

QM003

Quality Requirements for Suppliers

Issue 11

September 2025

Lockheed Martin UK Ampthill Ltd



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1. Introduction

1.1. Quality of the Product

Lockheed Martin's business depends on a reliable, global network of skilled suppliers that provide the materials, parts and services to make our products and deliver them to our customers, conforming to Lockheed Martin UK Amthill (LMUK-A) requirements, mission-ready and on time. Goods and services provided by our suppliers have a key impact on the quality of the products, solutions and services we offer our customers.

1.2. Supplier Quality Engineering and Global Supply Chain Operations Amthill

The LMUK-A Supplier Quality Engineers (SQE) and Global Supply Chain Operations Amthill (GSCO-A) are a dedicated collaborative team that engage and develop relationships throughout the supply chain. The SQE team have a high level of engineering knowledge and experience in reviewing quality requirements, sub-tier approval and nonconformity problem solving.

2. Scope

2.1. Aim

The aim of this document is to formally communicate the LMUK-A quality requirements to external providers of processes, products and services in accordance with AS/EN 9100 8.4., QM001 Quality Policy (available on request) and QM002 Quality Manual.

2.2. Distribution

QM003 shall be distributed to sub-contractors, suppliers and the sub-tier supply chain. The most up to date version of this document is maintained online at <https://www.lockheedmartin.com/en-gb/suppliers/mfc-uk.html>. This document may be copied by Lockheed Martin suppliers and subcontractors (at any tier of subcontracting) for use in support of Lockheed Martin contracts provided that it is not modified in any way and that this and all other copyright statements are retained. The supplier is responsible for ensuring that its own organisation and entire supply chain that provides an end product or service which forms part of a product or service required by LMUK-A meets the appropriate quality requirements. This information to be controlled in accordance to relevant contracted security classification of information to be exchanged between LMUK-A and supplier. For example a Non-Disclosure Agreement may be required for exchange of proprietary information and data.

2.3. Definitions

The term "shall" or "must" indicates a mandatory action. "Should" signifies an expected action, though some flexibility is allowed in how it is carried out. "May" denotes that the action is optional or at the discretion of the individual.

2.4. Order of Precedence

Any inconsistencies in this document shall be resolved based on the following order of precedence:

1. Applicable statutory and regulatory requirements
2. The contract (purchase order), including any special terms and conditions
3. Drawings, design data and any approved concessions or production permits
4. The Statement of Work (if applicable)
5. QM003.

3. Approved Supplier Minimum Requirements

3.1. Quality Management System

The minimum quality requirement for all suppliers of goods supplied, work performed and services provided to QM003-A & QM003-B shall be Quality Management System (QMS) certification to ISO9001 by a [UKAS](#) (or equivalent [IAF member](#)) accredited certification body. The certification scope of approval must include the work or service being provided.

3.1.1. Supplier Responsibilities

Suppliers are required to provide current and valid copies of their Quality Management System (QMS) certification, including the scope of certification. Suppliers must ensure that updated copies are submitted promptly whenever renewals, changes or re-certifications occur.

3.2. Cyber Essentials, Data Handling and Security

Proprietary Information provided or to be stored in electronic form shall only be stored on electronic system(s) that have been certified to the HMG Standard [Cyber Essentials Scheme](#) (CES), or alternative certification approved by LMUK-A.

3.2.1. Handling Sensitive and Proprietary Data

Sub-tier suppliers and sub-contractors used by the supplier that have access to any sensitive or LMUK-A proprietary data must be authorised with a Non-Disclosure Agreement (NDA) in place with LMUK-A.

3.2.2. Security

Suppliers working at OFFICIAL-SENSITIVE/LEGACY RESTRICTED, will be required to undergo a security assurance visit and risk assessment by LMUK-A Security personnel prior to the exchange of any sensitive information. Following the initial security assurance visit, the supplier will be required to complete an annual security questionnaire for review.

3.2.3. Remote / Virtual Meetings with Lockheed Martin

The use of Artificial Intelligence (AI) recording or transcription tools during meetings conducted on Microsoft Teams or similar virtual collaboration platforms is strictly prohibited. This includes any AI-powered features or third-party applications that automatically record, transcribe, analyse or summarize meeting content. This policy is in place to protect the confidentiality of discussions, safeguard sensitive information and ensure compliance with data protection and privacy regulations. Participants must refrain from enabling or authorizing such tools at any point during meetings unless explicit prior written approval has been granted.

3.3. Supplier Quality Verification

Where deemed appropriate, suppliers are expected to fully support scheduled on-site quality verification activities conducted by LMUK-A. This support includes, but is not limited to, providing access to relevant facilities, equipment, personnel, documentation and quality records necessary to carry out the verification. Suppliers must ensure that LMUK-A representatives are granted timely and unrestricted access to areas involved in the production, inspection, testing or storage of goods or services being supplied. Cooperation in these activities is essential to confirm compliance with contractual, regulatory and quality requirements.

