



## Testing Laboratory Approval for Independent Laboratory

**MEMO Nº:** AM-LAB-001-19 Rev.1

**Approval Date:** 13/09/2011

**SUBJECT:** INDEPENDENT TESTING LABORATORY APPROVAL

**Revision Date:** 29/06/2023

**SCOPE:** See Annex 1

**Element Materials Technology Seville**  
Parque Tecnológico Aeroespacial Aerópolis  
Wilburg y Orville Wright 1.  
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In accordance with CASA1400 is hereby approved as:

### INDEPENDENT TESTING LABORATORY According to CASA-1400-55-FT

**LIMITATIONS:**

The approval is limited to the scope describe in Annex 1.

**ACTIONS TO BE PERFORMED BY ELEMENT:**

The Qualification Dossier has to be maintained by supplier as process owner.

**REFERENCE DOCUMENTATION:**

208988	Nadcap Doc.	Nadcap NMMT Audit
1203352	Nadcap Doc.	Nadcap MTL Audit
906/LE1788	ENAC Doc.	ENAC Accreditation

**REMARKS:**

Airbus Defense and Space does not consider as valid any deviation not expressly stated in this document.

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	Name	Signature
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## ANNEX 1

- **METALLIC. MECHANICAL TESTING**

Test / Analysis	Method/ Test Procedure
Tensile test	ASTM E8/E8M / ASTM B557M / ASTM B557 / ASTM A370 / EN 2002-001 / UNE-EN ISO 6892-1 / UNE-EN ISO 6892-2
Axial fatigue (HCF)	EN 6072
Fracture toughness (K1c)	ASTM E399
Rockwell Hardness (Scales HRA, HRB, HRC y HR15T)	ASTM E18
Brinell Hardness	ASTM E10
Pin-Type Bearing Test of Metallic Materials	ASTM E238
Axial load on bushes and Bearings	AIPS03-03-012 / ADET 0191
Shear Testing	ASTM B769 / ASTM B831
Test Load for Swaging of Control Cables	I+D-P-377



• **METALLIC MATERIALS AND COATINGS**

Test / Analysis	Method/ Test Procedure
Electrical Conductivity	EN 2004-1 / ASTM E1004
Analysis of Aluminum Alloys by Spark Atomic Emission Spectrometry	ASTM E1251
Surface Roughness Measurements using Surface Contact Stylus Method	AITM 1-0070
Examination and preparation of test samples	ISO 1513
Industrial woven wire cloth. Technical requirements and tests	ISO 9044
Thickness measurement by microscopical examination of a transverse cross section	UNE EN ISO 1463 / ISO 2808 Method 6A
Measurement of coating thickness by eddy current method	AITM 6-6006
Dry adhesion test	ISO 2409
Wet adhesion test	ISO 2409 / UNE-EN ISO 2812-2
Solvent resistance test	I+D-E-299
Preparation of metallographic Specimens	ASTM E3
Diffusion in alclad	I+D-P-220
Eutectic melting	I+D-P-220
Exfoliation Corrosion Susceptibility in 2XXX and 7XXX Series Aluminum Alloys (EXCO Test)	ASTM G34
Intergranular Oxidation	I+D-P-225
Inclusion Content of Steel	ASTM E45
Electrical resistivity	AITM 2-0031
Rheological Properties on Non-Newtonian Materials by Rotational Viscosimeter	ASTM D2196
Determination of apparent viscosity using a single cylinder type rotational viscometer method	ISO 2555

