

Tube Specialties, Inc.

Supplier Quality Requirements (SQR)

1721 W. 10TH ST, TEMPE, Arizona 85281. Phone: 480-968-2453 Fax : 480-968-0300

Quality Management System: TSI recognizes Quality System certifications by accredited certification bodies (CB's) and may recognize the Industry Controlled Other Party (ICOP) process as evidence of compliance. In all cases TSI reserves the right to conduct an assessment of the supplier's quality management system. Certification to AS9100 or as appropriate AS9120 is preferred, at a minimum suppliers should maintain a Quality Management System compliant to ISO9001. Organizations that obtain certification/registration to any industry QMS program and subsequently changes certification/registration bodies (CB), loses its registration status, is put on notice of losing its registration status, or receives a major nonconformance shall notify TSI in writing within three days of receiving such notice from the organization's registration body (CB)." Seller shall immediately notify the buyer for any changes in: Quality Management Representative, any change in the QMS that has a potential to diminish the system or affect the conformity of the goods or services or any occurrence of natural disaster that diminishes the sellers ability to deliver conforming goods or services.

Special process supplier (Brazing, Chemical Processing, Coatings, Heat Treating, Material Testing, Non-Conventional Machining, Nondestructive Testing, Shot Peening, and Welding) shall be NADCAP certified.

Calibration Laboratories shall be certified to ISO17025.

Internal Audit: Supplier shall perform internal audits of their quality management system (QMS).

Quality Record: All records and data shall be in the English language. Any corrections to documents shall be recorded, dated, signed/stamped in permanent method. To correct information, draw a single line and enter correction. No erasures, covering, white out allowed. Document shall be retained for the minimum periods as follow:

- Indefinitely
Traceable Parts, Serialized Parts, Critical Parts, FAIR records, Flight Safety, Main Shaft Bearing support.
Any destruction of records shall be authorized by TSI.
- 30 Years
Manned Space Program Hardware
- 11 Years
Radiographic, Digitized Radiographs, Non-traceable/non-serialized parts, castings, others except off the shelf standard parts.
- 10 Years
Off the shelf standard parts, key characteristic data records, Mercury-free certification, military hardware.

Suppliers and their sub-tiers shall make all documentation/information needed to produce/support the manufacturing of the parts available within 24 hours. Documents shall be stored in area that meets local fire and safety codes. Electronic Data shall be secured with back up and audited to verify data integrity.

Resource Management: Eye examination, including visual acuity and color vision are administered by medically qualified/trained person in intervals not to exceed one (1) year. Color perception testing is required one (1) time.

Records shall be retained for personnel performing the following:

- Visual inspection
Shall be compliant with Jaeger 1 or equivalent
- Visual Inspection on welds
Shall be compliant with AWS D17.1
- Non-Destruction Testing
Shall be compliant with AIA/NAS410 or Mil-STD-867

Purchasing:

- Outsourced Processes
Suppliers and their sub-tiers shall use only TSI's end user approved sources (Customer ASL).
- Raw Material/Test Report
A certification report shall support all raw materials on PO for both the chemical and physical test reports. Each report shall list: Material Specification and Revision, Heat Number and Supplier, Chemical and Physical Test results, TSI part number, PO number and quantity. Material shall be supplied to the latest revision. A program to have independent Periodic testing shall be utilized on raw material to the applicable specification.

