

BU Platinum Engineered Materials

## Process Excellence Model Our Values



*combining competencies for process excellence*

## Introduction to Umicore

- We are a global materials technology & recycling company
- Our mission is to make “materials for a better life”
- The majority of our growth comes from clean technologies:
  - *technologies that are specifically designed to optimize the use of natural resources and to reduce environmental impact*
- We are listed on NYSE / Euronext Brussels with a market capitalization of some € 4.5 billion
- Revenues € 2.4 billion\*
- Turnover € 12.5 billion\*

\* On 31 Dec 2012



## Umicore, global leader in ...

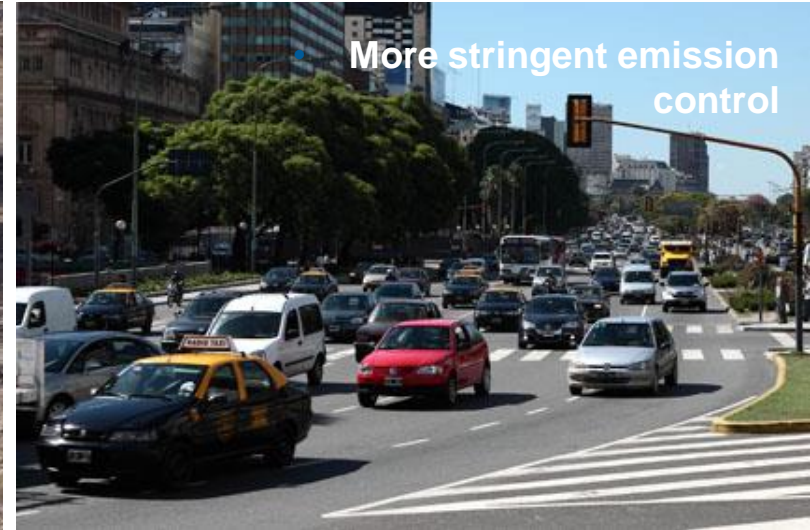


- **Automotive catalysts** for passenger cars
- **Key materials for rechargeable batteries** used in portable electronics and hybrid & electric cars
- **Germanium substrates** and other materials which are used in new photovoltaic technologies
- **Recycling precious metals** from old mobile phones, laptops, electronic scrap and spent catalyst material





# Key megatrends for Umicore



# Global presence: 14,438 people in 74 industrial sites



Figures include associated companies as of end 2012



## Umicore's businesses

### Energy Materials

- We develop materials which enable the clean production and storage of energy
- The business is driven by the demand for clean, low-carbon energy solutions

### Catalysis

- We develop technologies to treat automotive emissions
- The business is driven by increasingly stringent emission norms to promote clean air

### Recycling

- We operate a unique recycling process to deal with complex industrial residues and end-of-life materials
- The business is driven by materials scarcity and recycling legislation

### Performance Materials

- We produce a range of essential materials and chemicals based on precious metals and zinc
- Diverse applications:  
e.g. high-purity glass, construction, pharma, electrics/electronics



# Business unit Platinum Engineered Materials



- Produces casted and knitted platinum (alloys) manufacturing equipment, serving different markets
  - Special Glass Industries: high-purity & fiber glass manufacturing processes
  - Chemical Industries: catalytic ammonia oxidation processes
- Global leader in its markets
- Dedicated expert team managing customer process' complexity
- Life Cycle Management essential in optimising customer cost efficiency seen expensive base equipment cost



