LIT FACTORY

THE SMART RESEARCH FACTORY IN UPPER AUSTRIA

25.2.2017 - Introduction for JKU/LIT Call

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SMART PRODUCTION
Industry 4.0

Smart processing technologies are …

networked and monitored
controlled
predicted and adaptive
semi-autonomous
cognitive
self-optimized
resilient
green and economic

… and beneficially for Human, Environment and Business!
LIT FACTORY
Governing Concept

- To teach, explore and demonstrate potentials and technologies of digitization for smart cross-industry products and processes
- To reinforce existing strengths of our region
- To transfer research results into innovations
- To shorten ‘time-to-market’
- To cooperate with industry and SMEs
- To create smart benefits for human, environment and business

LIT Factory = High-tech research platform and center of excellence in product and production research

The first extension stages will be:

- **Smart research factory for the process-technological production of polymer light-weight structures by means of smart extrusion, compounding, injection molding, recycling and upcycling technologies**

- **Virtual Pilot Factory as ‘digital twin’**

Other extension stages will follow (see next slide in green color)
VISION for EXPANSION of LIT FACTORY
Product and Production Center

I4.0
Virtualization and Modeling
Process Digitization
CPPS
HMI & M2M
IIoT, Networks, Security, Safety
Human, Environment and Business

Process Manufacturing
(grey color ... examples)

Smart Polymer Processing
- Extrusion and Compounding
- Injection Molding
- Post-Industry Recycling
- Smart Products
Post-Consumer Recycling
Foaming Technology

Discrete Manufacturing
(grey color ... examples)

Chemical and Reactor Technology
Automotive Engineering
Medical Technology

Virtual Pilot Factory

first extension stages
LIT FACTORY
Production process of first extension stage “Polymer Processing”
LIT FACTORY
Smart, networked, adaptive, cognitive, self-optimizing, resilient, green processing technologies!

Virtualization and Modeling of Products and Production, Digital design
Process Digitalization, Predictive Data Analytics, Self Adaptation and Optimization
Cyber Physical Production Systems (CPPS)
Machine Learning and Data, Artificial Intelligence
Human Machine Interface (HMI) & Machine to Machine (M2M)
Industrial Internet of Things, SCM, Intel. Networks, Security and Safety
and others...

Digitization

Smart Process Production Facilities for Smart Products and Materials

Smart Material Handling → Smart Extrusion and Compounding → Smart Injection Molding → Smart Re- and Up-Cycling → Smart Product(ion) Verification & Validation → Smart Products

Smart Benefits for Human, Environment and Business (Accompanying Research)

Strategic Management, Trend Scouting
New Digital Business Models, Industrialization Concepts
Social Innovation, Acceptance and Human Benefits
IPR Management, Protection from Product Piracy
Research and Technology Assessment
Sustainable Development
Company Foundings

Digitization and others…

Smart Process Engineering & Production □ Smart Material Conversion into Smart Finished Products □ Smart Polymer Processing □ Smart Continuous & Batch Production

Smart Components □ Smart Process Machines & Technologies □ Smart Factories & Value Networks □ Smart Products □ Smart Benefits for Human, Environment & Business
LIT FACTORY
Integrated systems engineering over entire value network

- **Scientific Impact**
  - New Product Life Cycle Management Methods
  - New Computational and Experimental Modeling Concepts
  - New Concepts to increase Utility and Value of Polymeric Systems

- **Technological /Industrial Impact**
  - New Production Technologies of Multi-Layer-, Multi-Component-, Hybrid- and Lightweight Structures which will help to increase Production and Resource Efficiency as well as to exploit the unique Product Properties

- **Commercial /Societal Impact**
  - Reduction of Material, Energy and Pollution Intensity
  - Efficient Waste-2-Value Networks
  - Smart Products and new Developments e.g. for Mobility, Civil Engineering, Packaging, Lightweight Construction, Medicine
LIT FACTORY
Classification of Projects

FEI Focus
- F1) Smart Digital Components
- F2) Smart Process Machines & Technologies
- F3) Smart Process Factories & Value Networks
- F4) Smart Products
- F5) Smart Benefits for Human, Environment and Business
- F6) Others

Digitalization
- D1) Virtualization and Modeling of Products and Production, Digital design
- D2) Process Digitalization, Predictive Data Analytics, Self Adaptation and Optimization
- D3) Cyber Physical Production Systems (CPPS)
- D4) Machine Learning and Data, Artificial Intelligence
- D5) Human Machine Interface (HMI) & Machine to Machine (M2M)
- D6) Industrial Internet of Things, SCM, Intel. Networks, Security and Safety
- D7) Others

Products
- P1) Agile exoskeletons, eLegs, eArms or smart patient bed for humanitarian aims
- P2) Lightweight constructions for green-mobility
- P3) Composite technologies for building constructions and mechanical engineering
- P4) Structures for intelligent packaging
- P5) Recyclates for cross-industry products
- P6) Semi-finished products for other Pilot Factories
- P7) Others

Example
To predict wear and tear of shredder unit of recycling machinery by means of smart data mining.
- FEI Focus = F2 (Process Machines)
- Digitization = D2 (Predictive Data Analytics)
- Products = P5 (Recyclates)
THANK YOU

WE THINK PRODUCTION