CURTISS-WRIGHT, EXLAR AUTOMATION SUPPLIER QUALITY MANUAL

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1.0 PURPOSE

The purpose of this manual is to communicate Exlar and its customers' quality requirements and expectations to its suppliers.

Exlar procures products and services that are used in a variety of applications, including but not limited to medical devices, marine vessels, mission critical military equipment, and industrial/automotive applications. It is crucial that suppliers to Exlar understand the importance of the product and service quality required.

Exlar is committed to do business with suppliers who consistently supply parts, materials, processes, and services to specification, at a competitive price, and in accordance with the delivery schedule as defined by the purchase order. As such, this manual's intent is to aid suppliers in their understanding of Exlar's requirements regarding specific management, communication and reporting processes.

2.0 SCOPE

This manual applies to all vendors who provide materials, equipment and services to Curtiss-Wright Exlar Automation (herein referred to as "Exlar").

3.0 QUALITY SYSTEM REQUIREMENTS

3.1 Suppliers are encouraged to develop foundational quality systems that incorporate continuous improvement and emphasize defect prevention while reducing variation and waste.

3.2 ISO 9001 or equivalent third party registration is preferred. A supplier without third party registration will require more thorough scrutiny of its capabilities in order to ensure that adequate quality systems exist and are effectively deployed.

3.3 Suppliers are responsible for ensuring the quality of work performed by sub-tier suppliers, and are encouraged to review the quality systems and practices of sub-tier suppliers for adequacy and effectiveness.

3.4 Suppliers are required to notify Exlar of any changes to their Quality System accreditations resulting in system disqualification or downgrading. Failure to do so may result in disapproval of the supplier.

3.5 Suppliers are required to notify Exlar prior to implementation of any foreseen deviation to Exlar's design that affects conformance to design specification. In addition, changes to Supplier's designs that affect form-fit-function require notification to Exlar *prior* to implementation. Changes and deviations are to be approved by Exlar *prior* to implementation and shipment to Exlar. Failure to do so may result in disapproval of the supplier.
Request for deviation and change notifications are to be submitted in a timely manner to the designation deviation email, copying the designated primary Buyer.

4.0 RECORD RETENTION

4.1 Records created or obtained by the supplier or its sub-tiers related to testing, inspection and traceability and not otherwise delivered with a purchase order will be retained for a minimum of seven years per the retention policy.

4.2 Other records relevant to the procurement and not otherwise delivered with a purchase order will be retained for a minimum of seven years per the retention policy.

4.3 Storage conditions must allow the records to remain legible, readily identifiable and retrievable.

4.4 Suppliers will notify Exlar if unable to retain records at their facility for the required record retention period and provide such records to Exlar if requested.

5.0 RIGHT OF ENTRY

5.1 Exlar, its customers, government officials and notified body reserve the right to verify the quality and delivery of all Exlar procured materials and services at the supplier's facility, with prior notification.

6.0 APPROVED SUPPLIER LIST

6.1 Materials, equipment, and services will only be purchased from suppliers listed on Exlar's Approved Supplier List.

6.2 Exlar will select, identify, evaluate and approve suppliers based on their ability to supply quality materials, equipment, and services to specified requirements.

6.3 Exlar will disapprove or choose not to initially approve suppliers based on their inability or lack of willingness to improve or provide quality materials, equipment, and services to specified requirements.

7.0 CONFLICT MINERALS COMPLIANCE

7.1 The supplier agrees that it will comply with Curtiss-Wright corporate policy.

8.0 COUNTERFEIT AND/OR SUSPECT WORK

8.1 Our valued suppliers are held to the same high standards we provide to our customers. We are committed to building and fostering a leading supplier base. Supplier quality expectations are communicated to our suppliers through the Supplier Quality Manual, order placement, terms and conditions of purchase, and contracts. To aid in this mission, we manage supplier performance through scorecards, questionnaires, audits, and continual improvement. Curtiss-Wright, Exlar Automation may periodically request its suppliers for evidence to demonstrate compliance to these expectations.

