SMF FLYG / SME Aeronautics

The goal is to help SME:s to be approved subcontractors to the aerospace industry.

Activities:

- R&D projects (Level 1: 125 KSEK, Level 2: 325 KSEK)
- Seminars
- Student thesis
- Gap-analysis AS9100

Ongoing activities within the PTC arena in Trollhättan (Focus on Metal)

ITE Fabriks:
Hot sheet metal forming of Inner Duct

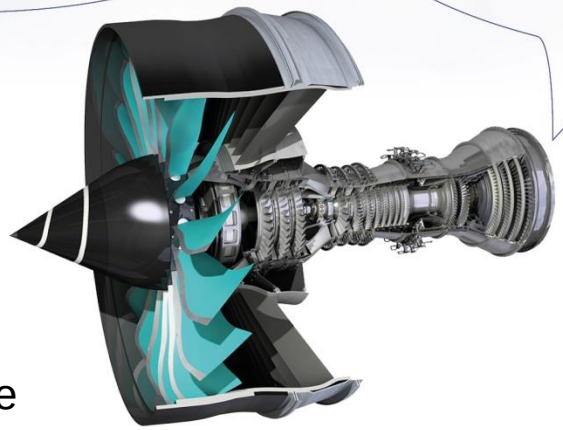
Tre D Mekaniska, Speedtool, Sand och Vattenbläst i Tyringe, Exova:
Cutting, blasting and etching of Inner Duct

Tooltec:
Residual deformations after machining

Hydroforming design Light: Hydroforming of Vane

Brogren Industries: Simulation of sheet metal forming + laserwelding

AH-Automation: Exchange of cutting tools with support of collaborative robots



Rolls-Roys Ultrafan™

Planned activites:

Jobro, Brogrens, HDL: Simulation of forming + laserwelding

AH-Automation, Trestad Laser, Brogrens, Tooltec: Automation of deburring, grinding and welding etc.

Bror Tonsjö: Automatic balancing of propellers and fans

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innovair

swerea
swedish research

Aeronautics SME Cluster – Focus Metal

brogren industries
Certified acc to AS9100

Tooltec
Certified acc to AS9100

swerea IVF

AH AUTOMATION

INNOVATUM TEKNIKPARK

GKN AEROSPACE

TONSJÖ
BROR TONSJÖ AB • MEKANISK VERKSTAD

TRESTAD LASER AB

SVB

SPEEDTOOL AB

HYDROFORMING DESIGN LIGHT

ITE
ITE Fabriks AB

JOBRO

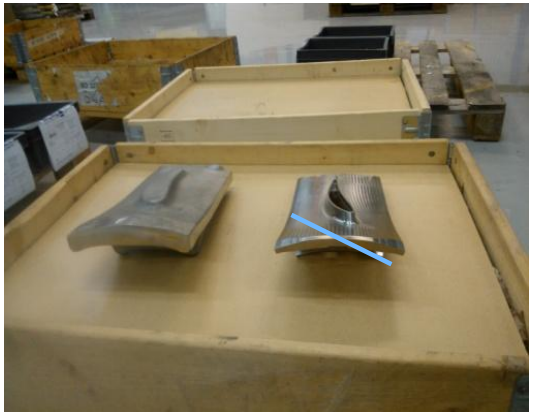
VINNOVA

nffp

innovair

swerea swedish research

Tooltec Level 2 - Residual deformations after machining



- **Aim** Predict residual deformations after machining of a forged component in nickel based alloy
- **Activities** Residual stress measurements using XRD, Geometry measurements using GOM and CMM, FE-simulations
- **Results** Methods for reducing geometric distortions
- **Proceeding activities**

  - Regional project funded by Västra Götaland

  - Project in cooperation with Swedish Automotive industry

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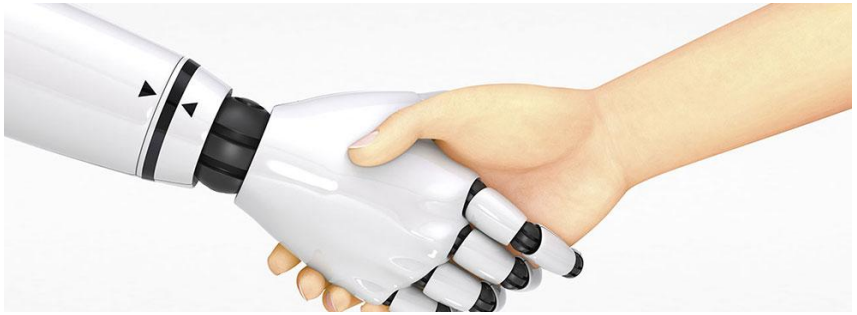
AH-Automation Level 1 - Exchange of cutting tools with Collaborative Robots