3.3.1. Types of Quality Verification

The type of verification activity to be performed shall be determined based on a risk-based approach and the level of verification or approval required by LMUK-A Supplier Quality. Factors influencing this decision may include the criticality of the product or service, historical supplier performance, complexity of the work, and compliance with applicable requirements. LMUK-A Supplier Quality will assess these elements to define the appropriate verification method to ensure that the delivered goods or services meet contractual, regulatory and quality expectations. Types of quality verification include the following:

Quality Verification	Description
Desktop Review	General review of quality capability
Document Review Verification	Verification of documentation accuracy
Product Audit	A focused examination of a particular product or a batch of products including traceability of materials
Production Process Audit	Evaluates processes against predetermined instructions or standards. Including special processes.
Special Processes Survey	Lockheed Martin Corporate level approval activity for special processes.
Test Witnessing	Review of test, calibration or validation activity including set up in accordance with standards.
Verification at Source	A focused examination of a particular product or a batch of products including the certification and end item data pack (if applicable) prior to shipment
Quality Requirement Review	On-site quality review of specific or general products, processes or requirements. Includes joint contract reviews with supplier and LMUK-A SQE. Less formal than an audit but may incur findings and actions.

3.4. Control of Externally Provided Processes, Products and Services

The supplier shall flow down the requirements of QM003 and must: -

- Ensure that externally provided processes, products and services conform to requirements
- Be responsible for the conformity of all externally provided products and services, including from sources defined by LMUK-A
- Ensure, when required, that LMUK-A designated or approved external providers, including process sources are used
- Identify and manage the risks associated with the external provision of processes, products and services, as well as the selection and use of external providers
- Require that external providers apply appropriate controls to their direct and sub-tier external providers, to ensure that requirements are met
- Determine and apply criteria for the evaluation, selection, monitoring of performance, and reevaluation of external providers, based on their ability to provide processes or products and services in accordance with requirements. The supplier shall retain documented information of these activities and any necessary actions arising from the evaluations

3.5. Right of Access

Suppliers and their sub-tier suppliers shall provide to LMUK-A, their customer, regulatory authorities and the Government Quality Assurance Representative (GQAR):

- The right of access to facilities where parts of the contracted activities are being performed including sub-suppliers' premises
- Information pertaining to the fulfilment of requirements in the Contract
- Unrestricted opportunity to evaluate supplier compliance with this document and conduct verification of product conformity.
- Assistance for evaluation, verification, validation, testing, inspection or release of the product to verify that Contract requirements have been accomplished at the supplier's or sub-supplier's premises
- Working area and facilities and the necessary equipment and staff available for reasonable use for performing verification
- Access to documented information in relation to products and services provided to LMUK-A to confirm product conformance.

4. Purchase Order Quality Conditions

4.1. QM003-A Quality Requirements for NATO Contracts

When referenced in the Purchase Order, Statement of Work, or contract documentation, QM003-A signifies that the work or services being provided are in support of NATO contracts and therefore subject to the full requirements outlined in QM003.

All Suppliers delivering goods or services for NATO contracts must comply with additional quality management system requirements in accordance with AQAP 2110.

- Software providers are required to comply with the NATO Supplementary Software Quality Assurance Requirements as outlined in AQAP 2210.
- Distributors of electronic components must be certified to EN 9120, ensuring appropriate controls over product traceability and handling.
- Testing and calibration laboratories are required to be certified to ISO 17025 to demonstrate technical competence and the reliability of their results.

4.1.1. Quality Plan

For high-value, high-risk or significant NATO contracts, the supplier shall submit a quality plan in accordance with AQAP 2105 when requested. To assist with this, an optional template form ([F0389](#)) is available and may be used to develop and present the deliverable quality plan.

4.2. QM003-B Quality Requirements for non-military contracts

QM003-B when indicated on the purchase order, statement of work or contract documentation indicates that work or services are for non-military contracts and that all requirements of QM003 apply with the exception of those imposed by AQAP 2110, AQAP 2105 and any Defence Standards.

4.3. QM003-C Requirements for Business Supplies, Works and Services

When referenced in the Purchase Order, Statement of Work, or contract documentation, QM003-C indicates that the requirements apply to business supplies, works or services that have no direct or indirect impact on the goods or services delivered by LMUK-A to its customer. No quality management system requirements apply. However, all goods and services provided must fully conform to the specifications, terms and conditions outlined in the purchase order, statement of work or contract documentation.

4.4. Calibrated Equipment or Services

All calibration and testing activities must be traceable to recognized national or international standards to ensure accuracy, reliability and consistency of measurement results. This traceability must be clearly documented and maintained as part of the supplier's quality records. Any calibration or testing must be conducted by laboratories that are certified to ISO/IEC 17025 or an equivalent accreditation standard. This certification must cover the specific scope of work being performed and demonstrate the laboratory's technical competence, impartiality and adherence to internationally accepted testing and calibration practices. An exception to this requirement may be granted for original equipment or product manufacturers who perform calibration or testing within their own facilities, provided they can demonstrate equivalent technical capability and traceability.

5. Product Traceability, Configuration and Certification

5.1. Traceability

Complete traceability throughout the entire supply chain must be maintained, including clear and verifiable links back to the Original Equipment Manufacturer (OEM) whenever applicable, particularly for contracts governed by QM003-A and QM003-B. This comprehensive traceability ensures that every component, material and process can be tracked from origin through to final delivery. Maintaining robust traceability is a critical measure to mitigate the risk of counterfeit or non-conforming articles entering the supply chain. It enables prompt identification, isolation and resolution of issues, thereby protecting product integrity, ensuring compliance with contractual and regulatory requirements and safeguarding the reputation of all parties involved. Suppliers are responsible for implementing and documenting effective traceability systems and must provide evidence of traceability upon request by LMUK-A or relevant authorities.

