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Supplier Quality Manual
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1. Purpose

To communicate Banks Technologies' minimum quality requirements and to serve as a guide for our suppliers and the supply chain. Effective implementation of the practices in the following Supplier Quality Manual (SQM) sections is required.

2. Application


These requirements apply to production part and service part suppliers including distributors of commercially available off-the-shelf (COTS) items.

3. References

Supplier Standards Guide (Doc# 50300)
 Federal Acquisition Regulations (FAR) 2.101
 ISO 9001:2015 Quality Management Systems
 IATF 16949:2016 Automotive Quality Management System Standard
 Fastener Quality Act Public Law No. 106-34 (1999)
 Defense Federal Acquisition Regulations Supplement (DFARS) 252.246-7007 Contractor Counterfeit Electronic Part Detection and Avoidance System
 Contractor Counterfeit Electronic Part Detection and Avoidance System (Doc #50437)
 DFARS 252.225-7009 Restriction on Acquisition of Certain Articles Containing Specialty Metals
 Defense Priorities and Allocations System (DPAS) 15CFR700
 Automotive Industry Action Group (AIAG) PPAP Manual 4th edition
 American Welding Society D1.1 and D1.2
 National Institute of Standards and Technology
 American Society for Nondestructive Testing
 Canadian Standards Association (CSA)

4. Definitions

- 1) Commercially available off-the-shelf (COTS) item - Items sold in the commercial marketplace that are not modified, combined, evolved, or "of-a-type" commercial items. For further definition, refer to FAR 2.101.
- 2) Production Part - parts, components, and material purchased by Banks Technologies that are intended to be used for powertrain assembly.
- 3) Drawing - In this procedure "Drawing" is used as a general term and shall refer to any official document provided by Banks Technologies for the purposes of communicating part requirements. This shall include, but is not limited to:
 - a) PDF Drawings
 - b) DXF files
 - c) Computer-aided design (CAD) models (or equivalent)
 - d) Banks Tech Standards or Technical Specification documents

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In the event an official drawing does not exist, in that instance only, an external document, such as a supplier’s own drawing, industry standard, or other reference document may be referenced.

- 4) Process Change - Any change to the process of producing a product that has the potential to impact the fit, form, function, or reliability of the product provided to Banks Technologies.
- 5) Product Change - Any proposed change to the Drawing (as defined above) requirements.
- 6) Rework - Bringing a nonconforming part back into conformance by simply reprocessing a prior sequence.
- 7) Repair - Bringing a nonconforming part back into conformance using methods outside the original process.
- 8) Defense Supplier - A supplier to Banks Tech who supplies a component that has a military end use or end user.

5. Responsibility

It is the responsibility of Banks Tech to communicate the requirements and expectations in this SQM via a purchase order or other binding contact and to maintain the availability of the current SQM on the website www.bankstech.com.

It is the responsibility of the supplier to fulfill all Banks Tech quality requirements identified in this document. Use of the words “shall” and “must” indicate that the statement is a requirement. In addition, suppliers are expected to fulfill Banks Tech quality expectations identified in this document. Use of the word “should” indicates that the statement is an expectation. It is the responsibility of the supplier to use the latest SQM available on the Banks Tech website.

6. Quality Management System

All suppliers shall have a quality management system that meets the requirements of this SQM and are expected to be compliant to ISO 9001:2015. Suppliers are subject to on-site audits, remote audits, or self-audits to ensure that a documented quality system is in place and is effective.

All suppliers shall conduct risk analysis and develop contingency plans, in accordance with ISO 9001:2015, to avoid disruptions that could result in failing to meet contract obligations.


All suppliers shall identify opportunities for improvement and implement necessary action items, in accordance with ISO 9001:2015, to meet customer requirements and enhance customer satisfaction.

6.1. Defense Suppliers

Defense Suppliers shall be ISO 9001:2015 or IATF 16949:2016 certified by an accredited third party registrar. The third party registrar must be accredited by a recognized member of the International Accreditation Forum Multilateral Recognition Arrangement (IAF MLA). Suppliers shall maintain the certifications and provide a current copy to Banks Tech Supply Chain personnel.

6.1.1. Control Plans

Controls Plans shall be developed, implemented, and maintained for all Defense programs and products.

