

# Danboro Quality System Procedure

## QSP-6.5 Supplier Quality Requirements

Version W

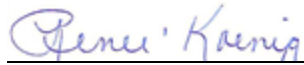
September 15, 2020



Quality Manager

9/3/2020

Date



Tool Operations Supervisor

9/10/2020

Date



Quality Assurance Supervisor

9/3/2020

Date



Author

9/15/2020

Date

Version	Version Date	Change Description
W	9/15/2020	Updated header format to be compatible with CEBOS. Revised form # PEF-06-007 to PFF-06-008. Section 5.3 - updated supplier scorecard information. Section 5.4.2 - updated written authorization information. Section 5.5.2 - clarified supplier gage calibration requirements. Throughout - updated to current ISO/EIC 17025 designation. Appendix III - listed current FMEA reference.
V	4/18/2019	Section 6.A.4.6.a – Updated to include requirement for maximum height on skid.
U	4/18/2019	Updated to remove Winston-Salem from the document and modified the format to make compatible with CEBOS. Also, section A.1.7 added to address counterfeit parts prevention.
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**Supplier Quality Requirements**

**1.0 PURPOSE.** This document identifies the responsibilities of suppliers to PennEngineering. It is intended to assist suppliers in identifying our expectations regarding quality matters. It is expected that our suppliers understand our commitment to delivering quality to our customers, and that they partner with us in implementing this commitment.

**2.0 RESPONSIBILITY.**

- 2.1 The Materials Supervisor and Quality Manager, with assistance from other personnel, are responsible for this document.
- 2.2 Suppliers are responsible to implement measures to ensure that quality products are delivered to PennEngineering in accordance with Purchase Order requirements. Suppliers shall implement measures to conform to the requirements of this document when so required by a statement on the purchase order, or as otherwise agreed by both the supplier and the Materials or Quality Departments of PennEngineering.

**3.0 APPLICABILITY.**

- 3.1 The requirements of this document do not override or negate any other purchase order requirements. In the case of conflict between the requirements contained herein and any other requirement on the face of the PO, the requirements from the PO prevail. Unless otherwise noted, the industry specification revision, which is current as of the purchase order date, shall apply.
- 3.2 This document extends to suppliers which affect the quality of fastener products of PennEngineering. Supplier categories are defined as follows:

**Category A: Subcontractors (see definition, Appendix II). Suppliers of:**

1. raw materials for fastener products (metals and plastics)
2. manufacturers of parts which will be sold as fastener product (metal, plastic, etc.)
3. heat treating of fastener product
4. plating and coatings applied to fastener product (full coverage)
5. coatings applied to fastener product (partial coverage)
6. surface finishing of fastener product
7. other processes on fastener products (not defined by any of the processes above)

**Category B: Indirect Suppliers (see definition, Appendix II). Suppliers of:**

1. raw materials for tooling and testing panels
2. manufacturers and suppliers of tooling and production equipment
3. heat treating (and other thermal processing) of tooling
4. plating and coatings applied to tooling
5. surface finishing of tooling
6. other processes on tooling (not defined by any of the processes above)

**Category C: Laboratories (see definition, Appendix II). Suppliers of:**

1. calibration services
2. product testing services

**Category D: Service Suppliers (see definition, Appendix II). Suppliers of:**

1. sorting companies
2. delivery services and trucking companies

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**Supplier Quality Requirements****4.0 DOCUMENT PARAGRAPH INDEX.****Para      Subject****5.0 General Quality Requirements – for All Suppliers**

- 5.1 Compliance to Government, Safety and Environmental Regulations.
- 5.2 Quality Management System Standard.
- 5.3 Supplier Performance.
- 5.4 Nonconforming Product.
- 5.5 PennEngineering Supplied Material and Equipment.
- 5.6 Verification of Process Capability.
- 5.7 Right to Verify Product at Supplier's Premises (i.e., Source Inspection).
- 5.8 Supplier Restitution
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**6.A Quality Requirements for Subcontractors.**

- A.1 Requirements for All Subcontractors.
- A.2 Specific Requirements for Raw Material Suppliers, Including Stock Plastic.
- A.3 Specific Requirements for Fastener Part Manufacturers, Including Plastic Injection Molders.
- A.4 Specific Requirements for Process Sources - Heat Treating, Plating, Surface Finishing, Plastic Overmolding (i.e. Injection Molding), Thread-Locking Patches, and Other Processes.

**6.B Quality Requirements for Indirect Suppliers.**

- B.1 Requirements for All Indirect Suppliers.
- B.2 Specific Requirements for Tooling Raw Material Suppliers.
- B.3 Specific Requirements for Manufacturers and Suppliers of Completed Tools and Tooling Blanks.
- B.4 Specific Requirements for Tooling Process Suppliers - Heat Treating/Thermal Processes, Plating/Coating, Surface Finishing, and Other Processes.

**6.C Quality Requirements for Laboratories.****6.D Quality Requirements for Service Suppliers.**

- D.1 Specific Requirements for Sorting Services.
- D.2 Specific Requirements for Delivery Services and Trucking Companies.

**Appendices.**

- I. General Packaging Requirements and Recommendations
- II. Definitions
- III. Referenced Documents
- IV. PennEngineering Facility

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**5.0 GENERAL QUALITY REQUIREMENTS – FOR ALL SUPPLIERS.**

**5.1 Compliance to Government, Safety and Environmental Regulations.**

- 5.1.1 All items supplied to PennEngineering shall satisfy current applicable governmental and safety constraints on restricted, toxic and hazardous materials; as well as environmental, electrical and electromagnetic considerations applicable to the country of manufacture and sale.
- 5.1.2. PennEngineering is committed to social and environmental responsibility in our activities as well as within our supply chain, regarding the prohibition of the use of Conflict Minerals (Tantalum, Tin, Tungsten and Gold – from the mines in or around the Democratic Republic of the Congo) per the latest revisions of the U.S. Securities and Exchange Commission or other pertinent agencies / authorities.  
  
