



OEM - Supplier Quality Manual

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Metalcraft is pleased to present the Supplier Quality Manual to the Supply Chain as evidence of continuous improvement and commitment to customer satisfaction. All Suppliers must read, understand and comply with all requirements within this Supplier Quality Manual (SQM). In the event that you need further explanation of requirements, please contact your respective Buyer or Supplier Quality Engineer.

Supplier Quality Manual (SQM) On-boarding Strategy

All Suppliers (as applicable per the Purchase Order Requirements) are required to become compliant/certified to the requirements in this Manual and strongly encouraged to strive to become compliant/certified to the latest ISO 9001 Standard, the IATF Standard, AS9100 Standard, NADCAP Standard, etc., with ISO 9001 being the minimum requirement.

New Supplier On-boarding Strategy

The New Supplier On-boarding Process Form will be sent to help evaluate projected suppliers. The evaluation process could include additional information/requirements to become an approved supplier to Metalcraft of Mayville including, but not limited to the documents listed on the form or references listed below in the Supplier Quality Manual.

After a supplier has been accepted and approved, supplier levels of approval, scorecard, and rating will follow the Supplier Qualification procedure and or this manual.

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Annette Hechimovich 13 - May - 2021

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Metalcraft of Mayville or their affiliates are referred to as “Metalcraft” in the body of this document.

Supplier Quality Manual

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1. Preface

The implementation and sustainment of a Quality Management system is a strategic decision of any organization. The design and implementation of an organization's quality management system is influenced by varying needs, objectives, products, and processes as well as the size of the organization and targeted markets. It is understood that each Supplier has their own approach to continuous improvement, however, there are certain requirements in this Manual that require compliance regardless of the state of the Supplier's quality system. It should be noted that all customer specific requirements outlined in this Manual are mandatory. In the event that there is a conflict in requirements between the AIAG Reference Manuals and this Manual, the requirements of this document/Manual shall prevail. Failure to comply could result in a range of activities varying from corrective action(s) to ending the Supplier/customer relationship.

2. Goal

The goal of this Manual is to provide a uniform method to communicate general requirements, expectations, customer specific requirements and guidelines to the Supply Chain.

For questions pertaining to the specific requirements outlined in this Manual, please contact the appropriate Metalcraft Purchasing or Quality Representative.

3. Purpose

The Supplier Quality Manual's purpose is to define the fundamental quality system activities that are required from Suppliers and their Supply Chain to ensure on-going Continual Improvement, effective Quality Planning and customer satisfaction.

Metalcraft's commitment to integrating Suppliers as team members creates a distinctive Supplier/customer relationship that ultimately builds a great business relationship.

4. Quality Management System

Metalcraft realizes that many Suppliers are registered or are currently pursuing registration/compliance to standards audited by third party registrars (such as IATF 16949, AS9100, NADCAP, or ISO 9001). This Supplier Quality Manual is formatted based on the requirements of IATF 16949. We as a customer strongly encourage the continued efforts of our Supply Chain to become and sustain certification and compliancy to ISO 9001 at a minimum.

- As a minimum, the Supplier shall possess all AIAG (Automotive Industry Action Group) Core Quality Tool Manuals – latest editions.
- If applicable, the supplier shall also possess any ASM, AWS, ASME or MIL standards including military standard 130(label and shipping) or other customer-required documentation depending on the application.

The required AIAG Manuals are listed below:

APQP – Advanced Product Quality Planning
PPAP – Production Part Approval Process
FMEA – Failure Modes Effects Analysis
SPC – Statistical Process Control
MSA – Measurement Systems Analysis

The above Manuals can be purchased at www.aiag.org

FAI Submission Requirements: see section 7.3.9

Supplier's Quality Management System documentation shall include the following:

- A documented Quality Policy and Quality Objectives
- A Quality Manual compliant to ISO 9001, AS9100 or IATF 16949.
- Documented procedures as required by this Manual

- Documents needed by the organization to ensure the effective planning, operation and control of its processes, and records required by this Manual.

Supplier documentation requested needs to be retrievable, accessible, and if necessary, available upon request. Initial response shall have a max 24 hr timeline from request.

5. Record / Documentation Retention Requirements

Records and documents providing objective evidence of conformance to drawings, standards, and other applicable specifications considered essential to the effective operation of the requirements/specifications shall be maintained. They shall be legible, dated, clean, and readily identifiable and maintained in an orderly manner. They shall provide traceability to the associated product and use actual data, as required by applicable specifications, to indicate acceptability of the product. Records and documents may be either hard copy or electronic format.

While in storage, records and documents shall be protected from damage, loss and or deterioration due to environmental conditions. Records shall be maintained for the life of the product or product family it is assembled including the duration of any applicable supersession and or warranty provisions, plus 7 years.

Before disposal, the Supplier shall provide Metalcraft with the option of having the records forwarded to Metalcraft for further retention or authorizing disposal of the records and documents at the Supplier's location. Disposition shall be done in a timely and appropriate manner. Metalcraft shall be notified when disposition has taken place.

6.0 Traceability

6.1 Product:

As a minimum, Supplier's must adhere to the ISO 9001 Standard for Product Identification and Traceability, and always identify its products from applicable drawings, specifications, or other documents, during all stages of production, delivery, and installation, where appropriate. Traceability system must also comply with FIFO (First In – First Out) principles for incoming, processed, wip, and outgoing material.

The Supplier/Supplier shall maintain traceability on any sub-assembly, product, lot or batch, where, and to the extent that, traceability is a specified requirement. This unique identification can be directly on the part or on the part container unless the PO or drawing requirements dictate otherwise. This information shall be documented and retained appropriately.

