



CAV Systems Limited

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## Quality Requirements for Suppliers (QRS)

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### RECORD OF REVISIONS

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Issue No	Effective Date	Prepared by	Approved by	Amendment details and identification
1	31 May 16	NM	KD	Release issue for CAV IP
2	11 May 17	NM	KD	Addition of anti-counterfeit requirement 21.0
3	22 Sep 17	PJW	KD	Corrections to numeric allocation of Sections 10 & 11 and Table of Contents
4	04 MAR 20	KD	KD	New logo & CAA form 1
5	24 MAR 23	KD	KD	Removal of EASA
6	23 OCT 24	KD	KD	Change to section 15.1 Retention Period & 23 Conflict Minerals.




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## Quality Requirements for Suppliers

### 1.0 Introduction

This document defines the requirements CAV Systems Ltd expect of their approved suppliers when carrying out work on any purchase orders placed by CAV Systems Ltd for components, assemblies, materials or processes.

### 2.0 Definitions

C of C	Certificate of Conformity
EDM	Electro – Discharge Machining
FAIR	First Article Inspection Report
NDT	Non-Destructive Testing
UK CAA	United Kingdom Civil Aviation Authority

### 3.0 Changes to Supplier / Sub-contractor Organisation

In the case of a change of ownership, name or location of the supplier, the CAV Systems Ltd Quality Department and/or Purchasing Departments shall be notified in writing as soon as possible – preferably, in advance of the said change.

Where there is a change to any senior personnel in the organisation e.g. Managing Director /Chief Executive Officer, Quality Manager, Operations Manager then the CAV Systems Ltd Quality Department shall be informed immediately.

### 4.0 First Article Requirements

The first production run carried out by each supplier shall be subject to a First Article Inspection in accordance with AS9102. The forms which form part of AS9102 shall be completed.

### 5.0 Release Requirements

#### 5.1 C of C

See appendix 1.

#### 5.2 CAA Form 1

Where the purchase order requests that the supplier release the goods on an UK CAA Form 1 in accordance with their CAA approval then the release shall be carried out in accordance with the requirements of the UK CAA.

#### 5.3 Raw Material / Mill Certificates and Analysis

In cases where the CAV Systems Ltd purchase order requests copies of raw material / mill certificates then, with each delivery the supplier shall furnish a copy of the incoming material certificate along with a copy of the certificate from the mill where the material was produced and the actual analysis results



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obtained by the mill or an associated test house confirming that all requirements of the relevant specification have been met.

Non aerospace material shall only be used when specified by the CAV drawing or when approved as a substitute for the specified material. It is not permissible for the sub-contractor/ stockist to upgrade material from commercial to aerospace grade, even when the chemistry and mechanical properties are shown by testing to conform. This can only be done by the original mill.

#### 5.4 Release Signatories

Each supplier shall maintain a list of approved signatories for release documentation which shall be furnished to CAV Systems Ltd on request.

### 6.0 Information for External Providers

The organization shall ensure the adequacy of requirements prior to their communication to the external provider.

The organization shall communicate to external providers its requirements for:

- a. the processes, products, and services to be provided ***including the identification of relevant technical data (e.g., specifications, drawings, process requirements, work instructions)***
- b. the approval of:
  1. products and services.
  2. methods, processes, and equipment.
  3. the release of products and services.
- c. competence, including any required qualification of persons.
- d. the external providers' interactions with the organization.
- e. control and monitoring of the external providers' performance to be applied by the organization.
- f. verification or validation activities that the organization, or its customer, intends to perform at the external providers' premises.



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- g. design and development control.
- h. special requirements, critical items, or key characteristics.
- i. test, inspection, and verification (including production process verification).
- j. the use of statistical techniques for product acceptance and related instructions for acceptance by the organization.
- k. the need to:
  - implement a quality management system.
  - use customer designated or approved external providers, including process sources (e.g., special processes).
  - notify the organization of nonconforming processes, products, or services and obtain approval for their disposition.
  - prevent the use of counterfeit parts.
  - notify the organization of changes to processes, products, or services, including changes of their external providers or location of manufacture, and obtain the organization's approval.
  - flow down to external providers applicable requirements including customer requirements.
  - provide test specimens for design approval, inspection/verification, investigation, or auditing.
  - retain documented information, including retention periods and disposition requirements.
- l. the right of access by the organization, their customer, and regulatory authorities to the applicable areas of facilities and to applicable documented information, at any level of the supply chain.
- m. ensuring that persons are aware of:
  - their contribution to product or service conformity.
  - their contribution to product safety.



