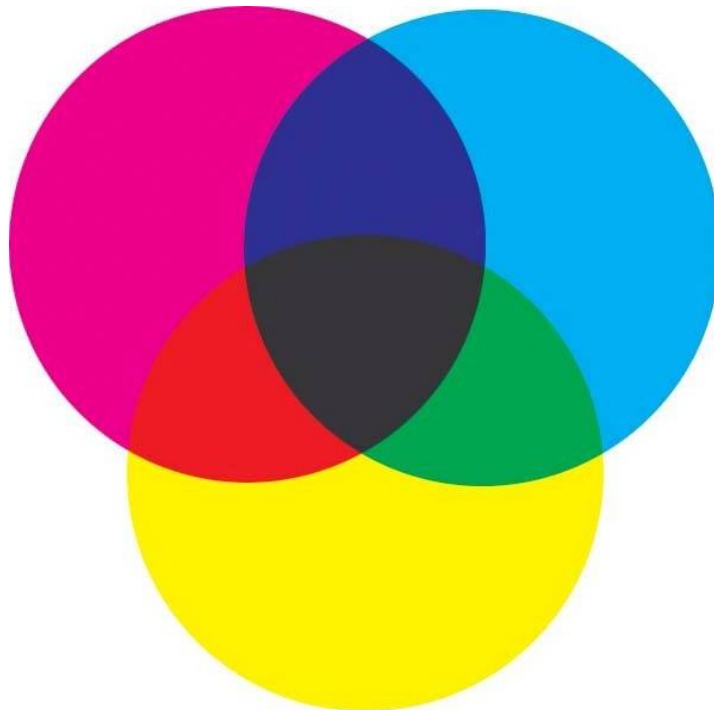




# Supplier Quality Requirements Manual



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TABLE OF CONTENTS

- i. EDAC's Integrated Management System Policy .....3**
- ii. Introduction .....3**
- iii. Scope.....3**
- 1. Supplier Agreement, Responsibility and Certification.....3**
- 2. Quality System Requirements .....4**
  - 2.1. Management Responsibility ..... 4
  - 2.2. Quality System..... 4
  - 2.3. Contract Review ..... 4
  - 2.4. Document and Data Control ..... 5
  - 2.5. Purchasing ..... 5
  - 2.6. Control of Customer Supplied Product..... 6
  - 2.7. Product Identification and Traceability ..... 6
  - 2.8. Process Control ..... 6
  - 2.9. Inspection and Testing ..... 7
  - 2.10. Inspection, Measuring and Testing Equipment Control..... 8
  - 2.11. Inspection and Test Status ..... 8
  - 2.12. Control of Nonconforming Material ..... 9
  - 2.13. Corrective and Preventive Action ..... 10
  - 2.14. Handling, Storage, Packaging and Preservation ..... 10
  - 2.15. Control of Quality Records ..... 11
  - 2.16. Internal Quality Audits ..... 12
  - 2.17. Training..... 12
  - 2.18. Statistical Techniques..... 12
  - 2.19. Production Part Approval - FAIR (First Article Inspection Report)..... 13
  - 2.20. Continuous Improvement ..... 13
  - 2.21. Manufacturing Capabilities..... 14
  - 2.22. Software Control (Non-deliverable) ..... 14
  - 2.23. Calibration Supplier Requirements ..... 15
- 3. Supplier Qualification ..... 15**
  - 3.1. Approved Supplier ..... 15
  - 3.2. Methods of Qualification and Continued Qualification ..... 15
  - 3.3. Right of Entry ..... 16
- 4. Purchasing Documents ..... 16**
- 5. Quality Planning..... 16**
  - 5.1. Control Plans ..... 16
  - 5.2. Process Flow Chart ..... 16
  - 5.3. Process Certification..... 17
- 6. Performance Rating ..... 17**
  - 6.1. Weighted Rating System ..... 17
  - 6.2. Quality Rating Calculation ..... 17
  - 6.3. Delivery Rating Calculation ..... 17
  - 6.4. Additional measurements..... 17
  - 6.5. Marginal..... 18
  - 6.6. Probationary status ..... 18
  - 6.7. Disqualification ..... 18
- 7. Environmental And Hazardous Material Processes ..... 18**
  - 7.1. Material Safety Data Sheets (MSDS)..... 18
  - 7.2. Visitors to EDAC facilities ..... 18
- 8. Confidentiality Agreement ..... 18**
- APPENDIX A: ..... 19**
- APPENDIX B: ..... 19**

i. **EDAC's Integrated Management System Policy**

**EDAC Technologies Corporation seeks to delight our customers by safely delivering the highest quality products on time with continual improvement of our performance. It is our social responsibility to protect our environment while maintaining full compliance with all applicable requirements and regulations.**

ii. **Introduction**

To meet the objectives of this policy, EDAC has implemented a quality system compliant with ISO 9001. This system is based on prevention and continuous improvement rather than defect detection.