8.2

9.0 PACKAGING, HANDLING AND SHIPPING REQUIREMENTS

9.1 Suppliers will ensure the use of adequate protective measures to prevent movement, shifting, damage and deterioration during transportation and storage, including but not limited to application of packages and wraps, cushioning, corrosion prevention and electrostatic discharge (ESD) protection. Pallet and containers shall be clean and free of sharp corners. Proper packaging, storage and handling ensure that parts that were produced with great care arrive in excellent condition. Contact the assigned Exlar buyer prior to shipment with concerns on adequacy of packaging, storage and delivery conditions.

10.0 CONTROL OF SUB-TIER SUPPLIERS

10.1 Suppliers have the responsibility to flow down to sub-tier suppliers the applicable requirements contained within all purchase orders, drawings, and specifications from Exlar.

10.2 Where Exlar controls design, Supplier will notify Exlar's designated primary buyer for pre-approval of the proposed Sub-tier supplier selection.

11.0 SUPPLIER ASSESSMENTS

11.1 Suppliers will be assessed for capability and suitability by Exlar prior to the placement of an initial purchase order and re-assessed on a determined schedule. This assessment may take the form of an on-site audit, a supplier self-assessment, and/or a supplier requirement & expectation questionnaire.

11.2 A "for-cause" on-site audit may also be required by the Exlar Supplier Quality Engineer in response to significant or persistent quality problems from a supplier.

11.3 Suppliers will be required to identify root cause and implement corrective action(s) for any observation that is identified by Exlar as a potential risk to Exlar and its customer(s).

12.0 SUPPLIER PERFORMANCE

12.1 Monthly performance reports for suppliers designated by Exlar as key will be compiled and delivered to the supplier via email by the designated Exlar buyer.

12.2 Any supplier that receives a performance report is expected to review the data and contact its Exlar designated buyer with questions or concerns.

12.3 Any supplier that is not designated as key can request a performance report from the designated Exlar buyer.

12.4 Performance reports may also be provided to a supplier that is not meeting Exlar expectations.

12.5 Supplier performance is tracked and monitored by Exlar.

12.6 Performance expectations are communicated by the designated Exlar buyer and align with Exlar's business objectives.

12.7 Exlar will provide assistance in the following areas to suppliers that are having trouble meeting expectations:

- Resolution of critical issues
- Continuous improvement
- Training on systems and best practices

13.0 SUPPLIER REQUIREMENTS

13.1 Mercury

13.1.1 The supplier will ensure that material furnished is free from mercury contamination.

13.2 Certificate of Conformance (CoC)

13.2.1 When specified on the purchase order or on the drawing, the supplier will provide a Certificate of Conformance signed by an authorized representative of the supplier's organization. The Certificate of Conformance will include at minimum the following information:

- Date of certification;
- Supplier name and address;
- Statement that materials and/or services supplied meet all requirements of the order;
- Exlar purchase order number and line number;
- Exlar part number and revision level;
- Quantity of parts shipped;
- Description of the parts or services being certified;
- Serial, lot or batch numbers, if applicable;
- Printed name and title of authorized signer.

13.3 Material Certification

13.3.1 When specified on the purchase order or on the drawing, the supplier will provide a material certification (material cert) for the parts supplied. Provision of a copy of the original Mill Test Report for the material meets the material certification requirement and is preferred, if available.

13.3.1.1 The material certification will include at minimum the following information:

- Date of certification;
- Supplier name and address;
- Heat, batch or lot number of the material;
- Type and grade of the material; and,
- Chemical composition of the material.

13.4 Process Certification

13.4.1 When specified on the purchase order or on the drawing, the supplier will provide one or more process certifications (heat treat certification, coating certification, etc.) signed by an authorized representative of the supplier's organization. The process certification will include the following information:

- Date of certification;
- Supplier name and address;
- Heat, batch or lot identifier;
- Exlar purchase order number and line number;
- Exlar part number and revision level;
- Quantity of parts shipped;
- Applicable process standard (as specified on purchase order, drawing or specification);
- Statement that process was performed in accordance with the specified standard; and,

- Printed name and title of authorized signer.