Applicable suppliers will be required to submit reports, certifications, and related documentation confirming if any conflict minerals are intentionally added and are necessary to the functionality or production of any applicable product. Our Conflict Minerals policy statement is located on our website as well as further guidance from EICC and GeSi.
- 5.1.3 Unless otherwise specified, suppliers shall not use mercury, mercury compounds, polychlorinated biphenyls (PCBs), PFOS or PFOA compounds in the manufacture or processing of PennEngineering products.
- 5.1.4 Unless otherwise specified, all items supplied to PennEngineering shall be compliant with European RoHS 2 Directive 2011/65/EU or a subsequent directive superseding it. Any exemptions used for compliance must be clearly communicated to PennEngineering.
- 5.1.5 Unless otherwise specified all items supplied to PennEngineering shall not contain any REACH SVHC (Substance of Very High Concern) in excess of 0.1% of article weight. SVHC list in affect when PO is placed shall apply.

**5.2 Quality Management System Standard.**

**5.2.1 Quality Management System – Subcontractors.**

PennEngineering expects that Subcontractors will implement a QMS certified to ISO 9001 requirements. Based on importance of the product supplied and the volume supplied to the automotive industry & PennEngineering, ISO 9001 certification may be waived (1) for non-automotive customers or (2) if authorized by automotive customers. Suppliers shall also implement applicable elements of other standards, including IATF 16949, AS9100, and QSLM Criteria for Class 2/Class 3 fasteners. Registration to the appropriate QMS standard is encouraged, based on the product/service the supplier provides. We evaluate our suppliers utilizing applicable sections and elements of these documents as the fundamental QMS requirement.

**5.2.2 Quality Management System – Indirect Suppliers and Service Suppliers.**

PennEngineering expects that Indirect Suppliers will implement a QMS certified to ISO 9001. Based on importance of the product supplied and the volume supplied to the automotive industry & PennEngineering, ISO 9001 certification may be waived. We evaluate our

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suppliers utilizing applicable sections and elements of this document as the fundamental QMS requirement. Registration to the appropriate QMS standard is encouraged, based on the product/service the supplier provides.

**5.2.3 Quality Management System – Laboratories.**

PennEngineering utilizes subcontracted calibration and laboratory sources which are accredited to ISO/IEC 17025 or national equivalent, or otherwise approved by the applicable customer. The original equipment manufacturer may perform calibration services when an accredited laboratory does not exist.

**5.3 Supplier Performance.**

PennEngineering measures the performance of its Subcontractors and Indirect Suppliers based on quality (conformance to product and PO requirements), on-time delivery, and responsiveness. Formal reports of supplier performance will be issued monthly for internal review. Formal supplier scorecards will be distributed to suppliers quarterly. See QSP-6.2 for details of the Supplier Scorecard program.

Suppliers are expected to deliver items with a goal of 100% on-time performance and zero defects. Suppliers shall establish and implement systems to strive for these goals.

*NOTE: Refer to Appendix II for the definition of "On-time Delivery".*

**5.4 Nonconforming Product.**

5.4.1 Suppliers shall not permit parts/material which do not conform to all requirements to be shipped to PennEngineering without documented authorization. Documented authorization shall be in the form of an "Engineering Supplier Waiver/Deviation" (SWD) approved by the Engineering Department of PennEngineering. This SWD shall be referenced on the purchase order.

In the case of an urgent delivery where a revised purchase order has not yet been received, a copy of the SWD shall be sent with each applicable shipment of parts/material, or the SWD number shall be referenced on the part/material packing slip and/or certification.


5.4.2 Suppliers who are unable to complete applicable inspections or tests in time to meet shipment due dates may be given approval to ship parts prior to the completion of the inspections or tests. Supplier shall obtain prior written authorization from PennEngineering for these situations via the following in order of precedence:

- Statement on the purchase order,
- Statement within the applicable process specification referenced on the PO,
- An Engineering SWD issued per paragraph 5.4.1,
- Written authorization (via email, fax, letter, etc.) from the buyer or the Quality Assurance Department of PennEngineering (must specify applicable information such as part number, lot number, PO number, and/or duration of authorization), or
- Statement of authorization found elsewhere in this document (paragraph A.4.5).

If test results show that parts fail to meet requirements, supplier shall immediately notify PennEngineering about the failure and quarantine all applicable product.

5.4.3 PennEngineering reserves the right to reject and return all product that does not conform to purchase order requirements. Authorization to return material/items will normally be

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requested; if authorization is not received within an appropriate time, items will be returned without authorization.

If the supplier disputes any such claim, the following rules will govern the resolution:

- a. Raw material shall be verified by appropriate testing by an independent laboratory.
- b. The results of heat treating and other thermal processes of metals (e.g., hardness) shall be verified by the Heat Treat Department or Technical Laboratory of PennEngineering following the referee method specified in the applicable specification. PennEngineering reserves the right to have this verified by appropriate inspection / testing by an independent laboratory.
- c. Plating, coating, and other processes that cover parts shall be verified by appropriate inspection and testing by an independent laboratory.
- d. Surface finish shall be verified by the Inspection Department of PennEngineering. We reserve the right to have this verified by appropriate inspection and testing by an independent laboratory.
- e. Dimensional nonconformities shall be verified by the Inspection Department of PennEngineering. We reserve the right to have this verified by appropriate inspection by an independent laboratory.
- f. Visual acceptance criteria will be developed on a case-by-case basis.

## **5.5 PennEngineering Supplied Material and Equipment.**

5.5.1 Any raw material supplied by PennEngineering for use in fulfilling an order shall be segregated and identified that it is the property of PennEngineering.