EDAC recommends all suppliers of components or materials to be, or become, third party registered to ISO 9001:2008 International Industry Quality Standard or AS9100 Quality Management System Requirements for Aviation, Space & Defense Organizations. In cases where supplier is unable to obtain such registration EDAC may conduct on-site assessments of suppliers to make a determination of the supplier's ability to meet EDAC requirements.

iii. **Scope**

This manual will be used as a basis for establishing workable relationships between EDAC and all of its suppliers. It is part of the purchase order by reference. The direction in this manual will not relieve the supplier of the obligation to furnish material conforming to all the requirements of the purchase order. However, the document is not intended to supersede any applicable contract or specification requirement. When conflicts occur, the order of precedence shall be:

1. The contract or purchase order
2. The engineering drawing
3. Specifications called out on the engineering drawing
4. This document

This manual applies to all EDAC suppliers of production materials, parts and services. It does not apply to suppliers of office supplies, shop supplies, tools, lubricants, and other items/services not contributing directly to the manufacture of EDAC Technologies' products.

EDAC suppliers are expected to review, understand and comply with the requirements of the contract and of this manual. This manual is part of the purchase order by reference.

**Additional requirements are included that apply to suppliers of Aerospace products or services only.** Aerospace orders can be identified by the inclusion of the statement of end use included in the purchase order. If the classification of Aerospace order is in question, please contact your EDAC buyer for clarification.




**1. Supplier Agreement, Responsibility and Certification**

The supplier is responsible for establishing a quality system in accordance with this manual. The supplier's quality system shall prevent the shipment of nonconforming product, as well as minimize waste and costs.

The supplier is required to provide material in accordance with engineering specifications, statistical requirements and purchase order requirements, as outlined in this manual and as required by the purchase order.

The supplier is responsible for all materials supplied to EDAC, whether manufactured or processed by the supplier or procured from a sub contracted-supplier (sub-tier). The supplier will provide a corrective action plan to correct non-conformances of supplied material within required time as specified in section 2.13 of this manual.

## 2. Quality System Requirements



EDAC is required to use the ISO 9001:2008 standard when developing its supplier base. The following is an abbreviated summary of the ISO 9001:2008 requirements, as well as EDAC specific requirements relating to those requirements. Where applicable, additional AS9100 requirements are included and are noted for **Aerospace suppliers** only. Suppliers are expected to obtain their own copies of ISO 9001:2008 or AS9100 as appropriate. The EDAC supplier survey reflects these requirements and is used for initial qualification of EDAC suppliers.

- Supplier Survey Form Number 145 will be used to assess Suppliers

### 2.1. Management Responsibility

Suppliers must adopt a process approach when developing and improving the effectiveness of their Quality System. The Supplier's top management shall define its policy for Quality, including its objectives and commitment for quality. The supplier shall have a documented organization structure that is appropriate for its requirements. The Supplier's quality objectives and policies shall be clearly understood at all levels within the organization.

The supplier shall have a continuous improvement plan for processes and quality systems, with the status periodically reviewed and updated.

The supplier shall be responsive to EDAC needs. They shall have a system in place to address any customer-related problems and track key events such as quotes, tooling, pricing, quality, delivery and engineering problems.

### 2.2. Quality System

The supplier shall maintain an effective documented Quality System. The documented quality system should be defined with manual, procedures and instructions in accordance with requirements of ISO 9001:2008, or equivalent specification(s). Systems not well defined in the manual shall be well defined in a procedure or work instructions.

### 2.3. Contract Review

The supplier shall establish and maintain documented procedures for contract review and for the coordination of these activities. They shall review all orders to ensure that:

- All requirements are adequately defined and all differences are adequately resolved.
- The supplier has the capability to meet the contract requirements. Including a risk-analysis, identifying any risk factors that may impact the supplier's ability to fulfill all contract requirements.
- Pricing is accurate and any discrepancies are resolved in advance of shipments.
- Delivery dates are confirmed within 7 work days after receipt of order.
- Supplier has all applicable specifications and that they are at the revision level current at the date of the contract. Any needed customer specification stated on the purchase order shall be promptly requested from EDAC Purchasing Department.

Note: it is the supplier's responsibility to purchase any applicable Industry Specification to the current revision.

Any discrepancies or queries shall be resolved before the order or contract is accepted. Amendments and/or revisions to orders or contracts shall also be formally reviewed.

**2.3.1. Technical Conflict**

If there is a conflict of technical terms or conditions associated with a purchase order, the order of precedence shall be:

- Text of Purchase Order
- The Drawing(s) referenced on the order, including published changes.
- Documents/specifications referenced on the drawing or purchase order.
- Documents/specifications referenced in other documents/specifications including this manual. Conflict in such secondary documents requires resolutions by EDAC Purchasing supported by Supplier Engineering.

**2.3.2. Verbal Instructions**

Decisions between the supplier and EDAC's coordinating personnel shall not be binding upon either party unless authorized in writing by purchase order or amendment thereto.

**2.4. Document and Data Control**

The supplier must have a verifiable system and procedures for the distribution and updating of drawings, standards, specifications, procedures and work instructions. The system must prevent the use of outdated documents and assure that current documents are available and in use by all individuals and work areas which require them.

EDAC provided specifications and drawings are strictly proprietary. Suppliers are not authorized to copy, or in any way make use of EDAC provided information other than for the purpose of fulfilling specific contract requirements, without the written approval of EDAC.

