

ThyssenKrupp Stainless

High-Performance Alloys, Key Figures and Forward Strategy

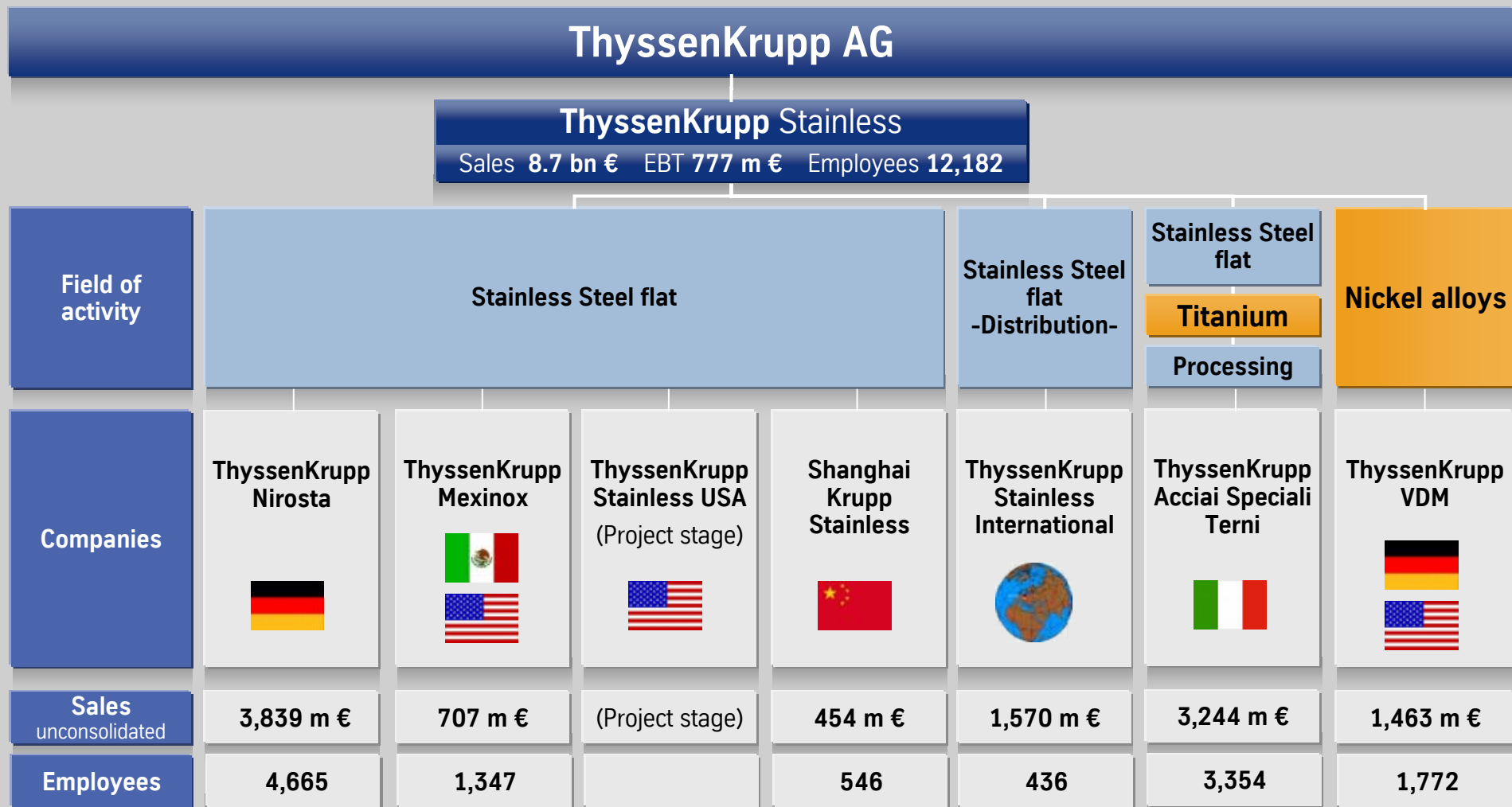
Dr. Jürgen Olbrich

CEO of ThyssenKrupp VDM GmbH

ThyssenKrupp Field Day
October 17, 2008

ThyssenKrupp AG

ThyssenKrupp Stainless, fields of activity and business units



* FY 2006/07



ThyssenKrupp VDM

Detailed Company Profile

Production Sites

ThyssenKrupp VDM



58791 Werder, Germany

www.thyssenkruppvdm.com

① Unna
Melting & Casting/Forging

② Siegen
Hot Rolling

③ Altena
Rod & Bar/Sheet & Plate

④ Werder
Strip/Wire/Service Center

Florham Park & Reno
Bar production, USA
~3,000 t aero alloys per year



Products & Services

Nickel and Cobalt based Alloys, specialty steels

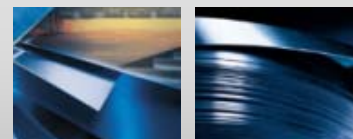


Plate & Sheet Strip



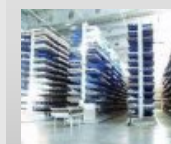
Rod & Bar Wire



Welding Consumables



Forgings & Billets



Service Center

Key Figures*

	2004/05	2005/06	2006/07
Sales [m €]	789	998	1,463
Sales [t]	46,700	44,500	47,100
Employees	1,760	1,746	1,772