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7. New Supplier Approval Process

A new supplier is defined as a supplier who has never done business with Banks Technologies or is a past supplier who has not supplied product within the last three years. Suppliers are required to complete the Supplier Account Info form (Doc #50304) and to notify Banks Tech of changes when they occur. Suppliers must agree to providing information to allow Banks Tech to perform a Financial Analysis and Risk Assessment. Additionally, all new suppliers are required to complete a W-9 Form and associated Accounts Payable Forms.

Banks Tech must have a signed Non-Disclosure Agreement (NDA) in place with a supplier prior to any intellectual property information exchange. Suppliers shall also acknowledge that Defense-related technical information provided by Banks Technologies is subject to export control laws and regulations of the United States. All new suppliers are subject to a quality management system audit and/or process capability audit. The audits will be conducted at the discretion of Banks Technologies when considering the potential supplier.

8. Technical Review

Technical reviews may be requested for new part introduction or part revisions. Suppliers must complete the Technical Review Checklist (Doc #50308) when requested by Banks Tech. Banks Tech Supply Chain personnel may schedule a meeting to review the Technical Review Checklist if required.

9. Advanced Product Quality Planning


The Supplier shall establish a structured approach to implement new processes and products. The supplier should use the five phases of Advanced Product Quality Planning as defined by the Automotive Industry Action Group (AIAG) to effectively launch new products and ensure process controls are established to achieve the highest levels of quality. This planning will enable the supplier to provide the required Production Part Approval Process (PPAP) documentation.

10. Production Part Approval Process

The Production Part Approval Process (PPAP) defines requirements for production part process and product approval. The purpose of PPAP is to determine if all customer engineering requirements and specifications are properly understood by the Supplier and that the manufacturing process has the capability to produce product consistently to meet these requirements during an actual production run at the quoted production rate.

The Supplier shall meet all PPAP requirements as specified by the purchase order and outlined in the Production Part Approval Process Requirements (Doc #50302) and Banks Tech PPAP Workbook (Doc #50303).

If any part requirement or specification cannot be met, the Supplier shall notify Banks Technologies to discuss and agree on the appropriate course of action.

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11. Supplier Change Request

ALL proposed process or product changes, whether permanent or temporary and including proprietary designs, MUST be approved in writing by Banks Technologies prior to implementation.

Banks Tech’s supplier is responsible to communicate all sub-tier change requests utilizing the Banks Tech Supplier Change Request (SCR) form (Doc #50015). The completed form shall be sent to Banks Tech per the requirements in Doc #50015.

If a Supplier needs to change manufacturing locations, the Supplier must notify Banks Technologies. The new manufacturing location may be qualified by an audit and a PPAP will be required.

Suppliers shall have a documented procedure that requires all temporary and/or permanent process or product changes to be communicated and approved by their customer prior to implementation. Once the SCR approval is granted, the supplier shall submit a corresponding PPAP for Banks Tech approval.

12. Source Inspection

Defense Supplier’s manufacturing and associated processes, products and inspection and/or test data are subject to review, verification, examination, test and/or analysis by authorized Government and/or Banks Technologies representatives.

13. 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 and activities must provide for identification, documentation, evaluation, segregation, and disposition. In the event that nonconforming material is present on finished product delivered to Banks Technologies, the Supplier is responsible for containing, investigating, and correcting the issue per Sections 0 and 15 of this manual.

13.1. Return Material Authorization

Banks Tech may notify the supplier of known or suspect nonconforming material and will request a Return Material Authorization (RMA). The supplier will have 48 hours to provide an RMA after receiving a written request to avoid potential scrapping of material by plant or return at supplier cost. Any rejected nonconforming material that has an extended cost less than \$100 may be auto-scrapped and debited back to the supplier.

13.2. U.S. Government (USG) returned parts

If a government-owned component is returned for analysis, the supplier shall reference the Report Control Number (RCN) issued by the USG and ensure that parts will not be discarded until authorized by Banks Tech. The supplier shall conduct and submit a root cause analysis and corrective action to Banks Tech in a timely manner.

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14. Corrective Actions

Banks Technologies will notify suppliers of problems regarding quality, delivery, packaging, and services in writing. Initial response and containment is expected within 24 hours.

