

GMA-WERKSTOFFPRUEFUNG GMBH NORDENHAM BRANCH

Werftstraße 1
26954 NORDENHAM
Germany

FOR THE ATTENTION OF

Klaus HOMBRINK Quality Manager
Tobias KRUSKA Chemical Lab Leader
Kevin NESTLER Mechanical Lab Leader
Juri RAUTENBERG Metallographie Lab Leader
Bernd ZAHAB Head of laboratory DT

CERTIFICATE PREPARED BY
GRADISTANAC Jérôme

YOUR QTML FOCAL POINT
GRADISTANAC Jérôme

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DATE
04/02/2021

OUR REFERENCE
SUR2020.0154 Ind. C

ARP-ID of the External Shop
305214

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In case of PTP results out of tolerances, the couples qualification can be downgraded to an authorisation to proceed or withdrawn and the PTP participation frequency is reduced to one year, subject to acceptance by Airbus of your Root Cause Analysis and associated Corrective Actions.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,

GRADISTANAC Jérôme
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>

We hereby declare the External Shop:

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Test Standard(s) *	Test label	Complex.	Qualif. Status	Next PTP part. **	QCS Ref.	Remark
AITM 1-0016	Determination of the effect of liquid cleaning agents upon the peel strength of heat cured film adhesive / bonding primer systems	Low	Authorised to Proceed July 2021			pending decision regarding NADCAP NMMT
AITM 1-0017	Determination of the effect of liquid cleaning agents upon the adhesion of paint primers to adhesive bonding primers	Low	Authorised to Proceed July 2021			pending decision regarding NADCAP NMMT
AITM 1-0019	Determination of tensile lap shear strength of composite joints	Low	Authorised to Proceed July 2021	2021		pending decision regarding NADCAP NMMT
AITM 1-0021	Determination of the effect of liquid cleaning agents upon the properties of elastomeric materials	Low	Authorised to Proceed July 2021			pending decision regarding NADCAP NMMT
AITM 1-0022	Wettability test	Low	Qualified			
AITM 1-0025	Fiber reinforced plastics - Flatwise tensile test of composite sandwich panel	Low	Authorised to Proceed July 2021	2021		pending decision regarding NADCAP NMMT
AITM 1-0030	Sealants - Determination of lap shear strength	Low	Qualified			Sealants
AITM 1-0033	Sealants: Determination of the curing rate of sealing materials	Low	Qualified			
AITM 1-0047	Determination of apparent interlaminar shear strength of fibre metal laminates (Glare materials)	Low	Authorised to Proceed July 2021			Composites (Glare) pending decision regarding NADCAP NMMT
AITM 1-0049	Tensile test method of fibre metal laminates (Glare materials)	Low	Authorised to Proceed July 2021			Composites (Glare) pending decision regarding NADCAP NMMT
AITM 2-0011	Drying time	Low	Qualified			
AITM 3-0007	Drop (reaction) test on aluminium and aluminium alloys	Low	Qualified with limitations			Also according to QVA-Z10-58-01 and QVA-Z10-58-02 (Restricted to Legacy Programs)
AITM 3-0013	Testing of susceptibility to exfoliation corrosion in 2XXX and 7XXX series wrought aluminium alloy products	Low	Qualified			
AITM 3-0015	Determination of phosphoric acid content	Low	Qualified			
AITM 3-0029	Determination of iron (III) as reactive compound in acidic surface treatment baths	Low	Qualified			Process baths
AITM 3-0030	Titration of sulphuric and tartaric acid in anodizing electrolytes	Low	Qualified			Process baths

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AITM 3-0032	Analysis of metals in galvanic bathes by ICP-spectroscopy	Low	Qualified			Process baths NCF V53D13013279 accepted
AITM 3-0034	Combined determination of free hydroxide and aluminium in alkaline surface treatment baths	Low	Qualified			Process baths
AITM 3-0035	Determination of chloride contaminations in surface treatment baths	Low	Qualified			Process baths
AITM 3-0036	Determination of hydrogen ions in surface treatment baths	Low	Qualified			Process baths
AITM 3-0037	Determination of phosphoric and sulphuric acid in anodizing electrolytes	Low	Qualified			Process baths
AITM 3-0038	Determination of non-volatile-residue	Low	Qualified			
AITM 4-0002	Microstructural characterization of welded aluminium structures	Low	Qualified			AI
AITM 5-0009	Determination of resistance to bond line corrosion	High	Qualified			
AITM 7-0003	Sealants - Determination of application time of sealing materials	Low	Qualified			
ASTM B117	Standard practice for operating salt spray (Fog) apparatus	Low	Qualified	2022		
ASTM B117	Standard practice for operating salt spray (Fog) apparatus	Low	Qualified with limitations	2022		Also according to QVA-Z10-59-01 (Restricted to Legacy programs)
ASTM B557	Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products	Low	Qualified	2021		
ASTM C363	Node tensile strength of honeycomb core materials	Low	Authorised to Proceed July 2021			honeycomb pending decision regarding NADCAP NMMT
ASTM E112	Determining average grain size	Low	Authorised to Proceed February 2021	2021		Al, Ti, Steel pending IRR clarifications
ASTM E1409	Determination of oxygen and nitrogen in titanium and titanium alloys by the inert gas fusion technique	Low	Qualified	2022		
ASTM E1447	Determination of hydrogen in titanium and titanium alloys by inert gas fusion thermal conductivity / infrared detection method	Low	Qualified	2022		