ThyssenKrupp Titanium

Detailed Company Profile



ThyssenKrupp Titanium

Viale Brin
Terni
Italy

Altendorfer Straße
Essen
Germany

www.thyssenkrupp-titanium.com

Key Figures

	2004/05	2005/06	2006/07
Sales [m €]	67	109	141
Employees	218	243	269

Products

- Commercially pure Titanium
- Low alloyed Titanium
- Alloyed Titanium

Products forms:
Cf. next page

Business areas

- Melting
- Forging
- Hot Rolling
- Cold Rolling
- Tube Welding

Customer groups

- Aerospace & Chemical Industry
- Medical Industry
- Energy Sector
- Seawater Desalination
- Offshore Industry
- Heat Exchanger

ThyssenKrupp Titanium

Detailed Company Profile – product forms

Raw material: Titanium sponge



Semi finished product: Titanium ingots



Finished products:

Tubes



Bars



Sheets and plates



Coils



High-Performance Alloys cover a wide Range of Product Forms within TKL

Product Portfolio of ThyssenKrupp Stainless: Stainless Steel and High-Performance Alloys

										
		Slabs	Hot rolled strip	Cold rolled strip	Precision strip	Tubes & pipes	Forgings	Rod & bar	Wire	Sheet & plate
HIGH-PERFORMANCE ALLOYS	ThyssenKrupp VDM	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	ThyssenKrupp Titanium	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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	ThyssenKrupp Stainless International*	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

● Nickel alloys ● Titanium alloys * Distribution company with own Service Centers

Typical areas of Application of High-Performance Alloys – a selection

ThyssenKrupp VDM



Heating Elements



Power Generation



Aviation



Architecture



Electronics



Offshore



Turbines



Astronautics



Automotive



Tooling



Chemical Industry



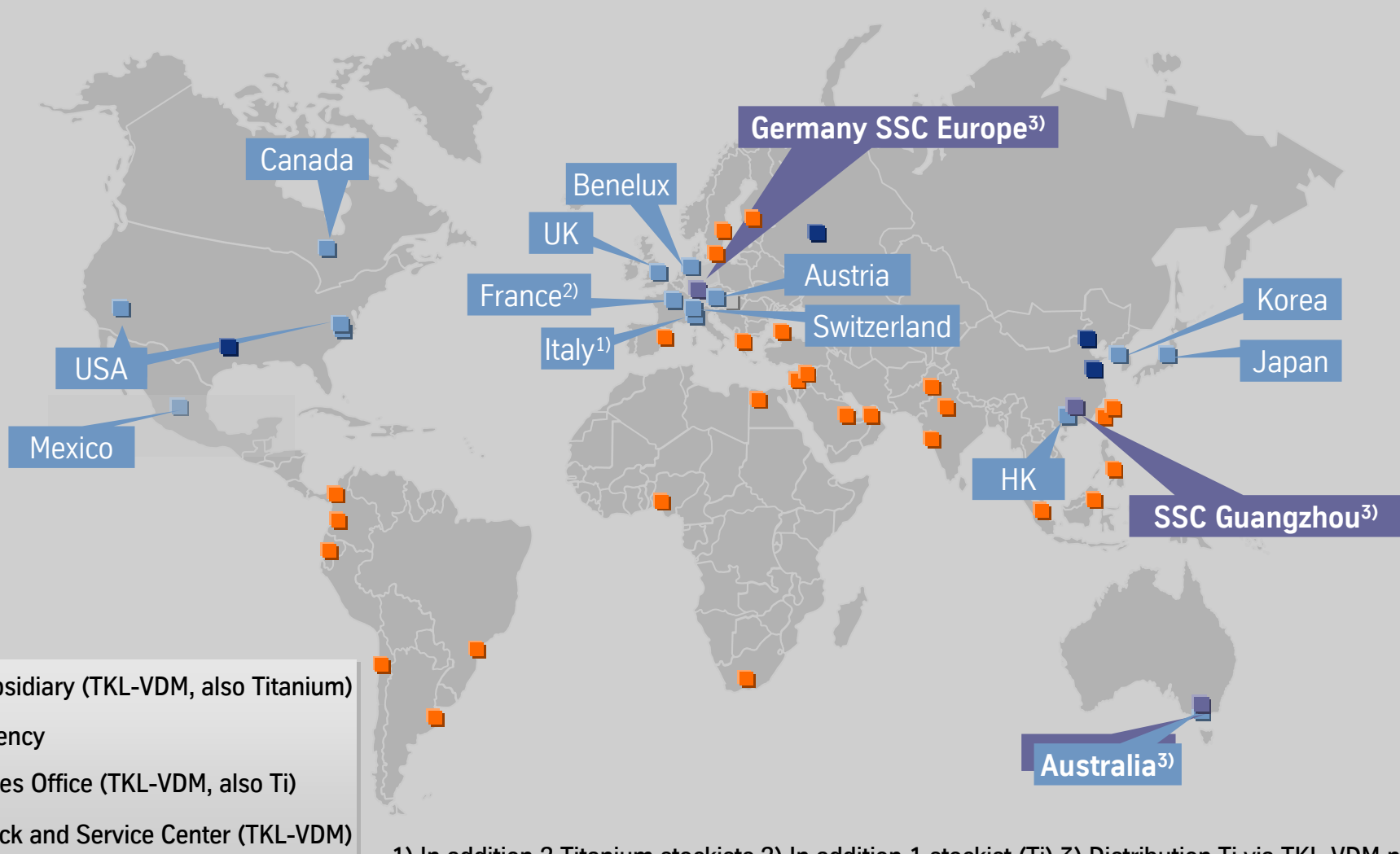
Heat Exchangers

ThyssenKrupp Titanium



High-Performance Alloys are distributed Worldwide via own Network

Worldwide Sales Organization of TKL-VDM distributes both Titanium and Ni-Alloys



1) In addition 2 Titanium stockists 2) In addition 1 stockist (Ti) 3) Distribution Ti via TKL-VDM network