Expiration dates of paints, solvents, chemicals or other associated use by date sensitive products delivered must have use by dates marked on all product containers and packing slips. Shelf life sensitive product shall have at least 50% of the usable shelf life left or Metalcraft has to have reasonable expectations to use the entire lot of material by the end of its shelf life. In some instances, this information will be on the certificate of conformance delivered with the product.

Failure to supply the appropriate documentation, shelf life requirements, and used by dates can result in a rejection or return of all materials shipped at the expense of the supplier.

6.2 Tools, Fixtures & Gauge Labeling

All Tools, Fixtures and Gauges (dies, patterns, cad models, molds, special tooling, weld fixtures, or part specific gauging, etc.) which are the property of Metalcraft or belonging to Metalcraft on the behalf of Metalcraft Customers must be properly labeled (asset tag along with pictures) by the supplier according to Metalcraft or Customer requirements.

No Metalcraft or Customer owned instruments shall be sold or consigned to another entity without proper notification and Metalcraft's written consent. In cases where fixtures, tooling, gauging, etc., are relocated to an alternative plant or sub supplier, Metalcraft shall be notified prior to moving and the APQP process revisited to ensure no adverse changes to the tool or product arise. In some cases, this could mean re-certification of the process via PPAP.

The supplier shall establish preventative/predictive maintenance schedules and procedures, including contingency plans for the tool/gauge/fixture/jig, etc., ensuring schedules are created, maintained and records can be supplied upon request.

Inspection reports must be submitted prior to full invoice payment for items listed above in section 6.2. Partial payments may be conducted depending on contracts.

7.0 Advanced Product Quality Planning (APQP)

The information provided within all APQP sections outline the specific Metalcraft requirements for APQP.

APQP is a structured approach for defining, establishing and specifying goals for product quality. Quality planning focuses on developing processes with process controls that, when properly managed, will ensure a high degree of quality within the manufacturing/assembly system.

Quality planning begins with a company's management commitment to defect prevention and continual improvement, as opposed to defect detection.

The Metalcraft APQP Program is based on the AIAG APQP and Control Plan, latest Edition requirements.

The Phases of the Metalcraft APQP Process are:

- 1) Plan and Define Program
- 2) Product Design and Development
- 3) Process Design and Development
- 4) Product and Process Validation
- 5) Feedback, Assessment and Corrective Action and
- 6) Control Plan Methodology

The Supplier shall follow the requirements of the AIAG APQP and Control Plan Reference Manual, latest Edition unless otherwise agreed upon by the Metalcraft Supplier Quality Department.

8. Production Part Approval Process – PPAP

The Metalcraft Production Part Approval Process (PPAP) defines requirements for production part approval. The purpose of PPAP is to determine if all customer engineering design record(s) and specification requirements are properly understood by the Suppliers and that the manufacturing process has the potential to produce product consistently meeting these requirements during an actual production run at the quoted production rate.

When a Level 1, 2 or 3 PPAP submission is required, suppliers shall submit the PPAP documents in .pdf format only to the FTP Server - <https://ftps.secure-mtlcraft.com/> at least two weeks prior to shipment requirement date allowing Metalcraft and or our customer time to review. If follow up communication is needed, contact buyer on PO.

Metalcraft will provide written approval of the PPAP package via a signed Part Submission Warrant (PSW). Interim PPAP approval may be used to permit the supplier to ship material for a limited time or quantity in accordance to the Part Submission Warrant (PSW) notation. Suppliers are not authorized to ship production material without full or Interim PPAP approval.

When measurement or test report discrepancies arise or reported, Metalcraft reserves the right to request and have delivered the original data from the CMM, Vision or other data automatically recorded for review.

8.1.1 PPAP Requirements

The Supplier shall meet all specified PPAP requirements as well as those outlined in the AIAG Production Part Approval Process Manual – latest edition. Production parts shall meet all customer engineering design record and specification requirements to include all safety, legal, and regulatory requirements.

If any part specifications cannot be met, the Supplier shall document its problem-solving efforts and contact the appropriate Metalcraft Buyer to engage support to determine appropriate action(s).

Level 2 PPAP submissions are the default requirement for the majority of products supplied to Metalcraft. The PPAP submission level can be changed at any time by Metalcraft in lieu of a new risk being determined. For PPAP submission requirements, see [MoM OEM PPAP Workbook](#) - PPAP requirements tab. PPAP requirements should be determined during launch or revision phases.

8.1.2 PPAP and Sample Production Parts

PPAP samples should be marked according to PPAP Workbook and Sample production parts must be labeled per Metalcraft requirements. If parts are loose in a package, each part must be marked accordingly on the part or on the bag each part is delivered in.

8.1.3 Design Record

The Supplier shall deliver upon request the design record for the saleable product/part, including design records for components or details of the saleable product/part. Where the design record is in electronic format, the Supplier shall produce a hard copy. Examples include, but are not limited to cad models, pictorials, geometric dimensioning & tolerance sheets, and ballooned drawing to identify measurements taken.

8.1.4 Reporting of Part/Product Material Composition

The Supplier shall provide evidence that the material composition conforms to the applicable specification requirements. The Supplier or sub-supplier must retain all material and mill test reports and certifications. Submission of these forms is required for PPAP submission level 2 or higher and all FAI submissions. In addition to submission of the material certifications and mill test reports, the Supplier shall input the necessary data into the Metalcraft PPAP workbook for material and all mill certs submitted shall be written in English. Supplier shall keep these records per the records retention section of this manual. Material certs should have, but not limited to: Heat/lot #, producers name (mill or raw

material supplier), address, signature and person's position who completed the certified testing.

