

SUPPLIER QUALITY REQUIREMENTS

For all ETL Approved Suppliers

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Author / Process Owner	
QA Manager Approval	
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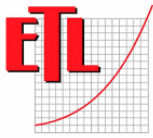
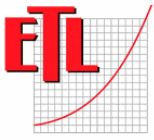


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1 Introduction

As Airworthiness legislation and customer contractual requirements necessitate a continued implementation of stringent quality disciplines and flow down of requirements throughout the supply chain ETL requires assurance from suppliers of satisfactory product quality.

This document details the Quality Management and assurance requirements expected by Electronic Technicians Ltd of its Suppliers and Sub-Contractors.

The requirements defined are mandatory and supplement the quality requirements and conditions of the purchase order.

This document shall form part of the contractual requirements between suppliers and ETL along with the Purchase Order, and any other documentation provided to enable the fulfilment of the order.

In the event of conflict between the requirements of this document and the requirements of the purchase order, the purchase order requirement shall take precedence unless otherwise agreed in writing by a member of ETL Quality or Purchasing departments.

Acceptance of a purchase order from ETL referencing this SQR-01 signifies supplier/subcontractor agreement to the conditions defined herein.

2 Quality Management System

The supplier shall establish and maintain a Quality Management System that complies, as a minimum, with ISO 9001. Compliance with an advanced quality standard such as Aerospace AS9100 (Manufacture), AS9110 (Maintenance & Repair) or AS9120 (Distributors) is preferred.

Suppliers with third party QMS certifications, from an internationally recognised Certification Body, shall provide copies of certificates (showing the Certification Body's UKAS, or equivalent, registration number) to ETL when a new certificate is issued or upon request. In addition, ETL shall be notified whenever there is a change in the suppliers business that affects the QMS including, but not limited to, any changes in the management structure or certification scope.

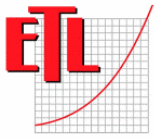
Where the service provided does not require the application of aerospace standards, or the company are unable to comply, ETL will undertake an assessment prior to approval as a Supplier which may include a physical audit.

3 Right of Access

Subject to reasonable notification where practical ETL reserves the right for a representative from ETL, an ETL customer, or a specified third party (end customer/regulatory agency), to perform an audit, inspection or assessment at the supplier's premises.

The supplier shall provide full rights of access to its facilities, processes, products in production, documents and records relating to product ordered by ETL.

Such verification shall not be used as evidence of effective control of quality, does not absolve the supplier of the responsibility to provide acceptable product and does not preclude any subsequent rejection by ETL or its customer.



4 Conflict Minerals

In July 2010 the United States enacted the Dodd-Frank Financial Reform Bill and Consumer Protection Act 1502(b) (Commonly known as the Conflict Minerals Law) which requires all US stock listed companies and their suppliers to disclose information concerning chain of custody and usage of conflict minerals. This refers to Tin, Tantalum, Tungsten and Gold mined in the Democratic Republic of the Congo and its adjoining 8 countries where revenues generated may, directly or indirectly, finance armed groups engaged in civil war resulting in serious human and environmental abuses.

ETL is committed to responsible procurement practices and has no intention of funding, in any way, the violations identified in the DRC or adjoining countries.

ETL requires its suppliers and sub-contractors to supply products that meet our, and our customers, specifications and requirements with regards to the above act and the traceability and sourcing requirements and restrictions it specifies. It is the suppliers responsibility to ensure that this requirement is reflected within their own supply chain.

5 Manufacturing Process Control

The supplier shall establish a production and quality control process that shall include, where appropriate:

- Specific requirements for compliant product (RoHS, REACH, material specs, inspection criteria etc.)
- Relevant safety information (H&S notices, COSHH requirements etc.)
- Identification of the equipment / machine and control programs for processing.
- A sequential description of the manufacturing and inspection steps.

The steps included in the process must be able to provide evidence of verification for any manufacturing or assembly characteristic that cannot be verified by a later inspection operation.

The supplier shall not change, as a whole, or in part, any product, material, process, specification or service without written approval from ETL.

Where a change is required due to obsolescence or withdrawal the supplier shall raise a permit / concession request as appropriate. (See 'Production Permit & Concession' clause.)

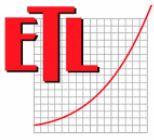
6 Record Retention

The Supplier will retain all manufacturing, purchasing and quality records associated with the orders for a minimum of 15 years after completion of the order (or until such time that the company ceases to trade). All documentation must remain legible and readily identifiable. The use of correction fluid (or other medium) on all forms of documents/records is prohibited.