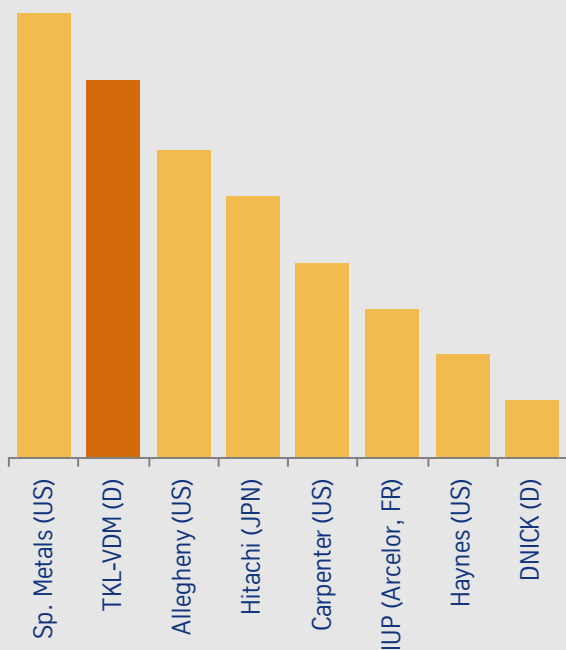


Market Environment – Nickel Alloys

TKL-VDM holds a leading position in the market for Nickel Alloys*

Shipments Nickel Alloys*

Deliveries in 2007
1,000 tons



Source: ThyssenKrupp VDM; estimates 2007

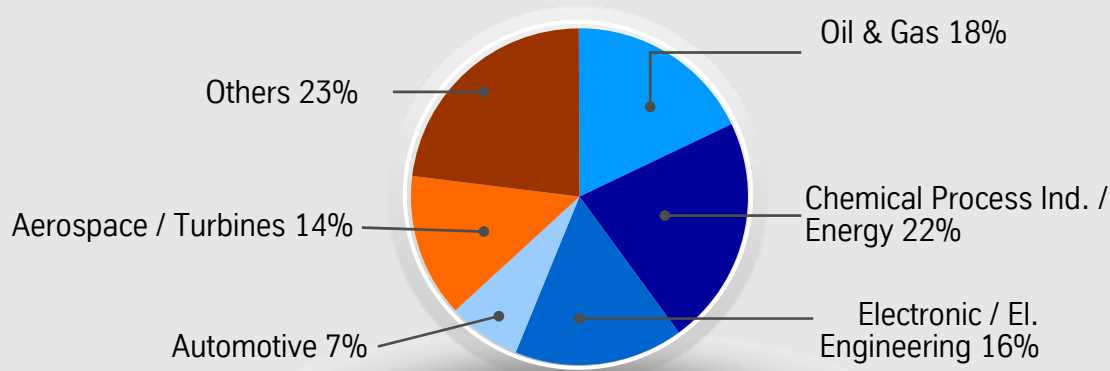
The 6 largest producers stand for 66% of all worldwide shipments

Nickel Alloys*, World Market Consumption in 1,000 t



Source: AMS; preliminary data 2007

Nickel Alloys*, VDM Sales by Industry**



** based on sold qty. incl. US production, CY 2007

*Per definition: Nickel >30%



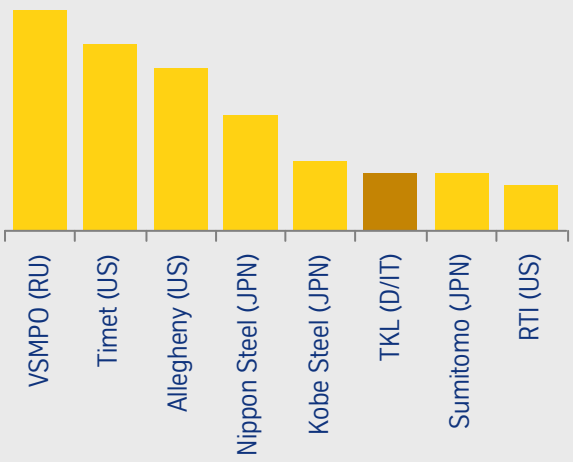
Market Environment – Titanium

TKL-Titanium is among the leading Titanium producers worldwide

Titanium Semis

Deliveries in 2007
1,000 tons

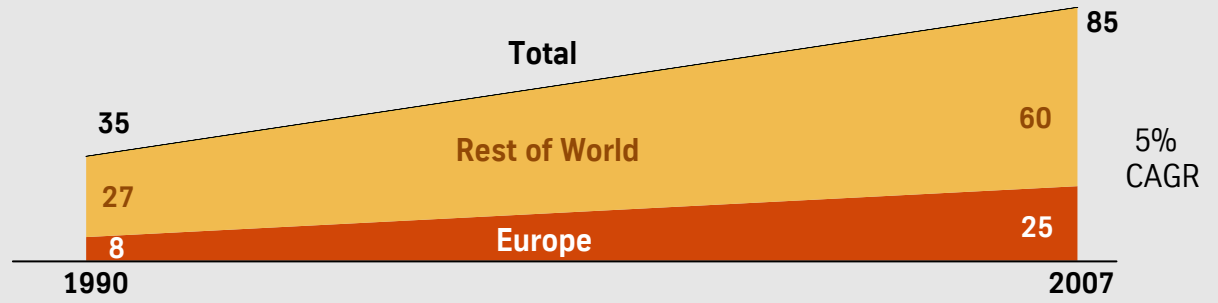
TKL is the only integrated Titanium Producer in Western Europe