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- COMPOSITES, ADHESIVES AND PLASTICS. MECHANICAL TESTING**

Test / Analysis	Method/ Test Procedure
Tensile Test	UNE-EN 2561 / UNE-EN ISO 527-1 / UNE-EN ISO 527-4 / UNE-EN ISO 527-5 / ASTM D3039/D3039M / EN 2597 / UNE EN 2597 / AITM 1-0007 / ASTM D638 / ASTM D882 / I+D-E-026 / I+D-E-253 / I+D-P-284
Open Hole and Filled Hole Tensile Strength	AITM 1-0007 / ASTM D5766/D5766M
Compression test	UNE-EN 2850 / AITM 1-0008 / ASTM D6484/D6484M / ASTM D1621 / I+D-E-051 / UNE-EN ISO 14126
Open Hole and Filled Hole Compression Strength	AITM 1-0008 / ASTM D6484/D6484M
Interlaminar Shear Strength	ASTM D2344/D2344 / UNE-EN 2563 / UNE-EN ISO 14130 / ABT 1-0006 / I+D-E-031 / I+D-E-255 / I+D-E-352 QVA-Z10-46-09
Flexure	UNE-EN ISO 14125 / UNE-EN ISO 14125 / UNE-EN 2562 / ASTM D790
In Plane Shear Strength	ASTM D3518/D3518M / EN 6031 / AITM 1-0002 / UNE-EN ISO 14129 / ASTM D3846
Interlaminar fracture toughness	EN 6033 / AITM 1-0053
Tensile Strength	/ UNE-EN ISO 527-1
Compression Strength	ASTM D695 / UNE-EN ISO 604
Climbing Drum Peel	ASTM D1781 / UNE-EN 2243-3
Compression	ASTM C365/C365M / UNE-EN ISO 844
Compressive Strength of Sandwich Constructions	ASTM C364/C364M
Flexure	AITM 1-0018 / ASTM C393/C393M
Core Shear	ASTM C273/C273M
Flatwise Tensile	ASTM C297/C297M / UNE-EN 2243-4 / AITM 1-0025 / I+D-E-246 / I+D-E-288
Peel Metal-Metal	UNE-EN 2243-2 / ISO 4578 / ASTM D3167
Single Lap Shear	ASTM D3165 / ASTM D1002 / AITM 1-0019 / ISO 4587 / UNE-EN 2243-1
Node Tensile Strength of Honeycomb Core Materials	ASTM C363/ 363M
Compressive properties of Polymer Matrix Composite Materials using a Combined Loading Compression (CLC) Test Fixture	ASTM D6641/D6641M
Compression Modulus test of composite laminates	prEN 2850
Compression Strength After Impact	AITM1-0010 / AITM 1-0077
Compression and Tension Strength After Impact	AITM1-0076

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• **COMPOSITES, ADHESIVES AND PLASTICS. MECHANICAL TESTING (Cont.)**

Test / Analysis	Method/ Test Procedure
Compressive tube shear	prEN 2667-2
Determination of Pull-Out/ Pull-Through Strength on Riveted Joints	AITM 1-0066
Bearing strength of composite laminates	I+D-E-325 / ASTM D5961/D5961M
Bearing/ Bypass interaction response of Polymer Laminates Using 2-Fasteners Specimens	ASTM D7248/D7248M
Compressive Residual Strenght Properties of Damage Polymer	ASTM D7137/D7137M
Tension Fatigue of Polymer Matrix Composite Materials	ASTM D3479/D3479M
Uniaxial Fatigue Properties of Plastics	ASTM D7791
Flexural Fatigue Properties of Plastics	ASTM D7774
Open-Hole Fatigue Response of Polymer Matrix Composite Laminates	ASTM D7615/D7615M
Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials by Four-Point Bending	ASTM D6272
Flexural Properties of Polymer Matrix Composites Materials	ASTM D7264/D7264M
Fibre-Reinforced Plastic Composites. Determination of Flexural Properties	UNE-EN ISO 14125
Facesheet Properties of Sandwich Constructions by Long Beam Flexure	ASTM D7249/D7249M
Interlaminar Fracture Toughness of Unidirectional Fiber-Reinforced Polymer Matrix Composites	ASTM D5528 / ISO 15024 / ASTM D7905/D7905M / ASTM D6671/D6671M
Determination of Fatigue of Fasteners in Mechanically Fastened Joints under Constant Amplitude Loading	AITM 1-0074
Constant Amplitude Fatigue Testing on Coupons	AITM 1-0075
Measuring the Damage Resistance of a Fiber-Reinforced Polymer Matrix Composite to a Drop-Weight Impact Event	ASTM D7136/D7136M
Measuring the Fastener Pull-Through Resistance of a Fiber-Reinforced Polymer Matrix Composite	ASTM D7332/ D7332M
Determination of Curved-Beam Failure Load	AITM 1-0069
Bond or Cohesive Strength of Sheet Plastics and Electrical Insulating Materials	ASTM D952

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- **COMPOSITES, ADHESIVES AND PLASTICS. PHYSICAL, CHEMICAL, THERMAL AND OTHERS TESTING**