8.1.5 Authorized Engineering Change Documents

The Supplier shall have any authorized engineering change document(s) for those changes not yet recorded in the design record, but incorporated in the product, part or tooling. All marked drawings from Metalcraft must be signed, dated, and approved. Marked drawings are acceptable for PPAP submission if a released or Advanced Drawing is not available due to timeline constraints in the interim.

8.1.6 Design Failure Modes and Effects Analysis (Design FMEA) *if the Supplier is product design-responsible.*

Metalcraft requires suppliers to develop a Design FMEA in accordance with, and compliant to, requirements if design-responsible. Metalcraft requires that the Suppliers adhere to the requirements outlined in the AIAG FMEA reference Manual – latest edition. The requirement for a DFMEA is communicated to the Supplier via the PPAP Part Submission Checklist (PSC), if the supplier is Design Responsible. When the Supplier is Design Responsible, the Supplier shall conduct this activity and maintain the living FMEA document as the design changes throughout the product lifecycle. The Supplier should use their own format for the DFMEA. The supplier shall perform risk prevention analysis covering the complete incoming and processed material delivered to Metalcraft.

8.1.7 Process Flow Diagrams (PFD)

The Supplier shall have a process flow diagram in the format outlined in the Metalcraft PPAP workbook. Process flow diagrams for “families” of similar parts are acceptable if the new parts have been reviewed for commonality by the Supplier. The PFD must represent the process flow of material from receipt of raw material to finished goods at the dock for shipment.

For production parts that are produced from more than one die, mold, tooling, pattern, cavity or production process, the Supplier shall complete a full layout to all characteristics. The Supplier's Process Flow Diagram must reflect production process redundancy if applicable.

8.1.8 Process Failure Mode and Effects Analysis (Process FMEA)

Metalcraft requires Suppliers to develop and maintain a Process FMEA in accordance with the requirements outlined in the AIAG FMEA reference Manual. The Supplier shall use the FMEA template within the Metalcraft PPAP workbook and the FMEA lists for severity, detection and occurrence which are also provided in the PPAP workbook.

The Supplier shall conduct the MFMEA – Machinery Failure Modes & Effects Analysis at the discretion of the Purchasing Agent listed on the Purchase Order (PO). Information on Machinery Failure Modes & Effects Analysis can be found within the AIAG APQP & Control Plan and FMEA Manuals.

8.1.9 Control Plan

The Supplier shall have a Control Plan defining all methods used for process control and complies with all Metalcraft requirements. Metalcraft requires that all Suppliers use the Control Plan template within the PPAP workbook. The Supplier shall use the Process Flow Diagram and FMEA to verify line of sight to the control plan. The control plan must include all Critical Product Characteristics and process controls driven by the FMEA process. In verifying effectiveness of the Control Plan, the Supplier shall account for all operations in the Process Flow Diagram and FMEA. Failure to comply will result in a rejected PPAP and/or request for re-submission of the Control Plan or other applicable documents.

8.2.0 Special Characteristics Requirements

Special Characteristics shall be listed on the control plan and any other supporting documents that help define the process and its tracking per the nomenclature on the print.

Note: Unless otherwise agreed to in writing, Cpk values shall be 1.33 or 1.67 depending on the level of special characteristics listed on the print.

8.2.1 Measurement System Analysis (MSA)

The Supplier shall have applicable Measurement System Analysis studies, e.g., gage R&R, bias, linearity, stability, etc. for all new or modified gages, measurement, and test equipment. The Supplier shall refer to the AIAG MSA reference Manual for additional information.

Equipment discrimination should be 10X the accuracy of the characteristic's tolerance being measured. When this cannot be attained, Metalcraft shall be notified.

8.2.2 Dimensional Results

The Supplier shall provide evidence of dimensional verification as required by the design record and the Control Plan proving compliance with specified requirements. The Supplier shall have dimensional results for each unique manufacturing process, e.g., cells or production lines and all cavities, molds, patterns or dies. The Supplier shall record actual results for all dimensions,

characteristics, and specifications as noted on the design record and Control Plan.

The Supplier shall indicate the date of the design record, change level, and any authorized engineering change document not yet incorporated in the design record to which the part was made, e.g., advanced drawings or marked drawings. The Supplier shall record the change level, drawing date, organization name and part number on all auxiliary documents (e.g., supplementary layout results sheets, sketches, tracings, cross sections, CMM inspection point results, geometric dimensioning and tolerancing sheets, or other auxiliary drawings used in conjunction with the part drawing). Copies of these auxiliary materials shall accompany the dimensional results when submitting PPAP packages. A tracing shall be included when an optical comparator is necessary for inspection.

The Supplier shall identify one of the parts measured as the master sample.

The Supplier shall use the dimension worksheet in the PPAP workbook when documenting and submitting dimensional results as part of a PPAP submission

8.2.3 Print Notes

Supplier should verify that any note(s) on the drawing that is applicable are ballooned or acknowledged. This could consist of, but not be limited to:

- Product material
- Paint used
- Requirements from other drawings or sub-assemblies
- ASM, AWS, ASME or MIL standards
- Performance test requirements listed in this manual such as
 - Life Cycle and or Functional Testing
 - Environmental requirements, etc.

8.2.4 Records of Material / Performance Test Results

The Supplier shall have records of material and/or performance test results for tests specified on the design record or control plan and adhere to the retention requirements outlined in Section 5 for Record / Document Retention.