5.1.1. Traceability Requirement Table

Category	Traceability Requirement
Raw Material	Lot traceable to manufacturers part no and batch with original manufacturers MTC (Mill Test Certificate) Type 2.1, 2.2, 3.1 or 3.2
Manufactured Parts	Traceability shall be maintained for all product throughout production from raw material to finished product (including product quantities, split orders, nonconforming product etc.) Raw material used shall be Lot traceable to manufacturers part no, lot no, date code with Mill Test Certificate
Commercial off the Shelf (COTS)	Traceability through supply chain to Original Equipment Manufacturer (OEM)
Modified off the Shelf (MOTS)	Traceability shall be maintained for all product modifications throughout production from material to finished product (including product quantities, split orders, nonconforming product etc.) The originating COTS item(s) shall have Traceability through supply chain to Original Equipment Manufacturer (OEM) Requirements specified for Raw Material & Mechanical/Electrical parts also apply where applicable for item modifications
Electrical, Electronic & Electromechanical Parts	Lot traceable to Original Equipment Manufacturers part no, lot no or date code

5.2. Configuration Management

The supplier shall establish, implement and maintain a comprehensive configuration management process to effectively identify, document and control the physical and functional characteristics of products and services throughout their entire lifecycle. This process is essential to ensure that all product attributes remain consistent, accurate and traceable from initial design through to delivery and any subsequent modifications.

The configuration management process shall include, but is not limited to, the following key activities:

- **Identification and Control:** Clearly identify all configuration items and their attributes, including hardware, software, documentation and related components. Maintain strict control over these items to ensure traceability back to specified requirements and contractual obligations.
- **Change Management:** Implement a systematic method for managing changes to configuration items, ensuring that all modifications are reviewed, approved, documented, and communicated to relevant stakeholders. Changes must be controlled to prevent unauthorized alterations and to maintain product integrity.
- **Documentation Consistency:** Ensure that all documented information—such as drawings, specifications, and records—accurately reflects the current, as-built configuration of the product or service. Documentation must be regularly updated to reflect approved changes and maintained in an organized manner accessible to authorized personnel.
- **Verification and Audits:** Periodically verify that physical products and services conform to documented configurations through inspections, audits or reviews. Address any discrepancies promptly to maintain compliance and quality.

By adhering to these configuration management principles, suppliers will support the delivery of products and services that consistently meet quality, regulatory, and customer requirements throughout their lifecycle.

5.3. Certificates of Conformity, Calibration Certification and Test Reports

Certificates of conformity, calibration certificates and test reports are critical documents that verify products, equipment or systems comply with established standards and specification requirements. These documents serve as formal validation of quality, accuracy and reliability at every stage of the supply and production processes.

5.3.1. Calibration Certification and Test Reports

Calibration certificates and test reports shall fully comply with the requirements set forth in ISO/IEC 17025, which governs the competence of testing and calibration laboratories. This includes ensuring that the reporting of results is clear, accurate and complete, with all necessary information such as measurement uncertainty, traceability to national or international standards, environmental conditions and any deviations from standard procedures clearly documented. Compliance with ISO/IEC 17025 ensures the reliability and credibility of the calibration and test data, supporting informed decision-making and maintaining confidence in product quality and conformity.

5.3.2. Certificate of Conformity

A certificate of conformity is mandatory for all products and services supplied unless the service is covered by a calibration certificate or test report. This certificate serves as an authorized contractual assurance that the goods or services listed comply fully with the applicable drawings, specifications, technical data and contractual requirements. Each certificate of conformity must include information in accordance with DEFCON 627 or AS9163 standards, ensuring consistency and completeness. The certificate must clearly state that the products or services conform to the specific requirements. This formal declaration helps to confirm compliance, supports traceability, and provides confidence to all parties that the delivered items meet the agreed-upon quality and performance criteria.

Ref.	AS9163 Requirement	DEFCON 627 Requirement
a	Title - CERTIFICATE OF CONFORMITY	Supplier name and address
b	Page number	Supplier unique CofC reference number
c	Certificate number	Purchase Order Number
d	Date	QN number of any approved concessions and production permits
e	Organization (external provider) name and address;	Acquirer name and organisation (if different from LMUK-A)
f	Customer name and address	Delivery address
g	Purchase Order Number	Contract Item Number from the Schedule of Requirements (where applicable)
h	Line item number*	Line item number when there is more than one line item on the CofC*
i	Quantity	Description of Article or Service including MM part number (where applicable), Specification and issue / revision / configuration status
j	Description including MM part number	NATO Stock Number (NSN) (where allocated)
k	Revision	Identification marks, batch and serial number(s)
l	Traceability (batch or serial numbers)	Quantities
m	Remarks including QN numbers for approved concessions	A signed and dated statement of conformity by the Supplier's Authorised Personnel
n	Conformity details	Exceptions or additions to the above are to be documented
o	Statement of conformity	N/A
p	Name and signature of the individual authorized to release products or services to the customer	N/A

*Line item numbers can correspond to either the purchase order's line item format or the supplier's Certificate of Conformity line numbering system.