- **Aim** Analyse possibilities with Collaborative robots
- **Activities**
  - Student project at Högskolan Väst
  - Seminar at Innovatum in Trollhättan
- **Results** Need to combine collaborative robots with complementary automation solutions for the selected case
- **Proceeding activities**
  - Establish Automation with AH-Automation, Trestad laser, Tooltec and Brogren Industries

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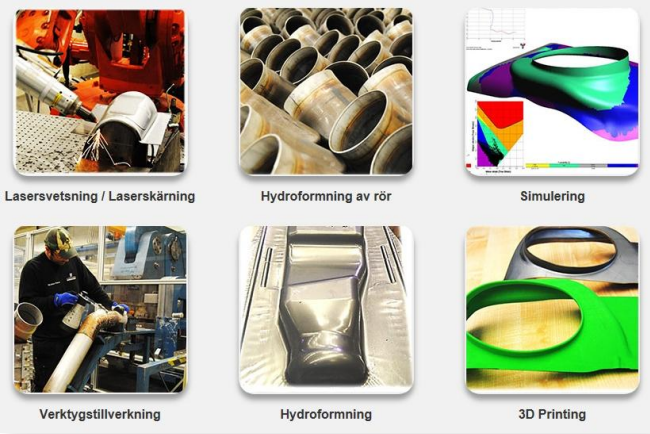
HDL Level 2 - Hydroforming of Vane



- **Aim** Explore possibilities to form a component with small internal radius without folds, cracks and thinning in an inconel based alloy
- **Activities**
  - Material characterisation, simulation, manufacturing, validation
- **Results**
  - Simulation introduced as support in component design and process planning
- **Proceeding activities**
  - Establish new project with HDL, Jobro, Borgren Industries and GKN

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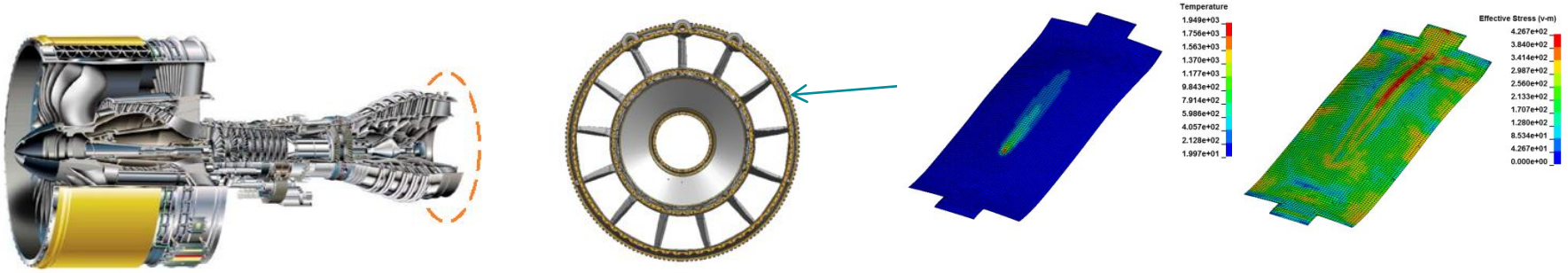
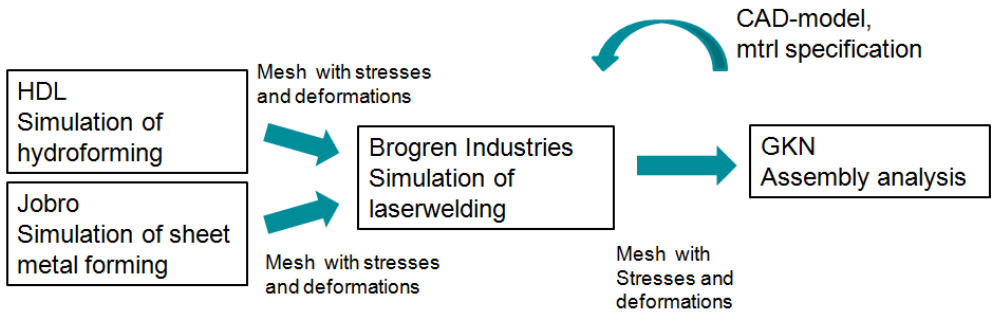
Brogrens Level 1 - Simulation of sheet metal forming + laserwelding