**2.5. Purchasing****2.5.1. Subcontracting (Sub-Tiers):**

Suppliers must use subcontractors that are approved by EDAC's end use customer when applicable. The supplier shall be responsible to flow down all the EDAC purchase order requirements (down to the lowest tier) and ensure their adherence.

EDAC reserves the right to disallow work being performed by any subcontractor.

EDAC reserves the right to evaluate and audit any supplier subcontractor. Any such action will not relieve the supplier of his responsibility to ensure the quality of any product or service obtained.

**2.5.2. Subcontractor Controls:**

The supplier shall conduct a survey of the source/subcontractor facilities before placing business with them. The supplier is expected to have a system to evaluate its sources and subcontractors.

The supplier shall document the methods and survey used to evaluate a source or subcontractor's capability and shall maintain documentation of this process.

The supplier shall have a documented Approved Supplier List.

The supplier is expected to have a system for the control of material/product purchased from subcontractors to assure all incoming material meets physical, chemical, visual, functional and dimensional requirement.

The supplier must encourage its sub-suppliers to comply with the requirements of ISO 9000:2008, AS9100, or appropriate Industry specification(s).

**2.6. Control of Customer Supplied Product**

The supplier shall establish and maintain documented procedures for the control of verification, storage and maintenance of EDAC or EDAC's customer's supplied product. Any such product that is lost damaged or is otherwise unsuitable for use shall be recorded and reported to EDAC Purchasing for resolution.

**2.6.1. Supplier responsibility related to EDAC owned inventory**

EDAC owned inventory should not be consumed or processed in any way without a purchase order and release from EDAC Technologies.

Within 24 hours of receipt of EDAC owned inventory the supplier shall provide information on part numbers and quantities received.

EDAC reserves the right to inspect (with reasonable notification) any EDAC owned inventory held by suppliers.

**2.6.2. EDAC provided tooling & fixtures**

Upon receipt, the supplier shall inspect for identification and general condition. The supplier shall immediately report damaged, malfunctioning or otherwise unacceptable items to EDAC Purchasing.

EDAC provided tooling & fixtures shall remain the property of EDAC. Supplier is responsible for the value of any lost/damaged tooling & fixture, other than normal wear and tear resulting from usage.

EDAC owned equipment may only be used for the production of EDAC orders. EDAC reserves the right to audit and inspect EDAC furnished property and equipment.

**2.7. Product Identification and Traceability**

The supplier is required to establish a lot traceability system that provides for positive identification and record keeping for each part throughout the major phases of receipt, manufacturing, inspection, testing, to the finished product.

When suppliers are processing products with lot trace systems from other internal or external suppliers, they must maintain the identity of the original lot trace number.

**2.8. Process Control**

The Supplier shall develop and maintain documented procedures, operator instructions, process sheets and test instructions for production, where the absence of such documents could adversely affect quality.

The supplier shall notify EDAC of any significant process or design change that may affect the fit, form or function of deliverable product. Included but not limited to changes of the location of manufacture, manufacturing method and/or material used in the process.

The Supplier shall comply with all EDAC and/or their customer's requirements for documenting and controlling special characteristics.

Section 5 of this manual describes the process control methodologies employed by EDAC Technologies.

### 2.8.1. Special Processes

EDAC Technologies considers the following Supplier processes “special processes”. The process and or operators of the special process shall be qualified as deemed necessary by the applicable end use customer or a 3<sup>rd</sup> part registrar such as NADCAP. Note: Where a special process is in use, procedures shall be established by the Supplier to verify the accuracy, skills and special environments needed to perform such operations.

The list of “Special Processes” that EDAC Technologies requires elevated levels of quality and statistical process control, by the Supplier include, but are not limited to;

- Plating
- EDM
- Brazing
- Welding
- Heat Treatment
- Laser Marking/Engraving

### 2.9. Inspection and Testing

Inspection and testing activities shall be performed at a minimum of:

#### 2.9.1. Verification of Incoming Product

Verification of Incoming Product can include one of the following methods:

- Receipt of statistical data
- Receiving inspection and/or testing
- Second or third party assessment
- Part evaluation by accredited contractor or test laboratory
- Subcontractor warrants or certifications (in combination with one of the methods above.
- Incoming inspection may be waived if supported by statistical data.

#### 2.9.2. Final Inspection and Testing

Final Inspection and Testing shall be conducted according to established processes. Records of all inspection activities will be maintained in accordance with supplier retention schedules and procedures.

Final Inspection Test data - When required by EDAC drawing, contract or PO the supplier must assure reports are supplied with each shipment. Data must be reviewed for completeness and conformance as part of the final inspection process.



#### 2.9.3. Visual Inspection (For Aerospace suppliers only)

Supplier shall ensure that each individual performing visual inspection has an eye examination at intervals of not greater than one year and that, if necessary or if correction is prescribed, each individual uses the required corrective lenses when performing required visual inspections.

All individuals performing visual inspection shall be capable of meeting the following eyesight requirement:

Near Vision: Snellen 14/18, (20/25), Jaeger 2 at 14 inches, or Ortho-Rater 8.

Color: Ability to distinguish red, green, blue and yellow as determined by Standard Colored Plates.