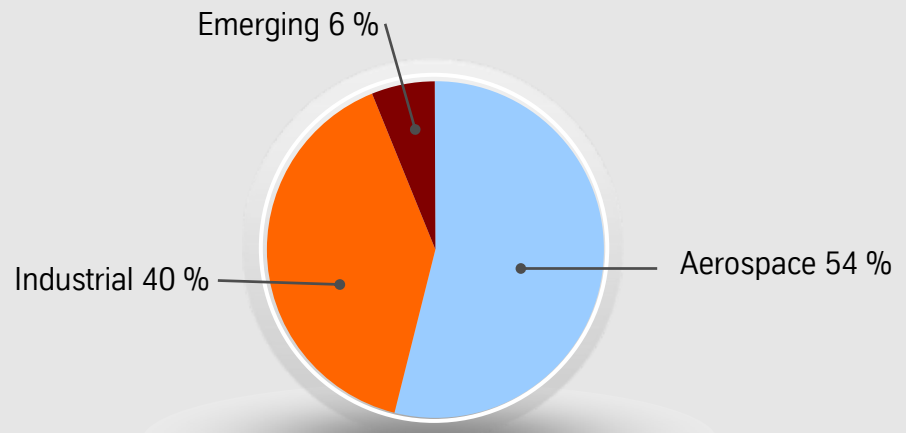
Source: ThyssenKrupp Titanium (estimates 2007)

The 5 largest producers stand for 67% of all worldwide shipments

Titanium, World Market Consumption in 1,000 t



Titanium Sales by Industry



ThyssenKrupp Stainless follows Megatrends – both in Nickel-Alloys...

...with Current Portfolio and R&D Investments of TKL-VDM

Global challenges

...driving force for TKL-VDM

Mobility



Alloys for Aerospace Applications



Alloys for Catalytic Converters

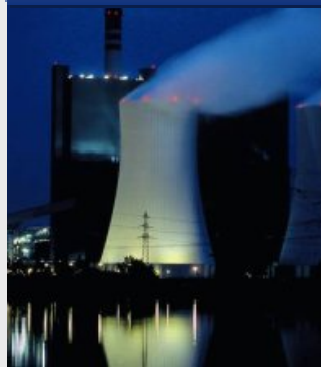


Sample: © Staxera GmbH

Alloys for Solid Oxide Fuel Cells

Limited resources

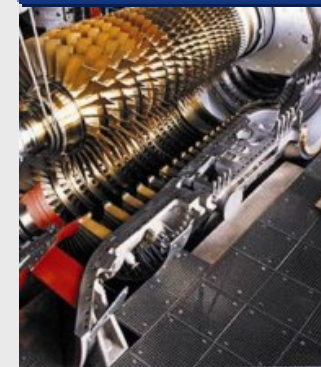
Alloys for 700°C Power Plants



Alloys for Flue-Gas-Desulphurization



Alloys for Gas Turbines



Climate change

...as in Titanium Applications

...with the highly sophisticated products of ThyssenKrupp Titanium

Mobility



Aerospace sector

Forged pieces

**Plates alloyed with
VCF** treatment**



Power



Energy

Plates CP*

**Tubes
Coils**



Urbanization



Seawater desalination

Tubes



Healthcare



Medical application

Forged pieces

**Plates alloyed with
VCF** treatment**



Forward Strategy ThyssenKrupp VDM

Growth opportunities in the Area of Nickel Alloys

- ① Optimization of internal efficiency / performance
→ Project “VDM - Value Driven Mobilization”
- ② Insourcing of vital production steps and reduction of bottlenecks
 - additional *remelting capacities*
 - commissioning of the *Forging Press*
- ③ Expansion of the value chain
→ New Stock and Service Centers
 - *Germany* (Werdohl)
 - *China* (Guangzhou)
- ④ Merging of production locations
→ Wire Mill relocated to Werdohl and modernized

