

**19<sup>th</sup>**

**International Technical Footwear Congress**

**February 03-05, 2016, Chennai, INDIA**

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# Shoes Produced by Smart Robots

**UITIC 2016**

**Klaus Freese**

**Managing Director, DESMA**



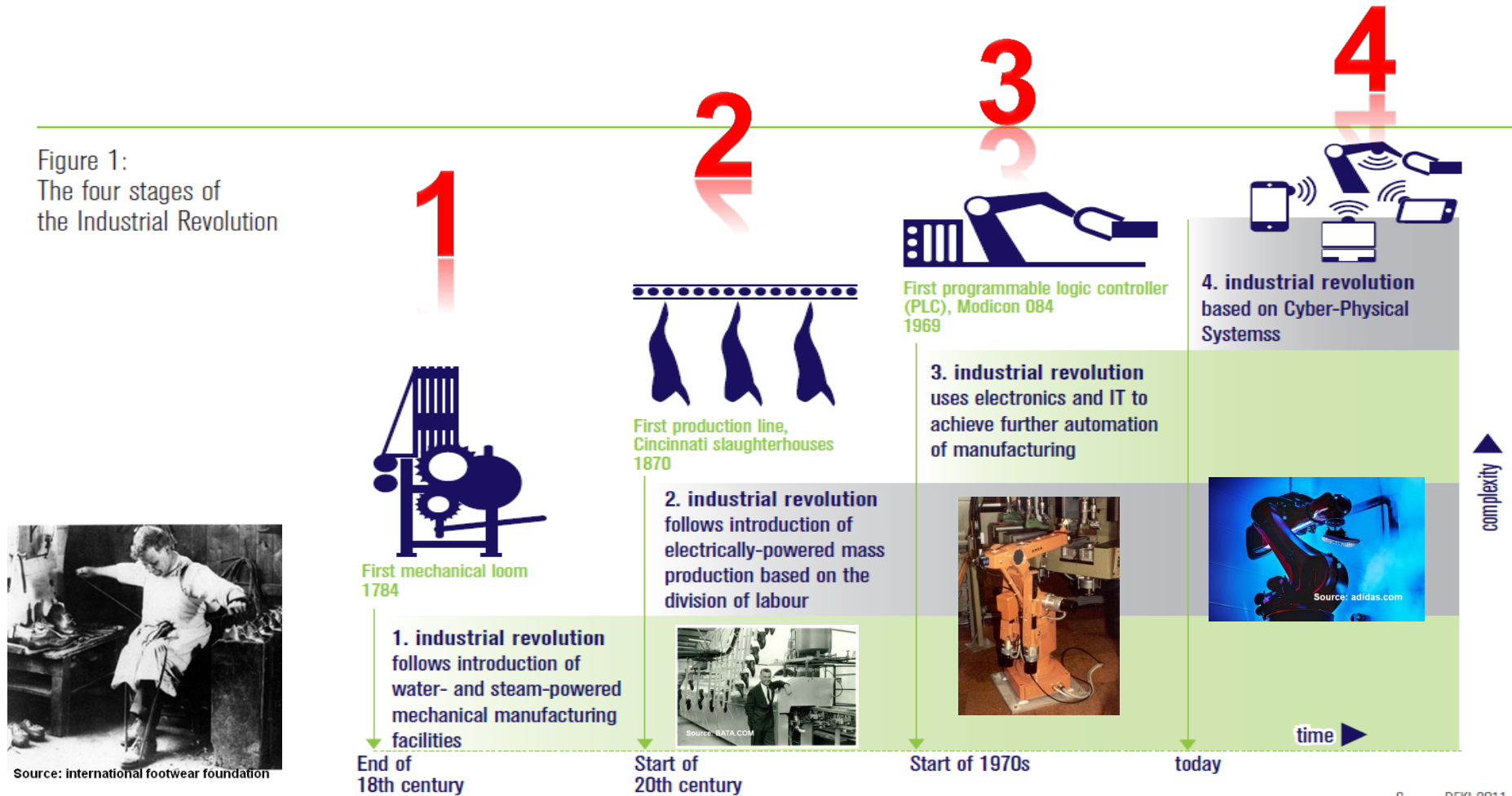
# Agenda

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- History – development of the industrial shoe manufacturing
- Advantages automation by using Robots
- Status Quo in usage of robots
- Industry 4.0 and the future in shoe-manufacturing