5.4. Documented Information Retention

Suppliers shall retain records relating to processing, testing, calibration, manufacture, supply, configuration, traceability and certification for a minimum of 7 years from end of contract date unless otherwise stated by contract or statutory requirements.

5.5. Serial Numbers

Parts designated as requiring serialisation shall be assigned unique serial numbers using sequential numerical values only. The serial numbers must increment in a strictly numerical, ascending order, starting from a predefined baseline number (typically 0001 with leading zeros as optional). Alphanumeric or non-sequential numbering systems are not permitted for serialised parts unless agreed or specified by design data, statement of work or purchase order. Serial numbers shall be recorded on all applicable documentation, including certification, test reports, concessions and production permits.

6. Counterfeit Avoidance, Detection, Mitigation and Disposition

6.1. Counterfeit Material

Counterfeit material presents a serious threat to the supply chain, with potential consequences including material loss, mission failure, or even risk to life. The primary defense against acquiring counterfeit parts is to thoroughly verify and understand the source of all components, regardless of the commodity type. Approved sources for mitigating counterfeit risks include the Original Component Manufacturer (OCM), Original Equipment Manufacturer (OEM) or their authorised distributors. Counterfeit material is defined as:

- An unauthorized copy, imitation, substitute or modified item, which is knowingly, recklessly, or negligently misrepresented as a specified genuine item from an original manufacturer or source.
- A previously used genuine item that has been salvaged or repurposed without disclosure to the customer.

Suppliers must establish and maintain a documented policy specifically aimed at preventing the introduction of counterfeit material. This policy should include an Anti-Counterfeiting Management Plan (ACMP) aligned with DEF STAN 05-135, especially for products and materials identified as having a risk of being counterfeit.

6.2. Electrical, Electronic and Electromechanical (EEE) Parts

Suppliers who procure and integrate Electrical, Electronic, and Electromechanical (EEE) parts into products supplied to LMUK-A are required to comply with the avoidance, detection, mitigation and disposition guidelines outlined in AS5553. This standard provides comprehensive controls to prevent counterfeit EEE components from entering the supply chain.

6.2.1. Obsolescence Management

Obsolescence can increase the risk of acquiring counterfeit EEE parts. To reduce the likelihood of purchasing counterfeit EEE parts, electronic equipment manufacturers should proactively manage the life cycle of their products through the use of an Obsolescence Management Plan or Diminishing Manufacturing Sources and Material Shortages (DMSMS) management plan. Suppliers shall notify LMUK-A in a reasonable time if a part is reported to be going obsolete.

7. Production Planning, Process Verification and Special Process Validation

7.1. Planning

7.1.1. Define and Review Requirements – Contract Review

The supplier shall determine the requirements can be met at the contract quotation stage. Commonly known as contract review, the supplier shall conduct and document a review process before committing to supply products or services demonstrating consideration for the following.

- Applicable statutory and regulatory requirements
- Requirements specified by LMUK-A, including the requirements for delivery and post-delivery activities
- Requirements not stated by LMUK-A, but necessary for the specified or intended use.
- Activities are covered in the suppliers QMS scope of certification
- Material and component availability, minimum order quantities (MOQ) and lead times
- Production, assembly, verification and special process capabilities meet requirements
- Drawing and design data characteristics, tolerances and any anomalies or queries
- Any sub-tier or external subcontract approvals and capabilities including the flow down of QM003
- First Article Inspection, End Item Data Pack (EIDP) or other documented information requirement
- Any deviations via a production permit request where LMUK-A requirements cannot be met or only partially met.

7.1.2. Supply Chain Quality Engagement

For orders that are considered significant due to their complexity, high value or elevated risk, a LMUK-A Supplier Quality Engineer (SQE) should be engaged to participate in the supplier's contract review process. The involvement of an SQE at this stage helps ensure that all quality-related requirements are thoroughly assessed and clearly defined, potential risks are identified and mitigated early and that the supplier is fully capable of meeting the contractual obligations. This proactive approach supports the successful execution of the order and helps maintain high standards of quality and compliance throughout the supply chain. Contact can be made with the SQA team via email: amphill.sqa@global.lmco.com

7.1.3. Competence, Training and Awareness

The supplier shall ensure that personnel involved in order processing or any work impacting product or service conformity are properly trained and understand the significance of their roles in meeting the requirements of LMUK-A contracts and related documentation.

7.1.4. Business Continuity and Disaster Management Planning

For QM003-A and QM003-B contracts, suppliers shall have a Business Continuity Plan in place, aligned with the requirements of ISO 22301. This includes establishing, implementing, operating, monitoring, reviewing, maintaining and continually improving a documented management system to protect against, reduce the likelihood of, and ensure preparedness for, response to, and recovery from disruptive incidents.

7.2. Process and Design Failure Mode Effect Analysis

The supplier shall identify and assess risks within its processes, including design, where applicable and take appropriate actions to eliminate or mitigate them. This should be demonstrated through the use of Design Failure Mode and Effects Analysis (DFMEA) and/or Process Failure Mode and Effects Analysis (PFMEA). Outputs from the PFMEA shall be used to develop process control documentation. For additional guidance, refer to AS13004: Process Failure Mode and Effects Analysis and Control Plans.