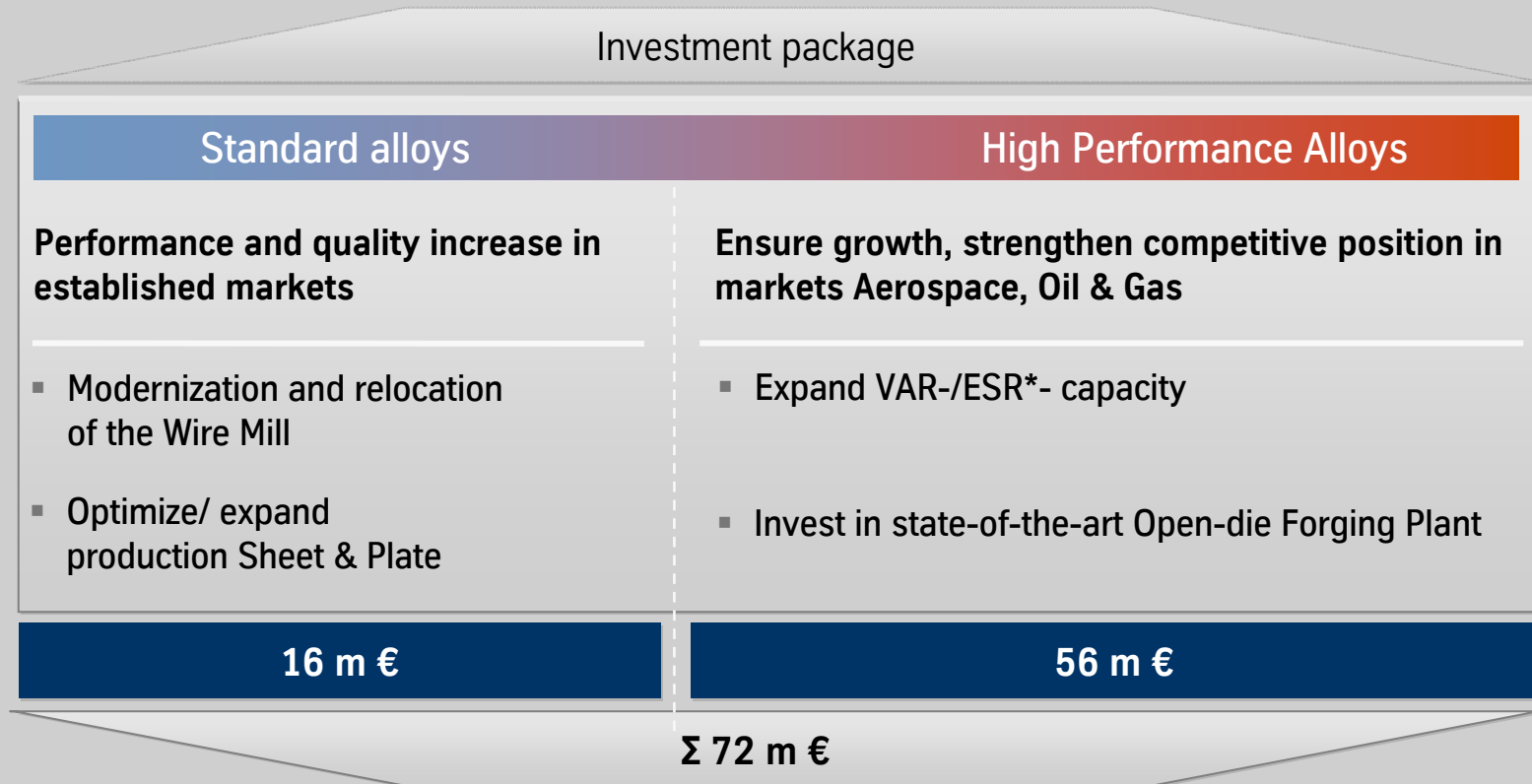
Continuous improvement (“Earn the right to grow”)

Project VDM „Value Driven Mobilization“ and TK Best initiative – reach operational excellence in results and Capital Employed

	Performance (EBT)	Capital Employed (CE)
Sales Force	<ul style="list-style-type: none"> • Increase sales volume • Optimize sales organization • Sales and Service initiative 	<ul style="list-style-type: none"> • Increase transparency through holistic logistics-concept • Net Working Capital initiative
Production	<ul style="list-style-type: none"> • Optimize value creation • Increase efficiency of production 	<ul style="list-style-type: none"> • Optimize processes (KAIZEN) • Net Working Capital initiative • Six-Sigma • Reduce lead-times • Optimize inventories
Overall Processes	<ul style="list-style-type: none"> • Purchasing initiative • Increase effectiveness and efficiency of administration 	<ul style="list-style-type: none"> • Implement new production planning system

Investment Package (2006-2008) (“Become Lead Supplier of Specialties”)