Reference: ASQR-01 Aerospace Supplier Quality Requirements

### 2.10. Inspection, Measuring and Testing Equipment Control

The supplier must utilize and maintain adequate inspection, measuring and test equipment to ensure the accuracy of all materials supplied to EDAC. The supplier shall ensure the environment for performance of inspections and test is adequate in respect to temperature, humidity, vibration, lighting and any other factors that could affect the accuracy of inspection and test results.

The supplier must maintain a documented calibration system for all measuring and test equipment. All personal measuring instruments are to be included in the program. The calibration program shall comply with the requirements of ISO 10012-1, ANSI/NCSL Z540-1, or equivalent and must be traceable to the National Institute of Standards and Technology (NIST). Evidence of evaluation and calibration shall be recorded and made available to EDAC upon request. The supplier shall notify EDAC Quality in the event of any calibration failures that may affect any products previously supplied.

#### 2.10.1. Gage R & R

EDAC may require that the amount of variation caused by the measurement system be determined by performing Gage R & R studies.

Gage R & R Studies are required whenever Critical Characteristics have been identified, either on the blueprint or purchase order. Total Gage variation shall not exceed 20% of the blueprint tolerance unless specifically authorized by EDAC.

### 2.11. Inspection and Test Status

The inspection and test status of product shall be identified by suitable means, which indicates the conformance or non-conformance of product with regard to inspections and tests performed.

The identification of inspection and test status shall be maintained, as defined in a control plan and/or documented procedures, traceable throughout production and delivery of the product to EDAC to ensure that only product that has passed the required inspections and tests are shipped.

Note: Location of product in the normal production flow does not constitute suitable indication of inspection and test status.

#### 2.11.1. Government Source Inspection / Customer Source Inspection (GSI/CSI)

When GSI or CSI is a requirement, it shall be stated as such in the Purchase Order. Unless otherwise specified on the purchase order the following notifications are required:

- For GSI the supplier will be responsible for contacting their local Defense Contracts Management Agency (DCMA) office to arrange for government source inspection. Notification shall be made 48 hours in advance of the time the products are ready for inspection or test.
- For CSI or if the supplier doesn't have a government representative, EDAC shall be notified immediately upon completion of production.

Upon request for source inspection the following information as a minimum shall be provided:

- purchase order number
- amendment number
- line item number
- drawing number
- piece or group number
- revision
- quantity
- type of inspection, either in-process or final



When required by contract, the Supplier shall pass this same requirement on to its subcontractors in procurement documentation.

Under no circumstances will GSI/CSI requirement relieve the supplier of their responsibility for complete inspection/test and production of quality parts.

When GSI/CSI is not required, both the Government and Customer reserve the right to inspect at the source, parts and/or services manufactured or performed within the supplier's facility or their subcontractor's facility.

### 2.11.2. Technical Plan

When a Technical Plan is required either by EDAC or EDAC's customer, the supplier will be required to develop a detailed Technical Plan describing the intended steps in producing the part.

The Technical Plan will be sent to EDAC for approval. EDAC will obtain approval from the customer or internally as necessary. When approved, a signed copy of the Technical Plan will be sent back to the supplier. In the event that the supplier's process is deemed proprietary, the supplier may submit the Technical Plan directly to the customer. The supplier shall not commence work until an approval has been obtained.

The supplier is expected to perform work in strict adherence to the proper revision of the Approved Technical Plan.

### 2.11.3. Certificate Of Conformance

A Certificate of Conformance, indicating parts meet all applicable specifications, is required for each shipment. This certificate must be signed or stamped by an authorized company representative. It must contain, as a minimum:

- Supplier Name And Address,
- EDAC's Part Number And Revision Level
- Purchase Order Number
- Quantity Shipped
- Date Shipped
- Heat lot number (raw material, forgings, castings)
- Applicable Specifications & Revision level
- If a Technical Plan requirement is applicable, The proper revision of the Technical plan shall also be stated in the Certification

### 2.12. Control of Nonconforming Material

The supplier shall establish and maintain a system to ensure that all non-conforming and suspect product is immediately identified, segregated and dispositioned. The supplier is expected to properly record all non-conformances and dispositions.

When a supplier becomes aware that nonconforming or suspect material has been shipped to EDAC, the supplier shall implement the following:

- Promptly notify EDAC Supplier Quality or Purchasing, that EDAC may have received the nonconforming or suspect material.
- Communicate to EDAC what corrective action has been taken.
- Any product or services provided by the Supplier which do not meet the acceptance criteria, whether found by EDAC or EDAC's Customer, will be rejected and the supplier will be responsible for correcting all nonconformances.

Lots determined to be non-conforming by EDAC are subject to one or more of the following dispositions with the supplier's concurrence.

- Return to the supplier.
- Scrap at EDAC facility at supplier expense.

- EDAC reworks the lot at supplier expense.
- EDAC performs 100% inspection, at supplier expense, and returns defective products to supplier
- Use, but provide notice of non-conformance and make adjustments necessary to compensate for deficiencies.

### 2.13. Corrective and Preventive Action

When either EDAC or the supplier discovers a non-conformance, the supplier must have a formal system to resolve the problem and verify that the solution implemented resulted in correcting the non-conformance.

The supplier shall utilize the Eight Discipline (8D), 5 Why method, or suitable alternative. The supplier shall take corrective action, when it is determined that the process is not stable or capable of producing the required product, and/or when it is verified that material does not conform to specifications.

