

project partners



Fraunhofer Institute for Factory Operation and Automation IFF, Magdeburg (Germany)

KUKA

KUKA Laboratories GmbH, Augsburg (Germany)



Airbus DS, Madrid (Spain)

IDPSA
Engineering & Robotics

IDPSA, Madrid (Spain)



PROFACTOR GmbH, Steyr-Gleink (Austria)

PRODINTEC
FACTORY OF FUTURE

PRODINTEC, Gijon (Spain)



FACC AG, Ried im Innkreis (Austria)

VALERI

Start: November 2012
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Coordinator: Fraunhofer IFF

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**validation of advanced,
collaborative robotics for
industrial applications**

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mobile manipulators for aerospace production

The factory of the future is now coming to the aerospace industry.



Industrial challenges in aerospace production include:

- Working with large, individual parts
- Price pressure through increased competition
- Varied customers with small batch sizes
- High quality of products and services required (average product lifetime: 20 years)

Currently, production of large parts is stationary, whereby the assembly takes days to complete.

The VALERI project proposes the development and validation of a mobile manipulator for assisting human workers in aerospace production tasks.



more flexibility

The project aims to carry out **three exemplary tasks**:

- **applying sealant** along grooves
- **inspection** of sealant for quality control
- **inspection** of braided carbon fiber parts

Our approach

- Enlargement of the workspace for the mobile manipulator
- Control of the complete kinematic chain of robot arm, platform, and additional drive (workspace enlargement) for true mobile manipulation
- Integration of multiple levels of novel safety technology for meaningful and safe human-robot collaboration
- Incorporation of flexible vision systems into the mobile robot system for the tasks of navigation, part recognition, and visual part inspection
- Simplification of programming on the shop floor and haptic interaction



Exemplary sealant application on long part (over 3 m in length)

complex challenges clear goals



Within VALERI, the project partners are developing an adaptive and flexible aid in the production of craft and small batch parts.

The project goals include:

- Demonstration of the flexibility of mobile manipulators that can be used on multiple production lines
- Implementation of safe human-machine-collaboration on the shop floor that allows robots to freely move around and work on different parts without separating fences
- Demonstration of technology for autonomous path-planning in complex inspection tasks
- Demonstration of using photometrical inspection systems with a mobile manipulator as proof-of-concept and for eventual use with other sensing technologies

Ultimately the results of VALERI will be applicable not only in the aerospace industry but to other manufacturing sectors as well.