7.3. Process Control and Documentation

The supplier shall control the production process to ensure configuration control and repeatability. Documented information for activities to be performed and results to be achieved can include process flow charts, control plans, production documents (e.g., manufacturing plans, travelers, routers, work orders, process cards) and verification documents.

7.4. First Article Inspection (FAI)

The primary purpose of FAI is to verify that production processes are capable of producing parts and assemblies that meet LMUK-A engineering and design requirements. A well-planned and executed FAI will provide objective evidence the supplier's processes can produce compliant product and that they have understood and incorporated associated requirements.

7.4.1. AS9102 First Article Inspection Report (FAIR)

When indicated on the purchase order a FAIR in accordance with AS9102 shall be submitted electronically prior to first delivery of all products to giinspection.fc-amphill@global.lmco.com. Additional full or partial FAIRs shall be provided when changes listed in AS9102 4.6 f. 1-6 occur. Guidance on the FAIR process is detailed in the LMUK-A [First Article Inspection Guidebook](#).

7.5. Special Processes

A special process is any process where the conformity of the resulting output cannot be fully verified through subsequent inspection, monitoring or measurement. As the quality of the final product relies on the accurate execution of the process, special processes must be validated and periodically revalidated. This involves the application of strict controls, the use of approved equipment and procedures and the involvement of qualified personnel to ensure consistent, reliable and compliant output.

7.5.1. Validation and Control of Special Processes

Suppliers that perform special processes shall establish documented information for special processes including: -

- Definition of criteria (specifications) for the validation and periodic re-validation of the processes.
- Determination of conditions to maintain the approval
- Approval of facilities and equipment and qualification of persons
- Use of specific methods and procedures for implementation and monitoring the processes
- Record retention of periodic testing (re-validation)

7.5.2. Special Processes Guidebook & Reference List

For detailed information, including definitions, requirements and a comprehensive list of special processes commonly used in aerospace, space and defence manufacturing programmes, refer to the [SPG01 Special Processes Guidebook](#).

7.5.3. Nadcap

Suppliers are encouraged to obtain or use [Nadcap](#) accredited sub-tier suppliers for special processes. Nadcap accreditation provides assurance that special processes performed are sufficiently validated and re-validated to industry standards and specifications.

7.5.4. Welding

All welding conducted by suppliers and their sub-tier shall be approved and re-approved by LMUK-A supplier quality via successful completion of a special processes welding survey / audit.

7.5.5. Surface Engineering and Chemical Processing

All surface engineering and or chemical processing performed on LMUK-A parts by suppliers and their sub-tier shall be approved by LMUK-A supplier quality via successful completion of [quality verification](#) activity proportionate to the risk and level of approval required.

7.5.5.1. Zinc Plating

Suppliers and sub-tier suppliers that Zinc plate parts for LMUK-A, unless otherwise agreed or called out in design data, shall use Def Stan 21-5 Table 1.6b Process 19-4 standard and Zinc Plate to ISO 2081 Fe/Zn5/A (Clear trivalent passivate) or for Zinc plating of fasteners shall use ISO 4042 Zn5/An.

7.5.5.2. Paint and Coating System Application Process

All painting and coating conducted by suppliers and their sub-tier shall be approved by LMUK-A supplier quality via successful completion of a [quality verification](#) activity proportionate to the risk and level of approval required.

7.5.5.3. Coating Adhesion Test / Process Validation

Where products are painted or coated by other means E.g. dry film lubricant (DFL), sufficient conditions shall be met to ensure effective adhesion is maintained in accordance with one of the following acceptance criteria.

- ISO 2409 Table 1 Class 0

- ASTM 3359 Test Method A (X-Cut): 5A (No Peeling or removal) or ASTM 3359 Test Method B (Cross Cut): 5B (0% Removed).

Periodic re-validation adhesion testing shall be performed on test coupons representative of product substrate and process. Frequency of testing shall be adequate to validate the paint process output. Test records must be maintained traceable to the product.

Refer to ISO 2409 paragraph 12 and ASTM 3359 paragraphs 9 & 14 for test report requirements relative to testing criteria. The scratch test method or its equivalent should be employed to evaluate the adhesion of Physical Vapor Deposition (PVD) coatings.

7.5.5.4. Surface Finish Acceptance Criteria

Supplied product with surface finishes for functional or cosmetic applications shall be uniform in appearance, free from blisters, lifting or peeling coating, pits, nodules, scratches, stains, cracking, excessive contact / jiggling marks or any other defect. This includes but is not limited to electroplated, conversion coated, anodised, painted, mechanically finished and passivated surfaces.

7.5.6. Electrical / Electronic Assemblies and Cable and Wire Harness Assemblies

All contract electronic manufacturing printed circuit assembly suppliers and sub-tiers shall be approved by LMUK-A supplier quality via successful completion of a [quality verification](#) activity proportionate to the risk and level of approval required. This may include a IPC-J-STD-001 survey.

7.5.6.1. Requirements and Acceptance Criteria

The below table indicates requirements for electrical / electronic processes and products.