Corrective actions must address the root cause of the nonconformance or instability, and may not be closed until the effectiveness of the action can be verified.

EDAC reviews incoming production material to ensure conformance with all applicable specification requirements. Review of the material also extends up to the time of actual use of an item or when a production operation has been performed on an item. If a nonconformance is detected by EDAC in any of these stages of review, a Supplier Corrective Action Request (SCAR) will be issued to the supplier. Nonconformance includes, but is not limited to, product nonconformance, administrative elements, (i.e. packing list errors, invoice errors, Document omissions, nonconforming packaging etc.)

Suppliers who fail to provide adequate corrective action by the due date assigned on the Supplier Corrective Action Request, may be subject to performance penalties up to and including suspension of the supplier's qualified status.

Nonconformance of a repeated nature is an indication of poor root cause identification, or correction. EDAC will institute progressively stringent containment requirements, specific to the nonconforming material, on that supplier. The extent of the containment requirements will be based on the severity of the nonconformance, and the risk they pose to EDAC or its customers. Action may include suspension of the supplier's qualified status.

### 2.14. Handling, Storage, Packaging and Preservation

The supplier shall establish controls to ensure that product is not damaged during manufacture or transportation to EDAC. The supplier shall comply with special packaging and/or preservation requirements that may be included in purchase order specifications or drawings.



### 2.14.1. Foreign Object Damage (FOD) (For Aerospace Suppliers Only)

A FOD preventative program must be documented and implemented to protect EDAC and its customer's product at all times. Suppliers shall establish methods and facilities for identifying, handling, and storing articles to ensure against contamination, corrosion, damage, deterioration and invasion of foreign objects or substances. For components, sub-assemblies susceptible to foreign object debris and damage, the supplier shall ensure articles are free from foreign objects and foreign object damage resulting from supplier processing. Specific attention should be given to:

- Food & beverage controlled
- Proper cleaning of internal cavities
- Tool and small part accountability control
- Loose objects

Reference: Supplier may consult <http://www.nafpi.com/nafpiguide.pdf> for additional information.

### 2.14.2. Preservation

All drawing oils and rust preventatives used by the supplier for the preservation of finished product must be in compliance with EDAC's Environmental Policy (section 7). The supplier shall comply with any special packaging and/or preservation requirements that may be included in purchase order specifications or drawings.

### 2.14.3. Packing Slips:

Packing slips must be secured to accessible area on outside of carton(s) or pallet(s) and have suitable protection.

### 2.14.4. Delivery and Freight (Shipping to a non-EDAC location)

#### General Instructions:

Unless directed by EDAC Technologies buyer all freight is to be shipped collect to the EDAC account. The supplier will be responsible for cost of all freight not shipped in accordance with EDAC Instructions.

EDAC Technologies Traffic Management will communicate documents that outline the preferred method of carriage. Carrier selection is based on the location, the size and weight of the shipment. Should the suggested carriers not service the shipper's location, call your EDAC Buyer for alternate routing.

### 2.15. Control of Quality Records

The supplier shall establish a documented procedure to define the controls needed for the identification, storage, protection, retrieval, retention and disposition of records.

EDAC requires that the Quality Records pertinent to the manufacturing of the product to be available for evaluation per the following record retention requirements.

- FAIRs (First Article Inspection Reports), control plans, tooling records, purchase orders and amendments shall be maintained for three calendar years after the last delivery of that product.
- Quality performance records (e.g., control charts inspection and test results shall be retained for seven calendar years after the year in which they were created, or per the end use customer requirement, whichever is longer.
- Records of internal quality system audits and management review shall be retained for three years.

Records must be complete, legible and identifiable to the corresponding product and shall be readily retrievable. Electronic records can be kept, but must be stored and maintained in the same manner as all "hard copy" records. All records shall be stored in such a way to prevent loss, deterioration or damage for the entire retention period.

Note: These requirements do not supersede any governmental or customer requirements. All specified retention periods shall be considered "minimums".



### **For all Aerospace suppliers**

Record Retention times shall conform to AS9100 in addition to the applicable customer requirements as flowed down in the purchase order.

#### **2.16. Internal Quality Audits**

The supplier shall have a formal documented method for auditing the complete quality management system. The audit shall verify whether quality activities and results comply with planning and to determine the effectiveness of the system.

#### **2.17. Training**

The supplier shall ensure that its personnel are aware of the relevance and importance of their activities and how they contribute to the achievement of the quality objectives.

The supplier shall establish and maintain a system for identifying the training needs and providing the training for all personnel performing activities affecting quality.

The supplier shall evaluate the effectiveness of this training and shall maintain appropriate records of training and job qualification.

#### **2.18. Statistical Techniques**

##### **2.18.1. Statistical Process Control (SPC)**

When deemed necessary or when EDAC specifies on the purchase order SPC shall be used to monitor and control a process and/or part characteristic. When not required by purchase order, suppliers are strongly encouraged to use SPC as a tool for continuous improvement, to monitor and control processes and to demonstrate process capability.



**For Aerospace Suppliers**, some customers may require that statistical procedures be applied to all transformational processes. In such cases this requirement will be stated on the purchase order.