The completion of the final corrective action report should be furnished to Banks Technologies no later than 45 days after the initial request. The return of nonconforming parts to the supplier should not delay the containment, initial investigation, or short term corrective actions. The final corrective action report should include all documentation of problem solving tools used (e.g. pareto analysis, 5 Whys, fishbone diagram, DOE, etc.) and include the updated Failure Mode Effect Analysis (FMEA) and Control Plan. Corrective actions should focus on addressing root causes by making improvements to the manufacturing process and Supplier's system. Root causes focused on inspection failures, operator error, or other types of blame are unacceptable.

The Supplier is expected to address rejects and failures regardless of whether Banks Tech requires submission of a corrective action, in order to prevent recurrence of the problems.

14.1. Containment


The Supplier must contain all nonconforming materials throughout the supply chain and implement short term corrective action. The Supplier is responsible for all inspection/sorting activities and, upon request, shall provide immediate containment at the Banks Technologies facilities to ensure no interruption to production. The Supplier must provide inspection work instructions, a detailed report of containment results, short term corrective action, and/or disposition activity upon request. The Supplier must provide Returned Material Authorization (RMA) at that time, if parts are to be returned.

14.1.1. Containment Level 1 (CL1)

Requires that the Supplier put in place a redundant inspection process at the supplying location to sort for a specific nonconformance, execute the corrective actions, and insulate the customer from the receipt of nonconforming parts/material. The redundant inspection must be in addition to normal production process controls and is executed by the supplier's employees. If the Containment Level 1 criteria is not executed properly such that Banks Technologies receives nonconforming material after containment, the Supplier will be placed on Containment Level 2.

14.1.2. Containment Level 2 (CL2)

Requires the same processes as Containment Level 1, with an added inspection process by a third party representing the customer's interests specific to the containment activity. The third party is selected by the supplier, approved by Banks Technologies, and paid for by the Supplier.

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14.1.3. Exit plan

The supplier must develop an exit plan including exit criteria to be removed from CL1 or CL2 containment. The exit plan must be approved by an authorized Banks Tech Quality Representative.

15. Rework and Repair

Rework and repair are different methods of correcting a nonconforming part and are defined in Section 4 Definitions. In the event that nonconforming product is reworked, the Supplier shall verify that the reworked product meets the design requirements. All repairs shall be submitted for prior approval per the requirements of Section 0 Supplier Change Request and must include a qualified repair procedure.

16. Supplier Performance Metrics

The purpose of supplier performance metrics are to identify the Supplier's conformance to Banks Technologies' standards. Parts and services delivered to Banks Tech are expected to meet the goals of maintaining zero defects and 100% on-time delivery. If the Supplier's performance does not meet the expectations of Banks Tech, the Supplier may be placed on new business hold or removed as an approved supplier. The Supplier can review Quality and Delivery performance by requesting their supplier scorecard.

16.1. Quality Requirements

Defect rate is used to monitor the Supplier's quality performance. It is calculated on a monthly basis using the quantity of defects divided by the quantity of parts delivered and is reported on the supplier scorecard as a percentage.

16.2. Delivery Requirements


The Supplier is expected to meet 100% on-time delivery including quantity and delivery date requirements per the purchase order or other contract.

17. Cost Recovery

All associated costs reasonably incurred by Banks Tech resulting from the Supplier's deficiency in meeting the purchase order terms shall be borne by the supplier. All associated costs reasonably incurred by Banks Tech resulting from Supplier product recall shall be borne by the Supplier. See Supplier Standards Guide (Doc# 50300) Section 10 Terms and Conditions for detailed requirements.

18. Warranty

The Supplier shall review all warranty claims on their parts, when applicable. Banks Technologies' expectation will be for the Supplier to collaborate to determine the root cause of the failure as well provide reimbursement for related repair expenses. See Supplier Standards Guide (Doc# 50300) Section 10 Terms and Conditions for detailed requirements.

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19. Product Traceability

If traceability is a specified requirement, the Supplier shall use unique identification for product (serial number, batch or lot number, date code, etc.). This information must be documented and retained per contract requirements. This traceability requirement also applies to the Supplier's sub-tier suppliers.