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- the importance of ethical behaviour.

### 7.0 Inspection Requirements

#### 7.1 Source Inspection

Where the purchase order from CAV Systems Ltd states that source inspection is required then the supplier shall contact the CAV Systems Ltd Quality department at least one week before the goods are due to be finally inspected (two weeks for suppliers located outside the UK). CAV will then arrange for a representative to be present at and to verify the final inspection process at the supplier's premises. CAV Systems Ltd Quality Department reserve the right to waive this requirement, notification of which will always be made in writing to the supplier.

#### 7.2 Non-conforming product

Where non-conformance is identified within manufactured product which will mean a departure from the design definition when the product is delivered then this shall be notified to the CAV Systems Ltd Quality department immediately upon discovery and prior to delivery of the affected items. When a non-conformance identified means that material "free issued" by CAV must be scrapped then this shall be notified to the relevant purchasing point of contact within CAV Systems Ltd as soon as practicable. Non-conforming material shall not be delivered to CAV without receipt of prior written agreement from the CAV Systems Ltd Quality department.

### 8.0 Packaging Requirements

All items despatched to CAV Systems Ltd shall be packaged sufficiently to prevent any damage to components or surface treatments during the handling and transportation process.

Where there is a requirement for specific packaging for a particular product then this shall either be quoted on the drawing, quoted on the purchase order or the relevant packaging specification shall be quoted on the purchase order.

### 9.0 Tooling

Each supplier / sub-contractor shall maintain a definitive register of all tooling, production, inspection or other tooling which they hold that is used in the fulfilment of CAV Systems Ltd purchase orders. This shall include tool numbers, locations and calibration status.

All tooling used for inspection purposes shall be reviewed on a regular basis. Any discrepancies with tooling provided by CAV Systems Ltd identified during these



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reviews shall result in the suspension of the tool from use. This shall be communicated immediately to the CAV Systems Ltd Quality and Purchasing departments. All product produced from discrepant tools shall be quarantined and 100% inspected to identify conformity to design requirements prior to use.

For tooling owned by CAV Systems Ltd customers then the tooling register shall be maintained in a format conforming to the requirements of that customer's specifications.

#### **10.0 Sub-contracting**

Where the supplier proposes to further sub-contract any processes involved in the fulfilment of the purchase order then the CAV System Ltd Quality Department shall be notified in advance.

Sub-contracting shall only take place with companies listed on the CAV Systems Ltd Approved Vendor List unless written permission has been received in advance from the CAV Systems Ltd Quality Department.

Where sub-contracting occurs then the contents of this document in its entirety shall be flowed down to that supplier.

#### **11.0 Non-conventional Machining Processes**

##### **11.1 General**

No non-conventional machining processes are permitted on work for CAV Systems Ltd without prior written approval from the Quality Department of the CAV. Under no circumstances shall these processes be used for machining to final size.

##### **11.2 Laser Profiling**

Unless otherwise defined by drawing or specification, any items which have been machined using a laser cutting process shall be subject to further processing to remove at least 1.5 times the Heat Affected Zone or a minimum of 0.040 inch of metal from all faces subject to the cutting process. This material may be removed by either mechanical or chemical methods.

##### **11.3 EDM / Spark Erosion**

Any items which have been machined using an EDM / Spark Erosion process shall be subject to further processing to remove a minimum of 0.003 inch of metal from all



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faces subject to the cutting process. This material may be removed by either mechanical or chemical methods.

### **12.0 Welding**

#### **12.1 Qualification of Welders**

All welders are required to demonstrate their ability to produce acceptable welded joints to the engineering requirements of BCAR A8-10 (this is available from the UK CAA website as part of CAP 553) or an alternative agreed in advance by the CAV Systems Ltd Quality Manager.

Records relating to each welder shall be retained by the sub-contractor to demonstrate the continued proficiency of the welder.

Each welder shall prepare test pieces on an annual basis (or at the frequency specified by the relevant prime contractor) for each type of weld and material group to be welded. These test pieces shall then be tested to the requirements of BCAR A8-10 by a laboratory agreed by the CAV Systems Ltd Quality Department.