13.5 Inspection Report

13.5.1 When specified on the purchase order or on the drawing, the supplier will provide an inspection report for the parts supplied. The inspection report will include the following information:

- Date of inspection;
- Exlar purchase order number and line number;
- Exlar part number and revision level;
- Quantity of parts inspected;
- Quantity of parts shipped;
- Measurement data for parts in their final, as-shipped condition;
- Inspection result (pass/fail); and,
- Initials or identifier of employee performing the inspection.

14.0 NONCONFORMING MATERIAL

14.1 Suppliers are responsible for providing products and services to Exlar that meet all applicable order requirements. To that end, the supplier is responsible for performing adequate inspection and/or verification activities to ensure that Exlar requirements are met. Incoming inspection is conducted on supplied products and services at Exlar's discretion and should not be considered a part of the supplier's quality control plan.

14.2 Nonconformance discovered by the supplier

14.2.1 Prior to shipment of product

14.2.1.1 The supplier is responsible for quarantining all nonconforming material to prevent shipment to Exlar.

14.2.1.2 The supplier is further responsible for assessing the nonconforming condition to determine whether it might affect other material, either in process at the supplier or already shipped to Exlar.

14.2.1.3 Exlar expects all suppliers to take immediate corrective action when a nonconforming condition is discovered to prevent shipment of suspect or nonconforming material to Exlar.

14.2.1.4 A request for acceptance of nonconforming material must follow the procedure detailed in the section for "Request for deviation" below.

14.2.2 After shipment of product

14.2.2.1 The supplier is responsible for contacting Exlar immediately in the event that nonconforming material is suspected or believed to have been shipped to Exlar.

14.2.2.2 The supplier is further responsible for conducting an immediate assessment of other products in process or completed for Exlar to ensure that all potentially affected product is identified and quarantined for verification.

14.2.2.3 If nonconforming material has been received by Exlar, a nonconformance report will be initiated. The nonconformance procedure is detailed in the section for "Nonconformance and supplier corrective action" below.

14.3 Nonconformance discovered by Exlar

14.3.1 When nonconforming material is discovered after receipt by Exlar, a nonconformance report will be initiated. The nonconformance procedure is detailed in the section for "Nonconformance and supplier corrective action" below.

14.4 Request for deviation

14.4.1 The supplier may request that Exlar accepts known nonconforming material under a one-time deviation by completing an *Exlar Supplier Deviation Request Form* (Form #70529), which is available from the designated Exlar Buyer or on Exlar's webpage for Suppliers.

14.4.2 The form is to be completed by Supplier as follows:

- Section I: Supplier information
  - Requestor Name and Supplier Name
- Section II: Deviation request details
  - Exlar PO Number, Exlar Part Number and Description
  - Total Quantity Affected
  - Deviating Details:
    - Issue type and subtype: Select from list given in Section IV.
    - Quantity affected by given issue (or potentially affected if deviation is being sought for an unsorted lot)
    - Spec requirement: drawing or purchase order specification (e.g. 0.500 +/- 0.005)
    - Deviating measurement: actual conditions/measurements from nominal. Note: Seller is responsible for providing the full range of measured, actual values.
- Section III is for Exlar internal use and should be left blank.

14.4.3 The completed deviation request should be submitted to the email given at the top of the deviation request form, for an internal review by Exlar Supplier Quality and routing for an internal disposition. Exlar Supplier Quality will notify the Supplier of final disposition.

14.4.4 If the deviation request is approved, Exlar Supplier Quality will provide the supplier with a copy of the approved, signed deviation form with a unique deviation number and a timeframe for when the request is active. In order for Exlar to determine which shipped parts are deviated, all approved deviated product shipped to Exlar must conform to the following:

- Include a copy of the approved, signed deviation form with shipment to Exlar;
- Segregate deviated product from non-deviated material; and,
- Clearly label deviated product.

14.4.5 If the deviation request is denied, Exlar Supplier Quality will notify the supplier of the reason for the rejection. The supplier is responsible for sorting all potentially affected parts prior to shipment in order to remove any that don't meet the specification or approved deviation.