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ASTM E1941	Determination of carbon in refractory and reactive metals and their alloys by combustion analysis	Low	Authorised to Proceed June 2021	2021		Pending PTP participation
ASTM E3	Standard guide for preparation of metallographic specimens	Low	Qualified			Al, Ti Also according to QVA-Z10-54-00 (Restricted to Legacy programs)
ASTM E340	Macroetching metals and alloys	Low	Qualified			Steel, Aluminium, Titanium, Beryllium-Copper
ASTM E407	Microetching metals and alloys	Low	Qualified			Al, Ti
ASTM E8	Tension testing of metallic materials	Low	Qualified	2021		
ASTM E9	Compression testing of metallic materials at room temperature	Low	Qualified	2022		
ASTM G110	Evaluating intergranular corrosion resistance of heat treatable aluminium alloys by immersion in sodium chloride + hydrogen peroxide solution	Low	Authorised to Proceed March 2021			Also according to QVA-Z10-59-03 (Restricted to Legacy programs) pending IRR
ASTM G34	Exfoliation corrosion susceptibility in 2XXX and 7XXX series aluminum alloys (EXCO Test)	Low	Qualified with limitations			Also according to QVA-Z10-59-04 (Restricted to Legacy programs)
EN 2002-1	Tensile testing at ambient temperature	Low	Qualified	2021		Also according to DIN EN ISO 6892-1: Tensile testing – Part 1: Method of test at room temperature Al, Ti, Fe, Beryllium-Copper, Steel
EN 2003-9	Titanium and titanium alloys - Part 9: Determination of surface contamination (method A: Micrographic examination / Method B: Hardness testing)	Low	Authorised to Proceed February 2021	2021		Method A pending IRR clarifications
EN 2243-1	Structural adhesives - Part 1: Single lap shear	Low	Authorised to Proceed July 2021	2021		Al/Epoxy pending decision regarding NADCAP NMMT
EN 2243-2	Structural adhesives - Part 2: Peel metal-metal	Low	Authorised to Proceed July 2021	2021		Al / Epoxy pending decision regarding NADCAP NMMT
EN 2243-3	Structural adhesives - Part 3: Peeling test metal-honeycomb core	Low	Authorised to Proceed July 2021	2021		Al / Epoxy /GFRP Also according to QVA-Z10-46-05 (Restricted to Legacy programs) pending decision regarding NADCAP NMMT
EN 2243-4	Structural adhesives - Part 4: Metal-honeycomb core flatwise tensile test	Low	Authorised to Proceed July 2021	2021		pending decision regarding NADCAP NMMT

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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	Authorised to Proceed July 2021			pending decision regarding NADCAP NMMT and IRR
EN 2667-1 (Pren)	Foaming structural adhesives - Part 1: Tensile single-lap shear	Low	Authorised to Proceed July 2021			pending decision regarding NADCAP NMMT ONLY according to QVA-Z10-46-01 (Restricted to Legacy programs)
EN 2667-2 (Pren)	Foaming structural adhesives - Part 2: Compressive tube shear	Low	Authorised to Proceed July 2021			pending decision regarding NADCAP NMMT ONLY according to QVA-Z10-46-06 (Restricted to Legacy programs)
EN 3114	Microstructure of ($\alpha + \beta$) titanium alloy wrought products	Low	Authorised to Proceed February 2021			pending IRR clarifications
ISO 1183-1	Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pycnometer method and titration method	Low	Qualified			
ISO 14125	Fiber reinforced plastic composites - Determination of flexural properties	Low	Authorised to Proceed July 2021			pending decision regarding NADCAP NMMT
ISO 148-1 (room temp.)	Charpy pendulum impact test (ambient temperature)	Low	Qualified	2021		
ISO 1518	Paints and varnishes - Scratch test	Low	Qualified			Paints
ISO 2409	Paints and varnishes - Cross-cut test	Low	Qualified	2022		Paints
ISO 2808	Paints and varnishes - Determination of film thickness	Low	Qualified	2020		Method 6A — Cross-sectioning - Version 1 — By grinding
ISO 2812-2	Paints and varnishes - Determination of resistance to liquids - Part 2: Water immersion method	Low	Qualified	2022		Paints
ISO 4578	Adhesives - Determination of peel resistance of high-strength adhesive bonds - Floating roller method	Low	Authorised to Proceed July 2021			pending decision regarding NADCAP NMMT
ISO 4628-2	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 2: Assessment of degree of blistering	Low	Qualified			