- a. Suppliers may not use such materials for any other purpose unless authorized PennEngineering.
- b. Supplier shall return any remaining raw material when the order is complete.
- c. Supplier may not substitute other material for any reason.
- d. If more or other material is necessary, the supplier shall contact the buyer at PennEngineering for direction.

5.5.2 Any equipment (machinery, tools, gages, etc.) supplied by PennEngineering for use in fulfilling an order shall be segregated and identified that it is the property of PennEngineering.

- a. Suppliers may not use such equipment for any other purpose unless authorized PennEngineering.
- b. Inspection, Monitoring, Measuring and Test Equipment (IMMTE) supplied by PennEngineering is calibrated with a sticker applied to show its status. Suppliers shall have an effective gage calibration system to ensure that any IMMTE is returned to PennEngineering in order to keep calibrations current.
- c. Suppliers shall return such equipment when the order is complete, unless otherwise directed by PennEngineering.

## **5.6 Verification of Process Capability.**

PennEngineering reserves the right to visit a supplier's facility for the purpose of reviewing their processes to verify capability to meet applicable requirements, and their continued conformance to these requirements. Such requirements may include, but are not limited to the supplier's ability to:

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- a. maintenance of an appropriate Quality Management System
- b. meet product/process requirements
- c. verify a product's conformance to specified requirements
- d. maintain necessary traceability
- e. handle product in manners to maintain identification and prevent product mixes
- f. deliver product within an appropriate timeframe

*NOTE: PennEngineering representatives who visit a supplier for these purposes agree to keep any details about proprietary processes confidential, and will not divulge information in any manner that is detrimental to the supplier.*

**5.7 Right to Verify Product at Supplier's Premises (i.e., Source Inspection).**

When specified in the contract or purchase order, or as otherwise agreed, suppliers shall afford representatives from PennEngineering and/or customers of PennEngineering the right to verify the conformity of product to specified requirements at the supplier's premises.

**5.8 Supplier Restitution**

Supply may be expected to compensate PennEngineering for the negative impact caused by poor quality or delivery performance.

**5.9 Records.**

5.9.1 Subcontractors: Refer to paragraph A.1.4.

5.9.2 Indirect Suppliers: Except as required by ISO 9001, the purchase order, and other paragraphs of this document, no records are required by this document.

**6.A QUALITY REQUIREMENTS FOR SUBCONTRACTORS.****A.1 Requirements for All Subcontractors.**

A.1.1 Process FMEA's, Control Plans, PPAP and embedded software.

A.1.1.1 The subcontractor shall develop Process FMEA's and Control Plans (See Definitions in Appendix II) as required, for parts made and processes performed on PennEngineering product. The subcontractor shall keep these documents on file, and shall keep the information current. Subcontractor shall submit copies of these documents to PennEngineering upon request.

A.1.1.2 When and as required by PennEngineering, the subcontractor shall comply with the requirements of the Production Part Approval Process (See Definitions in Appendix II). Specifically, subcontractor shall:

- a. submit a sample of production parts and all applicable documents (e.g. FMEA, Control Plan, material/process certifications, inspection/test results, etc.).
- b. not change the process without a resubmission of the applicable documents and approval from PennEngineering.

A.1.1.3 The subcontractor shall implement and maintain an assessment methodology for software development when supplying automotive products with embedded software or automotive product-related software. Utilizing risk based thinking regarding potential impact to the customer, the subcontractor shall maintain documented information of this assessment.

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**Supplier Quality Requirements****A.1.2 Risk Management.**

Subcontractors shall identify potential risks that could impact the subcontractor's ability to fulfill the requirements of PennEngineering Purchase Orders, and implement measures to prevent the cause or reduce the impact of these risks. Such measures shall include the implementation of contingency plans regarding utilities, work stoppages, labor actions, production equipment availability, and the sub-suppliers providing needed materials or processes.

Supplier shall provide appropriate reports of risk assessment and measures taken, including contingency plans, to PennEngineering upon request.

**A.1.3 Nonconforming Product Discovered After Shipment to PennEngineering.**

In addition to any other requirement, the supplier shall promptly notify PennEngineering if delivered product is found to be nonconforming to any purchase order requirement, or if product safety or reliability is affected. Notification shall include:

- clear description of the nonconformity
- part number
- quantity affected
- date delivered
- PennEngineering purchase order number
- PennEngineering work order number, if applicable
- Supplier's traceability information (i.e., lot number, batch number, heat number, etc.)
- any other information specifically requested by PennEngineering Quality Assurance

**A.1.4 Records.**

Subcontractor shall maintain records in accordance with ISO 9001 and to provide evidence of conformity to purchase order requirements, including product conformance and compliance to processing requirements. Records shall be maintained by the subcontractor for a period of not less than 20 years, unless otherwise specified on the face of the purchase order.

**A.1.5 Right of Access.**

Subcontractors shall afford representatives from PennEngineering, customers of PennEngineering, and regulatory authorities, the right of access to all facilities involved in the order, and to all applicable records.

**A.1.6 Flow Down of Requirements.**

Subcontractors shall flow down to their sub-tier suppliers the applicable requirements in the Purchase Order, applicable specifications, and of this document. Flow down shall include applicable product requirements, records requirements, and right of access.

**A.1.7 Counterfeit Parts Prevention.**

Subcontractors shall plan, implement and control a process appropriate to the product that prevents the use of counterfeit product and their inclusion in product(s) delivered to the customer.