8.2.5 Material Test Results

The Supplier or an accredited third party test lab (A2LA or ISO17025) shall perform or provide all chemical, metallurgical, or mechanical property tests for all parts and product materials when chemical, physical, metallurgical or mechanical property requirements are specified by the design record. The certificate should have the: original lab completing the tests name, date test completed, heat/lot # and signature of the person at the lab who completed the tests.

The Supplier shall use the PPAP workbook material template when reporting the above information.

8.2.6 Component First Article Testing (CFAT)

The Supplier shall conduct the appropriate CFAT testing as outlined on the design record (only applies if design record notes indicate requirement). Metalcraft may be required to notify the government or prime contractor within a preset number of days prior to the start of the CFAT testing. Metalcraft, our customers or a government representative reserves the right to be present at any such testing. If required, the Supplier shall work with the designated Metalcraft, Customer or government person for the reporting and planning of these test activities.

The Supplier shall conduct testing at the Supplier's facility or via a third party accredited laboratory unless a waiver is signed and approved by Metalcraft, our customer, or the government representative in the event the Supplier; within reason, can not perform the CFAT requirements. The waiver can be in email format or via a formal document. The Supplier shall include a copy of the waiver with the PPAP submission to be exempt from this requirement. The Supplier shall submit the test report with the PPAP package to Metalcraft. The test plan and test report must be agreed to by an authorized Metalcraft representative, our customer or the government agency overseeing the requirements.

Note: If Component First Article Test (CFAT) is required per the Design Record, CFAT testing documentation shall be included with the PPAP submission.

8.2.7 Performance Test Results

The Supplier shall perform tests for all part(s) or product material(s) when performance or functional requirements are specified by the design record.

Performance test results shall indicate and include the following:

- The design record change level of the parts tested,
- Any authorized engineering change documents that have not yet been incorporated in the design record,
- The specification number, date, and change level of the specifications to which the part was tested,
- The date on which the testing took place,
- The quantity tested, and
- The actual results.
- In the cases where only line items of the specification need to be tested, the test sections of the standard will be listed.

8.2.8 Initial Process Studies and On-Going Statistical Monitoring of Processes

The Supplier shall perform measurement system analysis to understand how measurement error affects the study of measurements.

When no Critical characteristics are identified, Metalcraft reserves the right to require demonstration of initial process capability on other characteristics based on risk.

The purpose of this requirement is to determine if the production process is likely to produce product that will meet Metalcraft's requirements. The initial process study is focused on variables not attribute data. Assembly errors, test failures, surface defects are examples of attribute data, which is important to understand, but may not be covered in the initial study. To understand the performance of characteristics monitored by attribute data will require more data collected over time. Unless approved by Metalcraft, attribute data is not acceptable for PPAP submissions.

8.2.9 Laboratory Documentation

The inspection and applicable testing for Production Part Approval Process (PPAP) shall be performed by a "qualified laboratory" (internal or external to the Supplier organization). The laboratory must have a legitimate business license, scope of business, and all documentation proving that the laboratory is qualified for the specific type of inspection and testing performed on any sample part/component. When required per discretion, the Laboratory shall be A2LA, ISO 17025 or use an equivalent accreditation lab agreed to by Metalcraft or our Customers.

8.3.0 Checking Aids

All instruments, templates, attribute and variable gages, fixtures, or jigs that are used to determine acceptance/rejection of a product characteristic shall be on a calibration program. The calibration program must have procedures for each type of checking aid verified. Calibration procedures must state the instrument(s) that can be used to verify the checking aid and its calibration must be traceable to a NIST standard; when no such standards exist, the bases used for calibration, verification shall be retained as documented information.

If at any time during the year the checking aid is reported out of calibration (dropped, calibration lapse, out of tolerance, etc.) since the last approval, the supplier shall perform research of all products this instrument could have measured. Accordingly, an impact statement should be created cataloging the part numbers and affects this could have had on each product produced.

- 1) Dropped gages - do not need this review unless they were not recertified but still used to inspect product after they were dropped.
- 2) Calibration lapse – do not need this review if the checking aid is still in calibration. A notation in the calibration record should be placed to explain why the calibration was not completed as required.

When product ships using an out of spec checking instrument, Metalcraft should be notified in writing with the results of this research to help evaluate how the products shipped affects Metalcraft, our customer and or the end user of the product produced.

The Supplier shall also certify that all checking aid characteristics align with the part/component dimensional requirements. In the event that the checking aid is used to verify Critical Product Characteristics, the Supplier shall conduct the appropriate Measurement Systems Analysis (MSA) activities including Gage R&R. The Supplier shall ensure that all “custom” checking aids have the customer part number, revision level and calibration tracking number, if applicable. The supplier shall provide for preventative maintenance of any checking aids for the life of the part.

8.3.1 Weld Fixtures

All weld fixtures must be certified either by the fixture manufacturer or the Supplier. Certification requires that the weld fixture be validated by verifying the part dimensions to the design record requirements. For characteristics that may result in distortion or warpage concerns, the Supplier shall verify the weld process capability. The Supplier shall bring any concerns to the attention of the appropriate Metalcraft Purchasing Agent for agreement on corrective action. The supplier shall provide for preventative maintenance of any checking aids for the life of the part.

8.3.2 PPAP Workbook and Part Submission Requirements

All Suppliers are required to submit the PPAP package (documentation and part/component samples) as requested per the requirements selected on the Part Submission Requirements. In the event the Supplier has questions as to the submission requirements, the Supplier should contact the appropriate Purchasing Agent. A copy of the PPAP Submission Requirements must be included in the PPAP document package. Suppliers are required to complete the required PPAP documents using the provided PPAP Workbook in MS Excel.