### **13.0 Special Processes**

Special processes in the context of this document are defined as any processes which cannot be verified by inspection subsequent to processing and thus require more stringent controls of the process parameters to ensure acceptable processing.

#### **13.1 Heat Treatment**

Any heat treatment required in the fulfilment of the purchase order shall only be carried out by suppliers approved to carry out heat treatment processes and listed on the CAV Systems Ltd Approved Vendors List. Heat treatment controls shall be in accordance with the relevant AMS specifications (AMS 2770, 2771, 2772 and 2750).

#### **13.2 Chemical Processing**

Any chemical processing required in the fulfilment of the purchase order shall only be carried out by suppliers approved to carry out the relevant chemical processes and listed on the CAV Systems Ltd Approved Vendors List. The required processing and controlling specifications will be called up on the drawing (either directly or indirectly).

#### **13.3 NDT**

Any Non-Destructive Testing required in the fulfilment of the purchase order shall only be carried out by suppliers approved to carry out the relevant processes and listed on the CAV Systems Ltd Approved Vendors list. The required processing and controlling specifications will be called up on the drawing (either directly or indirectly).





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### 13.3.1 Processing

The proposed testing specifications shall be agreed with the CAV Ice Protection Quality Department prior to carrying out any work on the order.

### 13.3.2 Personnel

All personnel carrying out NDT processes shall be qualified to the relevant National Standards acceptable to CAV Systems Ltd and to the appropriate Airworthiness Authority (EN4179 for example).

## 14.0 Design / Production and Production / Production Interface Agreements

Any orders placed by CAV Systems Ltd which request release of goods on an CAA Form 1 require that an interface agreement is in place between the supplier and CAV Systems Ltd. The format for this shall be agreed with the CAV Systems Ltd Quality department prior to shipment of the first items on the order.

## 15.0 Quality Records

### 15.1 Retention Periods

Those records defined in BS EN ISO 9001 or SAE AS9100 shall be available for scrutiny by CAV Systems Ltd representatives, their Customers or relevant Airworthiness / Aviation Authorities. They shall be retained for a minimum period of seven years, or longer if required by contract and **in no case are they to be disposed of without the prior written approval of the CAV Systems Ltd Quality Manager**, on expiry of the **Ten-year** period, the Supplier is required, if so instructed by CAV Systems Ltd to deliver designated records to the CAV custody.

### 15.2 Archiving of Records

Records should be archived in a safe and secure environment appropriate for the storage of paper documents.

If agreed in advance, then electronic archiving may be permissible subject to the agreement of the CAV Systems Ltd Quality Manager. Archiving of records, which are consigned from hard (paper) copies to microfilm/microfiche or electronic media (scanned images etc.), must be carried out in accordance with appropriate National Standards, e.g. BS 6498, acceptable to CAV Systems Limited and the Airworthiness Authorities. The continued integrity of archived records will be subject to review by the Supplier's internal quality audit function.



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### 16.0 Production Paperwork

The supplier shall ensure that production paperwork is created. This shall be detailed enough to communicate the engineering requirements to the manufacturing operatives. The production paperwork shall clearly indicate the status of a job at any particular time and shall also provide evidence of the inspection status of the items. This paperwork shall always accompany the items.

Any changes to production paperwork shall be reviewed in relation to the requirements of clause 4.0 of this document.

The production paperwork shall be sufficient to allow retrospective review of the sequence of manufacturing operations with times and dates as required.

### 17.0 Calibration

All tools and gauges used to verify conformance of items to be shipped to CAV Systems Ltd shall be logged and subject to regular calibration. This calibration shall be in accordance with and traceable to the relevant National Standards.

### 18.0 Product ID and Traceability

All product for shipment to CAV Systems Ltd shall be identified and traceable at all times. This shall include traceability to the individual batch / lot of raw material from which the goods were manufactured.

Traceability shall be sufficient to identify the following:

**Identification throughout the product life**

**All product manufactured from a single batch of raw material.**

**All product from the same manufacturing batch.**

**The destination (delivery, scrap etc.) of all items of a batch.**

**For assemblies the identities of all components used.**

Where CAV Systems Ltd send multiple batches of components to a subcontractor for any further processing the individual batch identities of these components shall be retained throughout processing and the subsequent shipment of the components back to CAV Systems Ltd.