# Introduction

Figure 1:  
The four stages of  
the Industrial Revolution



# Why Automation?

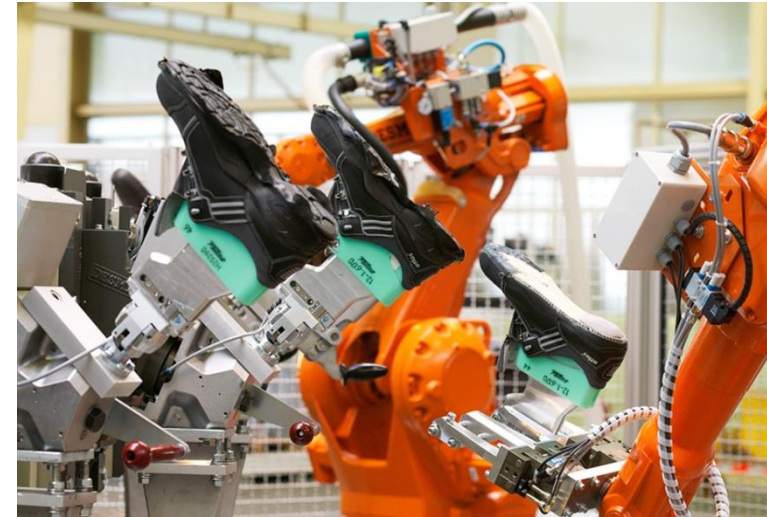




# Why Automation?

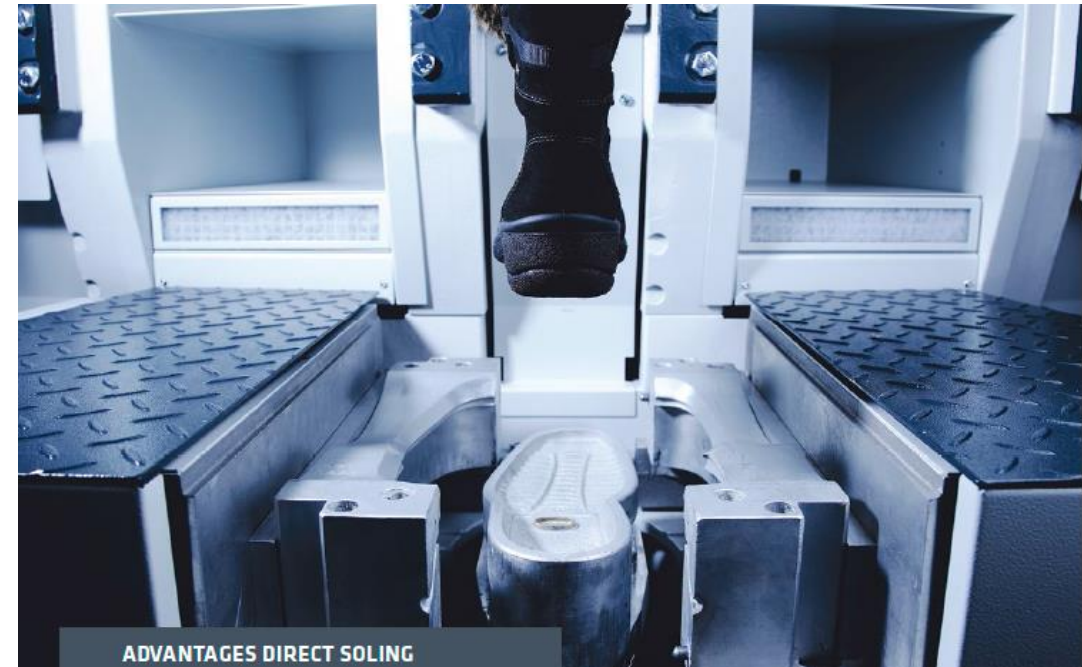
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- Improvement in quality
  - Robots operate in a constant standard process
    - Precise, robust and fast
- Reduction of production costs
  - Reduction of labor costs and material costs
- Higher productivity
  - Robots work 24/7
  - Constant output in heavy as well as difficult work
- Risk reduction
  - Release and protect humans
  - Optimization of material use - environmentally friendly