Forward strategy TKL-VDM

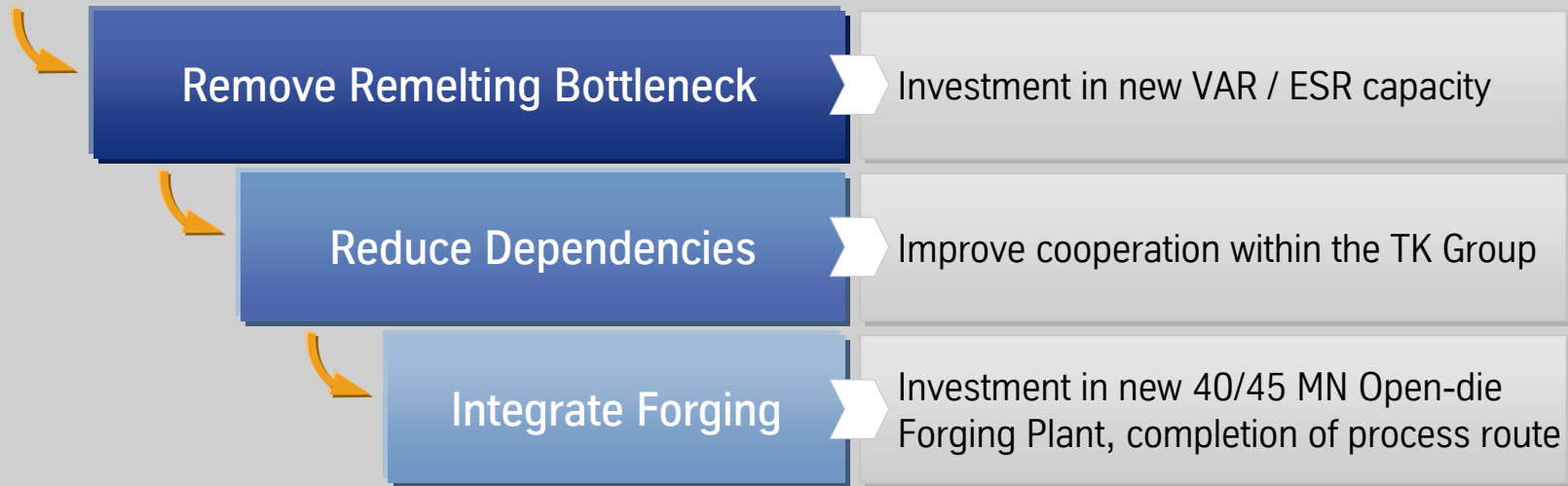


*VAR= Vacuum Arc Remelting; ESR= Electro Slag Remelting



Focusing on High-Performance Alloys

Implementation of the Forward Strategy High-Performance Alloys



TKL-VDM fully integrated supplier of forged products



ThyssenKrupp VDM Forging

Forging Press commissioned in 2008, plant Unna



Benefits

- Computerized process simulation
- Fully integrated process control and data documentation
- Integrated tool magazine, automatic tool and table shifting
- Fast and reliable

Equipment & Manufacturing Capabilities

Equipment

- 40/45 MN SMS Forging Press
- Railbound Manipulators 18/60 t
- Mobile Charging Manipulator

- Batch Furnaces
- Car Bottom Furnaces

Manufacturing Capabilities

Especially designed for ingots up to 8 t made of extremely hard **nickel and titanium** alloys required **by the aerospace industry**.

Also suitable for carbon steel ingots up to 60 t.



Stock & Service Center Concept

Inventory & prefabrication capabilities



Equipment & Stock & Prefabrication Capabilities

Equipment

- Laser cutting
- Bar & billet sawing
- Waterjet cutting



Stock

Permanent stock of a wide variety of alloys, see brochure „Service Center“



Prefabrication Capabilities

Cut to length and blanking

Rolling (round to flat wire)

Sawing of bars and billets

length 15 - 6000 mm

bars dia 10 – 540 mm

billets max 630 x 540 mm



ThyssenKrupp VDM Division Wire

Relocation and modernization in 2008, Werdohl Plant



Equipment

Equipment

- New drawing and shaving lines
- New wet drawing lines
- New straightening and cutting equipment
- Pickling and annealing lines

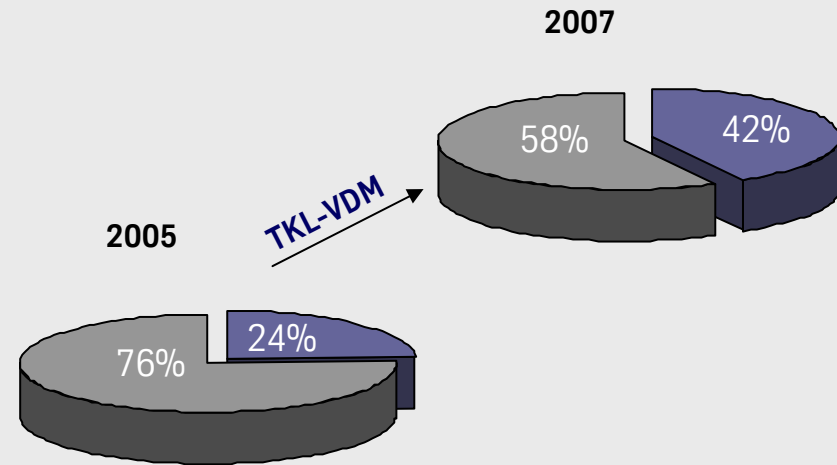
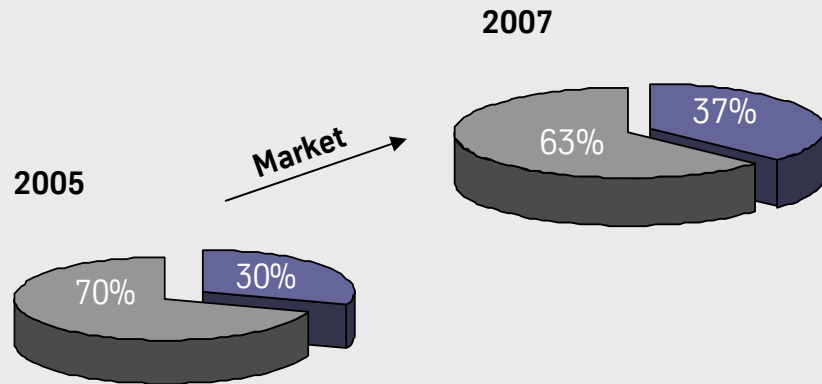


Benefits

- **New efficient plant layout**
- Modernized production lines
- **Higher productivity & profitability**
- Focus on **attractive product portfolio**



ThyssenKrupp VDM focuses its product portfolio on more profitable HPA markets



The market for High Performance Alloys (HPA) is continuously growing... TKL-VDM already expanded its HPA share in Industrial Engineering. In the future TKL-VDM focuses on more profitable HPA markets (**Aerospace** and **Oil & Gas**).