When SPC is required, the supplier shall provide variable data control charts and a statistical capability analysis on a quarterly basis as a minimum.

A process is considered in control when a Cpk of 1.33 or greater is achieved, and variation is normally distributed.

##### **2.18.2. Containment Plan**

When process measurement indicates a Cpk of 1.0 or less, a process Containment Plan shall be developed and implemented by the supplier.

This containment Plan shall be designed to ensure that nonconforming material does not get released to EDAC or EDAC's customers.

Some examples of Containment Plans are:

- Elimination of sampling plans
- 100% over-inspection
- Re-inspection of parts within 20% of specification limits



**For Aerospace suppliers**, Containment Plans will be subject to EDAC and/or EDAC customer's approval and must be implemented as quickly as possible when a need is discovered.

### 2.18.3. Sampling Plans

When a process is measured statistically and resulting evidence show a process is in control, supplier may request approval to implement a sampling plan. Sampling plans require written approval from EDAC Quality department. It is recommended that sampling plans be based on ANSI Z1.4, however supplier shall not use any sampling plan with an acceptance level greater than zero.



**Note: Aerospace suppliers shall perform 100% inspection at all times unless specific permission is granted in writing by EDAC Quality Department.**

### 2.19. Production Part Approval - FAIR (First Article Inspection Report)

If a First Article Inspection Report is required it shall be noted on the Purchase Order. When a FAIR requirement is required, a delta FAIR will automatically be required for the following circumstances:

- A change in the design affecting fit, form or function of the part.
- A change in manufacturing source(s), process(es), inspection method(s), location of manufacture, tooling or materials, that can potentially affect fit, form or function.
- A change in numerical control program or translation to another media that can potentially affect fit, form or function.
- A natural or man-made event, which may adversely affect the manufacturing process.
- A lapse in production for two years or as specified by the Customer.
- Special circumstances resulting from product or process problems.
- EDAC may request a FAIR as part of a SCAR.



**For Aerospace Suppliers**, the FAIR must conform to AS9102 as well as the appropriate customer specific requirement flowed down on the purchase order.

When a FAIR requirement is stated on the Purchase Order EDAC Technologies will not accept responsibility for products or services produced prior to FAIR approval. The supplier assumes risk for any production prior to FAIR approval.

### 2.20. Continuous Improvement

EDAC strongly recommends each supplier develop and institute a Continuous Improvement plan that includes Quality, Delivery, and Service.

Other areas for continuous improvement may include:

- Increase availability of product
- Increase cost competitiveness
- Improving productivity and process control
- More efficient use of resources
- Reducing testing frequencies
- Eliminating waste
- Reducing cycle time
- Customer satisfaction
- Excessive handling and storage

Performance indices shall be used to measure progress and effectiveness.

EDAC is committed to supporting its suppliers in continuous improvement efforts wherever possible, and expects suppliers to participate in joint mutually beneficial projects.

The objective of this element is to improve quality and delivery performance and reduce cost.

### 2.21. Manufacturing Capabilities

Suppliers shall provide appropriate technical resources for tools and gage design, fabrication and full dimensional inspection as necessary. If any of this work is subcontracted, a tracking and follow-up system is required.

#### 2.21.1. Preventative Maintenance

All key equipment used in the manufacture of EDAC product shall have a documented preventative maintenance plan in effect to ensure uninterrupted service and prevent unexpected delays in shipment. The frequency of such maintenance should be based primarily on statistical data, manufacturing equipment recommendations and past history.

#### 2.21.2. Tooling

All tooling used in the manufacture of EDAC product shall be maintained in a condition that will assure that quality parts will be produced and reasonable tooling life will be maintained.

All tooling owned by EDAC must be permanently identified, or otherwise controlled by electronic records, as the property of EDAC with the EDAC tool number. Tooling owned by EDAC shall only be used in the fulfillment EDAC orders. EDAC tooling designs and tools are deemed as confidential and are not to be viewed or discussed with any party not expressly authorized by EDAC.

### 2.22. Software Control (Non-deliverable)

The supplier must establish a Software Control Plan that addresses verification to satisfy the intended application and configuration management as a minimum; software development and verification, test criteria, identification, change control, storage & handling documentation, library control, and subcontractor control.



#### 2.22.1. For Aerospace suppliers

The supplier must establish a Software Quality Assurance Plan for the control of non-deliverable software that addresses the following:

1. Organizational responsibility
2. Identification of requirements
3. Coding standards
4. Verification and Validation
5. Target Environment
6. Version Control
7. Change Control
8. Access Control
9. Archiving, Backup and Recovery
10. Identification, Storage, Handling and Release
11. Training and Maintenance requirements
12. Documentation
13. Supplier oversight (i.e., audit and product acceptance)
14. Process for (COTS) acceptance prior to initial use
15. Analysis of Risks and Criticality
16. Software Support Tool Development Process
17. Internal audit or review processes

Reference: ASQR-07.5 - Control of Software

### 2.23. Calibration Supplier Requirements

#### 2.23.1. System Requirements

Supplier's calibration system shall meet the requirements of ANSI/NCSL Z540-1-1994 (formerly MIL-STD-45662A) or ISO/IEC 17025-2005.