# Extensive Expertise & Experience

→ Manufacturing close to our global markets

**Moscow / Russia**

- Local cooperation
- Ammonia Oxidation Solutions

**Hanau / Germany**

- Headquarters
- Glass Industry Solutions
- Ammonia Oxidation Solutions

**Vienna / Austria**

- Glass Industry Solutions
- Ammonia Oxidation Solutions

**Manaus / Brazil**

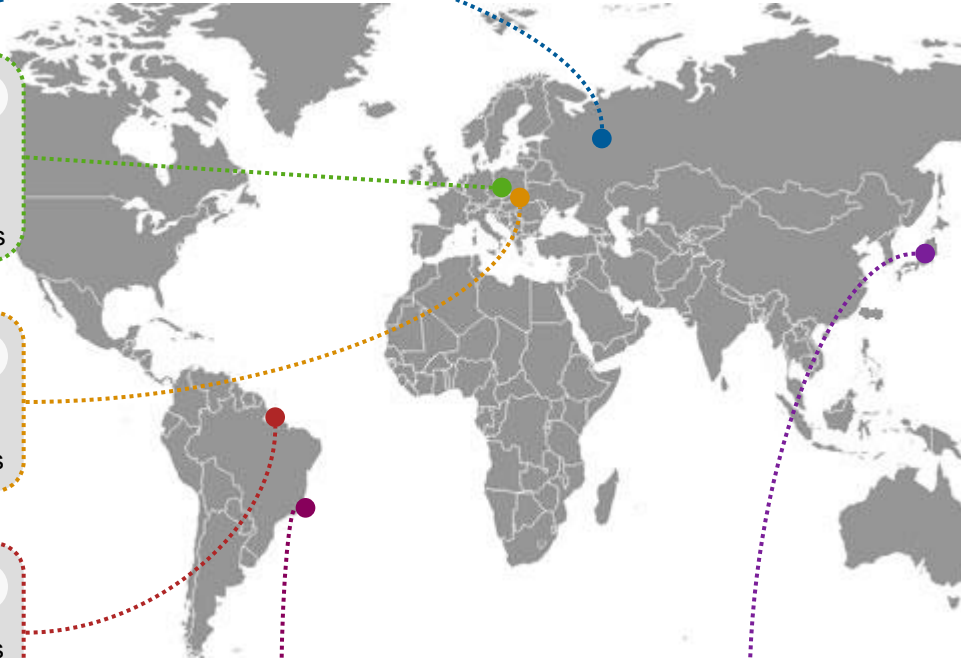
- Ammonia Oxidation Solutions

**Sao Paulo / Brazil**

- Glass Industry Solutions
- Ammonia Oxidation Solutions

**Yokohama / Japan**

- Glass Industry Solutions



**Expertise**

- ▶ Experts globally
- ▶ Experts for Engineering & Design
- ▶ Professional Technical & Commercial Network
- ▶ Inhouse industry expertise special glass & chemical

**Experience**

- ▶ 100+ years PGM history:
  - Treating & Manufacturing
  - Alloys & Compounds
- ▶ 40+ years ODS experience
  - Materials treatment
  - Materials manufacturing
- ▶ Supplying major international special glass & chemical leadings industries