Records shall be securely stored in a manner that makes them readily available at the request of ETL or regulatory bodies.

These records include, but are not limited to:

- Material receipt certifications
- Certificates of Conformance



- Works Routings
- First Article Inspection Reports
- Quality system records (control charts, inspection and test records / results etc.)
- Quality performance records (production part approvals, purchase orders and amendments etc.)

NOTE: Records shall be stored in either hardcopy or softcopy format – the softcopy must be stored in a format that cannot be amended or changed over time, e.g. scanned from hardcopy or ‘printed’ to a pdf or equivalent industry file format standard.

ETL must be notified and written permission gained from ETL Quality Department prior to disposal of any quality records. Instructions for disposal may provide for all records to be returned to ETL Quality Department for archiving with written agreement, in which case the records are to be collated together and fully identifiable to the appropriate ETL Purchase Order.

7 Sub-Contracting / Supplier Control

The supplier shall not sub-contract to a sub-tier supplier any work that is included in their scope of approval without ETL authorisation. The use of sub-tier suppliers shall be approved by ETL in writing prior to use. Any such approval will not relieve the supplier of the responsibility to ensure the quality of any product / service obtained.

ETL reserve the right to evaluate and/or audit any sub-tier sub-contractor / supplier.

The supplier is responsible for flowing down through their supply chain the relevant sections of this document and any specific requirements specified on the Purchase Order.

The supplier shall establish a process to verify that sub-tier purchased products and services meet the specified drawing and purchase order requirements including relevant sections of this SQR-01 document.

Verification activities may include inspection and audits on the sub-tier facility.

Sub-tier suppliers must be aware of the importance and their contribution to product compliance and safety, standards of ethical behaviour and counterfeit part prevention requirements.

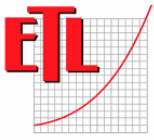
8 Special Processes

For orders supporting aerospace contracts, special processes shall only be performed by current NADCAP approved suppliers / sub-contractors.

Where a supplier / sub-contractor is not NADCAP approved for a particular requirement this is not included in their scope of approval and a suitable sub-tier supplier should be used.

ETL request all suppliers to maintain a list of all Special Process suppliers used in the manufacture of ETL Customers products.

Any process for production and service provision that cannot be verified by subsequent measurement or monitoring is classified as a special process. As per AS 9100 these processes include, but are not limited to:



- Chemical Processing
- Coatings (including painting)
- Composites
- Heat Treating
- Non-Destructive Testing
- Welding (Including Brazing)
- Nonconventional Machining & Surface Enhancement e.g. shot peening

The use of a NADCAP approved Special Processor does not relieve the supplier's responsibility for the quality of purchased products and services. Even though the sub-tier supplier has NADCAP approval, the ETL supplier still has the responsibility for oversight of that Supplier.

If a supplier requires use a non-accredited Special Process sub-tier supplier, the request must be submitted in writing to ETL Quality Manager. Written approval must be received before use. Any such approval will not relieve the supplier of the responsibility to ensure the quality of any product / service obtained.

9 Traceability

Traceability must be maintained through all stages of the suppliers manufacturing process, including the maintenance of inspection and test records.

All raw material obtained by the supplier to meet an order, and all parts incorporated into assemblies which are subsequently supplied must be traceable to the manufacturing source and identifiable to the manufactured item.

The Supplier shall maintain the identification of the configuration of the product in order to identify any differences between the actual configuration and the agreed configuration.

For any given product, the supplier must maintain the ability to retrieve a sequential record of its production, including manufacture, assembly, inspection and test.

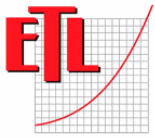
In the event of certain processes being further sub-contracted, traceability to the 2nd stage control, inspection and / or test records must be maintained and retrievable.

Documents relating to the traceability of items are included in the scope of the manufacturing, purchasing and quality records defined in the Record Retention clause.

10 Calibration Control

The supplier shall maintain a process for control and calibration of all test and measurement equipment used for verification of product characteristics. Calibration must be to the manufacturers specification or a recognised, published, national or international standard at appropriate intervals.

The suppliers system shall be based on ISO 10012 and include all inspection, measuring and test equipment.



11 First Article Inspection

Suppliers of manufactured items shall have a process requiring First Article Inspections to be carried out on each production run of a part number. This inspection shall be staged as appropriate to the build. The 'First Off' shall be identified at the end of the first production operation and shall be the first item processed and inspected at every subsequent stage of the production process.