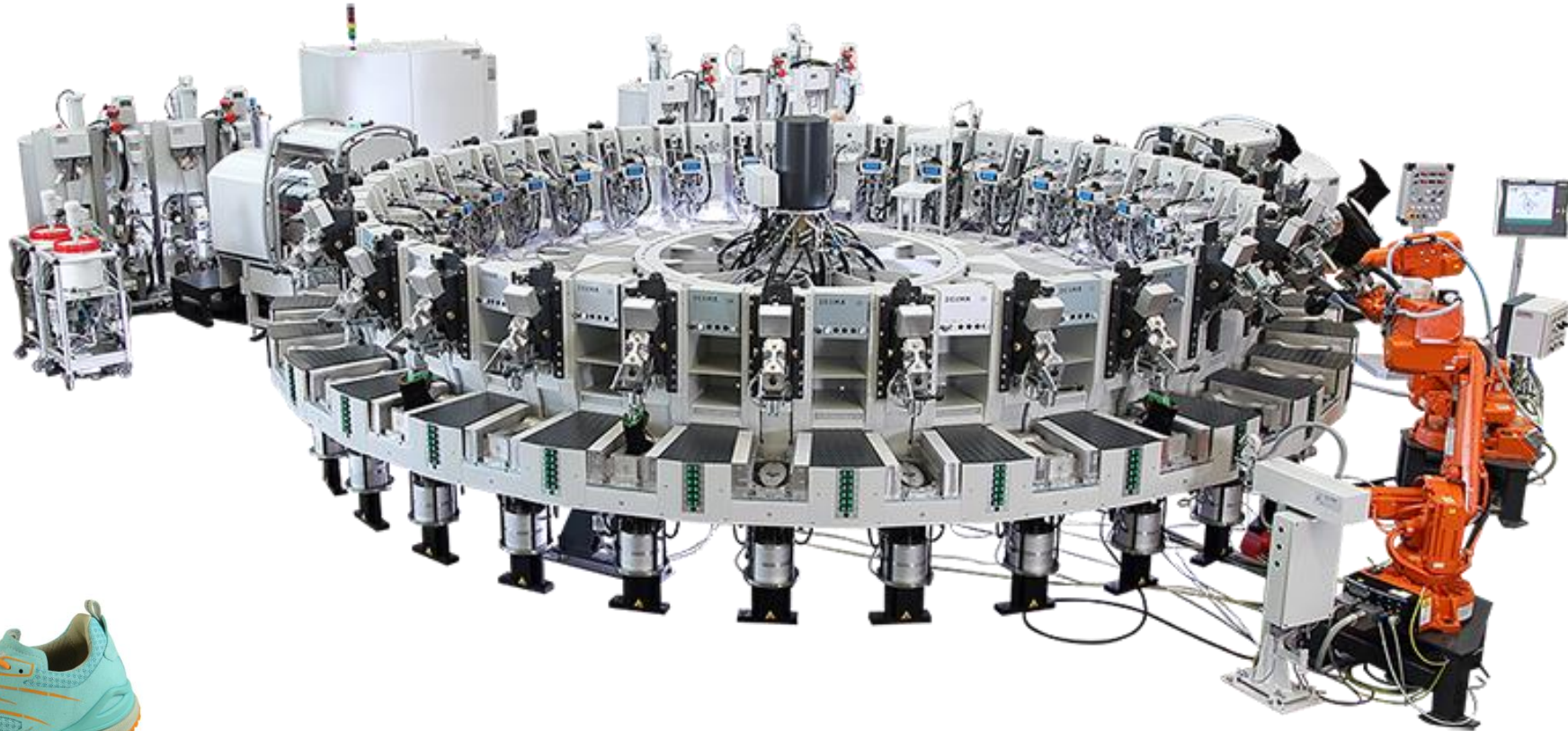


# Direct Soling (Direct Injection Process – DIP)

- Increase of productivity
- Standard manufacturing process
- Reduction of labour costs
- No transportation and storage of soles
- Flexible working process
- Preference for large production figures
- No or less adhesive needed

