

International Technical Footwear Congress

February 03-05, 2016, Chennai, INDIA

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Shoes Produced by Smart Robots

UITIC 2016
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Agenda

- 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

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Introduction

Figure 1: The four stages of the Industrial Revolution

Source: international footwear foundation



1. industrial revolution follows introduction of water- and steam-powered mechanical manufacturing facilities

End of 18th century



2. industrial revolution follows introduction of electrically-powered mass production based on the division of labour



Start of 20th century



First programmable logic controller (PLC), Modicon 084 1969

3. industrial revolution uses electronics and IT to achieve further automation of manufacturing



4. industrial revolution based on Cyber-Physical Systemss



complexity

time >

Start of 1970s today

Source: DFKI 2011

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Why Automation?





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Why Automation?

- 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



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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

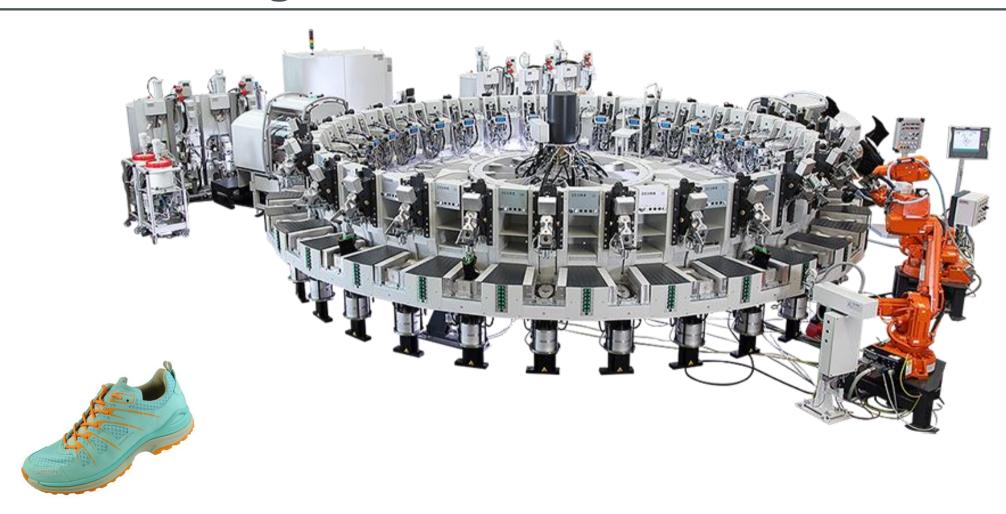




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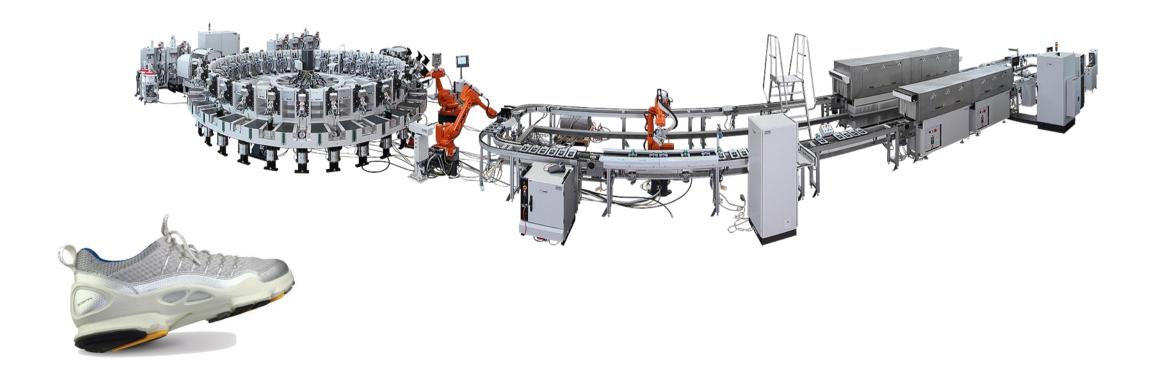
Direct Soling Machine



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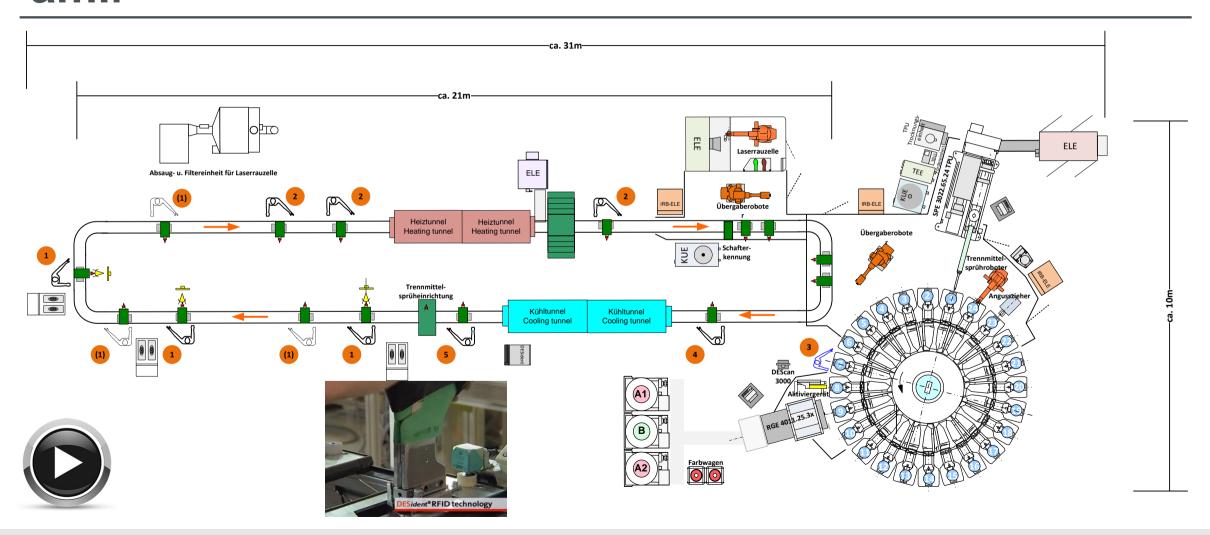
Direct Soling Machine with amir®



