AIRBUS

ELEMENT MATERIALS TECHNOLOGY - SEVILLE SLU

CL WILBURG Y ORVILLE WRIGHT N1 - PQ AERONAUTICO LA RINCONADA
41309 LA RINCONADA
Spain

FOR THE ATTENTION OF
Rafael CABRERA Structural Laboratory Manager
Esther GARCIA DEL CASTILLO Laboratory Manager (CEO)
Rocio OCAÑA
Antonio RAMIREZ Quality Assurance Mgr

CERTIFICATE PREPARED BY
NUNEZ Cesar

YOUR QTML FOCAL POINT
NUNEZ Cesar

E-MAIL
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+33 5 61 18 53 36

DATE
15/09/2020

OUR REFERENCE
SUR2020.0050 Ind. C

ARP-ID of the External Shop
277364

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 detailled 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.

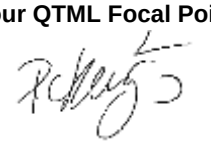
A qualified couple is not linked to a specific product. It is the proof that the External Shop is meeting the requirement of the M20691.2: Perform Couple <Product/Supplier Site> Compliance and Maturity's Activities for Material Products Suppliers and/or M20691.3: Perform Couple <Product/Supplier Site> 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In case of PTP results out of tolerances, the couples qualification can be downgraded to an authorisation to proceed or withdrawn and the PTP participation frequency is reduced to one year, subject to acceptance by Airbus of your Root Cause Analysis and associated Corrective Actions.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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Qualified or Authorised to proceed for the following Test processes:

Test Standard(s) *	Test label	Complex.	Qualif. Status	Next PTP part. **	QCS Ref.	Remark
AIPS/AIPI 01-02-005	Preparation of holes in fibre reinforced plastic (FRP) and hybrid materials	Low	Qualified with limitations			Limited to test specimens manufacturing and machining.
AIPS/AIPI 01-02-008	Torque tightening of screws, bolts and nuts	High	Qualified with limitations		161062	Limited to test specimens manufacturing and machining.
AIPS/AIPI 01-02-017	General assembly and installation of fasteners	High	Qualified with limitations		161062	Limited to test specimens manufacturing and machining.
AIPS/AIPI 01-02-022	Installation of parallel shank threaded fasteners	High	Qualified with limitations		161062	Limited to test specimens manufacturing and machining.
AIPS/AIPI 03-02-019	Manufacture of monolithic parts with thermoset prepreg materials	High	Qualified with limitations		161062	Limited to test specimens manufacturing and machining.
AIPS/AIPI 03-07-002	Machining of fibre reinforced plastic (FRP) components	High	Qualified with limitations		161062	Limited to test specimens manufacturing and machining.
AIPS/AIPI 05-05-004	Wet installation of fasteners	High	Qualified with limitations		161062	Limited to test specimens manufacturing and machining.
AIPS/AIPI 06-01-003	Surface preparation for thermosetting parts before structural bonding	High	Qualified with limitations		161062	Limited to test specimens manufacturing and machining.
AIPS/AIPI 06-01-004	Mechanical surface preparation of non-structural adherend prior to adhesive bonding	Low	Qualified with limitations			Limited to test specimens manufacturing and machining.
AIPS/AIPI 06-02-002	Non-structural adhesive bonding	Low	Qualified with limitations			Limited to test specimens manufacturing and machining.
AIPS/AIPI 06-02-006	Structural bonding of thermoset and thermoplastic matrices compocite parts	High	Qualified with limitations		161062	Limited to test specimens manufacturing and machining.
AITM 1-0002	Fibre reinforced plastics - Determination of in-plane shear properties (±45° tensile test)	Low	Qualified	2021		
AITM 1-0003	Determination of the glass transition temperatures (DMA)	High	Qualified	2021	131032	
AITM 1-0005	Fibre reinforced plastics - Determination of interlaminar fracture toughness energy - Mode I - G1c	High	Authorised to Proceed October 2020	2020	110894	
AITM 1-0007-A / B / C / D	Fibre reinforced plastics - Determination of plain, open hole and filled hole tensile strength	Low	Qualified	2021		

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AITM 1-0008-A1	Fiber reinforced plastics - Determination of plain compression strength (Thick specimens, <200kN)	High	Qualified	2020	111414	
AITM 1-0008-A2	Fiber reinforced plastics - Determination of plain compression strength (Thin specimens, <100 kN)	High	Qualified	2021	111414	
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	150672	
AITM 1-0010	Fibre reinforced plastics - Determination of compression strength after impact	High	Qualified	2021	150345	
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 1-0024	Determination of the completeness of cure of organic coatings	Low	Qualified			
AITM 1-0025	Fiber reinforced plastics - Flatwise tensile test of composite sandwich panel	Low	Qualified	2021		
AITM 1-0029	Fibre reinforced plastics - Determination of tensile strength of a tapered or stepped joint	Low	Qualified			
AITM 1-0030	Sealants - Determination of lap shear strength	Low	Qualified			
AITM 1-0042	Determination of Fatigue Crack Growth Rates for Clad Sheet and Clad Plate up to 12 mm in Constant-Load-Amplitude Tests	High	Qualified with limitations	2020	150084	Restricted to specimens of the type CT.
AITM 1-0053	Carbon fibre reinforced plastics - Determination of fracture toughness energy of bonded joints - Mode I - G1c	High	Qualified	2021	120350	