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**Supplier Quality Requirements****A.2 Requirements for Raw Material Suppliers, Including Stock Plastic.****A.2.1 Product Identification and Traceability.**

- a. Raw material shall be traceable to the mill's original heat or lot number.
- b. Each individual quantity (coil, bundle, spool, etc) of raw material delivered to PennEngineering shall be identified by a tag or other appropriate attached marking. Information required to be included on the tag (or appropriate marking) shall include:
  - Part number/size by PennEngineering part number as listed on the PO
  - Alloy designation
  - Weight
  - Heat number
  - Supplier's identification number which provides processing traceability (e.g. work order number, lot number, batch number, etc)
  - PennEngineering purchase order number
  - Subcontractor's name

**A.2.2 Process Control.**

- a. The subcontractor shall supply material produced in accordance with the requirements of the raw material specification identified on the purchase order, if applicable.
- b. Upon receipt of the first order for each raw material (by PennEngineering specification number), subcontractor shall submit material samples as required by the PennEngineering Quality Department for first article approval before first shipment of material. Material submitted for first article approval shall be representative of production and future shipments. Any subsequent changes to the process require re-approval of the new/revised process. Further, PennEngineering reserves the right to require a re-approval of material as deemed necessary.

**A.2.3 Subcontracting.**

- a. Raw material suppliers may subcontract any or all parts of their processing as long as all other requirements are satisfied.
- b. PennEngineering reserves the right to restrict or disallow the use of a subcontractor as a result of poor material quality or their inability or refusal to meet other applicable requirements.

**A.2.4 Handling, Packaging and Delivery.**

Raw material from different heat/lot numbers shall be appropriately separated in order to maintain traceability. Further, raw material shipped in order to fulfill more than one purchase order shall be appropriately separated in order to maintain traceability.

**A.2.5 Records.**

- a. All records delivered to PennEngineering shall be identified with the following in order to maintain traceability:
  - Part number/size by PennEngineering part number as listed on the PO
  - Alloy designation

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- Weight shipped
  - Heat number
  - lot number or other identification which will provide traceability
  - PennEngineering purchase order number
  - Subcontractor's name
- b. Material certifications and test reports as required by the applicable PennEngineering raw material specifications shall be obtained by the subcontractor and maintained by the subcontractor in accordance with paragraph A.1.3.

**A.2.6 Certificates and Reports.**

- a. Subcontractors of carbon steel and corrosion resistant (stainless) steel. A raw material certification of actual chemical and physical analysis shall be forwarded with each shipment.
- b. Subcontractors of aluminum, brass, and bronze alloys. A raw material certification of typical (or actual) chemical and physical analysis shall be forwarded with each shipment.
- c. Subcontractors of other materials (plastics, etc.). A certificate of conformance, along with a certificate of applicable tests, is required with each shipment.
- d. All certificates and reports listed in paragraph A.2.6.a. through c. above shall include the following information:
- PennEngineering purchase order/item number
  - Brief description of material ordered (size, type, class, etc.)
  - Applicable raw material specification and its revision, per purchase order
  - Material heat/lot number
  - Listing of all chemical and physical specification requirements, and the results of tests performed
  - Signature of an authorized subcontractor representative.

**NOTE:** *“Physical” requirements in paragraph A.2.6.a thru d. are often referred to as “mechanical” requirements in the text of PennEngineering raw material specifications. They include all of the following as applicable: ultimate tensile strength, yield strength, elongation, reduction in area, grain size, and decarburization, and may include others as defined within the raw material specification.*

**A.2.7 DFAR 252.225.7014.**

- a. Purchase order or referenced material specifications may require that material be “DFARs compliant”. In these cases, the supplier shall supply material in accordance with DFAR 252.225-7014. Material certificate shall identify the melt source of the material.

**A.3 Requirements for Fastener Part Manufacturers, Including Plastic Injection Molders**

**A.3.1 Purchasing.**

- a. Raw material purchased by the subcontractor used to manufacture parts shall conform to the requirements of the PennEngineering raw material specification and any raw material requirements identified on the purchase order or on referenced documents.

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- b. A raw material certification showing chemical and physical analysis shall be requested and obtained from the material supplier. Certification shall be forwarded to PennEngineering with shipment of parts.

**A.3.2 Product Identification and Traceability.**

- a. Subcontractor shall maintain traceability to the raw material heat/lot number from which the parts were made.
- b. Subcontractor may not mix parts made from different raw material heat/lot numbers. Each PennEngineering Work Order Number shall represent parts made from one raw material heat/lot.

**A.3.3 Subcontracting.**

- a. Subcontractor may not sub-contract any part of the processing or other requirements without prior approval of PennEngineering via a completed form PFF-06-008.
- b. Inspection and/or testing of parts may be subcontracted without the need for approval as long as the laboratory is ISO/EIC 17025 accredited for the inspection/testing to be performed.

**A.3.4 Process Control.**

- a. The subcontractor shall manufacture parts in accordance with the correct revision of the PennEngineering drawing, as identified on the purchase order.
- b. Parts shall be made from raw material in accordance with the description identified on the purchase order, drawing, or other referenced document.
- c. Unless stated otherwise on the purchase order, parts shall be manufactured according to the correct revisions of all process specifications identified on the purchase order, drawing, and other documents. This includes tapping procedures, heat treating specifications, finish specifications, and others as required.
- d. Supplier shall make appropriate provisions to prevent, detect, and remove foreign objects and debris from entering into containers of parts.
- e. Upon receipt of the first order for each part number, subcontractor may be requested to submit parts to PennEngineering for first article approval before continuing with processing. Parts submitted for first article approval shall be representative of production. Any subsequent change to the process requires re-approval of the new/revised process. Further, PennEngineering reserves the right to require a re-approval of process as deemed necessary.
- f. After the order for parts is complete, the subcontractor shall return any items belonging to PennEngineering. The subcontractor shall contact the buyer to properly complete the return.

**A.3.5 Identification, Traceability, and Marking Requirements for Packages.**

- a. Each container (bin, box, etc.) of products delivered shall be identified to indicate the subcontractor name, PEM part number, quantity, purchase order number, and supplier's lot traceability information.