First off inspection shall include full inspection of every attribute of a part specified including, but not limited to, part numbers used, workmanship, cleanliness, physical appearance, material, dimensions, finish etc. as appropriate to the product.

11.1 First Article Inspection Report

Where required under the Contract (Purchase order or Drawing requirement) the supplier shall produce a FAIR in accordance with the latest issue of AS9102.

The supplier is responsible for approving all sub-tier supplier FAIRs to AS9102 requirements.

ETL reserves the right to request additional copies of the FAIR from the supplier at no charge.

Documentation to be included in the FAIR pack submission are to include:

- Any associated and fully approved NCRs, permits or concessions
- Approved copies of any PAT/ATR or additional test data
- Lower level assembly FAIRS
- Sub-Contract supplier FAIRS
- Purchased part, component and material C of Cs (Showing traceability)
- Completed AS9102 Forms 1, 2 & 3
- Evidence of dimensional verification (this can be a CMM report, recording of records on a job traveller or inspection sheet or recording directly onto Form 3 etc.) where each measurement can be referenced to its drawing requirement.
- The delivery C of C shall be annotated to state that the parts are subject to a FAI.

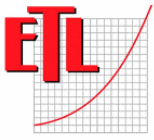
All other documentation and records relevant to product and process verification are to be retained by the supplier as per the retention of records clause in a manner that is readily identifiable to the relevant FAIR. These include, but are not limited to, protective treatment records, certificates of calibration for jigs / fixtures etc. material laboratory test results, other test result records required not already covered etc.

ETL reserve the right to request copies of supplier retained additional objective evidence records in support of the FAIR.

No FAI will be considered as complete until all non-conformances affecting the part(s) are closed and corrective actions have been implemented. The supplier shall conduct a partial (Delta) FAIR on the second run of a part that has been updated to clear previous NCRs, permits or concessions. This shall be repeated until the FAI can be classed as completed.

A Partial FAIR is only acceptable if there is a current full FAIR on file.

An updated FAIR shall be required as defined in AS9102 with one exception – the break in production requirement shall be reduced to one calendar year.



12 Foreign Object Debris / Damage (FOD) Prevention

The supplier shall have a defined FOD prevention system which is able to identify and control FOD and eliminate any further occurrences during manufacture, assembly or shipping. The system should preferably be based on the NAS412 standard.

The supplier's FOD prevention system shall include respective sub-contractor and sub-tier suppliers to measure effectiveness of compliance to requirements.

The supplier's FOD prevention system shall provide initial and periodic FOD training to relevant employees.

13 Production Permit & Concession

Any deviation from the drawing, Bill of Materials (BoM), purchase order or specifications defined including product, raw material, parts, processes, standards etc. shall not be permitted without authorisation.

Where necessary, requests for permission to deviate from documented requirements in advance of manufacture (Production Permit) and requests to accept or release items already manufactured which do not conform to documented requirements (Concession) are to be made in writing using the suppliers internal Permit / Concession request process.

Supplier must have documented procedures for managing product/process deviation, identification and documented procedures for non-conforming material identification, control, disposition, and disposal.

Suppliers are not authorized to proceed with a product or process deviation and/or disposition of non-conforming product without written approval from ETL.

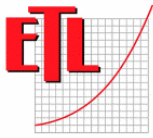
The Permit / Concession Number must be quoted on the suppliers CofC release documentation, and where identified, the part marked after the method has been agreed. Failure to observe these requirements will result in rejection.

Where the Permit / Concession is for less than the full quantity of an order the CofC shall identify the quantity affected. In addition, a label detailing the Permit / Concession number shall also be attached to each individual non-conforming item. If this is not possible due to size or configuration of the item the label may be attached to the bag containing the individual item.

14 Non-Conforming Product

The Supplier / Sub-Contractor shall have a system for the control of non-conforming items which must include provision for:

- Identification of non-conforming material or parts
- Segregation of such material or parts from acceptable items
- Documentation defining the nature of the defect and what remedial / corrective action has been authorised and undertaken. The document must clearly state the defective parts by number and serial / batch number
- Periodic review of product non-conformity
- Evidence to demonstrate that appropriate action has been taken to prevent recurrence
- Timely reporting (within 24 hours of findings) of delivered non-conforming product that may affect reliability or safety.



14.1 Rework

No rework shall be permitted on metallurgical or chemically treated parts without written approval from ETL Quality Manager and ETL customer Engineering. Re tempering of hardened and tempered parts to adjust material properties shall be permitted without approval but manufacturing records shall clearly record the operation, its parameters and the resulting properties achieved.

