

The Wacker logo is displayed in a white rectangular box with a black border, featuring the word "WACKER" in a bold, black, sans-serif font.

**WACKER**

CREATING TOMORROW'S SOLUTIONS

The background image shows a modern office building with a dark facade and large glass windows, reflecting the sky. To the right, there is a traditional white building with a red-tiled roof and dormer windows. A street lamp and a blue circular traffic sign are visible in the foreground. The scene is set on a clear day with a blue sky.

## **Wacker Chemie AG – Industry meets Start-ups**

Dr. Thomas Renner  
September 25, 2017

# WACKER's Innovations Are Based on Internal R&D Activities and Enhanced via Collaborations

## Innovation Strategy

**Innovation Management:** Project system for innovation and R&D project managers

**Key Group Projects:** Significant technology-driven core activities

**New Solutions:** Cross-divisional, customer-oriented technology development

### Consortium

Development of materials for new markets of the future, basic research

### R&D of the Business Divisions

Innovations within the scope of current business activities

### Engineering Processes (ZI)

Process development, optimization and productivity

### New Businesses

Introduction of new products in new markets

**Management of Public Funding:** Acquisition of funding, lobby efforts, networking

**University Management:** Coordination of all university cooperation and activities

**WACKER Chair / Institute of Silicon Chemistry - External Collaborations**

# R&D-Pipeline Covers a Diverse Range of Applications



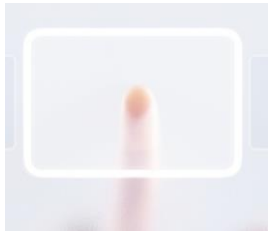
## Building/Renovation

- ▶ VAE dispersions and silicone based building preservation
- ▶ New binders and sealants
- ▶ Building insulation materials



## Photovoltaic

- ▶ High quality Polysilicon for efficiency leveraged cells
- ▶ Process optimization



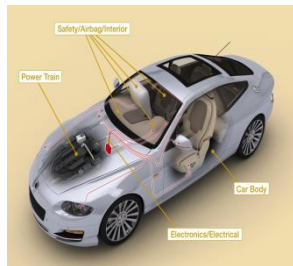
## Electronic

- ▶ Silicone film acting as dielectric electroactive polymer (EAP) thus allowing innovative smart sensor designs



## Household/Personnel care

- ▶ Silicone based antifoams for detergents
- ▶ Silicone based materials for property enhanced hair care and cosmetics



## Automotive

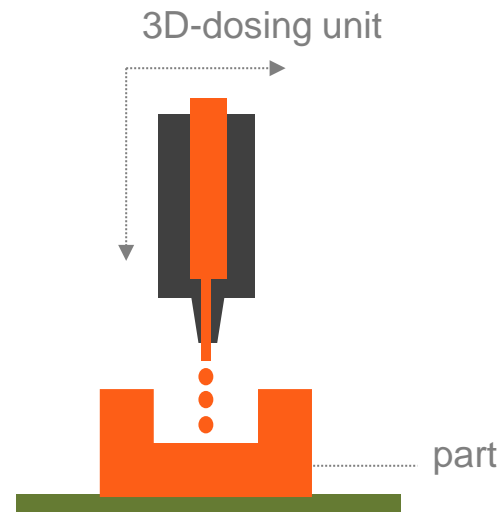
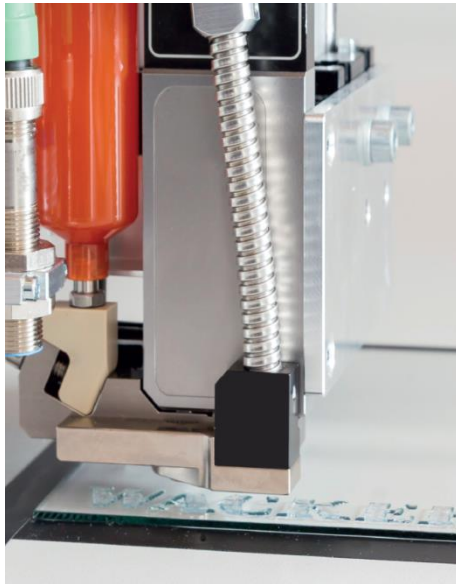
- ▶ High temperature resistant silicones
- ▶ High performance coatings for airbags



## Food/Pharma

- ▶ Cyclodextrin complexes for the production of purely vegetarian, fat and cholesterol reduced food
- ▶ Innovative production systems for Pharma proteins