Test / Analysis	Method/ Test Procedure
Differential Scanning Calorimetry (DSC)	AITM 3-0002 / UNE-EN 6041
Determination of the Extent of Cure by Differential Scanning Calorimetry (DSC)	UNE-EN 6064 / AITM 3-0008
Determination of Temperature and Enthalpy of Melting and Crystallization (DSC)	UNE-EN ISO 11357-3
Determination of Glass Transition Temperature by Modulated Differential Scanning Calorimetry (MTDSC)	ASTM E2602
Determination of Glass Transition Temperature by Dynamic Mechanical Analysis (DMA)	AITM 1-0003
Fiber, Resin, Void Volume	ASTM D2734 / ASTM D3171 / UNE-EN 2564
Qualitative analysis by infrared spectroscopy (FTIR )	ASTM E573 / ISO 4650 / AITM 3-0003 / ASTM E1252 / ASTM E168
Volatile Content	UNE-EN 2330 / UNE-EN 2558
Resin/Fiber Content	UNE-EN 2331 / UNE-EN 2559 / QVA-Z10-46-20
Mass per Unit of Area	UNE-EN 2329 / UNE-EN 2557 / ASTM D3776/D3776M / FED-STD-191 (Method 5041) / ISO 3801 / QVA-Z10-46-08
Determination of void content, loss on ignition, mechanical disintegration and statistical counting Methods	UNE-EN ISO 7822
Filler content	UNE-EN ISO 1172
Extractable Matter in Textiles	ASTM D2257
Apparent Density of Rigid Cellular Plastics	ASTM D1622/D1622M / DIN EN ISO 845
Gel Time	AITM 3-0004
Resin Flow	QVA-Z10-46-33
Expansion Ratio and Volatile Content	prEN 2667-3
Determination of the flow of adhesive films	prEN2243-7
Water Pick Up Test-Method to determine the impregnation level of Prepreg Materials	AITM 2-0061
Determination of the conditions of exposure to humid atmosphere and the determination of moisture absorption	prEN 3615
Determination of the effect of exposure to humid atmosphere on physical and mechanical characteristics	UNE-EN 2823 / ASTM D5229/D5229M
Determination of pore content in FRP using Automatic Image Analysis	AITM 4-0003
Macroscopic and Microscopic Examination of FRP	AITM 4-0005

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- **COMPOSITES, ADHESIVES AND PLASTICS. PHYSICAL, CHEMICAL, THERMAL AND OTHERS TESTING (Cont.)**

Test / Analysis	Method/ Test Procedure
Density of Sandwich Core Materials	ASTM C271/ 271M
Determination of the Laminate Ply Thickness	I+D-E-123 / I+D-E-124 / I+D-E-243 / ISO 4593
End (Warp) and Pick (Filling) Count of Woven Fabrics	ASTM D3775
Crack propagation test	I+D-E-301

- **ELECTRICAL PROCESSES**

Test / Analysis	Method/ Test Procedure
Visual inspection and Macrographic inspection in soft soldering of electrical connections	CASA-1156 / I+D-P-068 / AIPS07-10-001
Stripping and crimping of electrical connections. Visual inspection	CASA-1161 // I+D-P 216 / I+D-P 193 / I+D-P-215 / AIPS07-03-001 / AIPS07-02-001 / AIPS 07-04-010 / AIPS 07-04-024 / ECSS Q ST 70 26 C
Crimping of electrical connections. Metallography inspections	ECSS Q ST 70 26 C
Tensile Strength (crimped connection)	EN 2591-417
Shielded overbraiding of electrical harnesses. Visual inspection, electrical resistance and Mechanical requirements	I+D-P-396 / AIPS07-01-013

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## ANNEX 2. Summary of Accreditations

- **AC7101/1** - Nadcap Audit Criteria for Materials Testing Laboratories – General Requirements for All Laboratories
- **AC7101/3** - Nadcap Audit Criteria for Materials Testing Laboratories – Mechanical Testing
- **AC7101/4** - Nadcap Audit Criteria for Materials Testing Laboratories – Metallography and Microindentation Hardness
- **AC7101/5** - Nadcap Audit Criteria for Materials Testing Laboratories – Hardness Testing (Macro)
- **AC7101/6** - Nadcap Audit Criteria for Materials Testing Laboratories – Corrosion
- **AC7101/11** - Nadcap Audit Criteria for Materials Testing Laboratories – Fastener Testing
- **AC7122/1** - Nadcap Audit Criteria for Non Metallic Materials Testing – Mechanical Testing
- **AC7122/2** - Nadcap Audit Criteria for Non Metallic Materials Testing – Physical Testing
- **AC7122/4** - Nadcap Audit Criteria for Non Metallic Materials Testing – Thermal Analysis
- **AC7122-I** - Nadcap Audit Criteria for Non Metallic Materials Testing
- **Fabrication** – Codes F.2.1, F.3.1
- **906/LE1788** - ENAC Accreditation





## 0. INDEX OF REVISIONS.

### 0.1 REVISIONS LOG

Rev.	Date	Revised Pages.
Signature Approval		

1	29/06/2023	New approval is issued due to a general revision.
Daniel Sanchez Vivat TEPMS Certifier		