Process Control Requirement		
Process	Standard & Class	Description
Soldered Electrical and Electronic Assemblies	IPC-J-STD-001 Class 3	Requirements for Soldered Electrical and Electronic Assemblies
Product Acceptance Criteria		
Product	Standard & Class	Description
Printed Circuit Board Manufacture (PCB-M)	IPC-A-600 Class 3	Acceptability of Printed Boards
Printed Circuit Board Assembly (PCB-A)	IPC-A-610 Class 3	Acceptability of Electronic Assemblies
Cable and Wire Harness Assemblies	IPC-A-620 Class 3	Requirements and Acceptance for Cable and Wire Harness Assemblies
Electrical / Electronic Box Builds and Enclosures	IPC-A-630 Class 3	Acceptability Standard for Manufacture, Inspection and Testing of Enclosures

7.5.7. Lead Solder Requirement

Unless otherwise agreed and supported by completion of F0279 Pb-Free Supplier Questionnaire and an approved lead free control plan is in place, all electrical / electronic soldering shall be Lead solder.

7.6. Preservation of Product

The supplier shall preserve the product during internal processing, storage and delivery to the intended destination.

7.6.1. Shelf Life

Supplied products containing items with finite shelf life shall have the expiry date clearly identified on the product and the delivery documentation. The remaining shelf life must be a minimum of 80% of the total shelf life for the material at time of delivery unless otherwise specified by LMUK-A.

7.6.2. Packaging, Storage and Handling

The supplier shall adequately plan and ensure that products are protected, packaged and labelled as specified by contract. Where no packaging is specified, the supplier shall package to a standard that will provide adequate protection against damage, deterioration, corrosion, contamination and loss. The supplier shall ensure that the product packaging is labelled to a standard that provides adequate identification and traceability of the product. Any special handling or storage conditions must be clearly documented in the delivery paperwork. For example, temperature and humidity. Hazardous materials shall include appropriate safety data sheets (SDS).

7.6.3. Electrostatic Discharge (ESD)

Product supplied that are ESD sensitive shall be handled, packaged and labelled as such. This includes adequate ESD shielding and dissipative materials. Clear ESD labelling shall be used on external and internal packaging. Suppliers that handle ESD sensitive product must implement the requirements of ANSI/ESD S20.20.

7.6.4. Foreign Object Debris (FOD)

Inclusion of FOD is a nonconformity. The supplier shall establish a process to detect and prevent Foreign Object Debris. This should be in accordance with AS9146 or NAS412.

As a minimum the process shall include: -

- FOD process review
- Training of FOD practices
- Material handling and product protection
- Tool / hardware accountability
- Lost items search and documentation process

- Physical entry control into FOD critical areas
- Inspection for foreign objects prior to closing apertures and compartments during assembly

7.6.5. Firearms and Weapon Components

Suppliers transporting weapons or weapon component parts must hold a current Home Office approval to transport goods controlled under the Firearms Act 1968, Section 5. For explosive items, the supplier shall contact Head of Safety Services at LMUK-A, 3 business days prior to delivery.

8. Deviations – Production Permit and Concession

LMUK-A expects quality to be built into the design and production process of our product and this is also the expectation of the supply chain. Conformity first is key to the delivery of world class product to our customers and this culture and mindset needs to be throughout the supply chain. LMUK-A relies on the supply chain to deliver conforming product free from defects. All deviations must be reviewed and approved (or rejected) at a LMUK-A Materials Review Board (MRB). There are two types of deviation; production permit and concession which are described below.

8.1. Production Permit

An intentional deviation, production permits are considered permission to produce an item that deviates from design data. This may be because of design anomalies, material availability issues or other unforeseen reasons. A production permit can only be requested prior to production.

8.1.1. Materials Database

To provide approved alternatives and substitutes LMUK-A maintain a materials database that specifies approved material grades for use based on a classification code system. Where a material classification code is specified on drawing or specification, the Supplier must refer to the [LMUK-A Materials Database](#) to identify acceptable material grades for use. When relevant, a specific materials database version reference shall be referenced within the contract. Only the specific materials database version referenced on the contract shall be used by the Supplier. The materials database shall only be used where a related material classification code is specified on the drawing or contracted specification. It shall not be used for legacy drawings that specify a specific material specification.

8.2. Concession

An unintentional deviation, concessions are considered permission to deliver nonconforming product. Requests for concession will only be approved under exceptional circumstances at LMUK-A MRB. Whether approved or rejected, concessions will impact the supplier performance rating. Concession requests must include root cause corrective action. The supplier shall continuously improve processes to achieve a zero concession ethos.