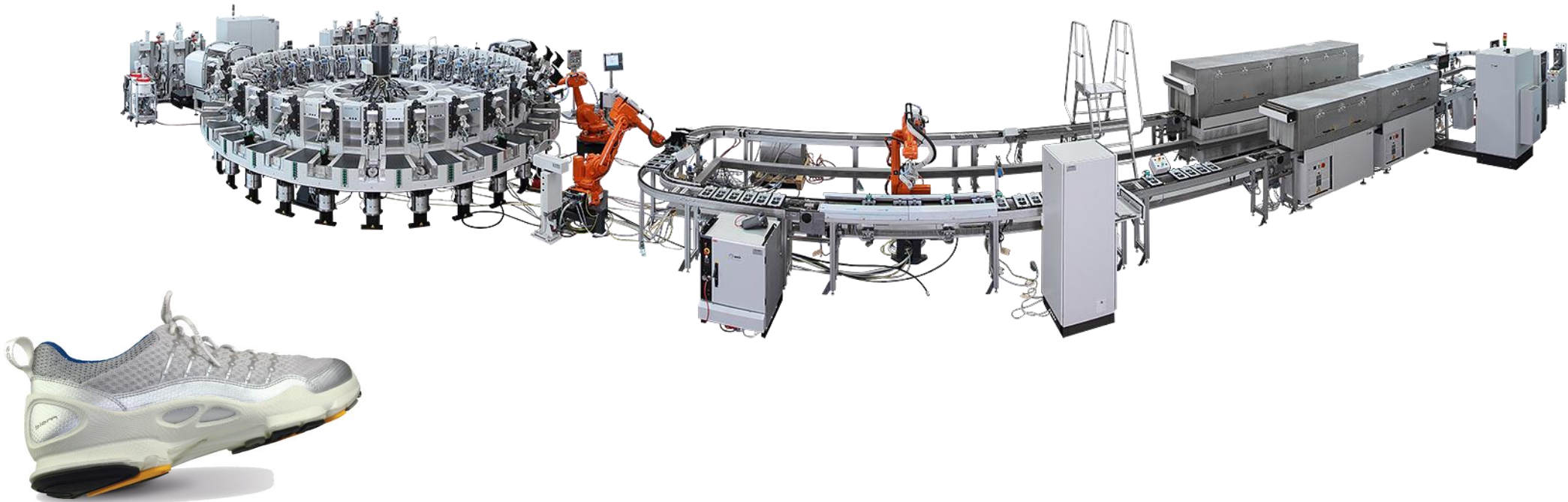


# Direct Soling Machine

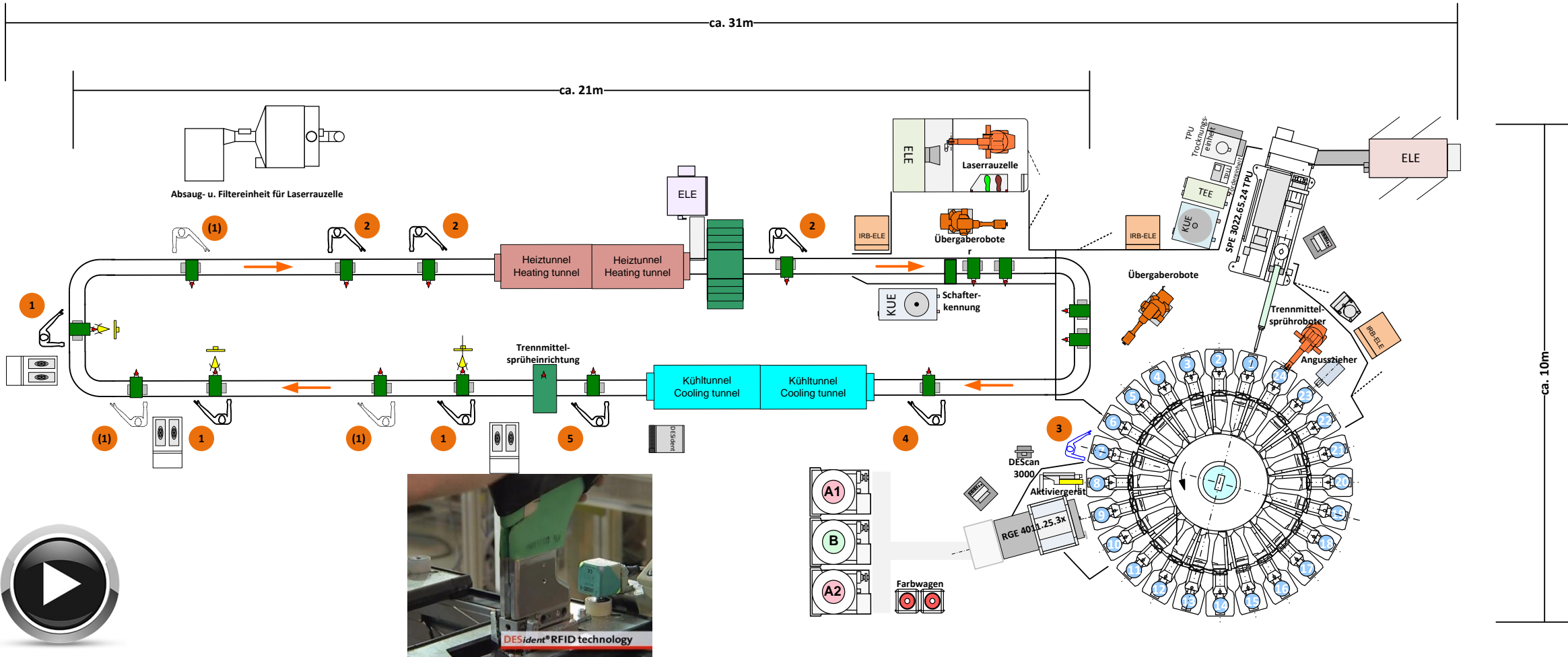




# Direct Soling Machine with amir®







# TPU Direct Soling

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# Robot Applications



Release Agent Spraying



Laser Roughing



# Shoes for Direct Soling

**Safety shoes**



**Military shoes**



**Casual**



**Children shoes**



**Business**



**Sports shoes**