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amir®



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TPU Direct Soling





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Robot Applications



Release Agent Spraying



Laser Roughing



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Shoes for Direct Soling

Safety shoes





Business





Military shoes



Sports shoes





Casual



PU boots

Sandals





Children shoes





Sole and components



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DIP Guides to New Possibilities

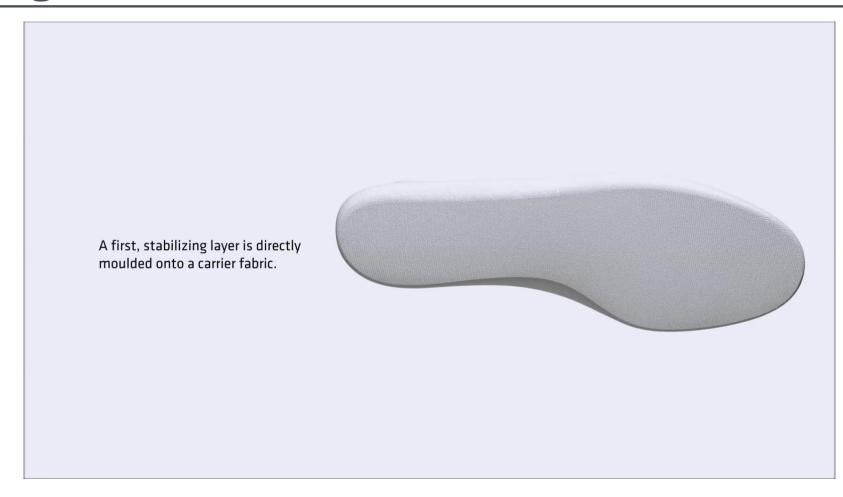
- Quality: Best sole adhesion to the upper and highest shoe quality
- Functions: Extended functions such as cushioning, flexibility, supporting
- Design: Boundless design possibilities for cup soles, blends and effects etc.



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Processing





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The future has began!



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Automation in Cementing: amir® c

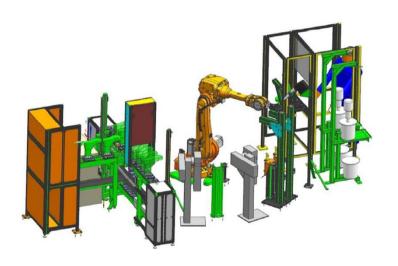


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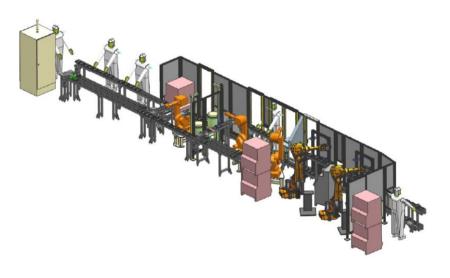
amir® c

Upper Processing Cell
 Sole Processing Cell
 Upper Processing Line









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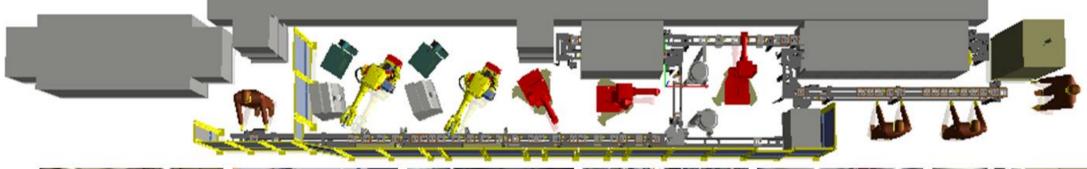
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Upper Processing Line



















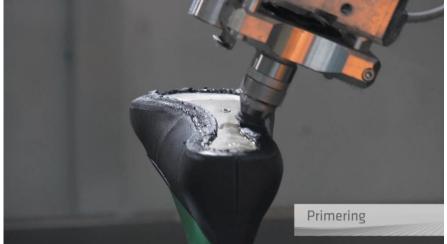


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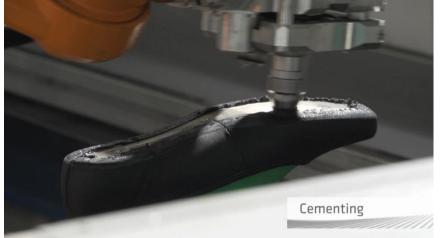
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Applications











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IT connected

 Identification: RFID on shoe last or last carrier

 HMI: Human Machine Interface (new operation surface)







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IT connected

Planning: simulation of production

Programming: offline programming (teaching) without interruption of production

 Service/Support: long distance diagnosis/teleservice







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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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19th

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Organizer



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Thanks for your attention!

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