Calibration Certificates shall be made available EDAC and are to include, as a minimum.

- Instrument Model Number
- Instrument Serial Number
- Record of all readings taken (including "as found" readings)
- Calibration method / procedure / guidelines
- Signature of person performing the calibration
- Identity of master used traceable to N.I.S.T.
- Amount of uncertainty

Calibration status labeling shall include;

- due date,
- person performing the calibration
- equipment's identification number.

Procedure or guidelines shall conform to ISO Guide 25-1990 or comply to commonly accepted industry standards.

The collective uncertainty will not exceed 4 to 1. Gages shall have a 95% reliability in-tolerance at the end of their interval schedule.

EDAC's Quality Dept must be notified as soon as possible if a gage is found to be significantly out-of-tolerance (Exceeding 25% of product tolerance) so that proper arrangements for product risk analysis can be made.

### 3. Supplier Qualification

#### 3.1. Approved Supplier

EDAC will create and maintain an Approved Supplier List (ASL) for suppliers of production material and processes.

Suppliers are added to this list as they meet established criteria and maintain an acceptable performance rating.

EDAC does not purchase materials or product related services from companies, which are not on the approved supplier list.

#### 3.2. Methods of Qualification and Continued Qualification

- **Supplier Qualification Form** - The Supplier Qualification Form 145 is used by EDAC to evaluate a new or potential supplier where applicable.
- **For Aerospace Suppliers:** Completion of Form 145 is required prior to classification on EDAC's Approved Supplier List as "aerospace approved".
- **Site Surveys** - Site Survey may be used by EDAC to evaluate Suppliers as needed. EDAC Purchasing and Quality representatives will determine the need for a Site survey.



### 3.3. Right of Entry

Employees of EDAC Technologies or EDAC's customer have the right of entry to the Suppliers facility. The Supplier must in turn include right of entry provisions in any authorized subcontractors.

This right of entry provisions shall allow employees of EDAC Technologies, or EDAC's customer that is authorized by EDAC Technologies, to verify the quality of workmanship, records, materials, and physically review applicable production lines in process, at any facility of the supplier or subcontractor.

Note: Representatives of EDAC Technologies, or EDAC's customer that require access to your facility, will sign any applicable non-disclosure agreements that you may deem necessary.

### 4. Purchasing Documents

It is the responsibility of the supplier to obtain any and all referenced documents on EDAC PO, drawing or other communication.

All documents must be requested through the EDAC buyer to assure the correct revisions are provided.

EDAC is not responsible for errors or omissions as a result of documents referenced but not supplied by EDAC. It is the supplier's responsibility to perform a complete contract review.

### 5. Quality Planning

When required, Advanced Quality Planning of new or changed products shall be carried out by cross-functional teams that use appropriate techniques to establish process controls. Including but not limited to:

- Develop and review Process Failure Mode and Effects Analysis (PFMEA) when required by EDAC.
- Develop a Process Control Plan.

Detailed PFMEA and control plan training materials and forms may be requested from EDAC through the responsible buyer or Supplier QE.

#### 5.1. Control Plans

EDAC requires a control plan for components, process or materials having significant or critical characteristics. Such characteristic are identified on the drawing or in an EDAC provided specification. The control plan shall be reviewed and updated as required, especially after every design and process change or if non-conformances are produced by the process. Control Plans may represent families of similar items produced from the same process stream. New or revised control plans shall be approved by EDAC Supplier Quality Engineer and/or EDAC's customer.

A Process Control Plan shall identify key process inputs and include a method for controlling each of them. A Process Plan should include the following as a minimum:

- Methods of manufacture
- Method of control
- Method of measurement
- Reaction Plan for out of control situations

#### 5.2. Process Flow Chart

The supplier shall have a process flow chart that will be organized in a material flow sequence from incoming material to packaging and shipment. The flow chart should be reviewed and updated as required. Process Flow Charts may represent families of similar items produced from the same process stream.



### 5.3. Process Certification

A process can only be certified when all of the following have been achieved;

- A process Control Plan has been created and adhered to
- Gage R & R demonstrates gage variability is less than 20% of total tolerance
- Preventative Maintenance Plan is in place
- The statistical analysis shows a normally distributed population with a minimum Cpk of 1.33
- Self audits are completed and documented

Reference: See EDAC's Process Certification Training for more detailed information

## 6. Performance Rating

A Performance Report is compiled on a monthly basis and published quarterly. It primarily consists of Quality and Delivery measurements. These elements will be evaluated by the purchasing and quality departments.

### 6.1. Weighted Rating System

These elements are calculated as described below and the results are weighted equally.

**Quality = 50%** of total rating

**Delivery = 50%** of total rating

### 6.2. Quality Rating Calculation

This data is gathered using nonconforming data from incoming inspection as well as later rejections determined to be the supplier's responsibility after nonconforming material review.

This rating is calculated by dividing the number of nonconforming pieces divided by the total number of pieces received in that month.

### 6.3. Delivery Rating Calculation

This rating indicates the delivery performance of material and services as measured against the agreed to lead time for the product. This data is gathered using receipt data for the supplier generated from the ERP system.

This rating is calculated by dividing the number of pieces received on time divided by the total number of pieces received in that month.