Standard Alloys HPA

Forward Strategy Titanium

Growth in market segments, where competitive advantages exist



World market leader in CP flat products and producer of highly specialized alloyed products**

Systematic Development

- Make market potentials accessible and diversification of raw material usage:
New EB-Furnace* enables usage of scrap and increases Ingot-/slab-capacity

Current Situation

- Single investment (e.g. VAR) to use high market demand/prices opportunistically

2004/05

- TKL Titanium as established player in the market with significant potential

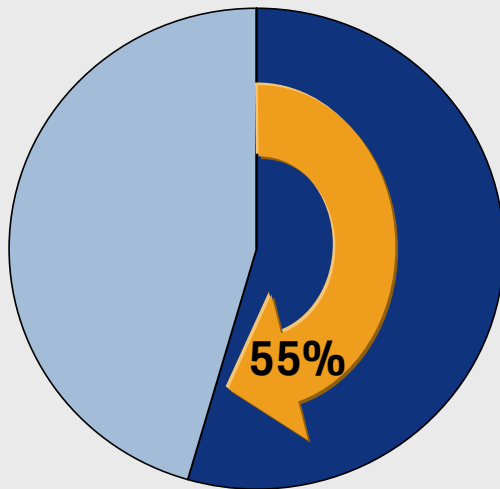
- Exploit market potential in Non-Aerospace applications requires higher depth of added value
- Enhanced use of downstream capacities of TKL-AST (Strip production)
- Collaboration with VDM forging shop for highly sophisticated aerospace and medical products
- Sponge supply:
As of today, enough sponge capacities existing worldwide

*EB furnace= Electron Beam Furnace; **CP= Commercial Pure (Titanium)



Titanium's strategy: expand Industry share of the business

2006/07



■ Aerospace
■ Industry



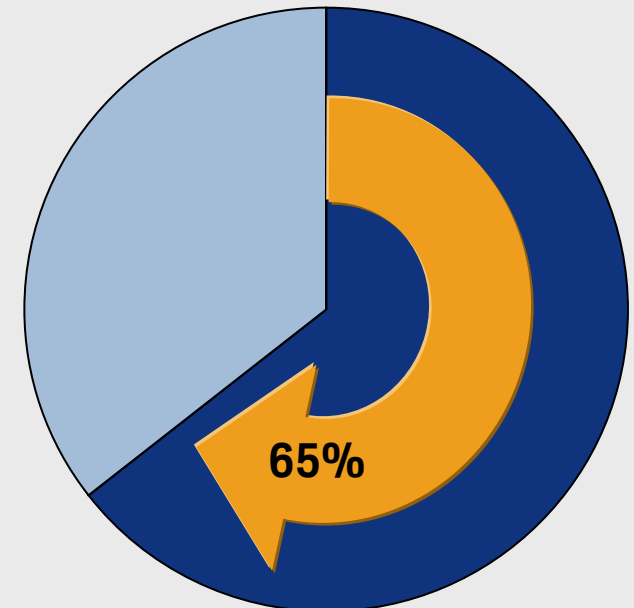
Product Forms

- Ingots
- Blooms

- Billets
- Bars
- Plates
- Coils
- Tubes

Strategic Goal

Expand proportion of Industry-related business

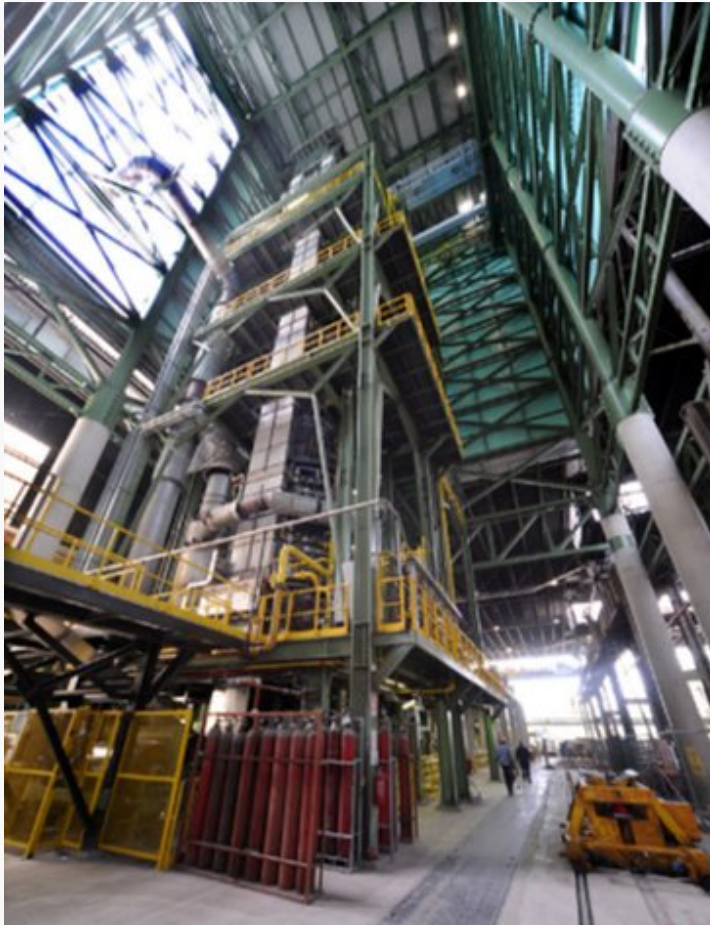


Electron Beam (EB) Furnace ThyssenKrupp Titanium



- First slab of the EB Furnace produced in June 2008
- Equipment follows planned ramp-up curve
- Certification process ongoing