20. Distributors

Distributors shall have in place a system to understand all parts origin, traceability to manufacturing location, and required specifications. The distributor shall be responsible for proper handling and storage to prevent damage and product deterioration. Shelf life shall be controlled in accordance with Section 33 Shelf Life. Packaging shall provide adequate protection to ensure safe delivery. The distributor is responsible for corrective actions in regards to nonconforming product supplied to Banks Technologies. All requirements within this SQM apply to distributors.

21. Control of Customer-furnished Materials

If Banks Technologies provides product for incorporation into the Supplier's product or related activities the Supplier shall establish and maintain documented procedures for the control, verification, storage and maintenance of Banks Technologies' product. Any such product that is lost, damaged, or is otherwise unsuitable for use shall be recorded and reported to Banks Technologies purchasing contact. Banks Technologies owned returnable packaging shall be considered customer-furnished material.

22. Tooling and Equipment Management


Tooling shall be permanently marked per the purchase order to identify ownership and unique ID number. Photo verification of tooling and proper tooling identification must be provided or included in the applicable component PPAP Workbook (Doc #50303) prior to payment.

The Supplier shall establish and implement a system for tooling and equipment management including the following:

- 1) Maintenance and repair facilities and personnel
- 2) Unique identification for tooling
- 3) Storage and recovery
- 4) Setup and validation
- 5) Tool change programs for perishable tools
- 6) Tool modification, including tool design documentation
- 7) Tool condition (wear, dimensional integrity, etc.) verification

23. Preventative Maintenance

The Supplier shall identify key process equipment and shall develop an effective planned total preventative maintenance system in order to prevent delivery or quality failures. The total preventative maintenance system should utilize predictive maintenance methods to continually improve the effectiveness and the efficiency of the identified key process equipment.

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24. Supply Chain Management

The Supplier is responsible for the communication of all purchase order requirements including those specified within this SQM to all sub-tier suppliers. The Supplier shall provide requirements and guidance to their Supply Chain consistent with the requirements of Banks Technologies. The Supplier shall have a process in place to ensure that all sub-tier suppliers have and maintain a system to provide conforming product and services in accordance with Banks Technologies' requirements.

24.1. Rated orders

Banks Tech's suppliers shall flow down all rated order requirements to their suppliers in accordance with Defense Priorities and Allocations System (DPAS) 15CFR700.

25. Identifying, Packaging, and Shipping

The Supplier shall provide for adequate facilities and instructions for handling, packaging, and shipping to protect the products and prevent damage during storage and transit.

The Supplier shall identify, clean, preserve, package, and pack in accordance with the applicable drawings, specifications, and instructions as referenced on the purchase order or other contract.

Unless otherwise specified, all uncoated or unprotected ferrous and nonferrous metal surfaces (internal and/or external) must be protected for a minimum of fifty (50) working days from date of shipment 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.

25.1. Part Marking Location


Some drawings specify only compliance to Military Standard 130 (MIL-STD-130) and may/may not include the marking method or location on the part. In those instances, it is important to ensure the identification is visible and legible during normal operational use (if it is affixed to the part), and it needs to be permanent through the life cycle of the part.

For components that are physically marked (by etching or stamping for example), the identification **MUST** be legible in its final state (after coating/painting). It is the supplier's responsibility to ensure conformance to this requirement.

For small components that cannot be marked physically, or tagged, select other alternatives within the standard. It is important that some method be used in part marking identification.

26. Counterfeit / Used Parts

All Defense Suppliers shall establish, implement and maintain documented procedures, which shall preclude and/or detect the use of counterfeit/used parts. All Defense Suppliers providing "electronic parts" (as defined within DFARS 252.246-7007) shall have developed and documented Purchasing procedures that reduce the risk of purchasing and utilizing counterfeit material. Suppliers shall have defined and documented Product Verification procedures that ensure the detection of counterfeit parts prior to formal product acceptance. Suppliers shall have developed and documented a Material

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Control Procedure that includes quarantining, reporting, and dispositioning suspect and/or counterfeit components.

Defense Suppliers are subject to the requirements in Contractor Counterfeit Electronic Part Detection and Avoidance System (Doc #50347).