14.4.6 Approved deviated parts received by Exlar which don't comply with the limits of the deviation will be rejected and Exlar will initiate a non-conformance report. In the case of a large lot, discovery of one or more such parts may result in the rejection of the entire lot.

14.4.7 Deviation requests are approved on a one-time basis. Past approval of a deviation request does not guarantee the approval of a subsequent request for the same part. The supplier is responsible for taking corrective action to ensure that the true root cause of the nonconforming condition is eliminated and future lots meet drawing and purchase order specifications without deviation.

14.5 Nonconformance and supplier corrective action

14.5.1 When a nonconformance report is initiated by Exlar for a supplier part or service, an email notification will be sent by Exlar Supplier Quality to the supplier's quality contact

person. This email will include a copy of the nonconformance report and any relevant supporting documentation.

14.5.2 Where a trend is identified, Exlar Supplier Quality will issue a formal supplier corrective action report (SCAR).

14.5.3 If parts are being returned to the supplier for rework or replacement, the email will also contain a request for an RMA (return material authorization) number in order to process the return.

14.5.4 Every effort will be made by Exlar to return the nonconforming part when possible.

14.5.5 Upon receipt or notification of a nonconformance report, the supplier must take the following actions:

14.5.5.1 Containment – Immediate action to prevent the delivery of additional nonconforming parts or services to Exlar. The supplier must also immediately assess the likelihood of other similarly nonconforming parts or services having been delivered to Exlar and alert Exlar Supplier Quality if that is suspected to be the case.

14.5.5.2 Correction – Action to rework, repair or replace the nonconforming parts or services. Correction timing will be communicated to Exlar as soon as possible. The receipt of nonconforming material hampers Exlar's ability to deliver on customer requirements, and is taken very seriously. As such, the supplier is expected to correct the situation with all possible speed and priority.

14.5.5.3 Root Cause analysis – Detailed review and investigation to identify the most basic failure condition that resulted in the nonconformance. Several methods are acceptable to Exlar, including but not limited to the "5 Why" process. The result must be the determination of a true root cause for the nonconformance. Further information and guidance on root-cause analysis will be provided by Exlar Supplier Quality upon request.

14.5.5.4 Permanent Corrective Action – A permanent change to the system identified in the Root Cause analysis to eliminate (or dramatically reduce) the possibility of the failure condition reoccurring. Examples of adequate Corrective Action include the following:

- Documented change in the design of tooling or equipment to create a mistake-proof situation.
- Documented change in a process or procedure to eliminate the opportunity for error, followed by documented training of all affected employees and sub-tier suppliers.
- Documented change from one machining process to another to reduce process variation.
- Documented change in control of raw material sourcing or selection of sub-tier suppliers to reduce variation and eliminate the opportunity for error.

14.5.6 The Supplier Corrective Action Report (SCAR) includes sections for Root Cause and Corrective Action, and must be filled out and returned to Exlar Supplier Quality by the supplier by provided due date. Submissions of completed Corrective Actions will be reviewed for adequacy upon receipt, and the supplier will be contacted with any questions or concerns.

14.5.7 Where nonconformance trending or a significant issue is identified by Exlar for a supplier, Exlar may elect to establish a special continuous improvement project or formal corrective action with the supplier.

14.5.8 Exlar encourages suppliers to develop a culture of continuous improvement. Nonconformances represent opportunities to identify and correct inadequacies in product, processes or systems. Exlar views earnest and timely efforts by suppliers to identify and address root causes in a very positive light.

15.0 ON TIME DELIVERY (OTD)

15.1 Suppliers are expected to deliver ordered parts and services by the promised date. Late deliveries impede Exlar's ability to deliver on commitments to our customers.

15.2 Parts and services found to be nonconforming are not considered to be on time, regardless of when they were received.

16.0 WORKMANSHIP

16.1 Suppliers are responsible for providing parts and services to Exlar's drawing specifications, purchase order requirements, and terms and conditions of purchase. Additionally, Exlar's suppliers will uphold workmanship that ensures absence of injurious defect and undesirable attributes for Exlar's customers.

16.2 Supplier are responsible for performing a visual inspection, especially concentrating on exterior surfaces, in normal lighting to prevent shipment of easily identifiable non-conformances due to poor workmanship.