# Silicone Additive Manufacturing is a Forward Integration Approach with a Ready to Use Technology Made by WACKER



## Prerequisite

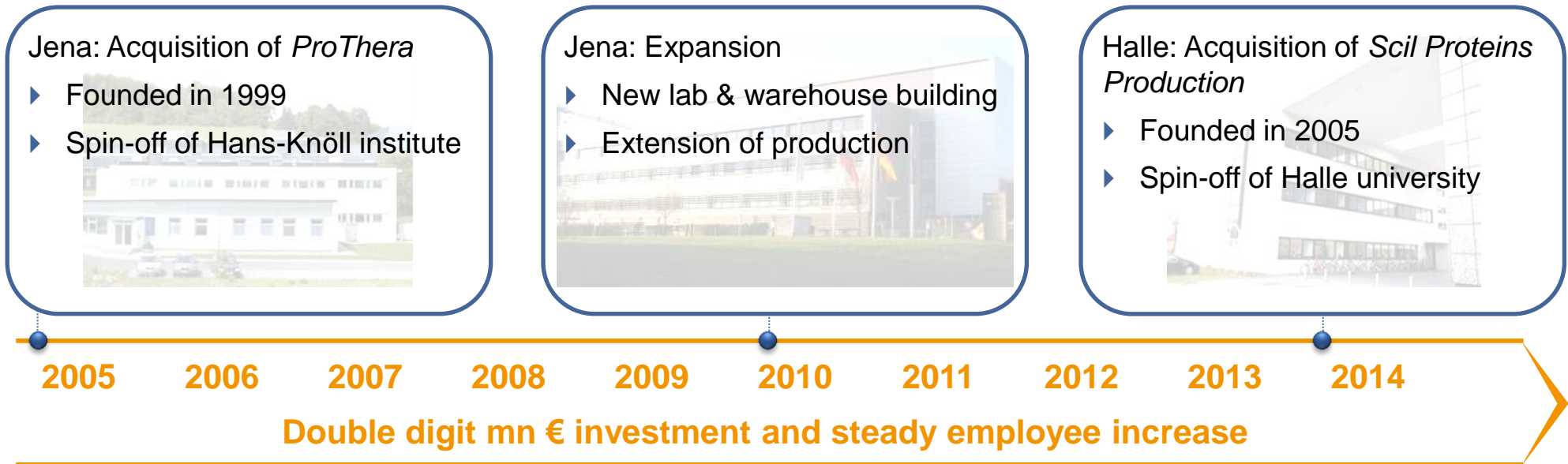
- ▶ CAD product design
- ▶ 3D printer

## Advantage

- ▶ Short development cycles (hours to days)
- ▶ Low costs for prototyping and small series (no economy of scale)
- ▶ Novel product design

▶ Additive molding (3D printing) of silicone parts will soon be established as an easy-to-use, flexible and cost-effective solution complementing traditional molding technologies like injection molding

# Strategic Acquisitions and a Strong Commitment to Biotechnology Formed a New Player with Unique Assets



## Drug substance for approved drugs



- ▶ Rapilysin/Retepase
- ▶ Myocardial infarction



- ▶ Spectrila/Asparaginase
- ▶ Blood cancer (ALL)

## WACKER technology platforms



- ▶ Protein is secreted
- ▶ No cell disruption needed



- ▶ Protein is inside the cell
- ▶ Efficient refolding

# Recap after Ten Years: the New Business is Coming of Age

## Remarkable sales growth



- ▶ Sites in Halle and Jena are fully integrated after two years
- ▶ Sales growth of 30% over the past two years – significantly above market growth
- ▶ WACKER's ESETEC® Technology is nominated for the German Business Innovation Award 2016

## Key Factors for growing a start-up business in corporate environment



- ▶ Apply intensive **learning attitude** to understand the new market
- ▶ Understand that **start-up cultures are different** to corporate cultures
- ▶ Give the start-up business **enough independence** for driving its business
- ▶ **Support** with corporate know-how
- ▶ **Be patient** and keep an eye on profitability

# Back-up

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# In 1903 Dr. Alexander von Wacker founded the “Consortium für elektrochemische Industrie GmbH”

## ▶ Further partners:

- ▶ Bosnische Elektrizitäts AG, Austria-Hungary
- ▶ Elektrizitätswerke Lonza AG, Switzerland
- ▶ Aktieselskabet Hafslund, Norway

## ▶ Location:

- ▶ 1903 -1918: Nuremberg
- ▶ since 1918: Munich

## ▶ Task:

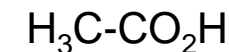
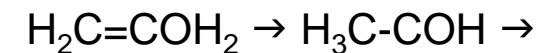
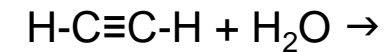
Development of new applications for acetylene as quickly as possible

## ▶ Outcome:

Foundation of Wacker Chemie in 1914



## ▶ 1910-1913: 1. WACKER Process for Synthesis of Acetaldehyde & Acetic Acid



## ▶ Further Products:

- ▶ Tetrachloroethane
- ▶ Trichloroethylene
- ▶ Perchloroethylene

## ▶ Applications:

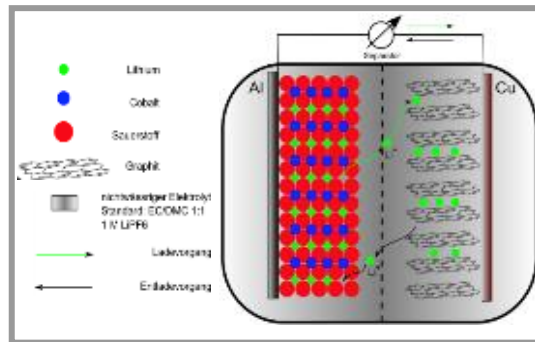
- ▶ Solvents
- ▶ Extraction agents
- ▶ Degreasing