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### **19.0 Document Control**

The supplier shall maintain a register of all drawings, specifications and other Engineering documents which are required for the supply of goods to CAV Systems Ltd. This shall include, as a minimum a record of the issue status and controlled locations.

### **20.0 Right of Access**

CAV Systems Ltd representatives, customer representatives and representatives of the relevant Airworthiness Authorities shall be permitted access to the supplier's site as and when required.

### **21.0 Drawing, Model and Specification Issues**

Drawing, Model and Specification issues will only be called up on CAV purchase orders where they differ from the current issue. If no issue is called up manufacture and processing shall be to the latest issue of the relevant CAV, customer or industry specification.

### **22.0 Anti-counterfeit**

CAV Systems Ltd adopts anti-counterfeit measures in order to eliminate the impact of counterfeit products on our customers.

To support these measures, CAV requests that its suppliers maintain appropriate processes to ensure purchases are only made from reputable sources approved by the supplier.

Should any suspected counterfeit parts affecting CAV supplies be identified by the supplier, the supplier should quarantine such parts immediately and report any suspected counterfeit items to the CAV Quality department, along with any appropriate authorities, as soon as possible.

### **23.0 Conflict Minerals**

Supplier acknowledges they must comply with laws and regulations applicable to direct or indirect procurement of critical materials and minerals as regulated by the Dodd-Frank Act, the Securities and Exchange Commission (SEC) under the adopted Conflict Minerals Final Rule. Conflict minerals currently include tantalum, tin, tungsten and gold "conflict minerals". Supplier confirms that products supplied, or services rendered under this order do not contain any "conflict minerals". Although we acknowledge Supplier may not be subject to these rules, our customers may at times request information related to items regulated under these regulations. At times Supplier may be asked to complete due diligence and provide information on products supplied or services rendered. Supplier agrees to perform best efforts in providing this information.



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## Quality Requirements for Suppliers

### Appendix 1: C of C requirements

#### 1.0 Introduction

All aerospace materials and supplies shall be released and conveyed under cover of the correct form of release document, i.e. a Certificate of Conformity, Approved Certificate, Release Certificate, etc as appropriate and as requested by the CAV Systems Ltd purchase order.

#### 2.0 Documentation

All Certificates of Conformity shall have:

- a. A unique serial number
- b. The name and address of the supplier
- c. A full and comprehensive description of the consignment which shall include the following minimum information.
  - I. Order Number
  - II. Part Number
  - III. Specification
  - IV. Description of Goods (including material condition, manufacture/cure date(s) etc as applicable
  - V. Serial numbers (if any)
  - VI. Batch Numbers
  - VII. Quantity
- d. A certifying statement
- e. Signature of an approved signatory

- 2.1 Attention shall be drawn to any item which does not fully meet the requirements of the order, drawing or specification, etc by means of suitable endorsements on the release documentation. Further, relevant information/data shall be transmitted in the same way.

Examples of circumstances/data requiring endorsement include, but are not limited to, the following

- 2.1.1 Additional requirements as requested by the purchase order
- 2.1.2 Condition of supply requirements.
- 2.1.3 Concession number granted.
- 2.1.4 Non-conforming items subject to further work after delivery.
- 2.1.5 Items with shortages or work outstanding
- 2.1.6 Reference to documents sent with the goods (e.g. First Article Inspection Reports).
- 2.1.7 Where CAV Systems Ltd have supplied free issue material, the supplier's release certificate for the end product shall quote the relevant CAV Systems Ltd material batch number on the release certificate.
- 2.1.8 When items are re-released following rejection the by CAV Ice Protection the CAV Systems Ltd Reject Note number shall be stated on the release certificate.



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## Quality Requirements for Suppliers

### 3.0 Direct Delivery Authorisation

Suppliers receiving purchase orders from CAV Systems Ltd requesting delivery to another supplier or direct to the CAV Systems Ltd customer shall send a copy of the release paperwork to the CAV Systems Ltd as notification of shipment to an address other than CAV Systems Ltd.

### 4.0 Approved Signatories

- 4.1 All release certificates shall be signed by the supplier's Quality Manager or his authorised nominee.
- 4.2 Personnel authorised to sign release certificates shall be listed in an appropriate authoritative document.