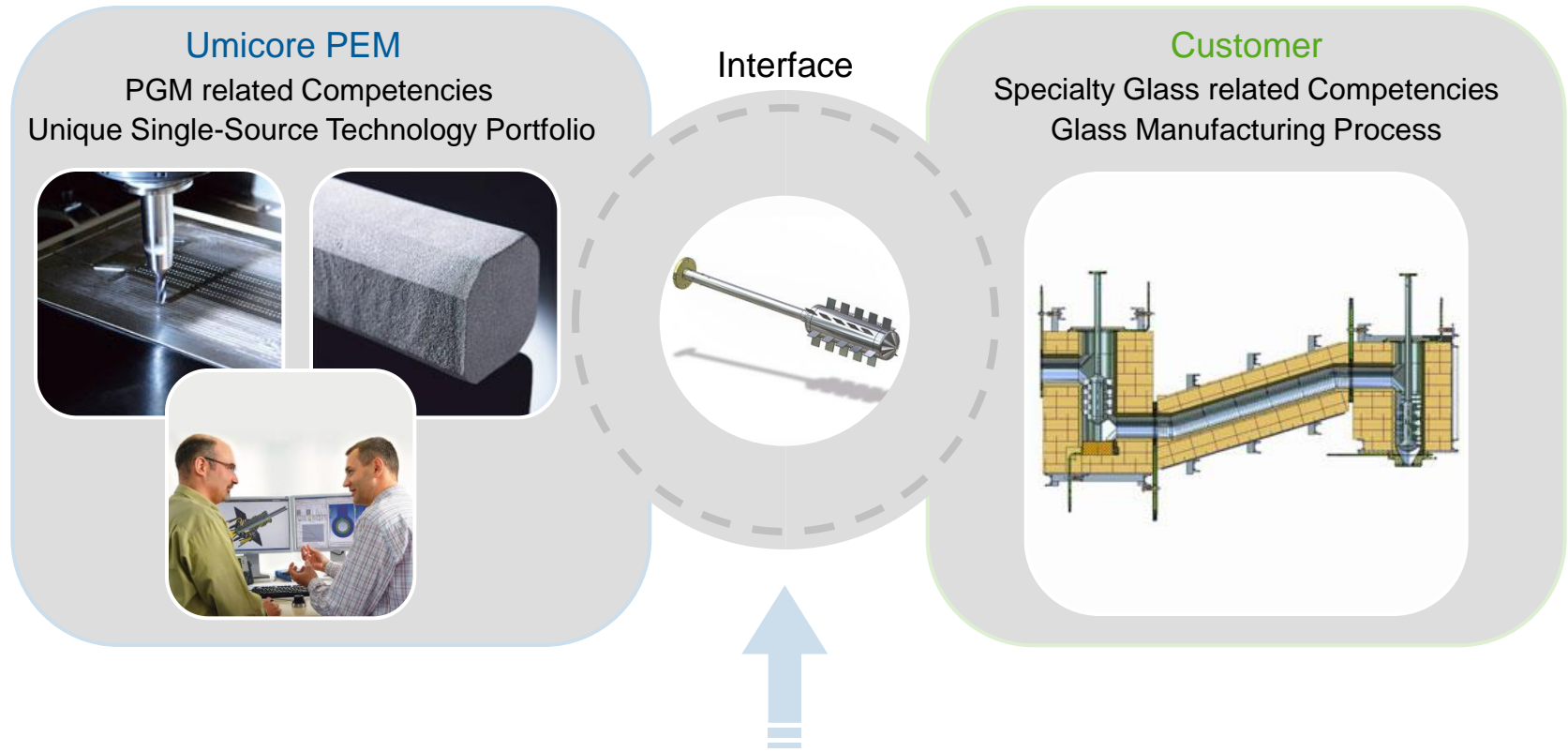






# Process Excellence Model

→ PEM can manage the PGM process interface



Synergy effects by joining forces through a systemic technology approach

→ Umicore's Total System Approach translates into substantial total cost reduction for Customers

