

Top line synergies – Leverage access to end markets



Develop PVD applications for Metco's Thermal Spray customers

- Oil & Gas
Gate valves, surface valves, drilling wear sleeves, sucker rod couplings
- Aerospace
Turbine (compressor, fan blades, gears), hydraulic actuation, landing gear
- Industrial Gas Turbine
Compressor blades, electrical power generation, micro turbines, mechanical drives ...

⇒ **Since closing: 37 customer-specific technology roadmaps**

Top line synergies – Leverage the footprint

Key rationale – Creating a global technology leader in Surface Solutions

- Aligns with the leading position in the Coating market
- Aligns with the leading position in Thermal Spray
- Advanced technologies create a unique global product and service portfolio
- Customer will be able to develop the next surface solution with the edge of R&D
- Disruptive access to general industry and markets the experience and power generation using data applications knowledge
- Established network of over 100 coating centers worldwide
- Globally balanced footprint
- Leverage strategic relationships in the US
- Existing established position in China and India to support market access for India



Use Balzers footprint

... to expand Thermal Spray equipment sales & distribution channels

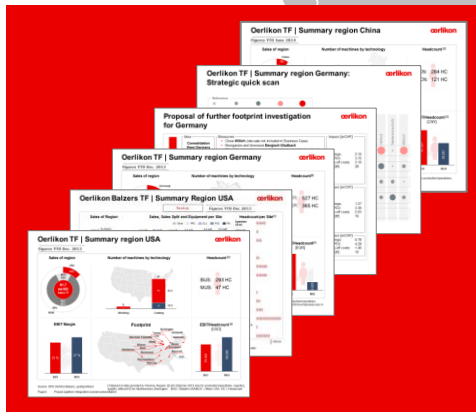
- particularly in countries with sub critical sales volume as of today

... to expand customer access for Friction Systems

- capture business with additional transportation OEMs

⇒ Strengthen customer access

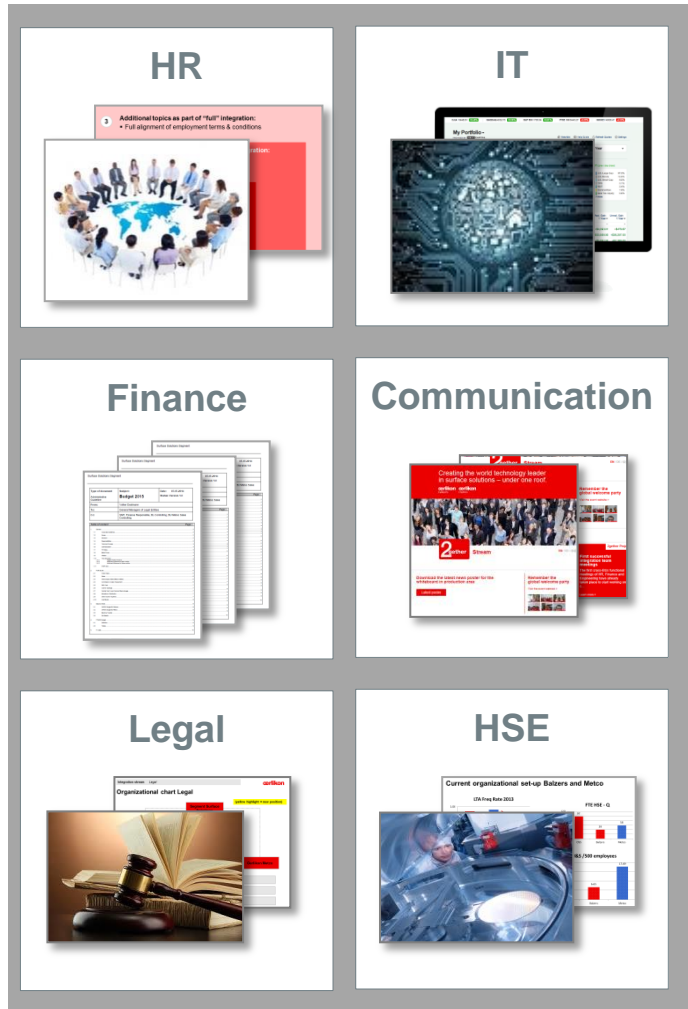
Footprint optimization – Optimized Thin Film footprint to support growth



Create long term footprint with growth potential

- Optimization of production facilities enabling better resource management, customer proximity and know-how protection
- Optimize utilization/ use existing capacities for growth
- Leverage Best-in-Class processes across Segment
- Improve logistic network to ensure high quality service for customers

Integration of administrative functions – Establish efficient support



Standardization and harmonization of systems and processes

- Establish HR, IT, Finance, Health Safety & Environment (HSE), Legal and Communication on Segment level
- Integration of sales/ operational processes and systems to efficiently drive regional sites and centers
- Ensure an aligned marketing approach for the entire product and service portfolio
- Secure highest HSE standards in the entire Group



- Integration process is well on track and according to plan
 - Organizational development/ integration of Thin Film business ongoing
 - Leverage Best-in-Class processes across Segment
 - Set-up support functions finalized
- Focus on leveraging the deal rationale: Combined technology portfolio, business model, market-access and footprint
 - Thermal Spray service center in build up ... addressing Aero, Oil & Gas and Power Generation market
 - Market penetration in racing market ... addressing 15 key customers
 - Balzers' PVD applications for Metco customer ... 37 customer tech roadmaps in development
 - Balzers footprint for Thermal Spray equipment sales & distribution ... strengthen customer access

Thank you.