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- b. Containers shipped separately shall be clearly marked or labeled to identify number of containers. Example: Carton #1 of 4, Carton #2 of 4, etc.
- c. Subcontractor may be required to send a copy of the applicable PennEngineering part drawing with each shipment of parts.
- d. Refer to Appendix I for packaging and package label requirements.

**A.3.6 Records.**

- a. All records delivered to PennEngineering shall be identified with the following, in order to maintain traceability:
  - PennEngineering purchase order/line item number,
  - PennEngineering part number,
  - Supplier traceability information
- b. Material certifications and test reports shall be obtained by the subcontractor and maintained by the subcontractor in accordance with paragraph A.1.3.
- c. If supplier is required to provide other processes (e.g., heat treating, plating, passivation, etc.) in the manufacturing of fastener parts, supplier shall maintain evidence of conformance to applicable process and test requirements for a period of not less than 20 years, unless otherwise specified.

**A.3.7 Statistical Techniques.**

Dimensions that are “boxed” in the field of the part drawing indicate that those dimensions are “controlled dimensions”. Controlled dimensions (if any) shall be charted and monitored using Statistical Process Control. The Quality Assurance Department of PennEngineering may be contacted to provide assistance, if needed.

**A.3.8 Certificates and Reports.**

- a. Referring to paragraph A.3.1, supplier shall submit raw material certification with each shipment of parts. Raw material cert shall identify the information required by paragraph A.3.6.a.
- b. When the purchase order (or a referenced document) requires a Certificate of Conformance (or Compliance), such certificate shall include the following information:
  - PennEngineering part number,
  - PennEngineering purchase order/line item number,
  - Brief description of part (and/or process),
  - Identification of drawing number (and/or process specification) and revision,
  - Subcontractor’s process lot/batch number,
  - Reference to raw material traceability, including heat number,
  - Identify the company names and locations of any sub-subcontractors used, (see paragraph A.3.3)
  - And signature of authorized subcontractor representative.

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**A.4 Specific Requirements for Process Sources - Heat Treating, Plating, Surface Finishing, Plastic Overmolding (i.e. Injection Molding), Thread-Locking Patches, and Other Processes.****A.4.1 Handling and Storage of Product**

- a. Subcontractor is responsible for the condition of PennEngineering parts while in their possession. Subcontractor shall implement methods to keep parts acceptably clean and free from substances detrimental to the parts, part surface condition, or part functionality.
- b. Subcontractor shall implement methods into their handling and production processes that eliminate the possibility of mixing work order/releases. Supplier shall also make appropriate provisions to prevent, detect, and remove foreign objects and debris from entering into containers of parts.

**A.4.2 Product Identification and Traceability**

Subcontractors of the various processes shall maintain traceability of parts in order to correlate subcontractor processing lots to the applicable PennEngineering Work Order / Release numbers. Individual PennEngineering Work Order/Releases may not be mixed.

**A.4.3 Process Control**

- a. Subcontractor shall process parts in accordance with the applicable PennEngineering specification as identified on the purchase order.  
*Examples of specifications include HT-102 (heat treat), FIN-P20 (plating), and MLD-003 (injection molding).*
- b. If the specification references another requirement as part of the processing, subcontractor is responsible for all such requirements, unless otherwise agreed upon with the buyer.  
*Examples: Some plating processes require a baking process after the plating process. Heat Treat processes often require testing in accordance with specification HT-501.*
- c. Upon receipt of the first order for each process (by PennEngineering specification number), subcontractor may be required to submit a sample of processed parts to PennEngineering for first article approval before continuing with processing (quantity of parts in sample to be agreed upon by the subcontractor and the buyer). Parts submitted for first article approval shall be representative of production. Any subsequent changes to the process require re-approval of the new/revised process. Further, PennEngineering reserves the right to require a re-approval of process as deemed necessary.
- d. Subcontracting – Refer to paragraph A.4.4.
- e. Heat Treating Subcontractors shall qualify and calibrate thermal equipment in accordance with PennEngineering specification HT-007 or SAE specification AMS-2750.
- f. When required by PennEngineering, Heat Treating Subcontractors supplier shall implement applicable processes in accordance with AIAG document CQI-9.
- g. When required by PennEngineering, Plating and Coating Subcontractors supplier shall implement applicable processes in accordance with AIAG documents CQI-11 and/or CQI-12.

**A.4.4 Subcontracting**

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- a. Subcontractor may not sub-contract any part of the processing or other requirements without prior approval of PennEngineering via a completed form PFF-06-008.
- b. Inspection and/or testing of parts may be subcontracted without the need for approval as long as the laboratory is ISO/EIC 17025 accredited for the inspection/testing to be performed.

**A.4.5 Nonconforming Product – Unable to Complete the Required Testing**

- a. When a process specification requires a test with a duration longer than 48 hours, subcontractors who are unable to complete such tests in time to meet shipment due dates are permitted to ship parts in accordance with paragraph 5.4.2 of this document. *Authorization to ship part under this paragraph can not be applied to shipments waiting for First Article Approval per paragraph A.4.3.c of this document.*