# Corporate R&D Projects Focus On New Technologies

## ▶ Lithium-Ion-Batteries (LIB):

- ▶ Anode materials comprising nano-structured silicon
- ▶ Optimization of electrolytes and binder systems



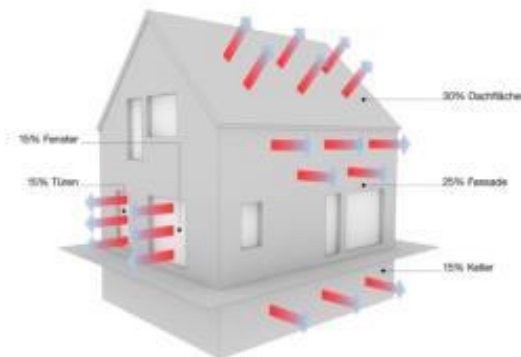
## ▶ Concentrated Solar Power (CSP):

- ▶ Defined silicone fluids as heat transfer fluids



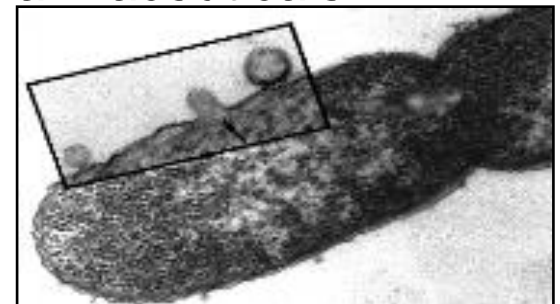
## ▶ Insulating materials:

- ▶ Silica based insulants



## ▶ Biologics:

- ▶ Recombinant production of proteins as pharmaceuticals (ESETEC®)
- ▶ Lipophilic bioactives
- ▶ Cyclodextrins



# WACKER's business portfolio – the basis for growth

## WACKER BIOSOLUTIONS

- ▶ High potential for future development

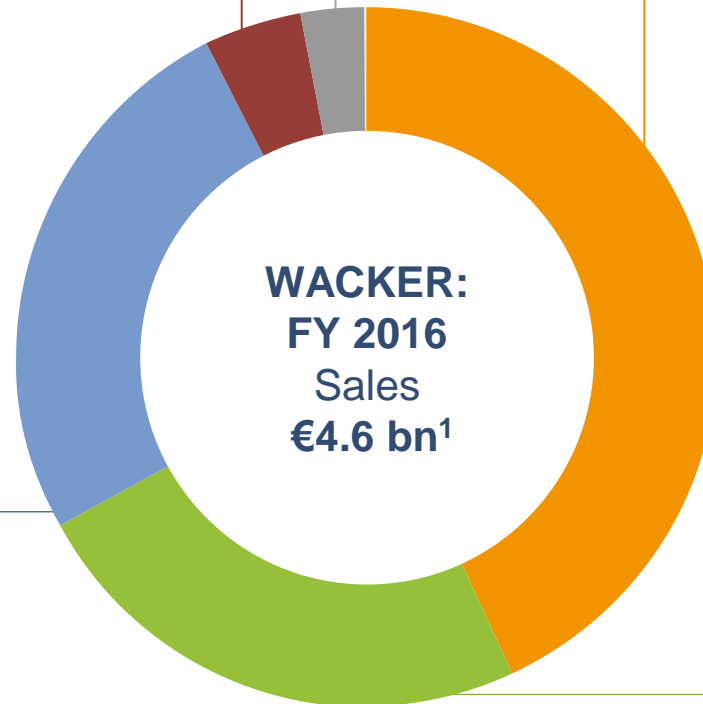
Others

## WACKER SILICONES

- ▶ No. 2 with global footprint
- ▶ Leading positions in key growth segments

## WACKER POLYMERS

- ▶ No. 1 in dispersible polymer powders
- ▶ No. 1 in VAE dispersions
- ▶ Global footprint



WACKER:  
FY 2016  
Sales  
€4.6 bn<sup>1</sup>

## WACKER POLYSILICON

- ▶ No. 2
- ▶ Cost and quality leader
- ▶ Enabling industry growth

1) External Sales in %, adjusted according to IFRS 5

# Innovations are a Key to WACKER's Business Strategy



- ▶ WACKER spends some 3 percent of sales on R&D
- ▶ Over the past five years, the Group has applied for patents for 90 to 100 inventions annually
- ▶ WACKER holds around 4,100 active patents and about 1,800 pending patent applications