**Sandals**



**PU boots**



**Sole and components**





# DIP Guides to New Possibilities

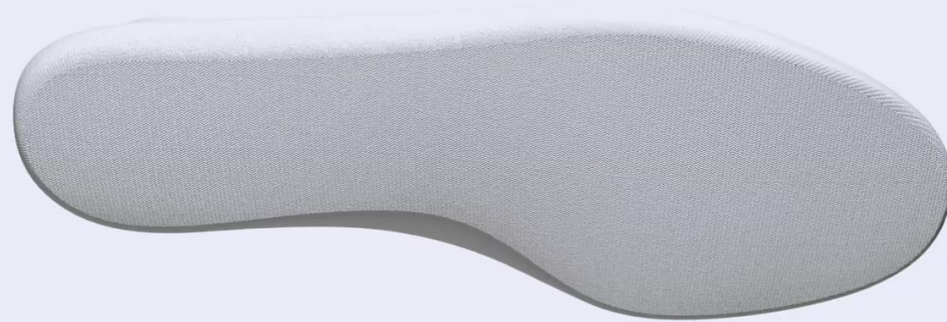
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- **Quality:** Best sole adhesion to the upper and highest shoe quality
- **Functions:** Extended functions such as cushioning, flexibility, supporting
- **Design:** Boundless design possibilities for cup soles, blends and effects etc.