**A.4.6 Packaging and Delivery**

- a. Maximum height of skid with containers shall not exceed 50 inches or 1.27 meters.
- b. Bins or boxes of parts as returned to PennEngineering shall not weigh more than fifty (50) pounds each.
- c. If parts are sent to the subcontractor in corrugated boxes:
  - Part Identification Tags in boxes as received from PennEngineering shall not be discarded.
  - After processing, parts shall be returned to PennEngineering in closed corrugated boxes. Appropriate measures shall be taken to protect the parts and keep the box from bursting while in transit. See Appendix I for packaging requirements and recommendations
  - Boxes of products shall be identified on the outside using labels or other appropriate legible method to include the following information (refer to Appendix I, paragraph I for an example): the subcontractor name, PEM part number, quantity, purchase order number, and PennEngineering work order – release number.
  - Containers shipped separately shall be clearly marked or labeled to identify number of containers. Example: Carton #1 of 4, Carton #2 of 4, etc.
  - Part identification Tags shall be placed in the boxes as they were when received by the subcontractor. The router as found in one of the boxes shall be returned in box #1 of the order.
  - Refer to Appendix I for additional requirements and information.
- d. If parts are sent to subcontractor in re-usable bins (i.e., metal, plastic, fiberglass, etc.):
  1. Part Identification Tags on bins as received from PennEngineering shall not be removed.
  2. After processing, parts shall be returned to PennEngineering in bins with tags of the same Work Order/Release in which they were received.
  3. Bins shall be securely covered to prevent mixing or loss of parts during transit.
  4. If bins are stacked on a skid:
    - Bin tags shall face the outside of the skid (metal bins) or in the sleeve on top of the bin (fiberglass bins),
    - Bins shall be stacked as evenly as possible, not more than 5 bins high,
    - Each work order shall be grouped closely together, in the same stack, on the

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same side of the skid, as much as is possible,

- The top bin shall be covered with appropriately fitting lids, and
- Bins shall be secured to the skid; “belly band” must be used for metal bins.

**A.4.7 Records**

Records of processing and process control shall be maintained in accordance with paragraph A.1.3.

**A.4.8 Certificates and Reports**

When the purchase order (or a referenced document) requires a Certificate of Conformance (or Compliance), such certificate shall include the following information:

- PennEngineering part number,
- PennEngineering purchase order/line item number and work order/release number,
- Brief description of process,
- Identification of PennEngineering process specification and revision,
- Identification of other process specification and revision, if required or applicable,
- Subcontractor’s process lot/batch number,
- Identify the company names and locations of any sub-subcontractors used, (see paragraph A.4.4)
- Signature of authorized subcontractor representative.

**6.B QUALITY REQUIREMENTS FOR INDIRECT SUPPLIERS.****B.1 Requirements for All Indirect Suppliers.****B.1.1 First Article Approval and Subsequent Re-approval.**

When required (written or verbal), upon receipt of the first order for each item (by PennEngineering specification number or tool number), supplier shall submit samples for first article approval before first shipment of product. Product submitted for first article approval shall be representative of future deliveries. Number of samples required for each approval is determined by the Quality Department of PennEngineering.

Any subsequent changes to the process require re-approval of the new/revised process. Further, PennEngineering reserves the right to require a re-approval of product as deemed necessary.

**B.2 Specific Requirements for Tooling Raw Material Suppliers.****B.2.1 Product Identification and Traceability.**

Each individual quantity (bundle, coil, spool, etc) of raw material delivered to PennEngineering shall be identified by a tag or other appropriate attached marking. Information required to be included on the tag (or appropriate marking) shall include:

- Material Size (e.g. thickness, width, length, etc.)
- Alloy designation
- Quantity (e.g. weight, length, etc.)

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### B.2.2 Process Control.

The supplier shall supply material produced in accordance with the requirements of the raw material specification identified on the purchase order, if applicable.

### B.2.3 Records.

All records delivered to PennEngineering shall be identified with the following in order to maintain traceability:

- Part number/size by PEM® part number (12 or 15 digit material code)
- Alloy designation
- Weight shipped
- PennEngineering purchase order number
- Supplier's name

## **B.3 Specific Requirements for Manufacturers and Suppliers of Completed Tools and Tooling Blanks.**

### B.3.1 Purchasing.

Raw material procured by the supplier for use to manufacture tools shall conform to the requirements of the raw material specification or description identified (if any) on the purchase order, drawing, or on referenced documents. *NOTE: Supplier shall contact PennEngineering to identify the required material type, if not readily identifiable.*

### B.3.2 PennEngineering Supplied Items.

- a. If PennEngineering provides the raw material for use, supplier may not substitute other material for any reason. If more or other material is necessary, the supplier shall contact the buyer for PennEngineering.
- b. After the order for tools is complete, the supplier shall return any items belonging to PennEngineering. Supplier shall contact the buyer to complete the return.

### B.3.3 Product Identification and Traceability.

- a. Supplier shall mark tools as required by the applicable part drawing (including all required information, marking method and location) if so stated. Any exceptions shall be as stated on the applicable purchase order or in the body of the drawing, or as defined by statement "b" below.
- b. When marking of tools is not possible due to size, configuration, or possible damage to tool, it is permissible to place tools into "compact" containers in order to identify them with the required information. All information required to be marked shall be included.

### B.3.4 Process Control.

- a. The supplier shall supply/manufacture tools in accordance with the correct revision of the PennEngineering drawing (if any), as identified on the purchase order.
- b. Tools shall be made from raw material in accordance with the material type if so identified on the purchase order, drawing, or other referenced document.
- c. If so stated, tools shall be supplied/manufactured according to the current revisions of all process specification identified on the purchase order, drawing, or other documents. This includes thread specifications, heat treating specifications, finish specifications, coating requirements, tool marking, etc.



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- d. When a tool drawing requires tools receive a coating (e.g., TiN, TiCN, etc.), it is permissible to allow coating to be applied to areas additional to those specified, unless otherwise stated on the tool drawing or purchase order. However, final tool dimensions must meet tool dimension and tolerance requirements after completion of all machining and coating.

### B.3.5 Handling, Packaging and Delivery.

- a. Boxes of tools shall be identified on the outside using labels or other appropriate legible method to include the supplier name and PennEngineering purchase order number. (refer to Appendix I, paragraph I.1 for an example).
- b. If shipping tools against several purchase orders, the shipping container shall clearly identify all applicable purchase order numbers on the outside of the container.
- c. If shipping multiple tool numbers in the same shipping container, each tool number shall be the supplier shall be segregated using appropriate internal containers in order to prevent confusion when received by PennEngineering personnel. Each internal container shall be clearly identified with the applicable purchase order number and the corresponding part number/item number as listed on the purchase order.

