

APPLUS+ BKWerkstofftechnik GMBH

ZUR AUMUNDSWIESE 2
28279 BREMEN
Germany

FOR THE ATTENTION OF

Michele COLLEVECCHIO Project Engineer
Sven HAGEMANN Quality Manager
Sascha MÜLLER Technical Manager
Jan SEIDEL Managing director

CERTIFICATE PREPARED BY
NUNEZ Cesar

YOUR QTML FOCAL POINT
NUNEZ Cesar

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DATE
21/02/2020

OUR REFERENCE
SUR2020.0014 Ind. B

ARP-ID of the External Shop
143041

TYPE of External Shop
Independent

Attestation letter for Qualification on Test Methods

Dear Madam, Dear Sir,

We herewith inform that the couples <Test Methods / External Shop> as detailed in the Appendix have been either registered or modified in the Official Airbus Qualified Test Methods List (QTML).

The latest valid status of all qualified <Test Methods / External Shop> couples is published by regular QTML reports:

- On Airbus homepage for Suppliers (<https://www.airbus.com/be-an-airbus-supplier.html>) - Only Independent Labs.
- On Airbus Supply Portal A2QS - All External Shops.

A qualified couple is not linked to a specific product. It is the proof that the External Shop is meeting the requirement of the M20691.2: Perform Couple <Product/Supplier Site> Compliance and Maturity's Activities for Material Products Suppliers and/or M20691.3: Perform Couple <Product/Supplier Site> Compliance and Maturity's Activities for Aerostructure Parts Suppliers.

- On a quality aspect: we kindly ask you to indicate us any modification which could have a quality impact.
- Concerning technical requirements:
 - * We kindly ask you to participate at least every 2 years to the PTP for the tests you perform on Airbus Products (see Appendix for details on next PTP participation requirements).
You can find all necessary information about PTP participation process on the website: <https://ptpscheme.com>.
In case of PTP results out of tolerances, the couples qualification can be downgraded to an authorisation to proceed or withdrawn and the PTP participation frequency is reduced to one year, subject to acceptance by Airbus of your Root Cause Analysis and associated Corrective Actions.
 - * On the other hand, you shall supply at least every 2 years the results of your Internal Homogeneity Studies per Test Families.

Airbus reserves the right to withdraw or suspend the qualification at any time for specific reason, e.g.

- Any major incident(s) detected on one or several Test processes
- Lack in quality
- Evidence non-compliance with the M20691.2 and/or M20691.3
- Loss of Airbus Supplier Approval
- Stop of the Business