Expand proportion of Industry-related business at Titanium



Bright Annealing Line in Terni:
through specific technical equipment, the line
became a key unit for Titanium-Strip production



Manufacturing of tubes,
especially for recuperator-tubes



Vacuum creep flattener for Titanium sheets

Plant Visit

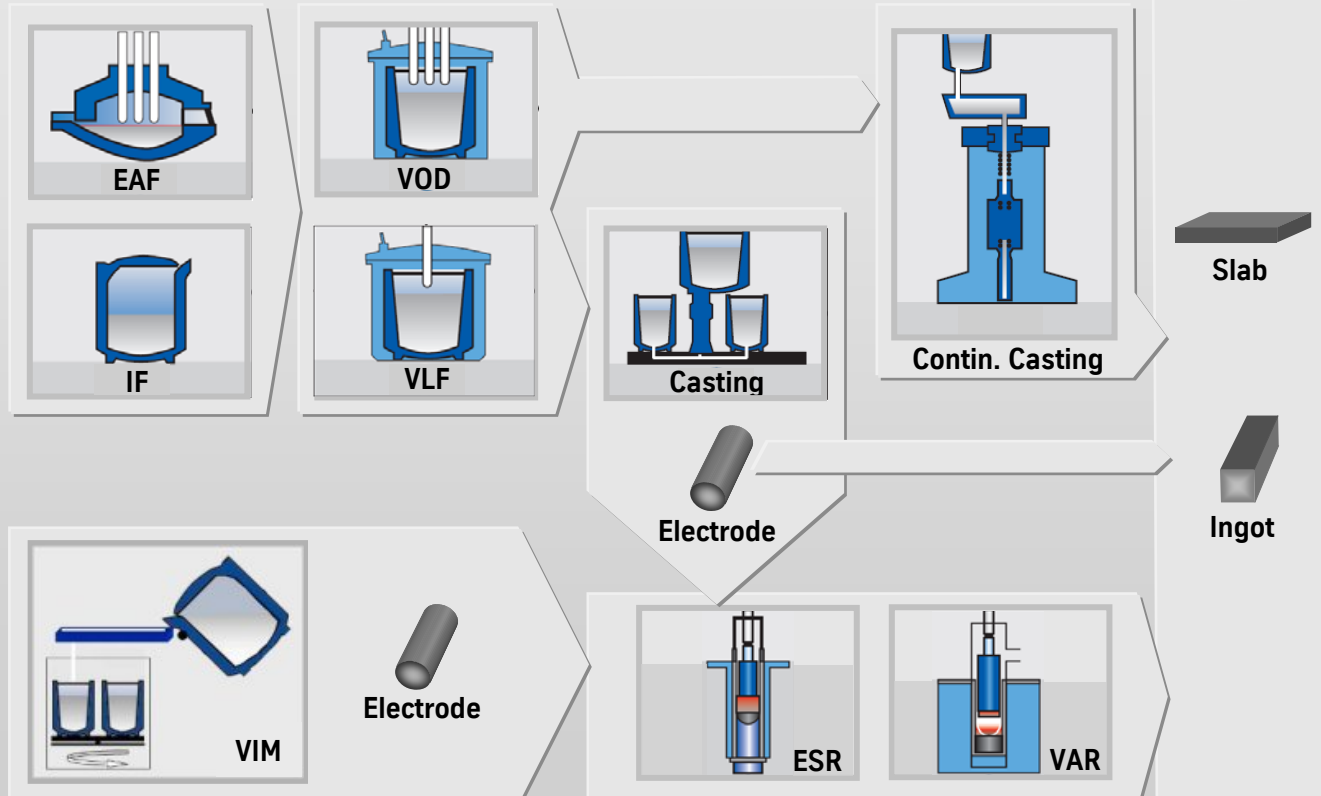
TKL-VDM Unna

- **Melting / Remelting**
- **Processing: Forging of Billets & Bars**
 - ▶ High Performance Alloys
 - ▶ Stainless Steels
 - ▶ Tool Steels

ThyssenKrupp VDM

Process flow Unna

Unna Plant

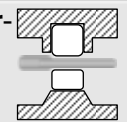


Processing

Plate & Sheet, Strip, Rod & Bar, Wire (**Altena, Werdohl**)



Forging –Billet & Bar–
Unna



Drawing, Finishing –Rod & Bar–
Altena

*EAF=Electric Arc Furnace; VOD=Vacuum Oxygen Decarbonization; IF=Induction Furnace; VLF=Vacuum Ladle Furnace; VIM=Vacuum Induction Melting

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- (i) market risks: principally economic price and volume developments,
- (ii) dependence on performance of major customers and industries,
- (iii) our level of debt, management of interest rate risk and hedging against commodity price risks;
- (iv) costs associated with, and regulation relating to, our pension liabilities and healthcare measures,
- (v) environmental protection and remediation of real estate and associated with rising standards for real estate environmental protection,
- (vi) volatility of steel prices and dependence on the automotive industry,
- (vii) availability of raw materials;
- (viii) inflation, interest rate levels and fluctuations in exchange rates;
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