- B.3.6 Records. All records delivered to PennEngineering shall be identified with the purchase order number and the tool number in order to maintain traceability.

## **B.4 Specific Requirements for Tooling Process Suppliers - Heat Treating/Thermal Processes, Plating/Coating, Surface Finishing, and Other Processes.**

### B.4.1 Handling and Storage of Product.

- a. The supplier is responsible for the condition of PennEngineering parts while in their possession. Supplier shall implement methods to keep parts acceptably clean and free from substances detrimental to the parts, part surface condition, or part functionality.
- b. Supplier shall implement methods into their handling and production processes that eliminate the possibility of mixing work order/releases, and prevent stray parts/items from getting into PennEngineering work orders/releases.

### B.4.2 Product Identification and Traceability.

Suppliers of the various processes shall maintain traceability of parts in order to correlate supplier processing lots to the applicable PennEngineering Work Order/Release numbers. Individual PennEngineering Work Order/Releases may not be mixed.

### B.4.3 Process Control.

- a. Supplier shall process items in accordance with the applicable PennEngineering specification or other description as identified on the purchase order.  
*Examples of specifications include HT-652 (heat treat), and FIN-X36 (plating).*
- b. If the specification references another requirement as a part of the processing, supplier is responsible for all such requirements, unless otherwise agreed upon with the buyer.  
*Examples: Some plating processes require a baking process after the plating process. Heat Treat processes often require testing in accordance with specification HT-501.*

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- c. Supplier may not sub-contract any part of the processing or other requirements without prior approval of PennEngineering.
- d. Thermal Process Suppliers shall qualify and calibrate thermal equipment in accordance with PennEngineering specification HT-007 or SAE specification AMS-2750.

**B.4.4 Nonconforming Product – Unable to Complete the Required Process.**

Subcontractors who are unable to complete the required process due to unacceptable tool conditions shall contact PennEngineering to determine the course of action to resolve the issue.

**B.4.5 Handling, Packaging and Delivery.****a. If parts are sent to subcontractor in re-usable bins (i.e., metal, plastic, fiberglass, etc):**

- Identification Tags on bins as received from PennEngineering shall not be removed.
- After processing, items shall be returned to PennEngineering in bins with tags of the same Work Order/Release in which they were received.

**b. If items are sent to the supplier in corrugated boxes:**

- If received, Identification Tags from PennEngineering shall not be discarded.
- After processing, items shall be returned to PennEngineering in closed corrugated boxes. Appropriate measure shall be taken to protect the items and keep the box from bursting while in transit. See Appendix I for requirements and other information.
- Boxes of products shall be identified on the outside using labels or other appropriate legible method to include the following information (refer to Appendix I, paragraph I for an example): the supplier name, PEM tool number, quantity, purchase order number.
- Containers shipped separately shall be clearly marked or labeled to identify number of containers. Example: Carton #1 of 4, Carton #2 of 4, etc.
- If received with shipment, Part identification Tags shall be placed in the boxes and the router shall be returned in box #1 of the order.

**c. Bins or boxes of items as returned to PennEngineering shall not weigh more than fifty (50) pounds each.****B.4.6 Certificates and Reports.**

When the purchase order (or a referenced document) requires a Certificate of Conformance (or Compliance), such certificate shall include the following information:

- PennEngineering part number,
- PennEngineering purchase order/line item number and work order/release number,
- Brief description of process,
- Identification of process specification and revision,
- Supplier's process lot/batch number,
- Signature of authorized supplier representative.

**6.C QUALITY REQUIREMENTS FOR LABORATORIES.****C.1 Requirements for All Laboratories.**

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- C.1.1 Laboratories shall meet the QMS Standard requirements of this document.
- C.1.2 Laboratories shall perform the service (calibration or testing) in accordance with purchase order requirements.
- C.1.3 The traceability and reporting requirements of the current revision of ISO/EIC 17025 apply.
- C.1.4 Laboratories shall provide complete calibration/test report. Calibration reports shall include “As Found” and “As Left” data
- C.1.5 Laboratories may not subcontract any part of calibration/testing without prior approval of the Quality Department of PennEngineering.

**6.D QUALITY REQUIREMENTS FOR SERVICE SUPPLIERS.**

**D.1 Specific Requirements for Sorting Services.**

- D.1.1 Suppliers who provide sorting services shall meet the same requirements as Process Source subcontractors as defined in paragraph A.4 of this document.
- D.1.2 Sorting suppliers shall perform the sorting service in accordance with purchase order requirements.

*No further requirements are defined at this time.*

**D.2 Specific Requirements for Delivery Services and Trucking Companies.**

- D.2.1 Suppliers who provide delivery services shall perform the service in accordance with purchase order or contract requirements.

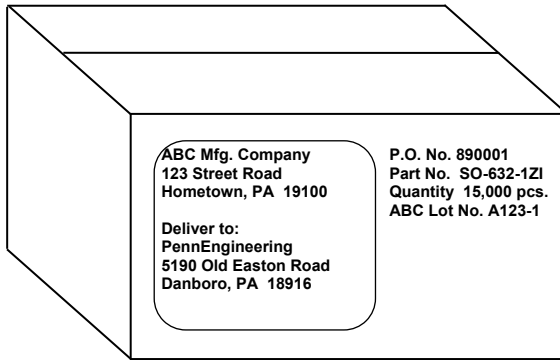
*No further requirements are defined at this time.*

### Appendix I

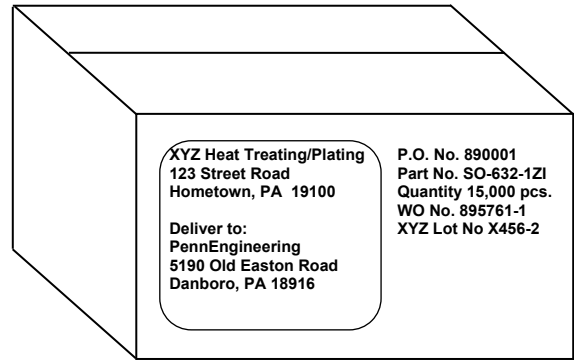
#### General Packaging Requirements and Recommendations

##### I.1 Illustration for Identification of Packages.

Picture 1. For parts and tools manufactured complete by supplier.



