



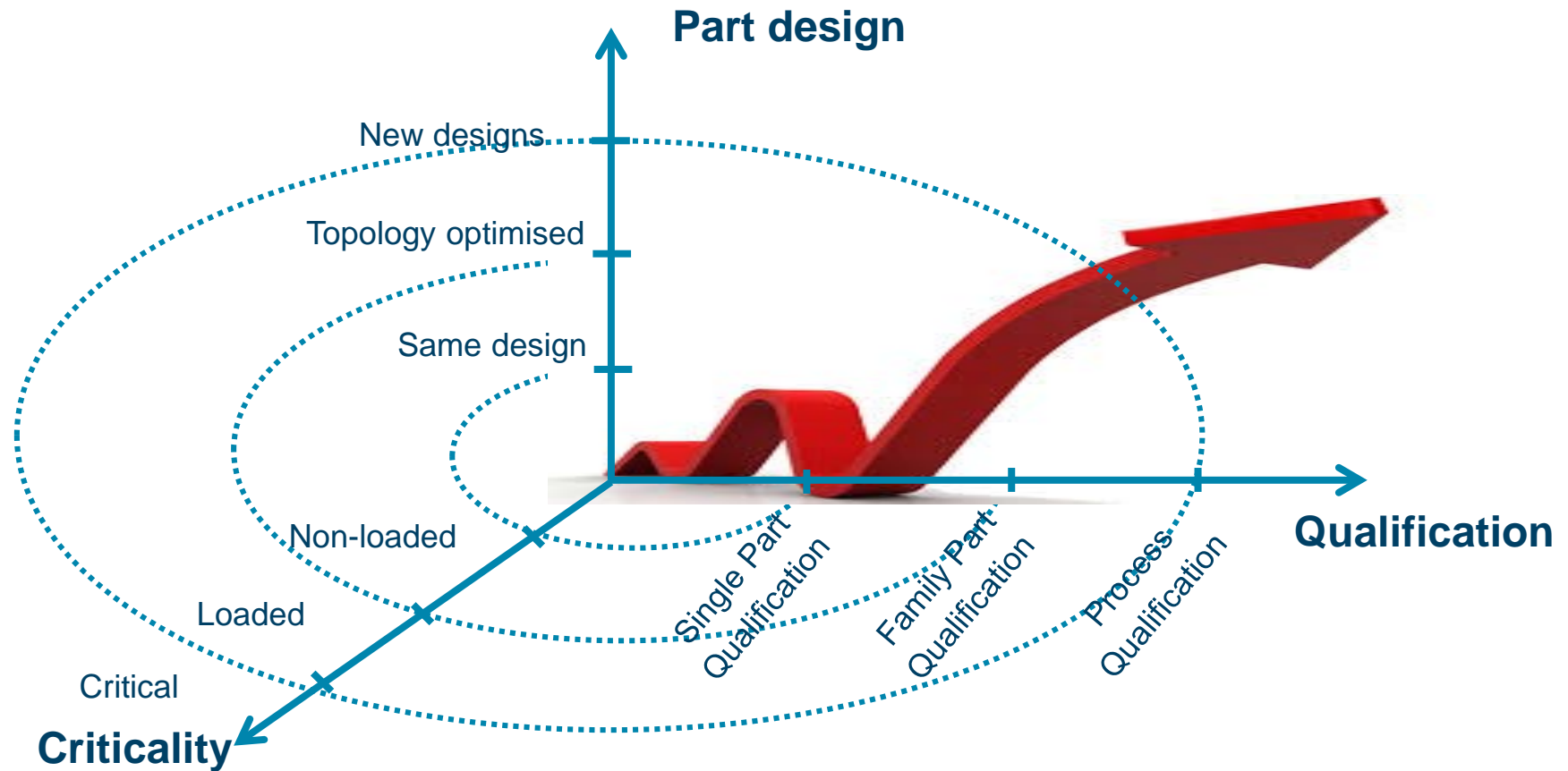
Structures qualification and certification approach supporting AM introduction for system parts