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AITM 1-0065	Fiber reinforced plastics - Determination of joint strength of mechanically fastened joints	High	Qualified	2020	180541	-QCS generated on 26/11/2018 - Testing machine ID: 9.1.4 (SN 183797/2008) -No specimen type restriction, both types I, II and III are covered. -Non assembled specimens are covered. Assembly process or already drilled specimens is allowed. -Full test temperature range is covered, typically -60ºC to 180ºC
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 with limitations	2020	180591	Qualified on 19/10/2018 *Limited to specimens below 10mm thickness
AITM 1-0070 (incl. ISO 4287)	Surface roughness measurements using surface stylus methods	Low	Qualified			
AITM 1-0076	Fibre reinforced plastics - Determination of compression aand tension strength after edge impact	High	Authorised to Proceed September 2020	TBD *		Limited for thicknesses < 6 mm.
AITM 2-0031	Determination of electrical resistivity by ohmic method	Low	Qualified			
AITM 2-0061	Water pick up test-method to determine the impregnation level of prepeg materials	Low	Qualified			
AITM 3-0002	Analysis of non metallic material (uncured) by differential scanning calorimetry (DSC)	High	Qualified	2020	180330	Qualified on 05/12/2018 TA Instruments DSC Q100
AITM 3-0003	Analysis of organic compounds by infrared spectroscopy (IR)	Low	Qualified			
AITM 3-0004	Determination of gel time and viscosity	Low	Qualified			
AITM 3-0008	Determination of the extent of cure by differential scanning calorimetry (DSC)	High	Qualified	2020	180331	Qualified on 05/12/2018
AITM 4-0003	Test method for determining the pore content of fibre reinforced plastics using automatic image analysis	High	Qualified	2021	160608	Qualified on 18/12/2018
AITM 4-0005	Macroscopic and microscopic examination of fiber reinforced plastics	Low	Qualified			

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AMS 2315	Determination of delta ferrite content	Low	Qualified			
ASTM B557	Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products	Low	Qualified	2020		
ASTM C273	Shear properties of sandwich core materials	Low	Qualified			
ASTM C363	Node tensile strength of honeycomb core materials	Low	Qualified			
ASTM C365	Flatwise compressive properties of sandwich cores	Low	Qualified			
ASTM C393	Core shear properties of sandwich constructions by beam flexure	Low	Qualified			
ASTM D1781	Climbing drum peel for adhesives	Low	Qualified			
ASTM D1876	Peel resistance of adhesives (T-Peel test)	Low	Qualified			
ASTM D732	Standard test method for shear strength of plastics by punch tool	Low	Qualified			
ASTM E10	Standard Test Method for Brinell Hardness of Metallic Materials	Low	Qualified	2020		Qualified on 22/07/2020
ASTM E111	Young's modulus, tangent modulus, and chord modulus	High	Authorised to Proceed June 2020			
ASTM E112	Determining average grain size	Low	Qualified	2021		
ASTM E1251	Analysis of aluminum and aluminum alloys by Atomic Emission Spectrometry	Low	Qualified	2022		
ASTM E18	Standard Test Methods for Rockwell Hardness of Metallic Materials	Low	Qualified	2020		
ASTM E238	Pin-type bearing test of metallic materials	High	Qualified	2021	090782	
ASTM E2602	Assignment of the glass transition temperature by modulated temperature differential scanning calorimetry (DSC)	High	Authorised to Proceed June 2020			
ASTM E3	Standard guide for preparation of metallographic specimens	Low	Qualified			