Picture 2. For parts and tools processed by supplier.



##### I.2 Packing and Container Requirements.

- a. Supplier shall implement provisions to prevent, detect, and remove foreign objects and debris from entering into packages of parts shipped to PennEngineering.
- b. Suppliers shall package product using appropriate manners to prevent breakage of product or package during shipment. (See recommendations in paragraph I.3 below).
- c. Each container of parts sent to PennEngineering shall not weigh more than fifty (50) pounds.
- d. Subcontractor shall not place more than one part number in the same shipping container. Further, subcontractor shall not place parts for more than one purchase order or parts made from more than one supplier lot/batch number in the same shipping container.

*Paragraph c. applies to all suppliers performing manufacturing or other processes on PennEngineering fastener products. Paragraph c. does not apply to tooling suppliers.*

- e. Partially filled containers shall be filled to the top with bubble pack or other appropriate filler to prevent crushing or breaking of container during transit.

##### I.3 Packing and Container Recommendations.

- a. Containers should be double-wall flute corrugated fiberboard, 275 lb. test and of uniform size. Each container should be lined with a 4 mil double poly liners, which should be tie-wrap or twist-wrap secured. This practice has proven to help prevent breakage of boxes during transit.
- b. Each container should be appropriately closed (with pressure sensitive tape, glue, etc; staples should be avoided) and then sealed with reinforced tape.
- c. Shipments of six (6) containers or more should be placed on a skid, and securely banded onto the skid. Banding should be in two directions.

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- d. If determined to be appropriate, supplier may band containers in two directions using polypropylene banding or polyglots tape (1/2 inch wide or larger).

**Appendix II****Definitions**

- II.1 Supplier – Source which provides items or services as required.
- II.2 Supplier Categories:
- (A) Subcontractor. Sources of items and processes that directly fulfill PennEngineering fastener product requirements, including packaging items such as bags and boxes.
  - (B) Indirect Supplier. Suppliers of items or processes that help PennEngineering fulfill its product requirements, but do not fulfill requirements themselves. *Most are tooling suppliers and those who perform processes on tooling, or supply test panel material.*
  - (C) Laboratories. Calibration Sources and Testing Laboratories.
  - (D) Service Supplier. Suppliers of items or processes that help PennEngineering fulfill its non-product related requirements. *Examples of this type of supplier include those who provide sorting processes, packaging materials (not a deliverable item to PennEngineering customers), trucking/delivery services.*
- II.3 Independent Laboratory – For purposes of this procedure, is a laboratory that is accredited to the requirements of ISO/EIC 17025 by A2LA, NVLAP or other recognized agency. The Quality Department of PennEngineering will chose the laboratory to be used.
- II.4 RFQ – Request for Quotation. A communication received by a subcontractor which requests pricing and delivery information regarding a product, material, service, etc. intended to be purchased by PennEngineering.
- II.5 Product – As defined for this document, product shall refer to the material, parts, etc. supplied, or the process performed, to fulfill purchase order requirements.
- II.6 “appropriate” – As used in this document, indicates where the absence of such would adversely affect the quality of product.
- II.7 Purchase Order (or PO) – Document or data issued to a supplier identifying items or services to be purchased.
- II.8 Tooling – For purposes of this document, tooling relates to those tools described by a drawing created by or for PennEngineering, or by other description making the tool unique to PennEngineering. It does not apply to production machine parts (i.e. gears, collets, drive shafts, etc.) or standard supplier catalog items (i.e. a commercially available stocked item such as a standard size drill or tap).
- II.9 On-time Delivery – Items are considered “on-time” when they are received at PennEngineering no later than the requested date as stated on the purchase order. Allowable tolerance for early delivery is determined by PennEngineering management and is based on supplier type and location.
- II.10 Control Plan – Written description of the systems for controlling processes. See APQP Reference Manual
- II.11 FMEA – Failure Mode and Effects Analysis. See FMEA Reference Manual.
- II.12 PPAP – Production Part Approval Process. See PPAP Reference Manual

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### Appendix III

#### Referenced Documents

##### PennEngineering Specifications and Other Documents

EWI-111	Raw Material Part Number and Specifications
HT-007	Thermal Process Equipment, Qualification Requirements
HT-501	Rockwell Hardness Testing Methods For Fastener Product and Location of Micro-Hardness Indentations

##### PennEngineering Forms

Form PFF-06-002	Supplier Questionnaire and Quality Commitment
Form PFF-06-008	Request and Authorization to Subcontract

##### Industry Standards and Other Documents

AMS 2750	Pyrometry
AS9100	Quality Management Systems – Requirements for Aviation, Space and Defense Organizations
ISO 9001	Quality Management Systems – Requirements
ISO/EIC 17025	General Requirements for the Competence of Testing and Calibration Laboratories
IATF 16949	Quality Management System Requirements for Automotive Production and Relevant Service Parts Organizations
APQP	(Reference Manual) Advanced Product Quality Planning and Control Plan
FMEA	(Reference Manuals) AIAG & VDA FMEA Handbook OR Potential Failure Mode and Effects Analysis
PPAP	(Reference Manual) Production Part Approval Process
CQI-9	Special Process: Heat Treat System Assessment
CQI-11	Special Process: Plating System Assessment
CQI-12	Special Process: Coating System Assessment

### Appendix IV

#### PennEngineering Facility

**Danboro, PA Phone: 215-766-8853**

Upon inquiries, please request Supply Chain or Quality representation