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November 2019

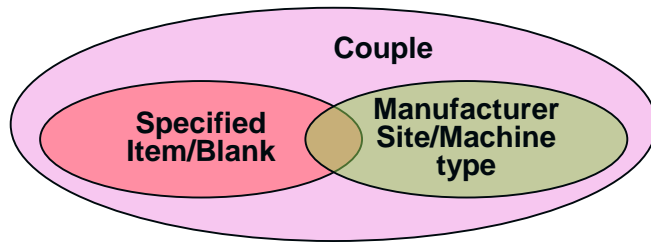
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AM for Structures - Step by Step Introduction

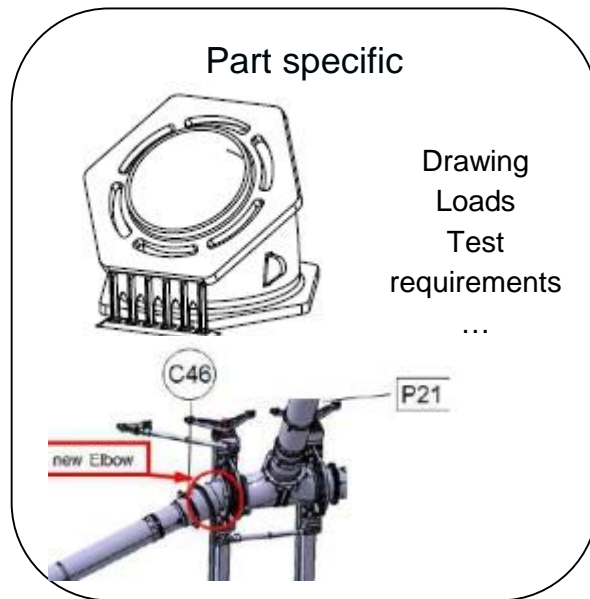


Structures approach for qualification – Part or Process qualification

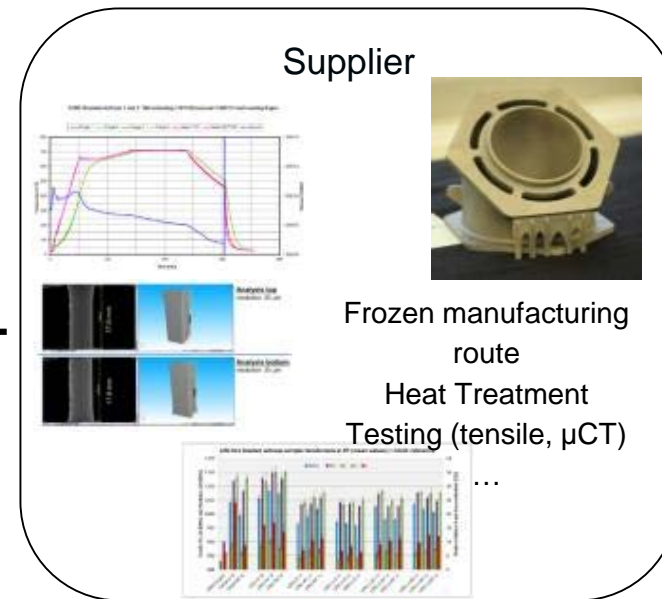
PART Qualification in accordance with AIRBUS Standards – link with system parts



Each Specified Item or blank from each manufacturer site/machine type is technically qualified.