Yours faithfully,

NUNEZ Cesar
Airbus Test Methods Auditor POMDS – CE
Your QTML Focal Point



SAUX Alexandra
Test Methods Coordinator POMDS– CE
Your Quality Responsible



Appendix: Matrix of qualified Couples <Test Methods / External Shop>

APPENDIX: Matrix of qualified Couples <Test Methods / External Shop>

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Test Standard(s) *	Test label	Complex.	Qualif. Status	Next PTP part. **	QCS Ref.	Remark
AITM 1-0001	Fiber reinforced plastics - Determination of mechanical degradation due to chemical paint strippers	Low	Qualified			
AITM 1-0002 (ISO 14129)	Fibre reinforced plastics - Determination of in-plane shear properties ($\pm 45^\circ$ tensile test)	Low	Qualified	2021		
AITM 1-0003	Determination of the glass transition temperatures (DMA)	High	Qualified	2020	170021	
AITM 1-0005	Fibre reinforced plastics - Determination of interlaminar fracture toughness energy - Mode I - G1c	High	Qualified	2021	090554	Also according to ASTM D5528
AITM 1-0006	Fibre reinforced plastics - Determination of interlaminar fracture toughness energy - Mode II - GIIC	High	Qualified	TBD *	090555	
AITM 1-0007-A / B / C / D	Fibre reinforced plastics - Determination of plain, open hole and filled hole tensile strength	Low	Qualified	2021		
AITM 1-0008-A1	Fiber reinforced plastics - Determination of plain compression strength (Thick specimens, <200kN)	High	Qualified	2020	110519-V02	
AITM 1-0008-A2	Fiber reinforced plastics - Determination of plain compression strength (Thin specimens, <100 kN)	High	Authorised to Proceed April 2021	2021	110519-V02	Limited up to 250 kN
AITM 1-0008-B / C / D	Fiber reinforced plastics - Determination of open hole or filled hole compression strength	Low	Qualified	2020		
AITM 1-0009-1 / 2	Fibre reinforced plastics - Determination of bearing strength by either pin or bolt bearing configuration	High	Qualified	2020	090547	
AITM 1-0010	Fibre reinforced plastics - Determination of compression strength after impact	High	Authorised to Proceed September 2020	2020	131072	
AITM 1-0018	Fibre reinforced plastics - Sandwich flexural test - Four-point bending	Low	Qualified			
AITM 1-0019	Determination of tensile lap shear strength of composite joints	Low	Qualified	2021		
AITM 1-0029	Fibre reinforced plastics - Determination of tensile strength of a tapered or stepped joint	Low	Qualified			
AITM 1-0053	Carbon fibre reinforced plastics - Determination of fracture toughness energy of bonded joints - Mode I - G1c	High	Qualified	2021	090554	Including Load Introduction using Blocks

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AITM 1-0065	Fiber reinforced plastics - Determination of joint strength of mechanically fastened joints	High	Qualified with limitations	2021	180540	-QCS generated on: 26/11/2018 -No specimen type restriction, both types I, II and III are covered. -Only pre-assembled specimens are covered. -Full test temperature range is covered, typically -60°C to 180°C. -Qualified on 26/11/2018
AITM 1-0066	Fibre reinforced plastics – Determination of pull-out / pull-through strength on riveted joints	Low	Qualified			
AITM 1-0067	Determination of tension through the hole strength on fastened joints	Low	Qualified			
AITM 1-0069	Fibre reinforced plastics - Determination of curved-beam failure load	High	Qualified	2020	150836	
AITM 3-0002	Analysis of non metallic material (uncured) by differential scanning calorimetry (DSC)	High	Qualified	2020	170022	
AITM 3-0008	Determination of the extent of cure by differential scanning calorimetry (DSC)	High	Qualified	2020	170023	
AITM 3-0027	Determination of the melting behaviour and the extent of cristallinity of semi-cristalline materials by differential scanning calorimetry (DSC)	High	Authorised to Proceed December 2020			
AITM 4-0002	Microstructural characterization of welded aluminium structures	Low	Qualified			
AITM 4-0003	Test method for determining the pore content of fibre reinforced plastics using automatic image analysis	High	Qualified	2021	090257	
AITM 4-0005	Macroscopic and microscopic examination of fiber reinforced plastics	Low	Qualified			
ASTM E112	Determining average grain size	Low	Qualified	2020		
ASTM E238	Pin-type bearing test of metallic materials	High	Qualified	2021	090556	
ASTM E3	Standard guide for preparation of metallographic specimens	Low	Qualified			Also according to AIP104-00-005
ASTM E340	Macroetching metals and alloys	Low	Qualified			
ASTM E384	Microindentation hardness of materials	Low	Qualified	2021		