PGM Cost

Maintenance Cost

Application Cost

Energy Cost

Fabrication Cost

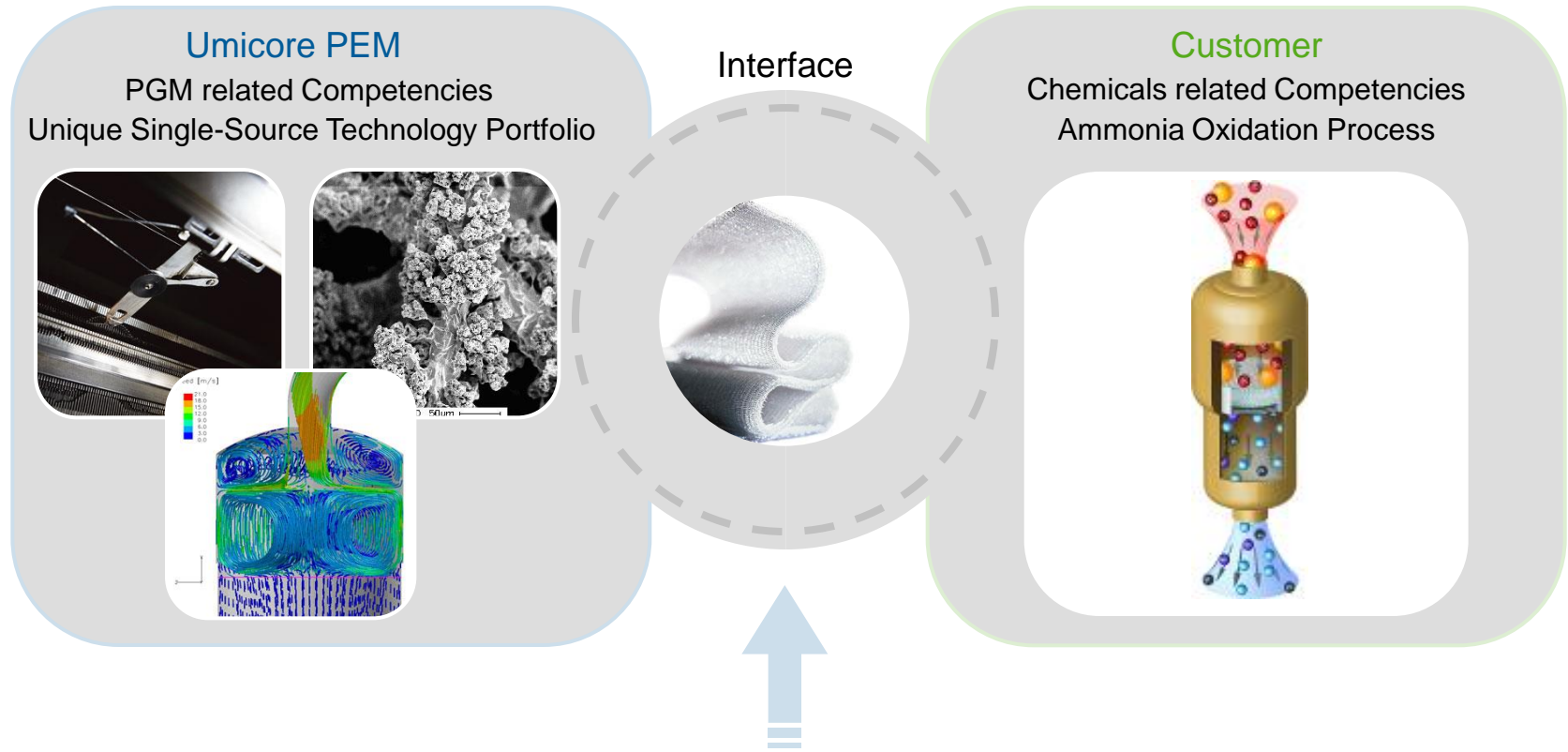
Refining Cost





# Process Excellence Model

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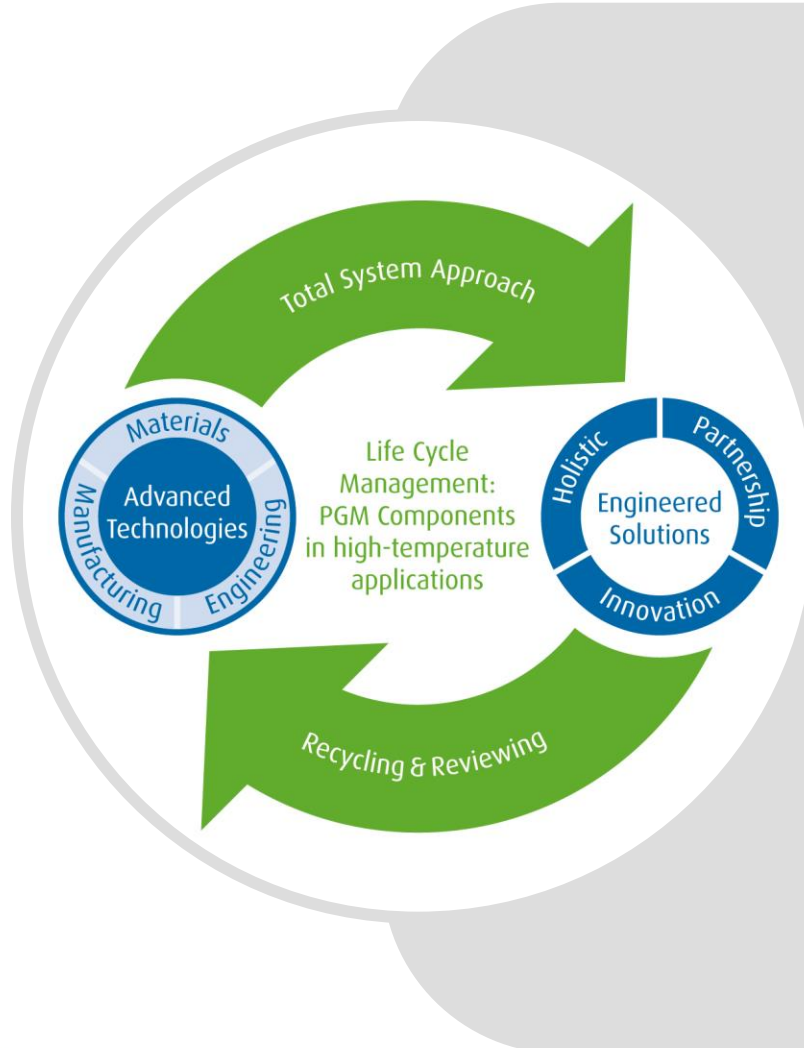
Fabrication Cost