27.Specialty Metals

Defense Suppliers shall not use Specialty Metals (as defined in DFARS 252.225-7009) melted or produced in a country other than the United States or other qualifying country listed in DFARS 225.003. Defense Suppliers are subject to the requirements in Restriction on Acquisition of Certain Articles Containing Specialty Metals (Doc #50348).

28.Certificate of Conformance

The Supplier shall establish, implement, and maintain documented procedures, which ensure adherence to the Banks Technologies Certificate of Conformance requirement. The supplier shall have an authorized representative certify that the parts ordered have been processed to procedures that ensure the material is conforming and free of counterfeit material. The certificate of conformance will also acknowledge proper adherence to Purchase Orders, drawings, and contract requirements. Unless the purchase order or contract specifies that the Certificate of Conformance is required to be provided with each shipment, the supplier shall complete and retain the Certificate of Conformance in accordance with Section 32 Record Retention. This document must be made available at the request of Banks Tech within 24 hours.

29.3D Solid Model Requirements

If the product drawing (composites, castings, etc.) relies upon the 3D CAD model to fully define the part, the PPAP shall include evidence that all measured samples conform to the geometry and associated GD&T requirements defined by the 3D CAD model.


The supplier shall:

- 1) ensure that the correct 3D solid model revision level is utilized
- 2) ensure that proper tolerances have been applied
- 3) ensure that the parts surface profile adheres to the model

30.Fastener Quality Requirements

The Supplier must develop a program to ensure fasteners conform to the specifications to which they are represented to be manufactured, to provide for accreditation of laboratories engaged in fastener testing, to require inspection, testing and certification in accordance with standardized methods of fasteners in accordance with Fastener Quality Act Public Law No. 106-34 (1999).

Banks Technologies will not accept any cap screws or flange bolts which do not have a manufacturers head marking on them. Cap screws must be produced per applicable International Fastener Institute (IFI), SAE J429, SAE 1199 or DIN Standards.

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31. Software / Embedded Software

Defense Suppliers of product-related software, or products with embedded software, shall implement and maintain a process for software quality assurance. The Quality Assurance methodology shall prioritize and mitigate risks based-upon the potential impact to the customer, and the organization shall retain documented information of the assessments conducted.

32. Record Retention

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

While in storage, records and documents shall be protected from damage, loss and deterioration due to environmental conditions. Records shall be maintained for a minimum of (5) years and the Supplier shall provide Banks Technologies with the option of having the records forwarded to Banks Technologies for further retention, as required by the contract, or authorizing disposal of the records and documents at the Supplier's location. Disposition shall be done in a timely and appropriate manner. Banks Technologies shall be notified when disposition has taken place.

32.1. Production records


Production-related documents (PPAP, Certificates of Conformance, etc.) are required to be retained for Current Year (CY) plus 50 years.

33. Shelf Life

Stock control shall be implemented, as appropriate, for shelf life items and the removal of obsolete/expired product. The Supplier shall mark the parts and exterior shipping container in accordance to applicable specifications for any items subject to age control (i.e.: paint, adhesives, rubber, hose assemblies, etc.). The expiration date must be noted on the outside of all containers of items with a shelf life. Products shall have 75% of their shelf life remaining when delivered to Banks Tech.

34. Welding Requirements (All Suppliers)

At a minimum the Supplier must comply with the appropriate industry accepted codes and standards, such as AWS, ASME or MIL-specs, or otherwise specified by the contract or design record. The Supplier MUST certify and maintain a record of any and all personnel that weld on Banks Technologies' components per the accepted codes and standards, along with maintaining that certification to satisfy Banks Technologies' customer requirements.

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34.1. 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 nonconformance concerns, the Supplier shall verify the weld process capability. Weld fixtures must be controlled in accordance to the requirements of Section 22 of this document.

35. Welding Requirements (Defense Suppliers)

The Supplier shall develop and submit Welding Procedure Specifications (WPS), Procedure Qualification Records (PQRs), and Weld Repair Procedures in accordance with welding standard(s). It is important to include all applicable WPS and PQRs when required in a PPAP or requested by Banks Tech. Welder Qualification Records (WQRs) shall also be available upon request. Welding operators must be certified per the specified standard.