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ASTM E340	Macroetching metals and alloys	Low	Qualified			
ASTM E399	Linear-elastic plane-strain fracture toughness KIc of metallic materials	High	Qualified	2020	090795	
ASTM E407	Microetching metals and alloys	Low	Qualified			
ASTM E647	Measurement of fatigue crack growth rates (da/dn)	High	Qualified with limitations	2020	150084	Restricted to specimens of the type CT.
ASTM E8	Tension testing of metallic materials	Low	Qualified	2020		
ASTM E9	Compression testing of metallic materials at room temperature	Low	Qualified	2020		
ASTM G34	Exfoliation corrosion susceptibility in 2XXX and 7XXX series aluminum alloys (EXCO Test)	Low	Qualified			
EN 2002-1	Tensile testing at ambient temperature	Low	Qualified	2020		
EN 2002-2	Tensile testing at elevated temperature	Low	Disqualified	2017		
EN 2003-9	Titanium and titanium alloys - Part 9: Determination of surface contamination (method A: Micrographic examination / Method B: Hardness testing)	Low	Qualified	2020		Method A
EN 2243-1	Structural adhesives - Part 1: Single lap shear	Low	Qualified	2021		
EN 2243-2	Structural adhesives - Part 2: Peel metal-metal	Low	Qualified	2021		
EN 2243-3	Structural adhesives - Part 3: Peeling test metal-honeycomb core	Low	Qualified	2021		
EN 2243-4	Structural adhesives - Part 4: Metal-honeycomb core flatwise tensile test	Low	Qualified	2021		
EN 2332	Textile glass fibre preimpregnates - Test method for the determination of the resin flow	Low	Qualified			
EN 2377	Glass fibre reinforced plastics - Determination of apparent interlaminar shear strength	Low	Qualified			
EN 2557	Carbon fibre preimpregnates - Determination of mass per unit area	Low	Qualified			

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EN 2558	Carbon fibre preimpregnates - Determination of the volatile content	Low	Qualified			
EN 2559	Carbon fibre preimpregnates - Test method for the determination of the resin and fibre content and the mass of fibre per unit area	Low	Qualified			
EN 2560	Carbon fibre preimpregnates - Determination of the resin flow	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	2021		
EN 2563	Carbon fibre reinforced plastics - Unidirectional laminates - determination of apparent interlaminar shear strength	Low	Qualified	2020		
EN 2564	Carbon fibre laminates - Determination of the fibre, resin and void contents	Low	Qualified with limitations	2021		Restricted to method B
EN 2597	Carbon Fibre reinforced plastics - Unidirectional laminates - Tensile test perpendicular to the fibre direction	Low	Qualified			
EN 2667-1 (PRen)	Foaming structural adhesives - Part 1: Tensile single-lap shear	Low	Qualified			
EN 2667-2 (PRen)	Foaming structural adhesives - Part 2: Compressive tube shear	Low	Qualified			
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)	Carbon Fibre reinforced plastics, compression test parallel to fibre direction, load introduction by shear	High	Qualified	2021	126664	
EN 2850-B (PREN)	Carbon fibre thermosetting resin unidirectional laminates - Compression test parallel to fibre direction - Method B	Low	Qualified	2020		

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EN 3615	Fibre reinforced plastics - Determination of the conditions of exposure to humid atmosphere and of moisture absorption	Low	Qualified			
EN 6072	Constant amplitude fatigue testing (HCF)	High	Authorised to Proceed December 2020	2020	090787	
EN 6072 (machining)	Fatigue test specimen machining (NADCAP test code O)	None	Authorised to Proceed December 2020	2020		
ISO 1183-1	Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pyknometer method and titration method	Low	Qualified			
ISO 14129	Fibre-reinforced plastic composites - Determination of the in-plane shear stress/shear strain response, including the in-plane shear modulus and strength, by the ±45° tension test method	Low	Qualified	2021		
ISO 14130	Fibre reinforced plastic composites - Determination of apparent interlaminar shear strength by short beam method	Low	Qualified			
ISO 1463	Metallic and oxide coatings - Measurement of coating thickness - Microscopical method	Low	Qualified	2020		
ISO 1519	Paints and varnishes - Bend test (cylindrical mandrel)	Low	Qualified			
ISO 2409	Paints and varnishes - Cross-cut test	Low	Qualified	2020		
ISO 2808	Paints and varnishes - Determination of film thickness	Low	Qualified	2020		Limited to Methd 7D & 12B
ISO 2812-2	Paints and varnishes - Determination of resistance to liquids - Part 2: Water immersion method	Low	Qualified	2020		
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 527-2	Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics	Low	Qualified			

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ISO 527-4	Plastics - Determination of tensile properties - Part 4: Test conditions for isotropic and orthotropic fiber reinforced plastic composites	Low	Qualified			
ISO 527-5	Determination of tensile properties - Part 5: Test conditions for unidirectional fibre-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	2021		
Z_Comp. spec. machining	Composite specimen machining / cutting / tabbing	None	Qualified			
Z_Comp. spec. prod.	Composite specimen production	None	Qualified			
Z_mechanical tests	Various mechanical tests	None	Qualified			ASTM D6641 - Compressive properties of polymer matrix composite materials using a combined loading compression (CLC) test fixture
Z_mechanical tests	Various mechanical tests	None	Qualified			
Z_Metal. Spec. prep	Metallic specimen preparation (for mechanical testing)	None	Qualified			
Z_Opt. metallo.	Optical metallography	None	Qualified			
Z_Physical tests	Various physical tests	None	Qualified			

* 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.