Summary

Surface Solutions Segment Analyst Day

Eisenach, November 6, 2014

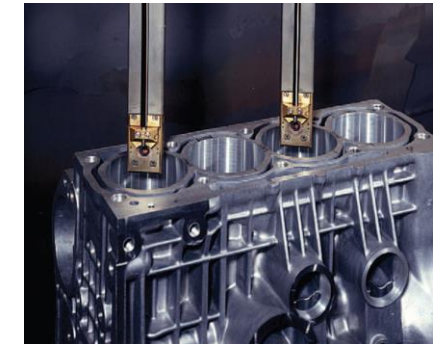
Dr. Brice Koch, CEO



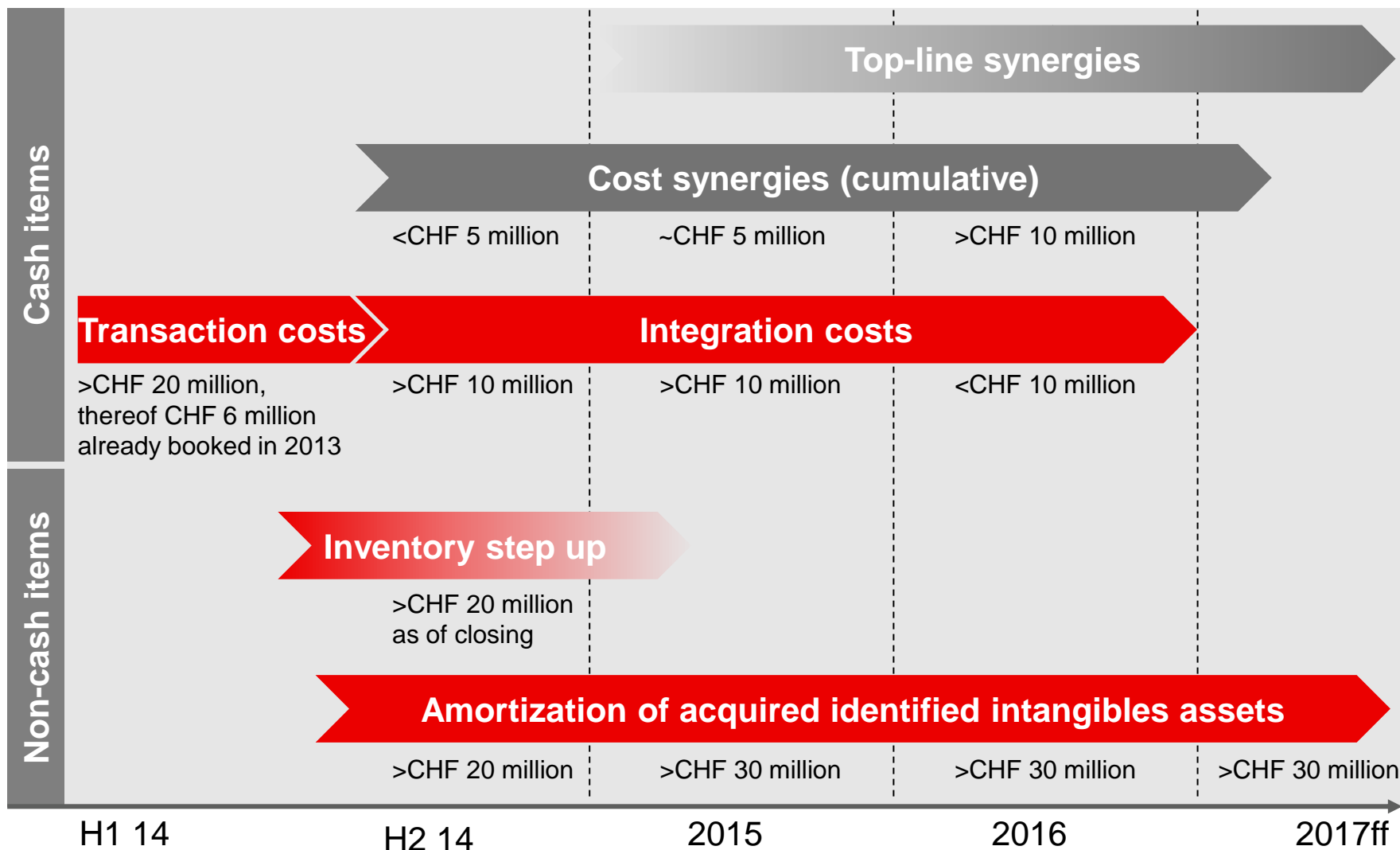
Surface Solutions Segment

Integration on track, opportunities confirmed

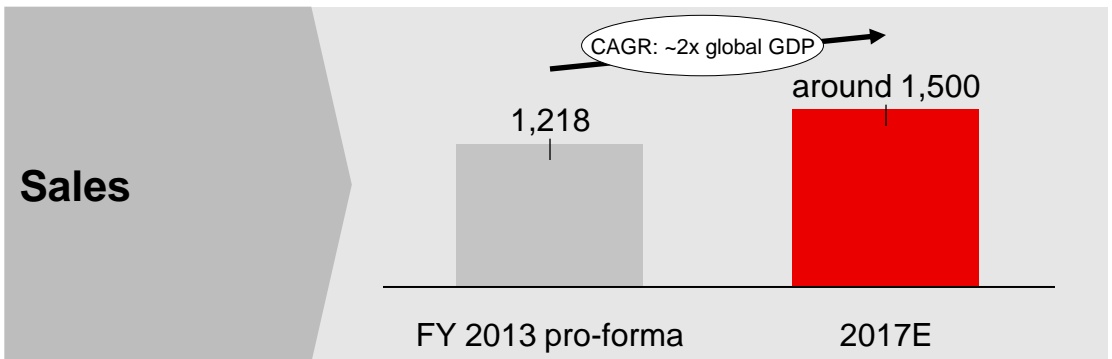
- Oerlikon creates a global technology leader in surface solutions
- Global megatrends requiring surface solutions
- Exposure to attractive growth markets
 - Tooling
 - Aviation
 - Automotive
 - Oil & Gas
 - Power Generation
- Deal rationale and complementarity confirmed
 - Technologies
 - Business models
 - Customer and market access