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- Special Process Certifications
Supplier shall include one (1) copy of test result and/or inspection data for any special process performed.
- Certification of Conformance
A C of C shall be included with each lot shipment and shall include: TSI's PO number, Part number and revision, shipper number, quantity, serial and/or lot numbers and the C of C statement at a minimum. All C of C's shall be signed and dated by an authorized representative of the organization.
- First Article Inspection
FAIR's shall be per AS9102. Inspection of a First Article Product shall be submitted to TSI Quality department for approval prior to the lot shipment. Key Characteristic shall be per SAE AS9103
- DFARS
Use of raw material from domestic/DFARS compliant countries is required
- Conflict Mineral
Suppliers shall comply with the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act Section 1502. TSI will not accept material containing Tin, Tantalum, Tungsten, and Gold from prohibited countries.
- Reach Compliance
Suppliers shall notify TSI of part(s)/product(s) that contain SVHC substance. The list can be viewed: <https://echa.europa.eu/candidate-list-table>.
- Source Inspection
Source Inspection when required will be requested 48 hours in advance and is required for all material drop shipments.
- Special Process
Supplier shall only use sources approved by TSI customers when applicable. If the approved source is unknown the supplier must contact the TSI purchasing agent to ensure the processor is approved. The processing shall be performed to the latest approved specification, if there are any questions on the applicable specification contact TSI for clarification before proceeding.
- Flow Down to Sub-tiers
All TSI requirements shall be part of flow down requirement to sub-tiers and needed sub-tiers maybe subject to TSI approval.
- Time & Temperature Sensitive Materials
Material received must have a minimum of 75% shelf life, as determined by the manufacturer, unless agreement is made prior to shipment.
The Certification shall include manufacturer, manufacturing date, lot/batch number and shelf life/expiration date.
- Change notification and Approval
TSI shall be notified of any changes in product/process, changes of sub-tiers Suppliers, manufacturing, process facility location, Key management changes within 30 days. Changes shall be approved by TSI.
- Non-conformance
Per this requirement the customer grants no authority to disposition product or process nonconformance's to the organization or its sub-tier suppliers. Repair is not allowed under this clause. The controls and related responsibilities for dealing with nonconforming product shall be defined in a documented procedure. The organization's documented procedure shall also define the responsibility for review and authority for the disposition of nonconforming product and the process for approving personnel making these decisions. When a nonconformance is discovered, a review process shall be initiated with the identification and documentation of the nonconformance. This review shall be the initial step performed by the organization to determine if the nonconformance needs to be reported to the customer (see below), and to determine if the nonconformance is minor and can be re-worked to a condition that completely conforms to the drawing or specification requirements. This review does not negate the requirement to identify, segregate, document, and report and disposition nonconformance. Nonconformance's shall be reported to the customer as soon as it is detected and determined not to be re-workable and may be salvageable. When notification is required, notification shall be within 3 working days after the nonconformance is discovered. This requirement applies to all procurements. Any nonconformance discovered by the organization, on products in their control, shall be documented by the organizations approved method of nonconformance reporting. AS9131 is an acceptable means of reporting. This shall include a detailed description of the nonconformance; location (by drawing reference point, hardware reference point, clock location, etc.); and exact callout of the violation by

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drawing or specification requirement (including sub-paragraph or illustration number). It shall also list what type of inspection revealed the discrepant condition, and what, if any, subsequent actions were taken prior to disclosure. Dimensional violations shall include "should be" and "is" dimensions, and tool(s) calibration traceability numbers. The organization shall ensure that product, which does not conform to product requirements, is identified and controlled to prevent its unintended use or delivery until dispositioned or scrapped after review. Written notification shall also include: Purchase Order number, Part Number, and Quantity.

- **Corrective Action**
When issued a corrective action by TSI, the use of analytical tools to determine root cause is required. Clearly state the containment required, root cause and correction action taken, provide objective evidence of implementation that eliminates risk of recurrence. All Corrective actions must be submitted to TSI's purchasing or QA manager by the due date listed.
- **Qualifications**
The supplier must maintain a process for managing all required personnel qualification and certifications.
- **Calibration System**
Maintain, protect, and preserve Tooling and Test Equipment. Supplier shall provide and maintain a calibration system with standards traceable to NIST or equivalent. Calibration shall be IAW ANSI Z540.
- **Sampling**
Sampling to be performed per the guidelines of ASTM-E122. Sampling is not permitted for identified critical items or key characteristics. Refer to AS9103 for further information.
- **Counterfeit prevention and control**
Electrical, electronic, and electromechanical parts per SAE AS5553 and Materiel per SAE AS6174
- **Part Marking**
All products must be identified by part number and lot and/or serial number. TSI prohibits the use of part marking/number that is false/misleading.
- **Packaging and preservation of product**
Supplier shall utilize packaging and preservation methods to ensure product is protected from any damage and corrosion during shipping and while stored.
- **Electro-Static Discharge Requirement**
Supplier shall comply with the requirement of the most current version of Mil-STD-1686 or ANSI/ESD S20.20
- **Prohibited Material**
The use of lead, mercury and cadmium is prohibited. A statement claiming parts were processed free of these prohibited materials shall be included in C of C.
- **For Parker product**
GE approved laboratory required for all raw materials. Supplier shall not use tap water, silicon dioxide, glass bead/silica oxide material, aluminum oxide, aluminum zirconia, garnet, almandiете, and nitrides.
- **FOD**
Foreign Object Debris (FOD) shall be eliminated prior shipment, supplier shall maintain FOD prevention program using AS9146 as a guideline.

Audit Rights/Right
Of Entry:

Buyer, buyer's customer and regulatory authorities have the right of access to all applicable areas of all facilities, at any level of the supply chain, involved in the order, and to all applicable records to verify the contracted work, records and materials. If Seller subcontracts work in fulfillment of the purchase order, this right of access clause shall apply to the subcontractor and shall appear on the Seller's purchase order to the subcontracted supplier.

