

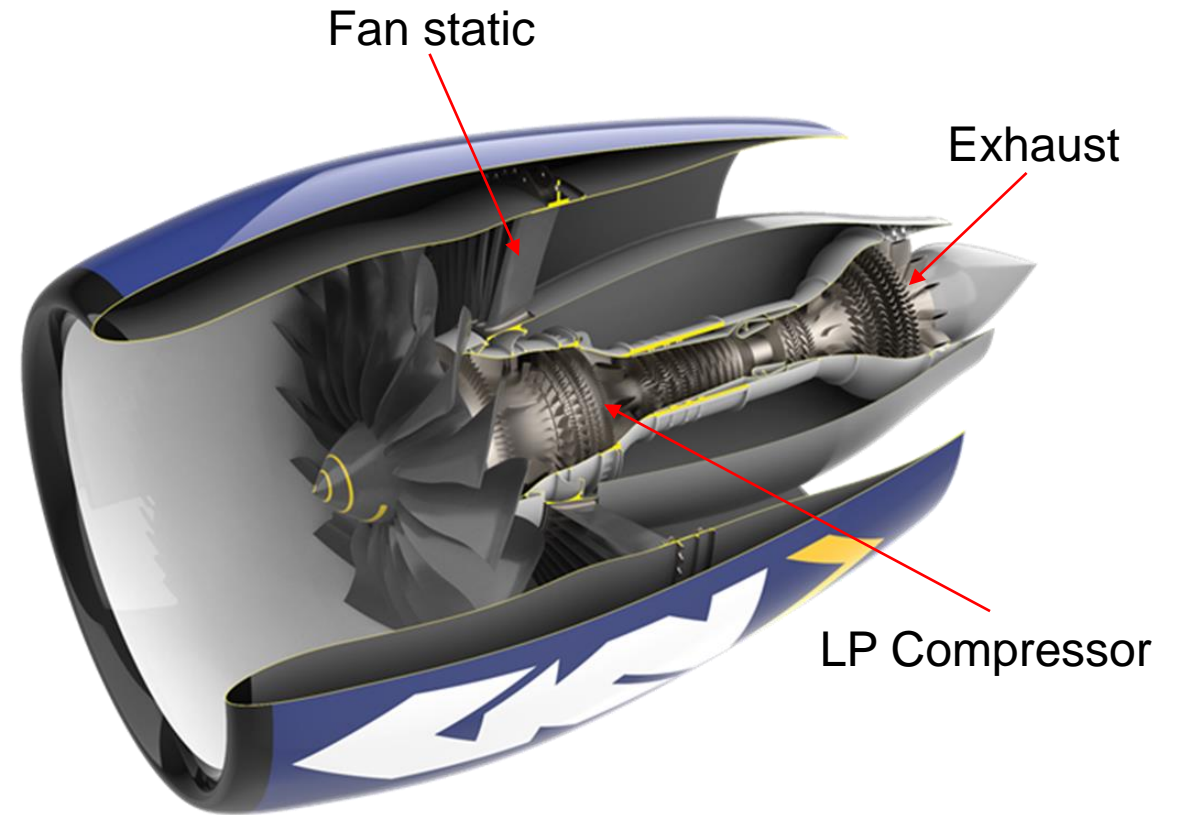
# SWE DEMO and SMEs

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# Demonstrators

- > Fan static module
- > Compressor module
- > Exhaust module
- > Turbine structure
- > Rotating frame modules



# SWE DEMO

## Industry

- > GKN Aerospace Engines Systems, Trollhättan

## Research centres

- > Högskolan Väst
- > Innovatum
- > Rise IVF
- > Rise SICOMP
- > Chalmers
- > KTH

## SME-partners

- > Brogren Industries
- > Tooltec
- > Permanova
- > Midroc Automation

## SME suppliers (manufacturing)

- > MVG Kristinehamn
- > RLM Mekaniska
- > Råbe Tooling
- > Bröderna Carlsson
- > A-Teknik
- > VBRC
- > HB Mekaniska
- > HDL (hydroforming)
- > Finepart (water jet cutting)
- > TPC (casting)
- > AIM (3D-printing)

## SME- suppliers (other)

- > Tuvanium (laserteknologi)
- > Inpernova (laserteknologi)
- > Dalco (laserteknologi)
- > Elitkomposit
- > AH Automation
- > Arcam (EBM-utrustning)

Over 20 SMEs involved

# Fan static module

- > Composite automation
- > AM outer ring
- > Industry 4.0
- > Joining/assembly
- > Future Factory (VGR)
- > SME involvement:
  - AIM
  - Arcam
  - Elitkomposit
  - Devex
  - Oxeon



# Fan static module – additive manufacturing

## Some results

- > Fan case ring – with AM stiffeners
- > Compressor split case – 100% AM
- > Laser/wire AM
- > SME involvement
  - Permanova
  - Tuvanium
  - Inpernova
  - Dalco



100% AM



Fan case ring @  
Farnborough Air Show 2018

# Compressor structure

- > Smart fabrication
- > European Ti casting supplier
  - Tooltec
  - Bröderna Carlsson



Cast titanium sector

# Flexible Automation at PTC

## “Plug and play” line

- > Reconfiguration:
  - State-of-art: months
  - Target: 30 min
  - Achieved: 4 min
- > Miljö-FIA (VGR)
- > SME involvement
  - Midroc Automation
  - AH Automation



## Concluding remarks

- > Over 20 SMEs involved
- > High TRL is interesting for SMEs
- > Demo is a step towards series deliveries of flight qualified h/w
- > International dimension