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ISO 48-4	Rubber, vulcanized or thermoplastic — Determination of hardness — Part 4: Indentation hardness by durometer method (Shore hardness)	Low	Authorised to Proceed June 2021			Pending measuring force, indentation depth and indenter geometry calibration certificates in accordance with ISO 48-9
ISO 6270-2	Paints and varnishes - Determination of resistance to humidity - Part 2: Procedure for exposing test specimens in condensation-water atmospheres	Low	Qualified			
ISO 643	Steels - Micrographic determination of the apparent grain size	Low	Authorised to Proceed February 2021	2021		pending IRR clarifications
ISO 6506	Metallic materials - Brinell hardness test	Low	Qualified	2021		Al, Ti, Fe, Beryllium-Copper
ISO 6507	Metallic materials - Vickers hardness test	Low	Qualified	2022		Al, Ti, Fe
ISO 6508	Metallic materials - Rockwell hardness test	Low	Qualified with limitations	2022		Al, Ti, Fe HRC only
ISO 8510-2	Adhesives - Peel test for a flexible-bonded-to-rigid test specimen assembly - Part 2: 180° peel	Low	Authorised to Proceed July 2021			pending decision regarding NADCAP NMMT
ISO 868	Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness)	Low	Qualified with limitations			ISO 868 only
ISO 9227	Corrosion tests in artificial atmospheres - Salt spray tests	Low	Qualified with limitations	2022		Also according to QVA-Z10-59-01 (Restricted to Legacy programs)
NASM 1312-13	Fastener test methods - Method 13: Double shear test	Low	Authorised to Proceed March 2021	2021		Also according to the QVA-Z10-37-04: Double-Shear Test on Fasteners Made from Metallic Materials Fastener (Al, Ti)
NASM 1312-20	Fastener test methods - Method 20: Single shear	Low	Qualified			Fastener (Al, Ti)
NASM 1312-8	Fastener test methods - Method 8: Tensile strength	Low	Authorised to Proceed March 2021	2021		Fastener (Al, Ti) Pending PTP participation
QVA-Z09-07-27	Determination of Chromium (VI) in surface treatment baths	Low	Qualified with limitations			Process baths Restricted to Legacy Programs
QVA-Z09-07-31	Determination of Sulphate in surface treatment baths	Low	Qualified with limitations			Process baths Restricted to Legacy Programs

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QVA-Z09-07-36	Determination of Hydroxide in alkaline cleaning baths	Low	Qualified with limitations			Process baths Restricted to Legacy Programs
QVA-Z09-11-01	Inspection of polyalkylene glycol baths	Low	Qualified			
QVA-Z09-19-01	Determination of the pH-value in Aqueous Media	Low	Qualified with limitations			Process baths Restricted to Legacy Programs
QVA-Z09-20-00	Determination of Water Hardness	Low	Qualified with limitations			Restricted to Legacy Programs
QVA-Z09-22-00	Determination of Dry Residue	Low	Qualified with limitations			Restricted to Legacy Programs
QVA-Z09-23-00	Determination of the Specific Conductivity in Aqueous Media	Low	Qualified with limitations			Process baths Restricted to Legacy Programs
QVA-Z09-25-00	Determination of removal rate of alkaline pickling baths	Low	Qualified with limitations			Process baths Restricted to Legacy Programs
QVA-Z10-53-00	Metallographic test - Macroscopic examination - General information	Low	Qualified			Al, Ti, Fe, CFRP
QVA-Z10-61-00	Determination of particle sizes	None	Qualified with limitations			Process baths Restricted to Legacy Programs
Z_Comp. spec. machining	Composite specimen machining / cutting / tabbing	None	Qualified			CFRP / GFRP
Z_Metal. Spec. prep	Metallic specimen preparation (for mechanical testing)	None	Qualified			Al, Ti, Fe, NE-metals
Z_Other	Other test - Specify in Remark	None	Qualified with limitations			80-T-35-0020: Alkaline Cleaning (Tendency of the bath to produce pitting) Restricted to Legacy Programs
Z_Other	Other test - Specify in Remark	None	Qualified with limitations			QVA-Z09-11-00 - Analysis of Saltpetre Melts Restricted to Legacy Programs
Z_Other	Other test - Specify in Remark	None	Qualified with limitations			QVA-Z10-54-03 - Examination for Copper Diffusion in Cladding Restricted to Legacy Programs
Z_Other	Other test - Specify in Remark	None	Qualified with limitations			80-T-34-5814 - Stuffer samples (connecting elements) Restricted to Legacy Programs

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Test Standard(s) *	Test label	Complex.	Qualif. Status	Next PTP part. **	QCS Ref.	Remark
Z_Other	Other test - Specify in Remark	None	Qualified with limitations			80-T-35-2010: Determination of the weight of the coating (chapter 6.1.1) Restricted to Legacy Programs
Z_Spectro. OES	Spectrometry: optical emission (OES)	None	Authorised to Proceed March 2021	2021		According to ASTM B265 - Standard Specification for Titanium and Titanium Alloy Strip, Sheet, and Plate The tests are performed at GMA in Essen under GMA Nordenham responsibility Pending PTP participation
Z_Spectro. OES	Spectrometry: optical emission (OES)	None	Authorised to Proceed March 2021	2021		According to EN 14726 (Aluminium alloys) The tests are performed at GMA in Essen under GMA Nordenham responsibility qualified 21/12/2018 Pending PTP participation

* 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.