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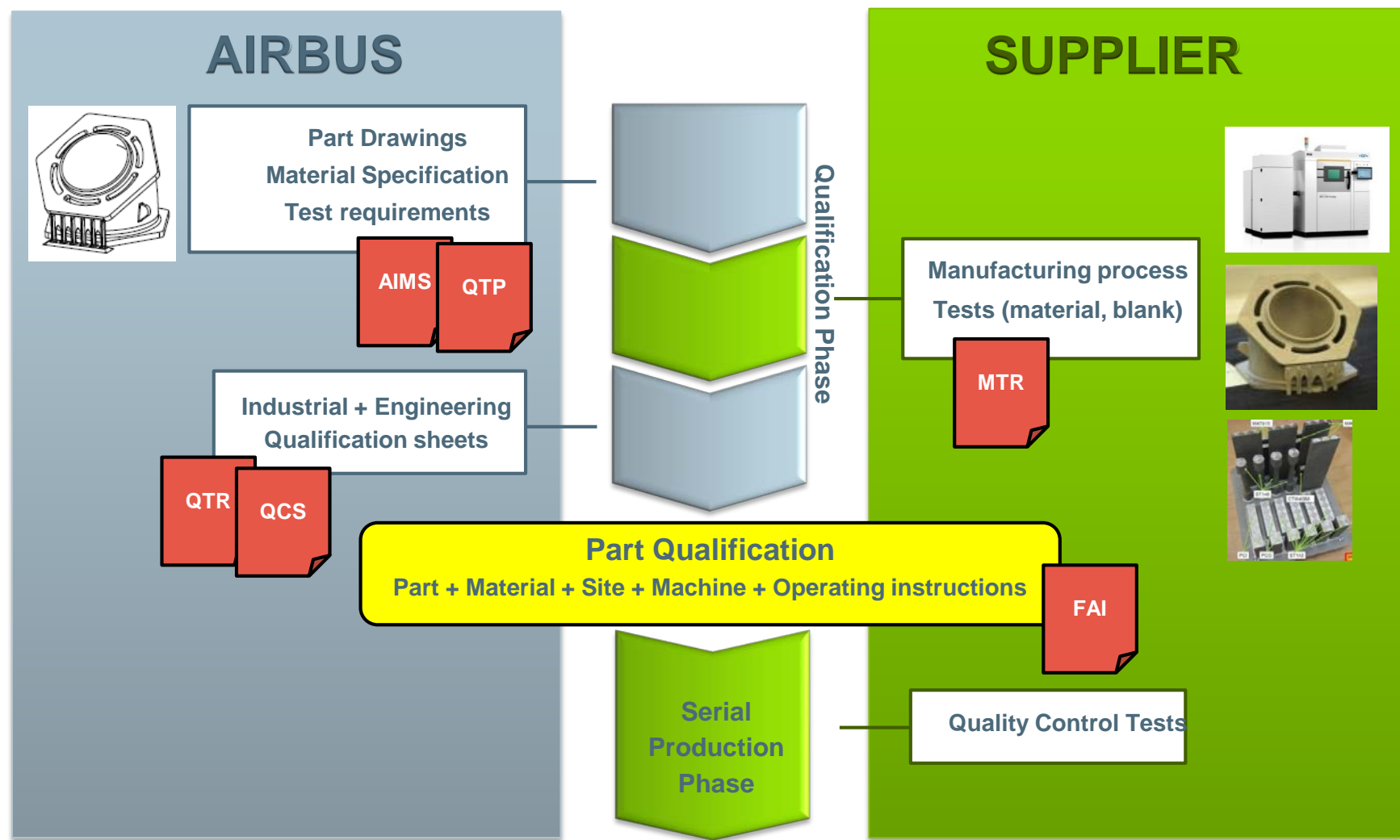


- for 1 part
- in 1 plant,
- with 1 Machine Serial Number,
- with 1 powder source,
- with a frozen Manufacturing process.



1 Qualified Part

Single Part Qualification



Structures Certification

- Current applicable CS25 requirements remain applicable for AM
- Applicable regulations from EASA CM-S-008:

Design & Construction

CS25.603 – Materials
CS25.605 – Fabrication Methods
CS25.613 – Material Strength Properties
& Material Design Values

+ Domain specific



Design & Construction

CS25.619 – Special Factors

-> Not applicable

- Airbus procedural documentation developed and applied to ensure qualification of material, process and machines.