### 6.4. Additional measurements

This rating may be supplemented at the divisional level with additional measurements for service or cost. Poor performance costs may also be applied to quoted price when determining cost competitiveness.

Your EDAC Buyer will apprise you of these details as applicable.

The resultant rating puts the supplier into one of the following classifications:

Performance Rating	Classification
98-100	Preferred
85-97	Acceptable
75-84	Marginal
<75	Poor

**6.5. Marginal classification**

If a supplier is in the **Marginal** classification a request for cause & corrective action plan will be issued to the supplier giving them an opportunity to rectify the situation and remain on the Approved Supplier List.

**6.6. Poor classification**

If a supplier is in the **Poor** classification they will also be given a request for a cause & corrective action plan but they will be put on a Probationary status until their rating can be improved to the next level.

A supplier in Probationary status may not be issued any new orders.

**6.7. Disqualification**

Under the discretion of the Quality Manager and/or the Purchasing Manager, a supplier can be disqualified for repetitive poor performance and who do not display a willingness to take positive corrective action. It will be at the discretion of the EDAC Purchasing and Quality Departments to remove a Probationary supplier from the Approved Supplier List.

In order to be re-instated to the Approved Supplier List, a supplier must demonstrate effective implementation of any outstanding corrective actions and be subject to an on-site audit.

**7. Environmental And Hazardous Material Processes**

A supplier shall have a process to ensure compliance with all applicable government safety and environmental regulations, including those concerning handling, recycling, eliminating or disposing of hazardous materials. Appropriate certificates or letters of compliance should evidence this.

Suppliers are encouraged to adopt the principles of the ISO 14001 Environmental Management System.

**7.1. Material Safety Data Sheets (MSDS)**

MSDS are maintained at all EDAC facilities for all chemicals used in that facility. Any chemical being shipped to an EDAC site must be accompanied by a MSDS or it must be supplied in advance of shipment.

**7.2. Visitors to EDAC facilities**

Suppliers are required to comply with **EDAC's Visitor/Contractor Environmental, Health and Safety Agreement (EWI-06)**, when performing work at EDAC Technologies' facilities or when performing any activity on our behalf associated with identified environmental aspects and/or significant hazards that could lead to deviation from our Integrated Management System Policy (section i), objectives and targets.

**8. Confidentiality Agreement**

Supplier agrees not to make use of or disclose to third parties any data, designs, drawings, specifications and other information furnished to it by EDAC except for the performance of any EDAC purchase order.

All EDAC order information is confidential between EDAC Technologies and Supplier and it is agreed by Supplier that none of the details connected therein shall be published or disclosed to any third party without EDAC Technologies' written permission.

### APPENDIX A:

#### Associated Documents (Bibliography)

The following publications contain additional information that will be of assistance to EDAC suppliers:



ISO 14001:2004 - Environmental Management System.  
ISO 9001:2008 - Quality Management Systems Requirements  
AS9100 Rev C – Quality Management System Requirements for Aviation, Space & Defense  
AS9102 – First Article Inspection Requirements (SAE)  
AS9103 - Variation Management of Key Characteristics  
ANSI/ASQ Z1.4-2008- Sampling Procedures and Tables for Inspection by Attributes  
ASQR-01 - Aerospace Supplier Quality Requirements (UTC)  
ASQR-07.5 - Control of Software (UTC)  
UTCQR-09.1 - Process Certification Requirements (UTC)  
FOD PREVENTION GUIDELINE (<http://www.nafpi.com/nafpiguide.pdf>)

#### Calibration related documents

ISO 10012-1 – Quality Assurance Requirements for Measuring Equipment  
ANSI/NCSL Z540-1-1994 - Calibration Laboratories And Measuring And Test Equipment  
ISO/IEC 17025-2005 - General Rqmts For The Competence Of Testing And Calibration Laboratories

### APPENDIX B:

#### Associated EDAC Documents/Forms

EDAC EWI-06 - Visitor/Contractor Environmental, Health and Safety Agreement  
EDAC Form 027 – Business Classification & General Information Survey  
EDAC Form 145 – Supplier Self-Survey / Audit  
EDAC's Process Certification Training

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### Revision History

#### Rev A 8/4/11

- Paragraph 2.3: changed delivery date confirmation from 24 hours to 7 work days.
- Paragraph 2.5.1: Revised 1<sup>st</sup> sentence
- Paragraph 2.8: Removed “Changes in any of these factors require prior written approval by EDAC”.
- Paragraph 2.8.1: Revised 1<sup>st</sup> paragraph
- Paragraph 2.12: Removed 2<sup>nd</sup> paragraph
- Paragraph 8: Removed 2<sup>nd</sup> and 4<sup>th</sup> sentences

#### Rev B 4/11/14

- Paragraph 3.2: First bullet - changed Form 027 to Form 145. Removed “Purchasing”. Added: “where applicable”.
- Paragraph 3.2: Second bullet - Removed Self-Survey statement and replaced with classification as “aerospace approved”. Added “**For Aerospace suppliers** to this bullet item only.

#### Rev C 4/2/15

Section i: Policy Statement updated

#### Rev D 6/2/15

Paragraph 2.15, 2<sup>nd</sup> bullet, added “or per the end use customer requirement, whichever is longer.”