8.3. Request Process

Suppliers must liaise with, and submit the request via the LMUK-A supply chain representative indicated on the contract / purchase order. Suppliers may use their own documentation to submit a request providing the required information is included or [F0577 Supplier Deviation Request Form](#) can be used. When submitting a request for concession or production permit, the following information shall be included: -

Required Information for Production Permit and Concession Request	
Suppliers unique reference number	Previous (or similar) deviation QN reference
Type of request (Concession or production permit)	Detail of the requirement
Date of request	Detail of requested deviation from the requirement including associated risks
Supplier name and contact details	Any supporting information, photos, drawings and technical data
MM part number and part description	Root cause corrective action plan to prevent recurrence
Serial number(s) / batch number(s) and quantity	Supplier stakeholder(s) (digital) sign off
Purchase order number and line item number(s)	Fields for LMUK-A sign off, additional comments and assigned QN number

9. Control of Nonconformities

9.1. Problem Solving – Root Cause Corrective Action

When supplier nonconformities exist, the supplier must perform Root Cause Corrective Action (RCCA) to investigate through the causal chain to the root cause and implement corrective actions to address the root cause and prevent recurrence of the problem. It is imperative when conducting RCCA the problem is understood in simple terms. The [Root Cause Corrective Action Problem Solving Guidebook](#) is available for further assistance.

9.1.1. RCCA Supplier Training Module

Lockheed Martin Root Cause Corrective Action Supplier Training Module is available [here](#). This training module is intended for supplier use and provides an overview of RCCA including methodologies, tools, roles/responsibilities and execution. The module completion time is about 60 minutes and should be completed in one session.

9.2. Supplier Corrective Action Report (SCAR)

A Supplier Corrective Action Report / Request (SCAR) Form A-0108 is a Word document that is produced from LMUK-A SAP quality notification (QN) system and emailed to the supplier for completion and return. The form is based on best practice problem solving AS13000 8D methodology including the following sections to be completed: -

- Correct stakeholders and Subject Matter Experts (SME) involved in problem solving activity
- Define and understand the problem
- Containment – Stop the problem at work in progress and stores etc. Agree actions to repair, rework, replace affected product.
- Root cause analysis. Identify the root cause through the causal chain (direct, contributing and root cause)
- Establish corrective action plan to address the root cause to prevent recurrence
- Implement and review corrective action plan
- Identify similar potential root causes elsewhere (Risk and Opportunity) and establish and implement preventive action to prevent occurrence
- Recognition activities through risk and opportunity, lesson learned and PFMEA database

SCARs shall be processed to the following timescales; 5 working days to acknowledge receipt and provide a containment plan and a further 25 calendar days to return the completed SCAR or an equivalent 8D type form. Depending on the risk and impact of the nonconformity further investigation and verification activity may be required by the LMUK-A SQE. The LMUK-A SQE may be called upon to assist with the SCAR process with the supplier as a key stakeholder.

9.3. Supplier Performance Rating

Nonconformances on delivered hardware to LMUK-A are viewed as escapes by the Supplier, and as such will impact the Supplier's performance rating. In addition, late, incomplete or insufficient SCAR responses compound the Suppliers performance rating which influences LMUK-A's future source selection decisions.

9.4. Post Delivery Nonconformity Letter of Disclosure

The direct supplier to Lockheed Martin UK Amptill Ltd., including Distributors, must promptly notify the impacted organization, in writing, when a product or article has been released from the supplier and subsequently found not to conform to any requirement that was applicable when the product was released.

9.4.1. Disclosure Letter

The company letterhead is to be used and a management representative must sign the notification. The supplier must submit the notification to amptill.sqa@global.lmco.com and their respective LMUK-A supply chain representative. The disclosure letter must include as a minimum:

- A clear description of the non-conformity.
- Affected programs, part number(s) along with the traceability number (serial number, lot number, batch number, heat lot, manufacturing date, test reports, etc.);
- Delivered quantity, reference PO number and origin of PO, shipping date and shipping address for each suspect serial number, lot number, manufacturing date, etc.;
- Short-term corrective action (containment plan), including replacement parts availability (schedules), recovery plan and effectivity (i.e.: serial number, batch/lot number, manufacture date);
- Inspection procedure, test data sheets along with acceptance criteria, as required.
- Requirements for components/parts delivered to operators/client/repair stations, etc.
- Potential impact on product safety, if known.
- Statistical safety risk analysis (applicable to Line Replaceable Unit (LRUs), major components and structures that are proprietary vendor design parts/components);
- Root cause analysis (provide supporting data analysis);
- Corrective action implementation (effectivity serial number, lot number, data code, etc.);
- Long-term corrective action and preventive action must include details and schedules (provide evidence);
- Vendor Service Bulletin (where applicable);
- Reworked or repaired parts under disclosure letter and returned to Lockheed Martin UK Amptill Ltd facilities or sent directly to Operators must have a unique alphanumeric identifier and marking shall be permanent. Identifier and marking must be agreed upon by the Supplier.

9.5. Warranty

In the event that a product is identified as nonconforming after the expiration of any applicable warranty period, and it is established that the nonconformity was present at the time of delivery, the supplier is still expected to take full responsibility for investigating the issue. Specifically, the supplier shall conduct a thorough root cause analysis and implement appropriate corrective and preventive actions to avoid recurrence. These activities shall be carried out in accordance with the established Supplier Corrective Action Request (SCAR) process, irrespective of the warranty status of the product. This requirement supports LMUK-A's commitment to continuous improvement, long-term product reliability and accountability within the supply chain.