The Supplier shall follow the appropriate welding standard(s) scope to qualify the welding and weld repair procedures. The Supplier shall prepare weld samples and test the weld procedure for qualification in accordance with the appropriate standard(s). Changes to the Weld Repair Procedures and WPS, or PQR that requires requalification, shall be resubmitted as part of a Supplier Change Request (SCR).


The use of pre-qualified weld joints as specified in American Welding Society (AWS) D1.1 does not preclude submittal of welding procedures. All Welding documentation referenced above and in any subsequent section shall be made available to Banks Tech upon request.

35.1. Structural Welding Procedure Design

Structural welding design shall be performed by the Supplier and will ensure that all metallic weldments meet the welding design and fabrication requirements in the prescribed standards listed herein or an approved equivalent. The use of pre-qualified weld joints as specified in AWS D1.1 does not preclude submittal of welding procedures.

35.2. Qualified Weld Repair Procedures

Suppliers must receive prior approval from Banks Tech before conducting any repairs. All repairs require an approved and qualified repair procedure. Suppliers shall utilize a Supplier Change Request (SCR) form to initiate a Banks Tech review. When a repair is required, the Supplier shall provide written repair procedure as part of the Supplier Change Request, identifying proper technique to correct defective products. The Welding procedures for the repairs shall be in accordance with the applicable welding standard(s).

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35.3. Qualified Welding Equipment

The Supplier shall develop and maintain a welding equipment calibration program. This program shall consist of, as a minimum, an annual comparison check of the machine output with instrumentation that has been certified and calibrated using standards traceable to the National Institute of Standards and Technology (NIST).

35.4. 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:

- 1) 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.
- 2) Current certified welding inspectors qualified by the Canadian Welding Bureau (CWB) to Level II or the Level III requirements of the Canadian Standards Association (CSA) Standard W 178.2 Certification of Welding Inspectors.

35.5. Nondestructive Testing

35.5.1. Visual Inspection

Visual inspections shall be in accordance with the applicable weld standards.

35.5.2. Nondestructive Critical Weld Joint Identification

The Supplier shall clearly identify in the product drawings, all critical joints required for Nondestructive Testing (NDT) other than visual inspection.


35.5.3. Qualified Nondestructive Inspectors

When NDT is required, the inspectors shall be qualified in accordance with the current edition of American Society for Nondestructive Testing Recommended Practice No. SNT-TC-1A. Only individuals qualified for NDT LEVEL I and working under the NDT LEVEL II or individuals qualified for NDT LEVEL II may perform nondestructive testing except visual examination. The NDT personnel need not be an AWS CWI. The Supplier shall make available all NDT personnel qualification records upon request by Banks Tech.

35.5.4. Nondestructive Testing Acceptance Criteria

When NDT is required for structural material(s) the acceptance criteria shall be as stated in the applicable standard. The acceptance criteria differ based on the design loads.

The Supplier shall state what joints are critical load bearing members and clearly identify these weldments for inspection purposes. In the case of critical structures, the acceptance

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criteria for cyclic loads will be as stated in AWS D1.1 and Class II structures for Aluminum welds in accordance with AWS D1.2.

36. Surface Preparation, Painting, and Finishing (All Suppliers)

The Supplier must comply with the finish requirement specified on the drawing. If no finish requirement is specified, all uncoated or unprotected ferrous and nonferrous metal surfaces (internal and/or external) must be protected for a minimum of fifty (50) working days from date of shipment against rust and corrosion and be suitably packed to prevent damage from handling or shipping. It remains the responsibility of the Supplier to ensure that finish requirements are upheld by the sub-tier finish suppliers. It is highly recommended that the Supplier mitigate risks by requiring sub-tier suppliers to document process flows, Process FMEA, and Process Control Plans in accordance with Banks Tech’s PPAP format.

The use of any pretreatment, plating, painting, or coating of any kind that contains Hexavalent Chrome is strictly prohibited.

37. Surface Preparation, Painting, and Finishing (Defense Suppliers)

Select government contracts mandate qualification and sustaining quality requirements, which are specified inside of the pertinent finish requirements drawings (example- 12593834). These requirements drawings will be listed on the purchase order when applicable.

Painters must be approved by Banks Technologies. Contact your Banks Tech buyer for a list of approved painters in your area.