# Processing

A first, stabilizing layer is directly moulded onto a carrier fabric.



# The future has begun!

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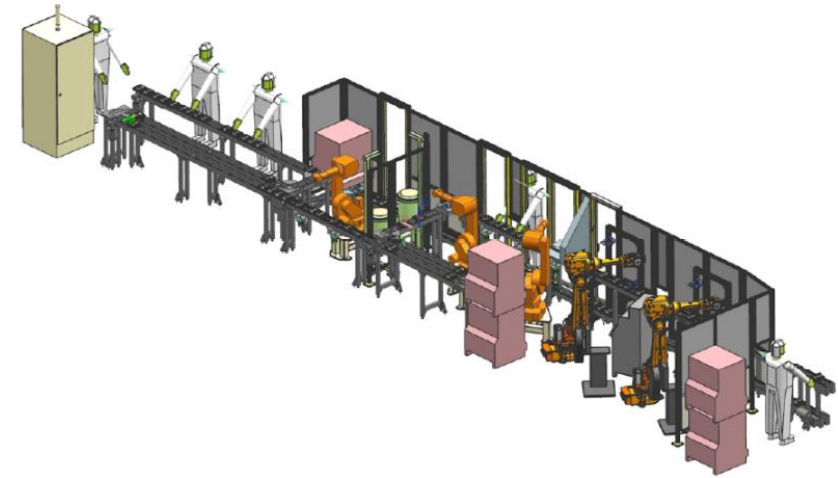
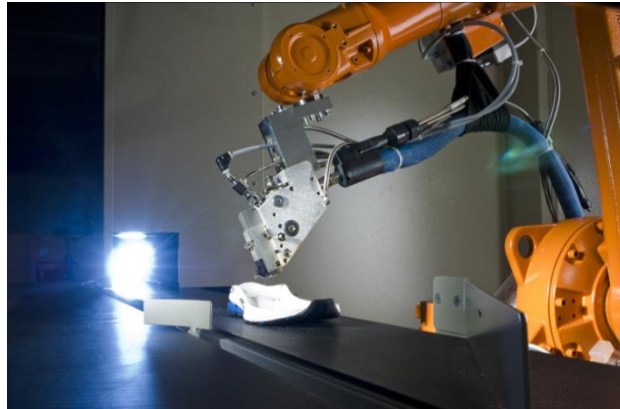
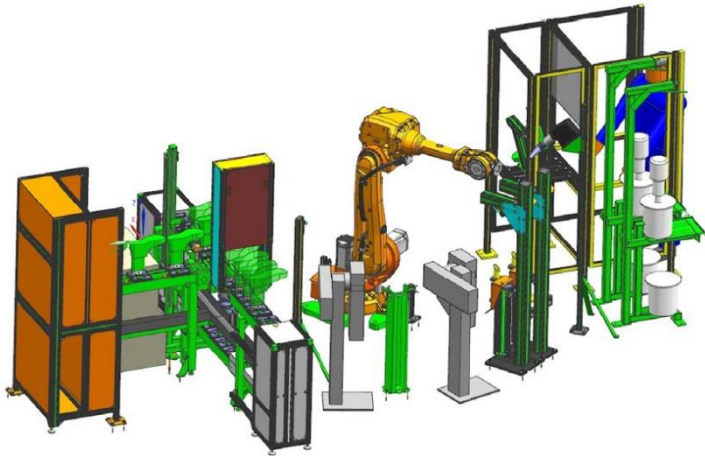