- **Aim** Introduce process simulation as SME collaboration tool
- **Activities**
  - Practical tests with simulation of forming + laserwelding using LS-Dyna and Autoform
- **Results** Methodology introduced at Brogren Industries
- **Proceeding activities**
  - Establish process simulation cluster



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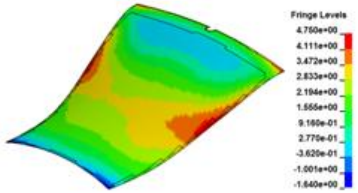
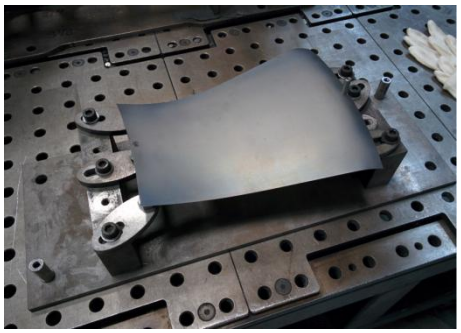
ITE Fabriks Level 2 - Hot sheet metal forming of Inner Duct





- **Aim** Production of hot formed components in titanium, study of repeatability, develop documentation for quality assurance.
- **Activities** Modification of hot forming tools, hot forming tests with method developed by support from simulation in NFFP6 project. Measuring of geometry results, development of documents for quality assurance.
- **Results** Details manufactured within required shape tolerances for serial production, documentation sent to GKN
- **Proceeding activities**

  - Discussions with GKN concerning new forming and welding project

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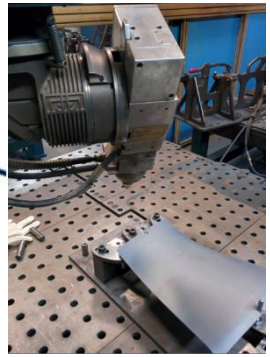
SpeedTool Level 2 - Production of pre-series of titanium details



- **Aim** Create a cluster of SME:s that can perform succeeding manufacturing processes after hotforming of titanium detail. Develop documentation for quality assurance (FAIR).
- **Activities** Performance of milling, wetblasting, etching (Exova), id-marknng of hotformed titanium details. Forming tool from ITE Fabriks in previous SME Aeronautics project. Development of quality assurance documents for each individual detail.
- **Result** Details manufacured within required geometric tolerances for serial production. Documentation sent to GKN.
- **Proceeding activities** Meeting with Procurement/Quality departments at GKN together with participating SME:s.

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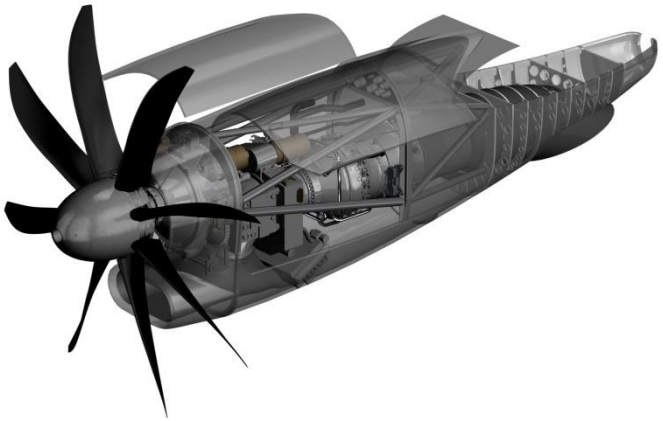
Bror Tonsjö Level 1 – Automatic balancing of propellers and fans

- **Aim** - Automatic balancing of aircraft propellers and fans
- **Activities**

  - Development of demonstration test rigg with engine like rotordynamic properties
  - Manufacturing of prototype balance ring
  - Evaluation of perfomance
- **Results**

  - Demonstrator that proves the balancing concept under realistic conditions
- **Proceeding activities**

  - Contact with propeller manufacturers
  - Further development of balance rings with rotationel speed triggered locking mechanism



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