Awareness:

Suppliers must ensure that persons Performing work are aware of their contribution to product or service conformity, their contribution to product safety, and the importance of ethical behavior.

DPAS Rated
Orders:

If this is a rated order certified for national defense use, Seller is required to follow all the provisions of the Defense Priorities and Allocations System regulation (15 CFR part 700) in obtaining controlled materials and other products, services and materials needed to fill this order. If this is a DX rated order, Seller must provide Buyer with written acceptance or rejection of this order within ten (10) working days after receipt. If this is a DO rated order, Seller must promptly provide Buyer with written acceptance or rejection of this order within fifteen (15) working days after receipt. Seller must include in any written rejection of a rated order the reasons for the rejection. Seller's written acknowledgement of this rated order shall constitute written acceptance of this DPAS rating.

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First Article Inspection Report:	<p>The organization is required to perform first article inspection on the items in this contract/purchase order. First article inspections shall be in accordance with AS9102. The inspection records and data shall be per AS9102 and shall identify each characteristic and feature required by design data, the allowable tolerance limits, and the actual dimension measured as objective evidence that each characteristic and feature has been inspected and accepted by the organization's quality and/or inspection function. When testing is required, the parameters and results of the test shall be recorded in the same manner. The first article inspection report must show evidence of acceptance by the organization's quality assurance representative. The first article(s) shall be produced on production equipment and using processes which will be utilized on production runs. Additionally, the organization shall perform subsequent FAI(s) per the requirements of AS9102 (i.e., following every major tooling, every design change, and subsequent to any evident quality degradation for a specified part or article). Records of all first article activity will be documented as required in AS9102, treated as quality/acceptance records, and made available to the customer if requested." NOTE: When imposing a first article inspection clause, one or more of the following should be specified (reference AS9102):</p> <ul style="list-style-type: none">a) DELIVERY OF FIRST ARTICLE INSPECTION RECORDS: "The organization shall provide 1 reproducible copy of the first article records and first article report accompanied by variables data with the initial shipment."b) RETENTION OF FIRST ARTICLE: "The organization shall retain the first article(s) item as objective evidence and make them available to the customer upon request. Disposal of the first article item is prohibited until authorized by customer in writing."c) cDELIVERY OF FIRST ARTICLE: "The organization is required to identify and deliver the first article item to customer for verification, as part of the contract/purchase order, prior to the shipment of any balance of said contract/purchase order, unless otherwise specified. <p>Supplier must have a process for control of Customer Provided Material. Return all supplied tools, fixtures, special packing and containers with parts when appropriate. Supplier may be subject to replacement charges if not returned.</p>
Customer Provided Material: Crisis Management:	<p>Supplier shall have business continuity management plan that includes disaster recovery and preparedness. Any disruptions in the planned supply chain shall be reported to TSI within 24 hours.</p>
Falsification of Media:	<p>Supplier shall conform the requirements of 14 CFR 21.2 (Falsification of applications, reports, or records).</p>
Software Quality Assurance:	<p>Suppliers and sub-tiers shall comply with appropriate version of RTCA-DO178 Software Consideration in Airborne Systems and Equipment Certification and DOD-STD-2168, Deliverable software per D0178/MIL-Standard.</p>
ITAR and EARR requirement:	<p>Product, including IP, may be ITAR and/or EAR controlled. The supplier must hold a current registration with the Directorate of Defense Trade Controls (DDTC).</p>
Customer/Government Source:	<p>TSI Customer and/or Government source inspection/verification may be required at your facility. Our customer may still reject subsequent delivered product.</p>
Configuration Control:	<p>All work shall be performed to the current revision of drawings and specifications unless otherwise specified. Supplier's shall have a process to ensure any configuration/revision changes are communicated to sub-tier supplier.</p>
Contractual Changes:	<p>Changes to the purchased requirements are not allowed unless communicated through a revision to the active purchase order.</p>
Supplier Monitoring:	<p>actively monitors supplier performance through a supplier rating process to include the on-time delivery and conformity of the products/services provided. The expected level of performance for external providers of product or service is: OTD >90% and PPM <500. If a seller's performance is deemed to be substandard they are notified and expected to respond to the buyer's representative with information on improvement. Communication of performance issues</p>

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between the buyer and seller may include: Phone, email, and formalized requests for corrective action. Escalation methods for not actively addressing the buyers request may include: Requests for formalized corrective action (SCAR's), on-site audits, on-site improvement activities, removal of approval status, and/or feed back through the OASIS databas

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