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ASTM E407	Microetching metals and alloys	Low	Qualified			Also according to AIP104-00-005
ASTM E9	Compression testing of metallic materials at room temperature	Low	Qualified	2020		QSC 090556
ASTM G110	Evaluating intergranular corrosion resistance of heat treatable aluminium alloys by immersion in sodium chloride + hydrogen peroxide solution	Low	Qualified			
ASTM G34	Exfoliation corrosion susceptibility in 2XXX and 7XXX series aluminum alloys (EXCO Test)	Low	Qualified			
EN 2002-1 (ASTM B557)	Tensile testing at ambient temperature	Low	Qualified	2021		
EN 2003-9	Titanium and titanium alloys - Part 9: Determination of surface contamination (method A: Micrographic examination / Method B: Hardness testing)	Low	Qualified	2021		Also according to AIP104-00-005
EN 2243-1	Structural adhesives - Part 1: Single lap shear	Low	Qualified	2021		
EN 2243-2	Structural adhesives - Part 2: Peel metal-metal	Low	Authorised to Proceed March 2020	2020		Also according to QVA-Z10-46-03
EN 2377 (ISO 14130)	Glass fibre reinforced plastics - Determination of apparent interlaminar shear strength	Low	Qualified			
EN 2378	Fibre reinforced plastics - Determination of water absorption by immersion	Low	Qualified			
EN 2561	Carbon Fibre reinforced plastics - Unidirectional laminates - Tensile test parallel to the fibre direction	Low	Qualified	2021		
EN 2562	Carbon fibre reinforced plastics - Unidirectional laminates - Flexural test parallel to the fibre direction	Low	Qualified	2020		
EN 2563	Carbon fibre reinforced plastics - Unidirectional laminates - determination of apparent interlaminar shear strength	Low	Qualified	2021		
EN 2564	Carbon fibre laminates - Determination of the fibre, resin and void contents	Low	Qualified	2021		Also according to QVA-Z10-46-12
EN 2597	Carbon Fibre reinforced plastics - Unidirectional laminates - Tensile test perpendicular to the fibre direction	Low	Qualified			

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EN 2746	Glass fibre reinforced plastics - Flexural test - Three point bend method	Low	Qualified	2020		
EN 2747	Glass fibre reinforced plastics - Tensile test	Low	Qualified			
EN 2823 (prEN)	Fibre reinforced plastics - Determination of the effect of exposure to humid atmosphere on physical and mechanical characteristics	Low	Qualified			
EN 2850-A (Pren) (ISO 14126-1)	Carbon fibre thermosetting resin unidirectional laminates - Compression test parallel to fibre direction - Method A	High	Qualified	2021	126629	
EN 2850-B (Pren) (ISO 14126-2)	Carbon fibre thermosetting resin unidirectional laminates - Compression test parallel to fibre direction - Method B	Low	Qualified	2020		
EN 6018	Determination of density according to displacement method	Low	Qualified			
EN 6072	Constant amplitude fatigue testing (HCF)	High	Qualified	2021	090560	
ISO 148-1 (low temp.)	Charpy pendulum impact test (low temperature)	Low	Qualified	2020		
ISO 148-1 (room temp.)	Charpy pendulum impact test (ambient temperature)	Low	Qualified	2021		
ISO 178	Plastics – Determination of flexural properties	Low	Qualified			
ISO 4578	Adhesives - Determination of peel resistance of high-strength adhesive bonds - Floating roller method	Low	Qualified			
ISO 4587	Adhesive - Determination of tensile lap-shear strength of rigid-to-rigid bonded assemblies	Low	Qualified			
ISO 527-4	Plastics - Determination of tensile properties - Part 4: Test conditions for isotropic and orthotropic fiber reinforced plastic composites	Low	Qualified			
ISO 604	Plastics - Determination of compressive properties	Low	Qualified			
ISO 643	Steels - Micrographic determination of the apparent grain size	Low	Qualified	2020		

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ISO 6506 (ASTM E10)	Brinell hardness test	Low	Qualified	2021		
ISO 6507 (ASTM E92)	Vickers hardness test	Low	Qualified	2020		Also in accordance with AIPI04-00-005
ISO 6508 (ASTM E18)	Rockwell hardness test	Low	Qualified	2020		
NASM 1312-4	Fastener test methods - Method 4: Lap joint shear	Low	Qualified			
Z_Comp. spec. machining	Composite specimen machining / cutting / tabbing	None	Qualified			
Z_Metal. Spec. prep	Metallic specimen preparation (for mechanical testing)	None	Qualified			
Z_Opt. metallo.	Optical metallography	None	Qualified			
Z_Spectro. OES	Spectrometry: optical emission (OES)	None	Authorised to Proceed September 2020	2020		*Steel samples not included

* Unless otherwise specified, last issue of the standard shall apply.

** Next PTP participation year is given for information - It is the External Shop's responsibility to check every year on the PTP Website (<https://ptpscheme.com/>) which kits are proposed.