8.3.3 Metalcraft – Customer Specific Requirements

Suppliers shall maintain records of compliance to all customer specific requirements including, but not limited to ASM requirements for our Aerospace Defense customers. Although every effort is taken to ensure Metalcraft and our

Customer's Requirements are conveyed and met, there will be instances where the supplier might know of other items that need to be reviewed. It will be the sole responsibility of the supplier to convey and ensure CSR's are met or exceeded.

8.3.4 Part Submission Warrant (PSW)

The Supplier shall complete the Part Submission Warrant after all PPAP elements have been verified and conform to all requirements. Metalcraft requires that Suppliers only submit one part number on a Part Submission Warrant (PSW). This PSW is part of the PPAP Workbook.

8.3.5 Appearance Approval Report

If the part/component has appearance requirements specified, the Supplier shall provide an Appearance Approval Report for each part or family of parts. AAR's are required when requested by a Metalcraft or our Customers representative. Note: Paint and/or Coating requirements are in the Material Test Results section of this manual.

8.3.6 Approval Process

Approved - The Supplier will receive a signed and approved PSW via email to the email address provided on the PSW submitted with the PPAP package.

Reject – A rejected PSW is sent to the Supplier in the event that the PPAP submission does not meet Metalcraft requirements. In the event of a rejection, the Supplier shall take all action necessary to expediently correct the non-conformances.

Interim Approved - The Supplier is authorized to ship material for production requirements on a limited time or piece part quantity basis. Interim approval is only permitted when the Supplier has clearly defined the discrepancies preventing full approval and has an action plan to resolve such discrepancies.

Minor documentation discrepancies – In this event, at the discretion of MSQ (rather than rejection of entire PPAP package) permits the Supplier to correct documentation discrepancies, the Supplier has 24 hours to re-submit the corrected document(s) unless otherwise agreed upon between the Supplier and Metalcraft Supplier Quality.

8.3.7 PPAP Submission

The Supplier is required to submit the PPAP paperwork to the FTP server <https://ftps.secure-mtlcraft.com/> and send an Email to the email address specified on the Purchase Order (PO) notifying him/her of submission. The Supplier is also required to submit a paper copy of the PPAP documents with samples (if samples are requested). Samples must be identified as PPAP samples – [MoM OEM PPAP Workbook](#) – Sample PPAP Label Requirements tab for appropriate label.

8.3.8 FAI - AS9102 & Submission Requirements

Direct questions regarding FAI & submission requirements shall be sent to the buyer listed on the purchase order along with the appropriate quality team member associated with that project. see [MoM FAI Workbook](#) - PPAP requirements tab.

All suppliers providing value added parts/products as part of the supply chain shall adhere to the current edition of the appropriate standard. when a product is not produced in a 12 month period, an updated submission is required.

Minimum requirements including but not limited to:

- a) Organizational name including any sub suppliers
- b) All design records and details
- c) Assembly and sub assembly ballooned prints including any notes
- d) Agreed upon layout forms (Suppliers or Metalcrafts)
 - a. Print part number
 - i. Including drawing number, if different
 - b. Part Name
 - c. Rev level
 - d. Manufacturing process references between CP, Flow and PFMEA
 - e. Balloon # on print including all notes and material
 - f. Gage equipment # used
 - g. Full or partial 5 pc FAI submission
 - i. If partial,
 1. Reason for partial
 2. Baseline part number associated with this change for traceability
 - h. Characteristic and tolerance measured
 - i. Example: (3X) shall have 3 separate records
 - i. Results including in or out of specification notations
 - j. Signature of individual measuring and recording data
 - k. Supplier signature including date prepared
 - i. Reviewer signature and date reviewed
 - l. Date of approval by your internal quality professional before it is sent to Metalcraft

All raw material suppliers are not required to perform FAI, but are required to follow raw material requirements detailed in this manual. Material certificates, and or coating certificates must accompany each shipment.

9.0 Conflict Minerals

Metalcraft encourages its direct and sub suppliers to source responsibly with certified conflict free smelters, whenever possible to increase the level of confidence that the parts produced in its products are free of conflict. In each case, Metalcraft could require suppliers to provide the conflict minerals reporting template (CMRT) either at RFQ or with the PPAP submission to ensure we have traceability.

Suppliers and sub suppliers products shall not contain Conflict Minerals, or if they may, the products are Democratic Republic of Congo “DRC conflict free”.

10. Supplier Deviation Requests

Suppliers are required to follow the Approval Request process prior to implementing any Process or Product Changes. PPAP Requirements will be communicated via an approved Supplier Change/Deviation Request Form. Contact the Metalcraft Purchasing Agent to request the form and initiate the Supplier Change/Deviation Request process.

There are two types of Requests:

- 1) Temporary Deviation Request for a specific lot of parts or a timeframe or a
- 2) Permanent Deviation Request

Requests can be a permanent (design, process, material, etc.) change or a temporary (deviation approval from the approved design, process, material, etc.) request for a specified period of time or amount of parts.

Examples below could include but not limited to:

- Temporary Process Change – Change to the PPAP approved process, tooling move, plant move, improved/new tooling, etc., however it may be functionally acceptable temporarily.
- Temporary Product Change – Change to the product such the design intent, material change, etc. however it may be functionally acceptable temporarily.
- Permanent Process Change – Change to the PPAP approved process, tooling move, plant move, improved/new tooling etc., on a permanent basis.
- Permanent Product Change – Change to the product such that it meets the current design intent and requires a design change.

