CUSTOMER APPROVAL & NADCAP CAPABILITY MEMORANDUM

To: Whomever It may applicable to.

Subject: Approved Laboratory Testing & Metallurgical Capabilities

Scope of Approval

This memorandum is intended to summarize the currently approved laboratory capabilities maintained by Element Charlotte in support of applicable Rolls-Royce Plc approval requirements and associated accredited testing activities.

All capabilities identified within this memorandum are performed within our active Nadcap and A2LA ISO/IEC 17025:2017 accredited laboratory quality systems and are controlled in accordance with applicable industry standards, customer specifications, internal quality procedures, PRI/Nadcap requirements, and ISO/IEC 17025:2017 accreditation requirements.

Element Charlotte maintains qualified personnel, calibrated equipment, validated laboratory procedures, and documented process controls necessary to support materials characterization, mechanical testing, metallurgical evaluation, and chemical analysis activities.

Accreditation Alignment

The approvals identified herein are maintained under the Element Charlotte Nadcap and A2LA ISO/IEC 17025:2017 accredited laboratory quality systems.

Per documented Rolls-Royce approval correspondence and audit communications, ISO/IEC 17025:2017 accreditation is recognized as acceptable for the identified testing scope when testing is performed at the accredited Charlotte facility. Additionally, Element Charlotte is authorized to perform Spot Micro testing under its active ISO/IEC 17025:2017 accredited laboratory quality system when testing is conducted at the accredited Charlotte facility.

These approvals support applicable Rolls-Royce requirements associated with:

- Mechanical Testing
- Metallurgical Evaluation
- Chemical Analysis
- Hardness Testing
- Fracture Mechanics
- Microscopy & Failure Analysis
- Laboratory Specimen Preparation Activities

Approved Customer (Rolls-Royce) Capabilities

Mechanical Testing

Standard / Method	Capability	Laboratory Method	Status
EN 10045-1 / ASTM E23	Charpy Impact	Charpy V-Notch Impact Testing	Approved
EN 2002-5 / ASTM E139	Stress Rupture	Creep / Stress Rupture Testing	Approved

ASTM E139	Creep Strain	Creep Testing	Approved
BS 131 / ASTM E23	Izod Impact	Izod Impact Testing	Approved
ASTM E292	Notched Stress Rupture	Notched Stress Rupture Testing	Approved
EN 2002-1 / ASTM E8	Tensile – Ambient Temperature	Tensile Testing – Ambient Temperature	Approved
EN 2002-2 / ASTM E21	Tensile – Elevated Temperature	Tensile Testing – Elevated Temperature	Approved

Chemical Analysis

Standard / Method	Capability	Laboratory Method	Status
ASTM E1019	Carbon / Sulfur	Combustion Analysis – Carbon / Sulfur	Approved
ASTM E1447	Hydrogen in Titanium	Inert Gas Fusion – Hydrogen Analysis	Approved
ASTM E1409 / ASTM E1019	O/N/H Analysis (Fusion)	Inert Gas Fusion – Oxygen / Nitrogen / Hydrogen	Approved
ASTM E415	Optical Emission Spectroscopy (OES)	Optical Emission Spectroscopy (Spark / Arc)	Approved

Metallurgical Evaluation

Standard / Method	Capability	Laboratory Method	Status
ASTM E112	Grain Size	Grain Size Determination	Approved
ASTM E45	Inclusion Rating	Inclusion Rating / Cleanliness Evaluation	Approved
ASTM E3 / ASTM E407	Metallography	Metallographic Examination	Approved
ASTM E1508	SEM / EDS	Scanning Electron Microscopy / Energy Dispersive Spectroscopy	Approved
Customer / OEM Specification	Spot Micro Testing	Metallographic Evaluation – Spot Micro	Approved

Hardness Testing

Standard / Method	Capability	Laboratory Method	Status
ASTM E18 / ASTM E10 / ASTM E92	Hardness (Rockwell / Brinell / Vickers / Knoop)	Hardness Testing – Rockwell / Brinell / Vickers / Knoop	Approved

Laboratory Support Processes

Standard / Method	Capability	Laboratory Method	Status
Customer / OEM Specification	Low Stress Grinding (LSG)	Specimen Preparation – Low Stress Grinding	Approved
Customer / OEM Specification	Specimen Polish	Specimen Preparation – Surface Finishing / Polishing	Approved
Customer / OEM Specification	Test Piece Machining	Test Specimen Preparation / Machining	Approved

Quality Commitment

Element Charlotte remains committed to maintaining Nadcap and ISO/IEC 17025:2017 accreditation compliance, customer-specific approval requirements, technical competence, equipment calibration and traceability, and continuous quality improvement to ensure accurate, reliable, and technically compliant laboratory results supporting aerospace applications.

Controlled Approval Statement

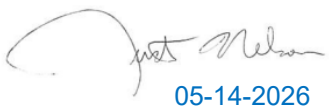
Rolls-Royce approvals identified within this memorandum are maintained through the Element Charlotte Nadcap and A2LA ISO/IEC 17025:2017 accredited laboratory quality systems and remain subject to ongoing accreditation compliance, internal quality surveillance, proficiency validation, and customer oversight requirements.

Nadcap and A2LA accreditation certificates and detailed scope information are available upon request.

Current Approval Status

Element Charlotte currently maintains APPROVED status for all capabilities identified within this memorandum supporting applicable Rolls-Royce plc approval requirements under the active Nadcap and A2LA ISO/IEC 17025:2017 accreditation scopes.

Memo Approval



05-14-2026

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05-14-2026

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