14.2 Repair

Repair procedures must be approved by ETL in advance of their use on ETL customer product. Approval of the repair procedure does not imply final acceptance of the product.

Known defective parts/material should not be sent to ETL without an approved Concession. This approved document shall be shipped with parts.

14.3 Scrap

Any product deemed as scrap shall be physically damaged beyond repair prior to removal from a bonded or production area for disposal. If the scrap involves product supplied by ETL, the Supplier must notify the ETL Buyer in writing and delay any "scrap action" pending formal instructions from ETL Buyer.

14.4 Supplier Discovery

When a supplier has any reason to suspect or knows that non-conforming product has been delivered to ETL, or ETL's customer, the supplier shall notify ETL Quality Department immediately. The notification must advise:

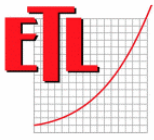
- Part numbers affected or drawing/specification requirement
- Quantity
- Detailed description of the non-conformance
- Purchase Order number(s) and line item number(s)
- Information identifying the non-conforming hardware, e.g., serial number, lot number, date of manufacture, etc.
- Shipping date, destination, carrier, bill of lading, or any other information necessary to locate the non-conforming product
- Cause of defect, if known at the time
- Dates when additional information or outcomes of investigations will be available
- Actions taken if sub-contractors or suppliers are involved and their corrective action plans

Supplier must cease all production activities related to the escape pending further ETL review.

14.5 ETL Discovery

ETL will contact the supplier and issue an NCR or request a SCAR against the parts prior to return. Returns will be systematically tracked and supplier DPPM (defect parts per million) will be recorded and monitored. Suppliers with a history of poor performance will be notified and shall be required to develop an acceptable improvement plan and schedule.

Continued poor performance and response to requests to improve may lead to removal as an approved ETL supplier.



The supplier shall ensure, with the manufacturer where necessary, that similar supplies are not similarly affected by a non-conformance and shall inform ETL of any non-conformities affecting product already delivered within 24 hours of identification.

The supplier is responsible for the withdrawal of products from stock that are suspected as non-compliant.

15 Counterfeit Parts

Suppliers must have a counterfeit parts prevention program capable of preventing the delivery of counterfeit parts to ETL and to control parts suspected or identified as counterfeit. Preference shall be given to suppliers with a program that is compliant to the SAE standard AS 5553 or AS 6081 for electronics and AS 6174 for material.

The Supplier is responsible for notifying ETL of any suspected counterfeit components used in ETL Customers designs immediately upon discovery, irrespective of whether the parts have already been delivered to ETL or not whether as part of an assembly or as components.

Counterfeit parts include the following considerations:

- Unauthorised copies or substitutes of an original Equipment Manufacturer or Original Component Manufacturer.
- Parts that are not traceable to an OEM or OCM, sufficient to ensure authenticity in manufacturers design & manufacture.
- Parts that do not contain proper external or internal material or components required by the OEM / OCM and are not constructed in accordance with the OEM / OCM requirements.
- Parts that have been reworked, re-marked re-labelled, repaired, refurbished but are represented as OEM / OCM authentic or as new.
- Parts that have not successfully passed all OEM / OCM required testing, verification, screening and quality control processes.

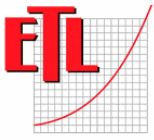
Parts shall not be procured from the “grey market” without express, written permission from ETL and shall be subject to a full review and shall require additional inspection and testing for every procurement batch.

Tests and inspections shall be performed in accordance with defined accept / reject criteria provided or approved by ETL or ETL customer. The minimum level of inspection and test for each part shall be as defined for a Level A requirement in AS6081.

On receipt of all components and after acceptance inspection the components shall be uniquely identified in a manner allowing traceability back to source.

Any parts identified as suspect counterfeit at ETL or ETL customer shall be immediately quarantined and the supplier informed. If parts are subsequently confirmed by inspection or testing as being counterfeit shall be destroyed and regulatory bodies shall be informed as per AS 5553.

All costs associated with or as a result of confirmed counterfeit parts shall be the suppliers liability.