10.1 Approval Request

Suppliers shall request approval from Metalcraft before making any changes to a specification or process for supplied products or services. Metalcraft Purchasing will provide written approval where granted.

Table 1: Changes that require PPAP or FAI Approval Prior to Implementation (Shipment of Production Quantity to Metalcraft)

Requirement	Examples
1. Use of other construction or material than that used in the previously approved part or product or specified in the most recent design revision level.	This material may be any that has not been formally approved or specified on the design record. An example may be material from an alternative source than used for the previously approved part.
2. Parts/components from new or modified tools (except perishable tools), dies, molds, patterns, etc., including redundancy or replacement tooling.	This requirement only applies to tools, which due to their unique form and function can be expected to influence the integrity of the part and/or component.
3. Use of refurbished tooling/equipment or rearrangement of existing tooling or equipment.	<p>Refurbishment means the reconstruction and/or modification of a tool or machine that incorporates; increasing the capacity, performance, or change of its existing functionality. The Supplier shall not confuse this with normal maintenance or repair/replacement of tooling or equipment components that do not impact performance.</p> <p>Rearrangement or floor plan change is defined as changes that affect the sequence of product/process flow from that documented in the product/process flow chart, which shall reflect any equipment or tooling redundancy.</p> <p>Metalcraft recognizes that minor adjustments of production equipment may be required to meet safety requirements such as installing safety covers, sensors, or elimination of potential electro static discharges. There is no need to acquire formal approval for these types of changes.</p>

	<p>Any change requiring critical equipment loss of power shall require a PPAP.</p> <p>Any change that affects the Process Flow Diagram must be approved prior to implementation and shipment of product.</p>
4. Changes due to moving tooling and equipment to/from a different plant location or from redundant manufacturing sites.	This change requires PPAP approval prior to shipment of production quantities.
5. Change of Supplier for parts, non-equivalent materials, or services (e.g.: heat-treating, painting, plating, rust preventative or inhibitors).	Suppliers are responsible for approval of subcontracted material and services that affect all characteristics of the part/component or processing.
6. Product produced after the tooling has been inactive for volume production for twelve months or more.	Notification is required when the part has had no active purchase order and the existing tooling has been inactive for volume production of twelve months or more. The only exception is when the part/component has low volume, e.g. service or special order vehicles. Metalcraft SQA reserves the right to require PPAP submission for service parts/components.
7. Product and process changes related to components of the production product manufactured internally or manufactured by Suppliers that impact safety fit, form, function, performance, durability, and/or appearance of the saleable product, to include any change to design record specifications. The Supplier shall agree with requests by a subcontractor prior to submission to Metalcraft Purchasing.	Any change that affects Metalcraft Customer Specific Requirements for safety, fit, form, function, performance, durability, design record specifications and/or appearance requires notification and approval.
8. Changes in test/inspection methods that have an affect on acceptance criteria require notification and PPAP approval. Sourcing raw material for a different sub-supplier or new supplier. Changes that do not affect acceptance criteria do not require notification or PPAP approval.	Notification and PPAP approval requirements depend upon the specific circumstances. When in doubt, submit notification.

11. Nonconforming Material

The supplier shall establish and maintain documented procedures to ensure that proven or suspected nonconforming products are prevented from unintended use or installation. The control procedures shall consist of identification, documentation, evaluation, segregation and disposition of nonconforming material.

In the event that nonconforming material is present on finished product, the supplier is responsible to aid Metalcraft, in evaluating and correcting the issue. Metalcraft is entitled to recover all costs reasonably incurred in taking corrective action from the supplier.

Charge backs may be given for all activates completed by Metalcraft. Charge backs will be debited against the supplier for all expenses related to nonconforming material activities.

12. Corrective Action Requirements for Suppliers

Metalcraft will notify suppliers of problems regarding quality, delivery, packaging and services in writing. Initial response and containment is required within 24 hours from notification. This initial response includes, at a minimum:

- Utilization of a documented corrective action format (8D report or an agreed upon method)
- The problem description
- All personnel assigned to resolve the concerns
- Containment actions taken for supplier shipped products
- Containment of all in transit material
- Probable or determined root cause
- Implement poka-yoke actions, if possible.

The final corrective action report (8D report or an agreed upon method) shall be completed and sent back to Metalcraft no later than 45 days after the initial request, or an agreed upon timeline when corrective actions need customer and or appropriation approval. The final corrective action report should include all documentation of problem solving tools used.

Corrective actions may be issued for any product associated issues including Metalcrafts customer complaints. These timelines could be shortened depending on contract requirements.

13. Sorting, Rework or Repair

- When supplier parts do not meet specifications, the supplier shall assume responsibility of sorting, rework or repair activity. The supplier shall

provide detailed work instructions for any sorting, rework or repair activities, including re-inspection requirements. Metalcraft shall have the opportunity to review and agree on the verification method to ensure sorted, reworked or refurbished product meets the print, part design or process requirements.

- All repairs bringing the product back to spec require an approved, qualified repair procedure and must provide detailed instructions for all activities. Work instructions and procedures to complete these tasks must be approved by a Metalcraft Quality Representative before actions are taken.
- Metalcraft requires the marking of such reworked, repaired and verified product or a reported end date. The supplier should provide a clean date for any reworked, refurbished products and possibly uniquely mark the product for at least a short period of time. Supplier should keep this information as per the regular product tracking records retention requirements.