16.3 Exlar's minimum workmanship standards focus on cosmetic, machining and packaging/handling/shipping. These standards are applicable for raw material, machining, assembly, and material finishes including but not limited to painting, coating, heat treatment and surface finish:

16.3.1 Cosmetic standards

16.3.1.1 Suppliers shall employ cosmetic standards, in order to prevent undesirable attributes in the product for Exlar's customers, such as the following:

16.3.1.1.1 Burrs and other excess material. Typically, contamination, flash or rough material left behind during QPQ, grinding, molding or similar processes. Burrs tend to block holes or threading and can potentially loosen and affect the function of a finished product.

16.3.1.1.2 Scratches. The quantity, length and depth influence acceptability. Typically, scratches that do not pass the "fingernail test" are unacceptable, as are any scratches that may create leakage paths or compromise seals.

16.3.1.1.3 Lines and stripes. The appearance of easily noticeable lines or stripes influences acceptability; both are commonly caused by the extrusion process and accentuated by subsequent finishes.

16.3.1.1.4 Surface color and textures. The material finish is to appear uniform within the lot. Suppliers are to follow recommended time settings for curing, heat treatment, QPQ and other similar treatments. Colors and

hues should be within appropriate Exlar approved limit samples, if applicable.

16.3.1.1.5 Contamination. Sludge and other residue due to uncleanliness influence unacceptability. Loose particles that may affect flow paths and purity of material are unacceptable.

16.3.1.1.6 Corrosion. Signs of material deterioration or erosion, typically due to oxidation causing rust, are unacceptable.

16.3.2 Machining, Treatment, Finish standards

16.3.2.1 Supplier shall employ machining, treatment and finishing practices in order to prevent undesirable attributes in the product for Exlar's customers, such as the following:

16.3.2.1.1 Pits. Typically, a pit has a characteristic tail or line. A pit with a depth greater than its width is unacceptable.

16.3.2.1.2 Chips and Breaks. The absence of wanted material and recognized as more than a scratch is unacceptable. Typically, causes include incorrect or warn out tooling, stress-strains, imperfect material or mishandling.

16.3.2.1.3 Surface marks and Dents. Typically, exterior surface marks or dents seen as nicks, or skips caused by tools or poor handling. Quantity of marks or dents influence acceptability.

16.3.2.1.4 Contact marks. Common results from racking or mounting in an undesirable location. Typically, marks that follow a pattern and are easily visible are unacceptable.

16.3.2.1.5 Bleed out. The inconsistent appearance of finish on the exterior, typically seen around the top of a hole, is unacceptable. Bleed out is often associated with the plating process.

17.0 NOTIFICATION OF CHANGE

17.1 Supplier is to uphold the Terms and Conditions of Purchase, including notification to Exlar's primary Buyer of the following changes:

- Location of manufacturing
- Acquisition by another company of Seller

17.2 In addition, Supplier is to notify Exlar Supplier Quality of the following change:

- Change in production processes and/or equipment affecting the production of product or services

17.3 Notification will be reviewed for impact.

Owner

Name	Title	Signature	Date
Kathy Curtis	Supplier Quality Engineer	ON FILE	ON FILE

Approvals

Name	Title	Signature	Date
Dale Kersten	Director of Operations	ON FILE	ON FILE
Pete Sattervall	Customer Service & Logistics Manager	ON FILE	ON FILE
Rich McKusick	Materials Manager, Operations	ON FILE	ON FILE
Dan Madsen	Sr. Manager, Operations	ON FILE	ON FILE
Barry Wessman	Operations Manager, Ground and Naval Defense Segment	ON FILE	ON FILE

Change Control

Revision	Description of Change	Date	Changed By
A	Initial	8/11/2015	Kathy Curtis
B	Update to Deviation Process; Inclusion of Workmanship Standard and Notification of Change.	9/19/2016	Kathy Curtis
C	Inclusion of Counterfeit and/or Suspect Work. Update to Notification of Change, Nonconformance and Deviation.	1/2/2019	Kathy Curtis

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1. DOCUMENTATION CONTROL