Qualifications of Materials, Parts,
Processes

AIRBUS Material
Specification

AIRBUS Process
Specification

AIRBUS Process
Instructions

- Domain specific requirements and MoC defined

*MoC = Means of Compliance

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Systems approach for qualification and certification

- Airbus developed approach for AM Systems Equipment designed and manufactured by suppliers and certified through Airbus.
- Basis and starting point was the EASA agreed approach for structure parts.

Principles of Supplier-led System and equipment development:

- Contractual requirements cover functionality to be demonstrated + performances to be met
- Required performance is provided to part Supplier and is demonstrated by the Supplier
- Airbus does not impose solutions nor material & process specifications on Suppliers
- Each Supplier adopts their own appropriate solutions to meet the contractual requirements.
- The means must be agreed with Airbus.

Key difference is M&P part: structure = prescriptive and Airbus specs, system = performance based with supplier solutions

Systems approach for qualification and certification

AM parts in Systems Applications:

- Supplier defines the appropriate materials and processes to be applied
- No recognised international standards to apply in assessing the performance of the AM part.
- Airbus have therefore defined their own set of requirements based on:
 - Experienced/ lessons learned gained through application of AM technology on Structural parts,
 - Experience of Suppliers, and
 - Guidance published by the FAA and EASA.
- Airbus validates that the Supplier has met the requirements of technical spec

This requires combination of skills to assess supplier in x-functional team:

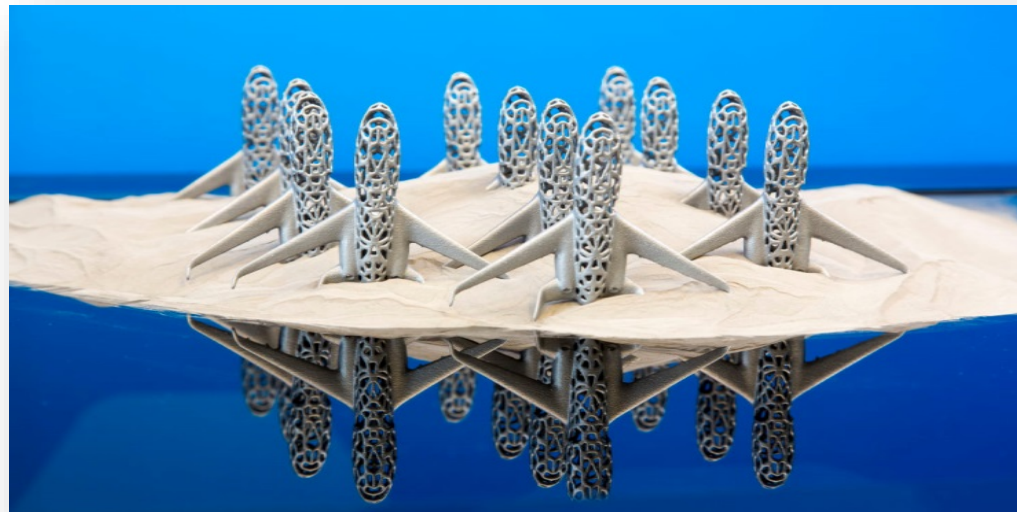
- ✓ Transverse Material & Process AM expertise
- ✓ System specifics AM expertise



Conclusions

AM Systems parts will be assessed as usual against 25.1301 and 25.1309 being the 'core' certification requirements

- Compliance will be addressed through the DDP (Declaration of Design and Performance)
- AM Materials & Processes are assessed as part of the functionality and performance assessment demonstrated by the Supplier
- Airbus is performing audits of its suppliers to ensure appropriate introduction of AM material and processes using Structures experience gained
- X-functional teams are set up to support AM Introduction for system parts.



Thank you!