14. Welding Requirements

Suppliers must comply with the appropriate industry accepted codes and standards, such as AWS, ASME or MIL-specs, as they apply to the components manufactured and supplied to Metalcraft. Suppliers **MUST** certify and maintain a record of any and all personnel that weld on Metalcraft components per the accepted codes and standards, along with maintaining that certification to satisfy Metalcraft's customer requirements. Welding is not used as a repair measure for defective parts unless approved by Metalcraft approved weld repair procedures in accordance with the appropriate industry accepted codes and standards as they apply to the components manufactured and supplied to Metalcraft are approved

Metalcraft welds to the standards of AWS and also MIL where applicable.

Suppliers shall comply with all pertinent AWS and MIL Standards as specified on the design record and correlate to the product design record.

14.1 Qualified Welding Inspector

Qualified inspectors trained to perform inspection functions shall be used for the verification of weld quality, and shall be in accordance with at least one of the following conditions: Current certification in accordance with the American Welding Society (AWS), Certified Welding Inspector (CWI) or Senior Certified Welding Inspector (SCWI), qualified and certified in accordance with provisions of AWS QC1.

15. Contingency Plans

Suppliers are required to prepare contingency plans for such instances listed, but not be limited to: environmental instances, utility interruptions, labor shortages, key equipment failures, field returns and or acts of god such as weather related instances to reasonably protect Metalcraft and our customers in the event of a supply chain event or emergency.

16. Continuous Improvement Plans

Suppliers are required to meet zero delivered defects. Metalcraft reserves the right to visit suppliers and in some instances, complete assessments/audits. Assessments may include but are not limited too; Self-assessment or an onsite visit which could include risk analysis and determine if other actions are required.

17. Cosmetic Quality Requirements

Cosmetic standards for paint and imperfections in the surfaces seen by the end user should be reviewed during the APQP process. Unless customer specific requirements dictate otherwise, cosmetic evaluations shall be reviewed against Metalcraft's WK26064 Paint Inspection Standards form.

18. Escalation Process

All suppliers shall have an escalation process to ensure all personnel they contract or do processes in their facilities will know who to contact when process requirements are not clear, or when suspect or defective product is discovered or reported ensuring the parts are processed correctly or quarantined per procedure.

19. Special Processes

Suppliers who perform or subcontract "special" processes, defined by AIAG and OEM Industry as Heat Treating, Plating, Coating, Welding, Casting etc., these suppliers and sub-tiers, when required, shall comply with the following AIAG standards and complete the associated forms:

CQI-9 Special Process: Heat Treat System Assessment
CQI-11 Special Process: Plating System Assessment
CQI-12 Special Process: Coating System Assessment
CQI-15 Special Process: Welding System Assessment
CQI-27 Casting Process: Casting Systems Assessment

20. Safety Data Sheet (SDS)

A safety data sheet, in accordance with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), must be sent and approved by the receiving plant before delivery of any chemicals (processed or natural) is allowed.

21. Sub Supplier Control

Metalcraft suppliers are responsible for the control and continuous improvement efforts of each sub-supplier including Metalcraft appointed. Metalcraft reserves the right to visit sub-suppliers and in some instances, complete assessments/audits. Assessments may include but are not limited to; Self-assessment or an onsite visit which could include risk analysis and determines what other actions are required.

Metalcraft requires sub suppliers to at least have a management system in place for all produced product shipped that can affect customers and if applicable, working towards 3rd party ISO certification.

Suppliers will conduct operations to meet or exceed all applicable environmental laws and regulations in the US and or in their district. This would include all applicable government standards, regulations and statutes.

Supplier assumes responsibility for compliance from all levels of supply fulfillment including purchased material.

22. NADCAP Laser and Machining Contracted and Subcontracted Requirements

It is the sole responsibility of the supplier or sub supplier to ensure all NADCAP requirements including the flow down of all customer specific requirements associated with NADCAP laser and machine operations subcontracted.

Suppliers and sub-suppliers to Metalcraft or Metalcraft Customers shall have procedures in place for laser and machining processes affected by NADCAP. Process data must be recorded and approved by a Metalcraft Customer-authorized person or a customer approved designated Metalcraft or supplier employee.

23. EDI Requirements

All suppliers shall have the ability to receive EDI requirements or have an agreed upon alternative method including, but not limited to receiving releases, sending advanced shipment notices, etc.

24. Supplier Performance Ratings

All suppliers shall provide 100% on-time delivery performance to Metalcraft receiving sites. Cost incurred as a result of delivery shortfalls caused by the supplier is the sole responsibility of the supplier.

The supplier shall notify the appropriate Metalcraft receiving site of any non-conforming parts sent and the agreement from Metalcraft stating substandard parts could ship and are being delivered. Supplier will also notify all affected sites that could receive this product. The appropriate identification of product must be agreed upon with Metalcraft to ensure proper tracking of parts is attainable throughout our system in case production or field issues occur.

Scorecard ratings will be generated quarterly for product delivered in that quarter using plant Delivery Performance, PPM and Wave Length data. It is the supplier's responsibility to inform Metalcraft Purchasing of any discrepancies with the data provided. Supplier's delivery scores will not be affected by any purchase order agreed to or not, that fails to provide the full product lead-time.

Delivery metric will be measured on a PO level. Any order that fails to deliver (LOTIF) Line On Time In Full that Metalcraft has not previously been notified and agreed on, will be marked as late.

25. Customs

It is the sole responsibility of the supplier to complete all pertinent forms and declarations for shipment(s) including origin of the products required by customs regulations. When doing so, the maximum customs preferences have to be declared by the supplier. In cases of doubt, the supplier is responsible for clarifying any unclear concerns with customs authorities and or any chamber of commerce.