10. Lessons Learned

10.1. UK REACH: Chromates (Hexavalent Chromium) in Chemical Processing and Paint Systems

Def Stan 03-032 Parts 1 to 6 was updated to Issue 6 in January 2024, which included the removal of references to paint systems containing chromates. This update supports the regulatory objective to ensure that [substances of very high concern \(SVHCs\)](#) are progressively replaced with less hazardous substances or technologies, where technically and economically feasible alternatives are available. Certain chromate compounds such as strontium chromate, zinc potassium chromate and chromium trioxide are included on the [UK REACH Candidate List of SVHCs](#) due to their classification as SVHCs. An authorisation for the use of hexavalent chromium compounds has been approved under UK REACH for specific [Aerospace and Defence](#) applications. While this authorisation remains valid until **September 2036**, suppliers are expected to remain up to date with the [UK REACH authorisation status](#) of any chromate-based materials in use. Furthermore, suppliers must ensure full compliance with UK REACH obligations.

10.2. Poor Paint Adhesion

The application of a paint is a special process and is not straight forward. It requires defined process control to ensure requirements are met. Over the last 7 years significant costs in production stops, rework, repair and returns have occurred due to poor paint adhesion. As a minimum suppliers and sub-tier suppliers must ensure that sufficient periodic adhesion testing (validation) is conducted. Acceptance criteria is detailed in the [Paint Systems & Application Process](#) section in this document.

10.3. Availability of Defence Standards

Defence Standards (Def Stan) are freely available at no cost by signing up at <https://www.dstan.mod.uk/>

10.4. RoHS Compliant Zinc Plating

Def Stan 21-5 Table 1.6b calls out ISO 2081 and BS 6338. All Zinc plating shall be RoHS compliant. Only Trivalent Chromate (Cr3+) passivation shall be applied in accordance with ISO 2081 Para 6.3.

10.5. Supplier Quality Engineering Assistance

The LMUK-A SQE team can be contacted by email (amptill.sqa@global.lmco.com) for questions on any quality related subjects. By leveraging the expertise of the LMUK-A SQE team, stakeholders can expect to receive accurate, reliable and actionable information to address their quality-related concerns. Collaboration with the team can contribute to the continuous improvement of processes, products and services.

QM003 Issue Control

Date	Iss	Clause	Changes	Change by
22-Jun-2016	2	All	Complete re-write of Quality Requirements for Suppliers	Konrad Burgoyne
13-Mar-2017	3	All	Order of Precedence added; Delivery Quality Condition descriptions changed ISO 9001:2008 References removed. Figure 1 Additional Flow-Down Requirement Selection Flowchart amended in line with AQAP 2110 Edition D, AQAP 2110 Edition D (2016) supersedes AQAP 2110 Ed 3, 2120 and 2130; Part marking as per purchase order, design data or drawing added; The supplier shall ensure that full traceability is maintained and can be provided on request throughout the sub-tier supply chain added; Certificates must be traceable to the certifying quality representative or company official on request added; Reference to raw material certification where applicable and name of authorised certifying quality representative or company official removed; Deviation from design data generalised; Shelf life requirement increase to 80% unless otherwise specified; Figure 2 Delivery Documentation Requirement Flowchart added; Requests for deviation permit or application for concession amended in line with current process	Konrad Burgoyne
31-Oct-2017	4	All	Restructure of Document to align with ISO 9001 and AS9100 requirements	Craig White
05-Jan-2018	5	3.6	Addition of Regulatory Authority to 'right of access'	Craig White
30-May-2018	6	4.9.1	Change to C of C requirements (FAI)	Craig White
		4.11.2	Addition of Production Permit term	Craig White
		Appx 2	First Article Requirement clarification on flowchart	Craig White
03-Jul-2018	7	Appx 3	New section added to Appendix 3 to include Special Process Document References & update to Appendix 2	Craig White
27-Feb-2019	8	3.2 & Appx 3,	Re-write of Special Process Approvals and amendment to table	Craig White
		Multiple	Hyperlinks to LM web resources updated and obsolete hyperlinks removed	
21-Dec-2020	9	Multiple	Substantially re-written and restructured.	Jon Hood / Will Cullen
			15/02/2021- Clause 6.1 typo corrected - stated AS9102 not AS9120 for distributors certification. AS9120 added to appendix 3 table.	
05-Jan-2023	10	All	Concise and simplified re-write incorporating lessons learned	Konrad Burgoyne
09-Sep-2025	11	2.1 2.2 3.2.3 3.3 4.1 5.3 5.5 6.1 6.2 7.4.1 7.5 7.5.4.1 7.5.5 7.5.6 9.1.1 9.4 9.5	Text added: QM001 Quality Policy (available on request) and QM002 Quality Manual Copyright information added Prohibited use of AI during meetings added Joscar replaced with Supplier Quality Verification QM003-A Clarification of AS9120 for electronic component distributors. Test and calibration laboratories certified to ISO 17025 Certification Documentation clarification of required information Serial number requirement Minor clarification on counterfeit material Removal of AS6081 requirement Change of FAIR submittal email address Table of listed special processes removed and referenced in SPG01 Special Processes Guidebook link Addition of ISO 4042 Zn5/An for zinc plating of fasteners Addition of process control and product acceptance criteria table for electrical / electronic assemblies and cable and wire harness assemblies Leaded solder requirement clarification Addition of the RCCA Supplier Training Module Post delivery nonconformity letter of disclosure addition Clarification of nonconforming product and warranty addition	Konrad Burgoyne

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