SAVE ENERGY AND CUT COSTS WITH EIFS - EXTERIOR INSULATION AND FINISH SYSTEM

Silvia Basei, Account Manager Construction Polymers, 14th of October 2009
Convegno “Efficienza energetica per l’ edilizia, Milano

CREATING TOMORROW’S SOLUTIONS
• Welcome to WACKER

• VINNAPAS® Polymers in Exterior Insulation and Finish Systems (EIFS)
WACKER CHEMIE AG – SUCCESSFUL FOR MORE THAN 90 YEARS

WACKER Chemie AG
- Founded 1914 by Dr. Alexander Wacker
- IPO in April 2006
- Head office in Munich
- 27 production sites worldwide

Key figures 2008
- Employees 15,922
- R&D expenditure € 163 Mio.

WACKER Chemie Sales (mill. EUR)

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (mill. EUR)</th>
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<tbody>
<tr>
<td>2005</td>
<td>2,756</td>
</tr>
<tr>
<td>2006</td>
<td>3,337</td>
</tr>
<tr>
<td>2007</td>
<td>3,781</td>
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<tr>
<td>2008</td>
<td>4,298</td>
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</tbody>
</table>

Burghausen site
WACKER POLYMERS - GLOBAL SETUP WITH REGIONAL FOCUS

WACKER POLYMERS 2008

- Sales: € 868 Mio.
- Employees: 1,579

Wacker Polymers – Global Setup

Wacker Polymers - Sales in EUR mn**

* Sale of PA catalyst business in 2002, Divestiture of the brine and caustic soda business in 2003; sales effect of APP Acquisition in 2008
### WORLD MARKET LEADER CONSTRUCTION POLYMERS: ADDING VALUE TO DRY-MIX MORTAR SYSTEMS

#### Products

<table>
<thead>
<tr>
<th>Co- and Terpolymers as</th>
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<tbody>
<tr>
<td>Dispersible Polymer Powders</td>
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<tr>
<td>Dispersions</td>
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</table>

#### Trademark

VINNAPAS®

#### Main Industries

Construction Chemicals
Dry-Mortar

#### Applications of Dispersible Polymer Powders in Dry-Mix mortars

- Tile adhesives
- Grout mortars
- Sealing slurries
- **Exterior Insulation and Finish Systems**
- Primers
- Cementitious surface coatings
- Self-leveling compounds
- Adhesive slurries
- Plasters
- Concrete renovation
- Gypsum applications
- Skim coats
- Powder paints
- Troweling compounds
• Welcome to WACKER

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CLIMATE CHANGE IS OMNIPRESENT - SAVING ENERGY IS CRUCIAL FOR STOPPING GLOBAL WARMING
SINGLE LARGEST ENERGY-CONSUMING SECTOR IS BUILDINGS: RESPONSIBLE FOR MORE THAN 50% OF ENERGY USE

- Industrial buildings: 30%
- Tertiary building: 20%
- Industry: 12%
- Dwellings: 8%

Energy consumption in buildings:
- Space heating / cooling: 55%
- Water heating: 15%
- Electrical appliances: 10%
- Cooking: 8%
- Lights: 5%
- Other: 7%

Source: DG TREN, European Commission
EXTERIOR WALL INSULATION CONTRIBUTES THE MAJOR PART OF SAVING ENERGY IN BUILDINGS

- solar panels = 7%
- modern heating systems = 12%
- insulation of cellar = 12%
- roof insulation = 11%
- heat-absorbing glass = 11%
- External Wall Insulation = 30%

Source: WDVS-Fachverband, 2006
THE MAIN COMPONENTS OF EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS)

- Adhesive
- Polystyrene (insulation)
- Embedding mortar
- Fibre mesh
- Top Coat / Plaster
- Adhesive
The power of exterior insulation and finish systems: superior way to insulate your walls

Scientific measurements are available to calculate energy loss

- Energy loss through a wall is measured as
  - \( U\text{-value} = \frac{W}{m^2 K} \)
  - Energy that transfers per square meter and per hour for each temperature degree difference between inside and outside

→ The lower the U-value the better the insulation

Concrete wall (20 cm)

Aerated lightweight concrete (20 cm)

EIFS: Concrete wall (20 cm) with insulation panel

- U value: 3.70
- U value: 0.66
- U value: 0.36

Source: http://www.energiesparhaus.at/denkwerkstatt/uwert.htm

Exterior Insulation and Finish Systems
Silvia Basei, 14.10.2009, Slide 11
Exterior Insulation and Finish Systems

HIGH REQUIREMENTS FOR MORTAR AS THE CRITICAL COMPONENT OF EIFS

Requirements for fresh mortar:
• Good workability for manual and machine application
• Long open time

Requirements for hardened mortar:
• Good adhesion to polystyrene boards and other substrates (concrete, bricks, old renders)
• High flexibility and impact strength
• Good vapor permeability
• Hydrophobic properties (water repellency)
• Good weathering resistance
WITH WACKER’S VINNAPAS® POLYMERS, YOU GAIN FOUR STRONG PERFORMANCE FEATURES

Functions of VINNAPAS® Polymers in EIFS mortars:

- Improved adhesion to all substrates (polystyrene, mineral wool, concrete, bricks, old renders etc.)
- Increased flexibility and improved impact resistance
- Excellent hydrophobicity
- Durability and long-term performance

→ With WACKER’s VINNAPAS® products, EIFS become stable, flexible and long-lasting
LABORATORY TESTING IS MANDATORY FOR A SUCCESSFUL EIFS DEVELOPMENT
VINNAPAS® MAKES THE DIFFERENCE

With 3% VINNAPAS®

Without VINNAPAS®
Savings during the last 50 years reached with EIFS in Germany

~ 740.000.000 sqm

~ 240.000.000.000 liters Saved heating oil
~ 670.000.000 tons Saved CO₂
~ 120.000.000.000 € Saved heating costs (oil price 2007)

• EIFS is a well established and approved building application for several decades.
• EIFS is ecological since it reduces residential energy consumption and CO₂ emissions significantly.
• EIFS is economical since it reduces heating costs significantly with reasonable expenditures.

Source: Market study "Quo vadis WDVS 2007-2012"
WACKER‘S TARGETS

Our Targets

• We want to promote EIFS
• We want to promote the “System Mindset” for EIFS
• We want to promote the quality awareness in the field of EIFS and also dry mortars

We are looking forward to discussions …

• … with architects, construction companies on EIFS and trends in exterior wall insulation.
• … with authorities on system quality and norms
• … with individuals who want to enter the EIFS field
THANK YOU FOR YOUR ATTENTION!

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