Supplier is liable for any costs incurred by Metalcraft for any delays, including but not limited to: declarations, clarifications and all documents which are necessary for customs clearance ensuring products are delivered on time and not damaged.

26. Reach Requirements

When required, suppliers shall comply with REACH requirements. One of the requirements of REACH is manufacturers and importers have a duty to register for each legal entity or substances on their own, unless the substance is exempt from registration.

Registration requirements also apply to substance(s) intentionally released from articles under certain conditions, in which case the article producer/importer is

responsible for the registration. Supplier should review all REACH Requirements to ensure Metalcraft and its Customer's requirements are met.

27. RoHS Directives/Requirements

RoHS directives apply to any business that manufactures, sells or distributes any products with an electrical or electronic component, or sells to resellers, distributors or integrators, etc., who would be impacted if they utilize restricted materials delivered to any number of countries. Metalcraft and all of its suppliers fall under this directive.

RoHS directives also apply to the metal industry for any application of metal plating, anodizing, chromating or other finishes on components/products, as well as the composition of raw materials.

These statements are not meant to be all inclusive to the RoHS standard/requirements/directive. Suppliers and sub suppliers should review all RoHS Requirements to ensure they comply with the latest directive ensuring compliance to any new substance(s) that could be added to the most recent release(s).

28. Environmental Compliance

Suppliers shall ensure compliance with all applicable legal environmental requirements (international, national, regional, local) as well as any specific requirements concerning environmental protection such as: soil, water, air, conservation of resources, waste minimization, noise protection, and any haptic requirements.

In cases where the supplier wants to withdraw a product from the market, the supplier has to inform Metalcraft and jointly define alternative solutions and allowable timelines.

29. PO Reviews

It is the sole responsibility of the supplier to check each PO for accuracy against the product produced. Material or process certification requirement as noted on drawings, stated in the MoM OEM PPAP Workbook or as required by our customers shall be submitted per contract with traceability back to the material supplier, if applicable.

To ensure payment within the agreed upon terms, the purchase order number must appear on all documentation supplied including but not limited to: packing slip, bill of lading and freight bill. The invoice must list the PO, Jit number(when applicable), and the packing list number. Packing list must also have the Jit number listed, when applicable.

30. Logistics - Shipment and Delivery Requirements

Scheduling agreements and purchase order confirmation is required. Shipments may arrive within lead time but, -0- days late. Quantity and cost variances must be approved prior to product shipment. Over shipment is not accepted without prior approval from buyer and or management.

Supplier is required to have a 45-day firm window supply on hand unless otherwise agreed to. Metalcraft assumes no liability for fabrication or production in excess of the firm window unless written approval has been obtained. Supplier's active support and contribution to any change in this process is required.

Unless otherwise agreed to in writing, product barcoding will follow MoM Form Supplier Part Identification Label Standard requirements file. Labels will be positioned horizontally on each box/container on the skid/pallet and if possible, viewable to the outside of the skid. Labels should be attached sufficiently to ensure it remains in place and legible for the shelf life or usage of the product. All previous, old labels removed prior to shipment.

Packaging needs to protect the product, be recyclable, clean and not damaged, and be free of CFC's, chlorine and non-toxic, if incinerated. Unless otherwise agreed to in writing, products need to be delivered in metal or plastic containers however, cardboard and wood will be accepted, but is not preferred. Shipments must comply with receiving customer's federal, stated, and local laws.

31. Commercial-off-the-shelf (COTS)

COTS products are ready-made and available for purchase in the commercial market to supplement, enhance or replace proprietary systems. These parts are commercially available, unaltered, and may be procured through distributors.

When providing a PPAP for COTS parts, suppliers are expected to submit all elements of the requested PPAP level. At times, due to the nature of COTS parts, suppliers may be unable to obtain all data for all elements for a PPAP. In these cases, the supplier is expected to demonstrate / affirm conformance with supporting PPAP documents or Certificates of Conformance by supplying the following minimum or agreed upon PPAP elements:

- Design Record (Bubble Print)
- Engineering Change Documents (If applicable)
- Customer Engineering Approval (If applicable)
- Dimensional Results / Print Notes Verification
- Sample Production Parts
- PPAP Sample Photos
- Customer Specific Requirements (If applicable)
- Parts Submission Warrant

- Catalog Page or equivalent from OEM to demonstrate commerciality (if available)

When the supplier cannot attain all PPAP elements, a Certificate of Conformance (C of C) will be required in addition to the above elements. The C of C letter shall:

- Confirm the article is commercially available
- Be on the supplier's company letterhead
- Include the Metalcraft part number
- Include the part revision level,
- Be signed by a representative within the supplier's organization that has decision making authority.
- Positively affirm that the part meets the requirements within the print.

31.1 "COTS Plus":

Parts that are COTS (as defined above) but have additional print or performance requirements that Metalcraft or our Customers have deemed important (because of the part's application). If the OEM catalog page does not include all print specifications, the supplier is responsible to provide objective evidence that the part meets the requirement within the print.

32. Material Preservation

Unless otherwise specified, all uncoated or unprotected ferrous and nonferrous metal surfaces (internal and/or external) must be protected for a minimum of thirty (30) working days from date of receipt against rust and corrosion and be suitably packed to prevent damage from handling or shipping. All openings (i.e. hydraulic tubes, electrical connections, etc.) must be adequately protected by closures to prevent contamination or damage.

Approved Rust Preventatives:

- Nox-rust VCI-10,
- Corfilm 100 or
- A Metalcraft approved water soluble rust preventative equivalent.