Primers and paints must be procured with a U.S. Army Research Laboratory (ARL) Qualified Products List (QPL) source. Approved sources can be found at <https://qpldocs.dla.mil/>.

38. Casting Requirements

38.1. Wall thickness


Casting parts with inner passages and/or wall thickness features require verification that minimum thicknesses are maintained throughout the procurement cycle. The controlling features on the drawing may be expressed as dimensional or as a surface profile (or both). The method for verification may be achieved by sectioning and measuring. Unless otherwise stated, re-verification shall be conducted semi-annually (identical as radiography frequency). Whatever method is used, it is required that photos and measurements be recorded, retained, and provided upon request.

38.2. Inspection Reports

Radiographic inspection reports shall be signed by a NAS 410 certified technician.

38.3. Inspection Frequency

The first casting shall be radiographed in all routine and random positions described on the position chart, Control Plan, and part drawing.

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Subsequent castings shall be radiographed in those areas that were defective in the immediately preceding castings, until compliance with the required standard has been obtained. Objective evidence shall be provided by the producer that corrective action has been taken to eliminate the deficiency.

38.3.1. Radiographic Inspection Process

Radiographic inspection frequency shall be conducted based on the requirements listed below.

- 1) PPAP submission: One part per mold cavity. PPAP submittals to include:
 - a) Radiographic inspection reports
 - b) Radiographic images (with evidence that Image Quality Indicators were utilized)
 - c) NAS 410 Certifications
 - d) Laboratory accreditations
- 2) Initial Production (first 10 lots): One part per mold cavity from every 30 molds poured.
- 3) Production Sampling: One part per mold cavity twice per year (minimum). Increased frequency of radiography may be advisable (at the supplier's discretion) to ensure conforming product. If a non-conformance is realized, all costs for repair or replacement of nonconforming parts (since the last successful production sampling schedule) shall be borne by the Banks Tech supplier.

Note: Banks Tech reserves the right to conduct process audits to verify conformance to the above requirement.

38.4. Casting Repairs

Suppliers must receive prior approval from Banks Tech before conducting any repairs. All repairs require an approved and qualified repair procedure and must meet the specified standard on the applicable position chart, Control Plan, and part drawing. Suppliers shall utilize a Supplier Change Request (SCR) form to initiate a Banks Tech review.


38.5. Radiography Position Requirements

For initial production castings, routine and random positions shall be selected for radiography by an NAS 410 qualified operator to ensure compliance to all applicable requirements throughout the entire casting.

38.6. Occurrence Reaction

The occurrence of a rejectable defect in any area on a casting shall require the radiographic inspection of each subsequently poured casting in that area until the defective condition is corrected.

In the event of one failed radiograph from a lot, radiograph 3 additional samples (our level 3 PPAP quantity) from the same lot. If those 3 samples pass, scrap (or repair) the nonconforming part, and

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utilize the remaining lot if the non-conformance is believed to be isolated. Begin initial production radiograph schedule again (1 out of 30 for 10 consecutive lots).

If more than one part in a lot fails, that entire lot is scrap or must be 100 percent inspected. A root cause, correction, and preventative action will be required. Additional radiographs will be required to support the corrective and preventative actions taken. Begin initial production radiograph schedule again (1 out of 30 for 10 consecutive lots).

Objective records must demonstrate justification to advance from Initial Production sampling to Production Sampling.

39. Hardening Requirements

When hardening procedures are required, they must be submitted to Banks Technologies for Quality approval on each contract, along with isometric drawings and a macro-etched sample representative of the part for which the procedure is written. Hardening procedures will not be transferred with past production contracts.

40. Part Cleanliness

At a minimum, all materials and parts delivered to Banks Technologies shall be clean and free of debris, residual abrasive materials, and corrosion products that may adversely affect function or appearance. Refer to the design record or contract for detailed part cleanliness, cleanliness monitoring, and cleanliness control requirements.

41. Records / Forms

- Supplier Account Info form (Doc #50304)
- Technical Review Checklist (Doc #50308)
- Production Part Approval Process Requirements (Doc #50302)
- PPAP Workbook (Doc #50303)
- Banks Tech Supplier Change Request form (Doc #50015)