# Automation in Cementing: amir<sup>®</sup> c

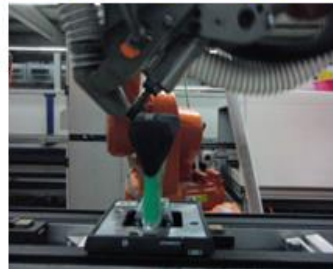
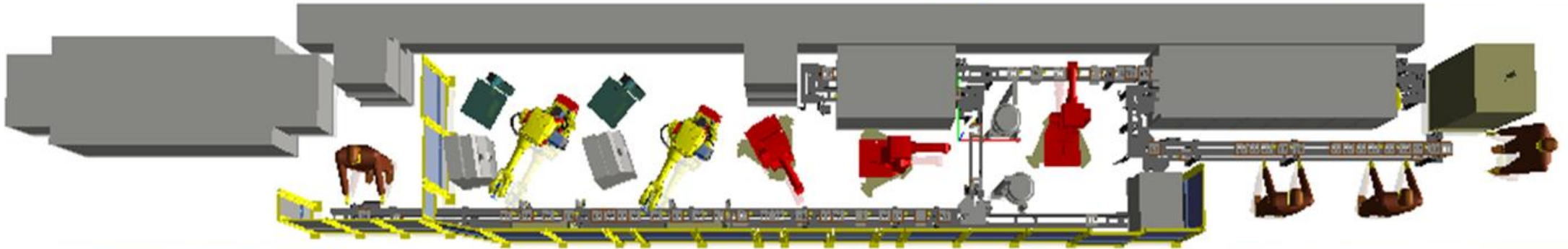




