

Strategic Multiannual Roadmap Factories of the Future PPP

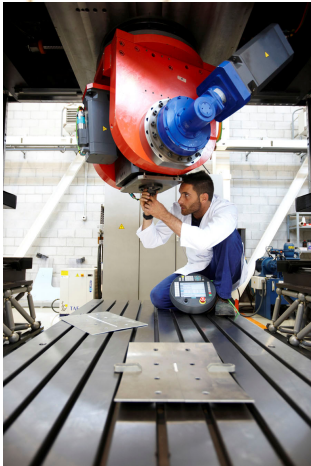


FoF InfoDay

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RTD Needs provided by



- Manufuture Sub-platforms: Agriculture Engineering and Technologies-AET, Clean Environment Technology-CET, European Concept, Foot wear, Micro Nano Manufacturing-MINAM, Rapid Manufacturing-RM, European Tooling
- Other ETPs: Advanced Engineering Materials and Technologies-EuMat, ARTEMIS, ENIAC, EPOSS, European Steel Technology Platform (ESTEP), Future Textiles and Clothing-FTC, Industrial Safety, NESSI, Photonics 21, Robotics-EUROP, Food for Life, Sustainable Chemistry, Waterborne
- Manufacturing related ETPs: Advisory Council for Aeronautics Research in Europe-ACARE, European Construction Technology Platform, European Rail Research Advisory Council (ERRAC), European Road Transport Research Advisory Council-ERTRAC, European Space Technology Platform-ESTP, Forest Based Sector Technology Platform-Forestry, Photovoltaics



RTD Needs Selection Criteria



- Innovative Enabling Technology – Must
- Factory Oriented Technology-Must
- Cross Sectorial Application Fields



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Basic content and structure of the multi-annual roadmap: 2011-2013

Main R&D Challenges:

- SD1 Sustainable Manufacturing
- SD2 ICT enabled Intelligent Manufacturing
- SD3 High performance manufacturing
- SD4 Exploiting new materials through manufacturing



SD1 Sustainable Manufacturing

a) Environmental friendliness

- (a1) High efficiency and near to zero emissions
- (a2) Alternatives to energy-intensive processes
- (a3) Improved use of renewable resources at factory level.
- (a4) Production using environment-neutral materials.

b) Economic growth

- (b1) Methodologies and tools for sustainable maintenance.
- (b2) Innovative re-use of equipment and factory design
- (b3) Decision support methodologies for the design of manufacturing systems.

c) Social well-being

- (c1) Adaptive and responsive human machine interface.
- (c2) New human-robot interactive cooperation in advanced factory environments.
- (c3) The new human-centred production site.
- (c4) Development and adaptation of organisational structures and leadership for sustainability.



SD2 ICT enabled Intelligent Manufacturing

a) Smart Factories: Agile manufacturing and customisation

- (a1) Adaptive and fault tolerant process automation and control
- (a2) Intelligent production machines and “plug-and-produce” connection of automation equipment, robots and other intelligent machines
- (a3) Large-scale testing and validation of robotics-based and other automated manufacturing and post-production automation processes
- (a4) Novel methods of interaction with, and automatic tasking of, intelligent cooperative automation and robotic control systems
- (a5) Laser applications
- (a6) New metrology tools and methods

b) Virtual Factories: Value creation, global networked manufacturing and logistics

- (b1) Increasing management efficiency of global networked manufacturing
- (b2) ICT for sustaining the value of products
- (b3) Product/service systems
- (b4) Managing volatile manufacturing assets

c) Digital factories: Manufacturing design and product life cycle management

- (c1) Knowledge and analysis
- (c2) Enhanced, interoperable models for products and processes
- (c3) Design environments
- (c4) Lifecycle management



SD3 High performance manufacturing

- a) Flexible adaptive production equipment, systems and plants for rapid (re)configurations and optimal energy use**
- (a1) New high performance manufacturing technologies in terms of efficiency (volumes, speed, process capability), robustness and accuracy.)
 - (a2) Plug and play components based on intelligent materials or combinations of passive and active materials (engineered materials)
 - (a3) New hybrid production systems for manufacturing and assembly/disassembly, based on robotics and/or automation technology
 - (a4) Adaptive machines and prod. systems for optimal energy consumption
- b) High precision micro-manufacturing machines and systems**
- (b1) Rapid Micro-Manufacturing technologies
 - (b2) 3D Micro-parts Production
 - (b3) Micro-factory and Micro-Manufacturing Systems
- c) Tools for production planning and in-situ simulation for open reconfigurable and adaptive manufacturing systems**
- (c1) Methodologies and tools for reconfigurable manufacturing systems design
 - (c2) Knowledge based tools for process planning
 - (c3) Integrated shop-floor simulation
 - (c4) Advanced interactive graphical user interface
- d) Zero defect manufacturing**
- (d1) Quality monitoring and proactive process improvement
 - (d2) Intelligent Measuring Systems for Zero-Defect Manufacturing
 - (d3) Advanced decision-making tools for zero defect manufacturing
 - (d4) Development of a new generation of knowledge-based self-learning systems



SD4 Exploiting new materials through manufacturing

- a) Net-shape manufacturing for advanced structural and functional materials**
- (a1) Complete manufacturing chains for nanophased components
 - (a2) Manufacturing of engineered metalics and composite materials
 - (a3) Up-scaled systems for high performance manufacturing of textile-based structures
- b) New material functionalities through manufacturing processes**
- (b1) Roll-to-roll manufacturing of large area and high throughput flexible plastics electronics
 - (b2) Manufacturing processes for new flexible components
- c) Manufacturing strategies for renovation and repair**
- d) Product design using sustainable material processing technologies**
- (d1) Modelling and simulation of manufacturing processes
 - (d2) Manufacturing processes using advanced materials for energy generation and supply
 - (d3) Manufacturing of highly miniaturised components
 - (d4) New technologies for casting, material removing and forming processes





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Factories of the Future AIAG members:
INESC, PATRAS UNIV., AGORIA, TWI, FESTO, TNO,
DAIMLER, VDMA, SAP, COMAU, TRUMPF, RUROBOTS,
CRF, CETIM, FATRONIK-TECNALIA

Involved European Commission members:
DG Research, DG Information Society