16 Shelf Life / Storage Sensitive Devices or Material & Electro Static Discharge (ESD)

- The supplier shall ensure that if a supply has a limited Shelf Life it would have at least 75% remaining of the manufacturer recommendation at time of delivery to ETL.
- Shelf life expiry date shall be clearly displayed on the lowest level packaging of every item being supplied (not just on the container box).
- The supplier is responsible for the calculation of the expiry date based on manufacturing date and storage period according to the classification of the material.
- The latest Safety Data Sheets shall be provided with any updates.
- The delivery note and C of C shall include expiry dates and clearly define the required storage condition (e.g. temperature ranges, humidity).
- For rubber products, unless otherwise specified, the Shelf Life and storage conditions shall follow the guidelines of ISO 2230 section 6 & 7 (Rubber products – Guidelines for Storage).
- The packaging shall be opaque to prevent the product from degrading.
- The supplier is responsible for informing ETL about every case of non-conformity or concern identified by the OEM / OCM, by supplier itself or by other customers (including item re-call).
- The supplier shall maintain all OEM / OCM C of C and this shall be available for inspection and recall within 24 hrs at request of ETL, ETL customers and / or Regulatory Authorities.
- The retention period of C of C is as defined in the Record Retention clause of this document.

Any requested test reports and/or certifications shall include the expiration date including the day, month and year.

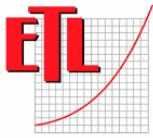
ETL reserves the right to reject and/or retain any material with less than 75% Shelf Life remaining. This data shall be stipulated on the C of C.

When temperature-controlled material is involved the Supplier shall ensure that the material is delivered to ETL in a manner that maintains its condition when dispatched.

When moisture-controlled material is involved, the supplier shall store material / components in a humidity-controlled environment or sealed in the manufacturer's original packaging and in accordance with recommendations, and if required baked in accordance with manufacturer's instructions.

Packaging for such materials shall be clearly marked as containing temperature / moisture-controlled material. ETL reserves the right to reject or retain any material where storage requirements have been exceeded.

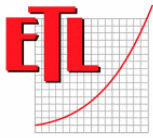
Supplier shall ensure that all ESD sensitive materials, devices, or assemblies capable of being degraded, damaged or destroyed by electrical static charge shall be handled in accordance with ANSI/ESD-S-20.20.

**17 Applicable Documents**

2202/95/EC (REACH)	Restriction of the use of Certain Hazardous Substances in Electrical & Electronic Equipment
AS5553	Fraudulent/Counterfeit Electronic Parts; Avoidance, Detection, Mitigation and Disposition
AS6081	AS6081 - Fraudulent/Counterfeit Electronic Parts: Avoidance, Detection, Mitigation and Disposition - Distributors
AS9100	Requirements for Aviation, Space and Defence Organisations
AS9102	Aerospace First Article Inspection Requirement
AS9120	Aerospace Requirements for Stockist Distributors
ISO 9001	Quality Management System Requirements
NAS412	Foreign Object Damage/Foreign Object Debris (FOD) Prevention

18 Abbreviations / Definitions

Chain of Custody	Chronological documentation or paper trail, showing the paper trail, custody, control, transfer, analysis, and disposition of physical or electronic evidence
CMM	Co-ordinate Measuring Machine
C of C	Certificate of Conformity
Counterfeit Part/s	An unauthorised copy, imitation, substitute, or modified part which is knowingly misrepresented as a specified genuine part of an original or authorised manufacturer
DS	Design Specification
ESD	Electrostatic Discharge
ETL	Electronic Technicians Limited
FAI	First Article Inspection (See AS9102 standard)
FAIR	First Article Inspection Report
FOD	Foreign Object Debris / Foreign Object Damage (See AS9146 standard)
ITEM	A detail component or an assembly
NADCAP	National Aerospace Defence Contractors Accreditation Programme. A Quality Standard to control non-standard processes such as Wire Erosion, Spark Erosion, Surface Treatment, NDT and Welding
NCR	Non-Conformance Report
OCM	Original Component Manufacturer
OEM	Original Equipment Manufacturer
PAT	Product Acceptance Testing



ELECTRONIC TECHNICIANS LTD

Top-Flight Electronics Manufacturing

Doc No: SQR-01

QA	Quality Assurance
QMS	Quality Management System
QS	Quality System
RCCA	Root Cause and Corrective Action
RoHS	Restriction of Hazardous Substances
Special Process (SP)	A process to establish properties of a product or material during the manufacturing process, the nature of which can usually only be verified at a specific point is the manufacturing process
SQ	Supplier Quality (encompassing Supplier Quality and Supplier Development functions)
SQR	Supplier Quality Requirements
Supplier	A Company providing material or a service to and/or working to drawings, specifications, etc. supplied by ETL.
Sub-tier Supplier	A company providing material or a service to the Supplier in connection with an ETL Contract
Traceability	Clear and auditable "Chain of Custody" from raw material or OEM / OCM to final delivery.
UKAS	United Kingdom Accreditation Service