Refining Cost



# Process Excellence Model

→ Technology Leadership drives our market approach



## Managing the platinum interface

- ▶ Tailored engineered solutions are the key to optimize design & functionality of our customers' platinum equipment in production processes for
  - Special & Fiber glass
  - Ammonia oxidation
- ▶ Tailored engineered solutions enable perfect correlation of the platinum component and its immediate boundary conditions (periphery).
- ▶ Life Cycle Management means closed loops and partnerships to jointly develop & learn.

## A unique single-source portfolio

- ▶ Proprietary & branded engineered materials
  - FKS® families (Pt PtRh PtIr PtAu)
  - Specialty cast alloys (PtRhPd PtRh PdNi)
- ▶ Outstanding engineering competencies
  - Exceptional designs & functionalities
  - Designs aligned with material properties
- ▶ Cutting-edge manufacturing technologies
  - Unique product features & patterns
- ▶ Inhouse target industry application expertise



# Our Markets

→ Adding value to the special glass & chemical industries

## Special Glass Industries



### Display Glass

- ▶ Screens
- ▶ Laptops
- ▶ Touchpanels



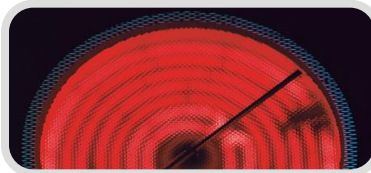
### Optical Glass

- ▶ Camera Lenses
- ▶ Mirrors
- ▶ Prisms



### Crystal Glass

- ▶ Household
- ▶ Decoration



### Technical Glass

- ▶ Cooking Surfaces
- ▶ Lab Glass
- ▶ Lighting



### Fiber Glass

- ▶ Composites
- ▶ Isolation

## Chemical Industries



### Fertilizers

- ▶ Nitrates
- ▶ Mixed Fertilizers



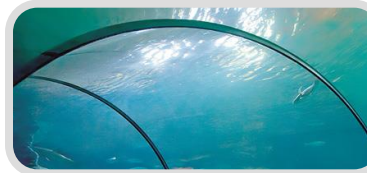
### Explosives

- ▶ Technical Nitrates
- ▶ Mining



### Chemical Intermediates

- ▶ Polyamides
- ▶ Polyurethanes
- ▶ Amines



### Transparent Plastics

- ▶ Acrylic Glass
- ▶ Noise Protection
- ▶ Domes



### Animal Feed

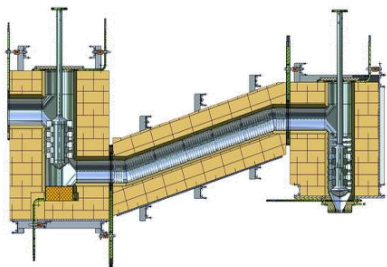
- ▶ Methionine



# Our Products

→ The playing field...