- Upper Processing Cell
- Sole Processing Cell
- Upper Processing Line

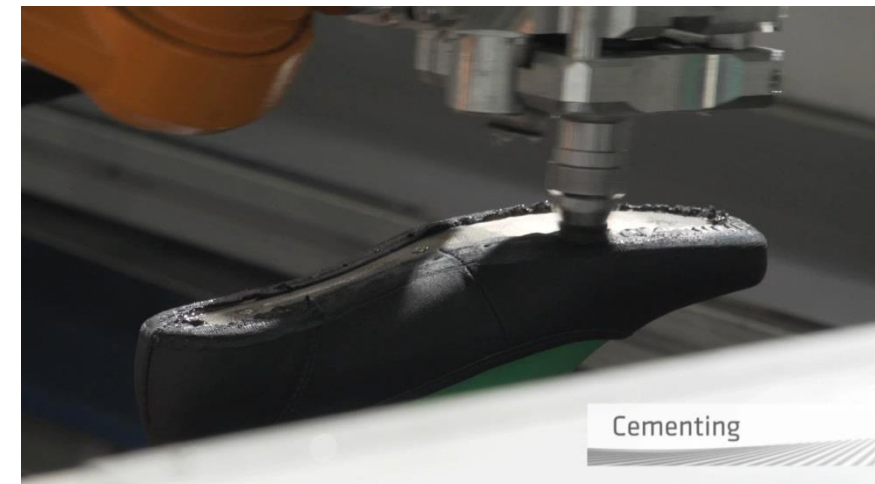
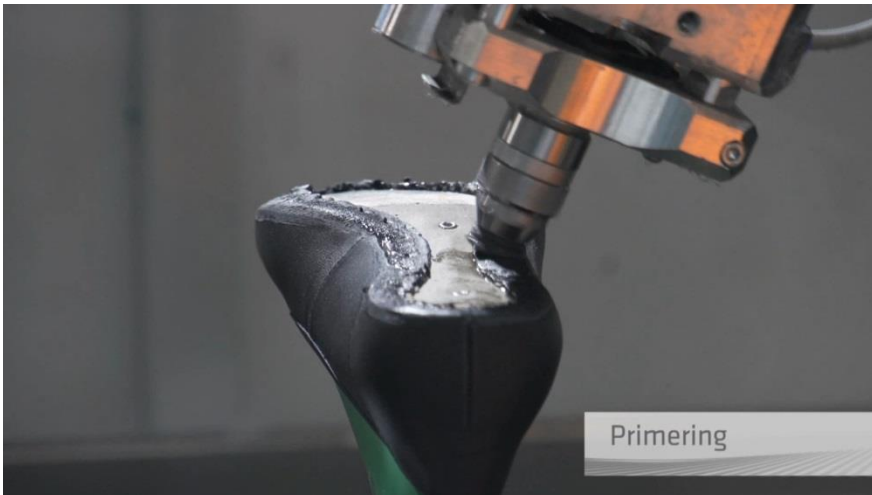
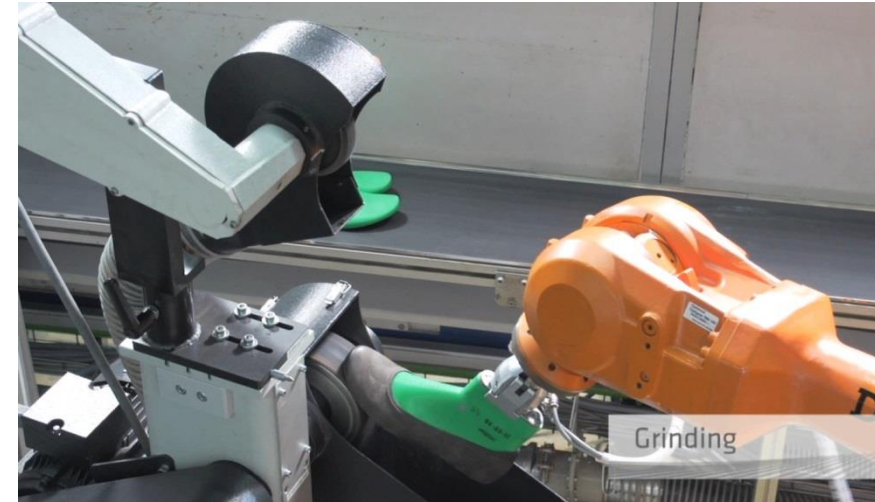
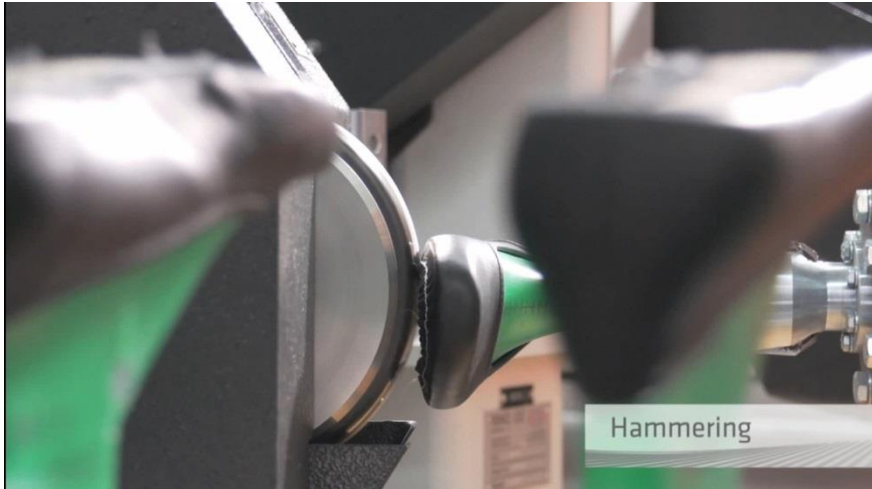


# Upper Processing Line



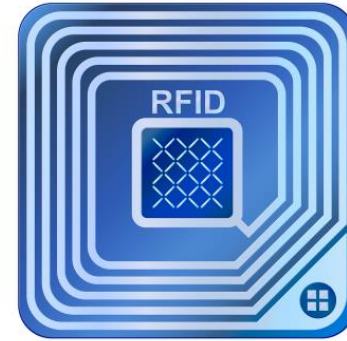


# Applications



# IT connected

- **Identification**: RFID on shoe last or last carrier
- **HMI**: Human Machine Interface (new operation surface)





# IT connected

- **Planning:** simulation of production
- **Programming:** offline programming (teaching) without interruption of production
- **Service/Support:** long distance diagnosis/teleservice



# What comes up tomorrow...

- Human & robots work side by side
  - More sensoric's
  - Integrated software
  - High speed data transmission
  - More data-space
  - Shoes with memory
- 
- => Smart factories & smart shoes!



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# Thanks for your attention!

## UITIC 2016

## Klaus Freese

## Managing Director, DESMA