 - Footprint
- Integration on track



Financial impact of Metco transaction – Confirming our cost assessments

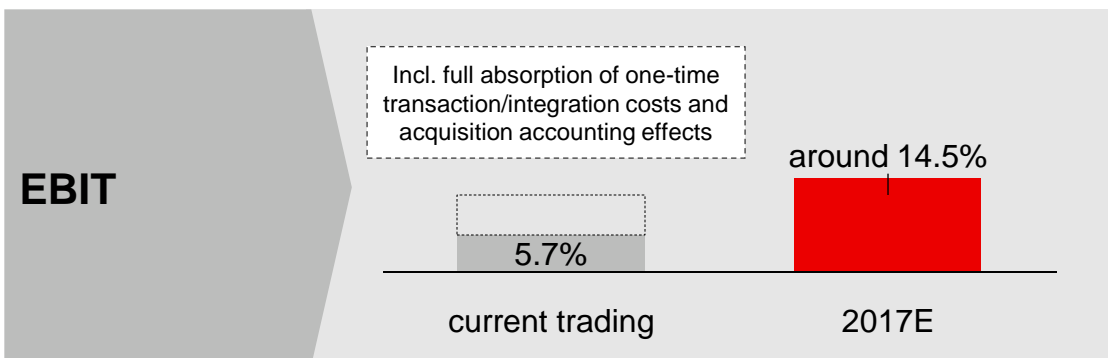
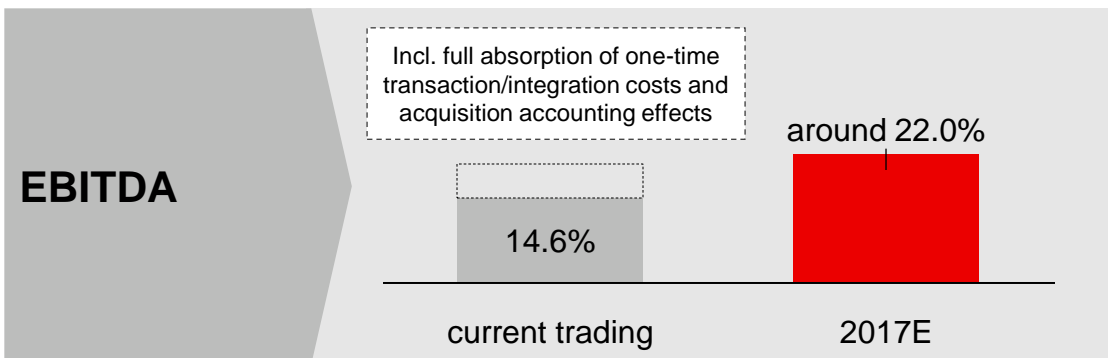


Surface Solutions Segment expected to grow ~2x GDP with profitability expansion



Mid-term expectation Surface Solutions Segment

- Based on a current global GDP growth assumption of ~3 %



Thank you.



**OC Oerlikon Management AG, Pfäffikon
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Switzerland**

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Head of Investor Relations**

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