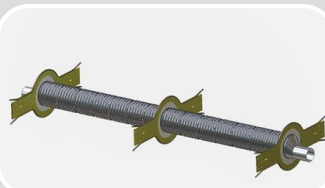
## Our Components for the Special Glass Industries



- ▶ Feeder Systems
- ▶ Special Glass Melting
- ▶ Special Glass Forming



Stirrer Cells



Refining Chambers



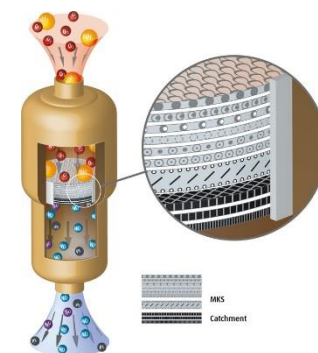
Orifices



Plungers

## Our Gauzes for the Chemical Industries

- ▶ Catalysts for Ammonia Oxidation
- ▶ Recovery of Platinum Losses in Operation
- ▶ Production of Nitric Acid and Hydrogen Cyanide



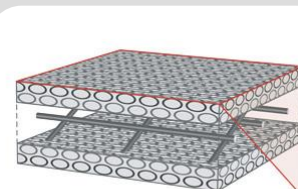
Mono-Layer Gauzes



Multi-Layer Gauzes



Woven Gauzes



Knitted Gauzes

# Process Excellence Model

→ Our Values



Our approach is...

- ... a total system consideration.
- ... to provide single-source solutions.
- ... to correlate key parameters.
- ... to understand what matters most.
- ... open-minded to manage complexity.



# Process Excellence Model

→ Our Values



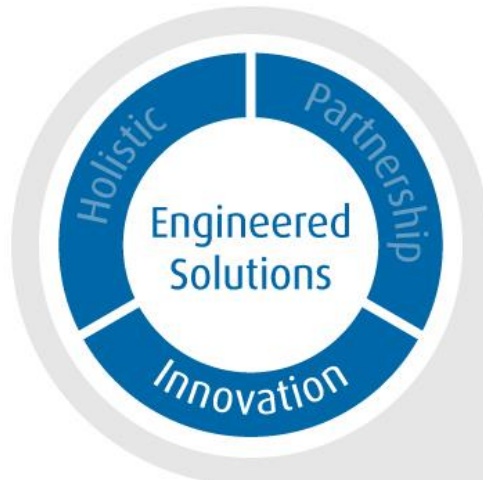
Our approach is...

- ... to cultivate transparent communication.
- ... to say what we do and do what we say.
- ... to strive for long-term cooperations.
- ... to operate in closed loops.
- ... to enable joint learning.



# Process Excellence Model

→ Our Values



Our approach is...

- ... to consider innovation an attitude.
- ... to transform ideas into solutions.
- ... to build our visions on tradition.
- ... to be passionate about design.
- ... to apply high IP standards.







# Process Excellence Model

→ Partnership in Russia since 5 years



5 years of successful cooperation: V.Vasekin (Supermetal) & J.Leyrer (Umicore PEM)

To perfectly serve Russian designed UKL7 plants Umicore started a local partnership with Supermetal five years ago. This cooperation is characterized by the expertise of two specialists in their operating fields: Supermetal who have been supplying the Russian market with PGM components for the last 50 years and Umicore as a global technology leader for specialty materials based sophisticated PGM solutions.

The two partners jointly founded a production unit at the Supermetal Scientific & Industrial Complex. Operating local with a strong partner enabled us to successfully develop and manufacture state of the art catalyst gauze systems meeting the individual requirements of our Russian customers, such as multi-layer gauze systems with reduced installed PGM quantity and increased  $\text{NH}_3$  selectivity.



BU Platinum Engineered Materials

**Challenge us!**

More to explore:

[www.platinum-engineered-materials.com](http://www.platinum-engineered-materials.com)



*combining competencies for process excellence*

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