

Gear Technology

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| Work Instruction 6.1 | Rev. E | Date: 03/23/10 |
| Supplier Quality Assurance Requirements | | |

a) Purpose:

To provide Purchase Order terms and conditions, and Quality Clauses per Q.A.P. 6.0 paragraph 6.9, for the procurement of supplies and services and QAP 10.0 Paragraph 10.7 receiving inspection.

100.1 Scope:

These work instructions apply to Subcontractors who perform work or provide items or services to Gear Technology.

Amendment Record

This procedure contains only those pages issued by the Quality Assurance Manager. The Quality Assurance Manager will authorize changes and verify obsolete pages are withdrawn and destroyed. The master copy of this procedure, stored in the Quality Assurance Department, will be the final authority as to the amendment status of this procedure.

| Date | Section/Page | Details | Stamp |
|----------|-----------------------------|---|-------|
| 8/22/03 | All | To create electronic WI update and add Gear Technology QC Clauses. (Now Rev. "A") | #1 |
| 2/21/06 | Q1, Page 6, & Added Q14 | Changed from Material certifications to Material Certificate, Added Q14 (SPC Requirements - Rev. "B"), Added requirement 100.5.17 | #1 |
| 10/03/07 | General Terms & Conditions. | Added paragraph 100.5.18 "Preference for Domestic Specialty Metals Clause DFAR 252.225-7014", revised paragraph 100.5.4, added req's, (English language). | #1 |
| 6/13/08 | Add 100.5.5.1 & 100.5.5.2 | Receiving inspection and extent or nature | #6 |
| 03/23/10 | Add 100.5.8.1 | Reprocessing (Rework) Heat Treat Suppliers Only): | #6 |

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100.3 Responsibilities and Authority:

The Gear Tech Purchasing Manager has the primary responsibility to ensure that only Gear Technology / Customer approved suppliers are used for the procurement of items, product, or services relating to product.

100.3.1 The Gear Tech Quality Assurance Manager has the primary responsibility to ensure subcontractor's are monitored and controlled as required per QAP 6.0.

100.4 Associated Documents:

Q.A.P. 6.0 Purchasing,
QAP 10.0 paragraph 10.7 Receiving inspection
Audit Rating Form 6.1,
Audit Form 6.1A

100.5 Supplier Quality Assurance Requirements:**General Terms and Conditions:**

100.5.1 – Purchase Order (PO) is an offer to enter into a contract, which is accepted by the seller signing the PO or returning sellers own form of acknowledgment, or commencement of supplies or services ordered.

Point of Contact – Gear Technology Buyer referenced on the P.O. will be your point of contact for any questions, problems, or information. **Do Not** accept any change to the technical and quality requirements unless authorized in writing by the Buyer.

100.5.2 – Order of Precedence: When the requirements of the PO and applicable documents are in conflict, the following precedence shall apply in the order listed:

- a) Purchase Order.
- b) Blue Print of the revision specified on the P.O.
- c) Documents and Specifications referenced on the Blue Print.
- d) Documents referenced in the referenced documents.

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100.5.3 – Reservation of Rights: During performance of the Purchase Order, the suppliers facilities, quality systems, manufacturing processes, and articles produced, are subject to review, verification and analysis by Gear Technology, Gear Technology’s customers, and or authorized Government Representatives. The Supplier shall extend these reservations rights to their sub-tier suppliers.

100.5.4 – Retention of Records / Records: Unless otherwise specified, Supplier records which provide verifiable evidence of compliance to the purchase order shall be retained for a period of 7 years from the closing of the purchase order. Records shall be submitted or retained in the English Language unless otherwise approved in writing by the Gear Tech Buyer.

All records shall be legible and of sufficient quality to allow re-production or copies of those records to be produced.

100.5.5- Workmanship: As a provision of the purchase order Suppliers are responsible to implement and maintain Workmanship Standards and Quality System activities during performance of the purchase order. Controls shall be established to maintain Environmental conditions, Handling, Cleanliness, Material trace ability, Inspection, Calibration of Inspection Measuring & Test Equipment and any processing that will affect product quality and compliance to the Purchase Order.

100.5.5.1- Receiving: Incoming materials, products, gages or supplies provided by Gear Technology suppliers or customers shall be inspected or verified prior to its release to production in our shipping & receiving area, unless otherwise specified in writing by Gear Technology Quality Management.

100.5.5.2-The extent or nature: of the receiving inspection and testing process may be based upon supplier performance. Suppliers who maintain a grade level “A” may only require verification that the required inspections have been performed by the review and acceptance of supplier inspection documents. Inspection personnel whom have verified supplier performance for the acceptance of product shall note the supplier’s grade “A” onto the shipping document in the proximity of their stamp. After ten lots are received using the Grade verifications the next lot will be inspected complete to audit the suppliers continued performance.

The grade “A” inspection format will be tracked in the supplier FTQ logs by indication

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of "A" in the activity code column.

100.5.6- Packing, Packaging, and Preservation: The Supplier shall ensure appropriate packing, packaging, and preservation methods are utilized for shipment of product or items to Gear Technology.

100.5.7- Notification of Facility Change: Supplier shall not relocate any production or processing facilities during performance of the purchase order without promptly notifying Gear Technology for review of such facilities for compliance to quality requirements.

100.5.8- Deviations: Deviations or waivers from any purchase order requirement requires written authorization by Gear Technology's Purchasing Department.

100.5.8.1 - Reprocessing (Rework) Heat Treat Suppliers Only):

Any re-processing, re-tempering and / or quenching to meet stated requirements is not allowed without written approval from Gear Tech Engineering. All re-processing approved by Gear Tech will show the additional processes and any re-test on the certification. The supplier will submit a request in writing to the Gear Tech Buyer that addresses the request in detail and the current condition of product.

100.5.9- Nonconforming Material: The Supplier shall identify and withhold from shipment, all articles not in full compliance with the purchase order unless authorized by the Buyer. Isolated nonconforming product such as set-up parts (Maximum Qty. 3) that are tagged and segregated from conforming product can be shipped if noted on the suppliers shipping document and authorized by the Gear Tech Buyer.

Nonconforming product withheld by the supplier must be submitted to Gear Technology's Quality Assurance Department through the Buyer.

The supplier shall submit a report that includes specific details as to the discrepancy and provide root cause, corrective action, and preventative actions taken to prevent a reoccurrence. A copy of the supplier report or Gear Technology's report will be forwarded to the supplier with dispositions and actions required for the shipment of nonconforming materials.

100.5.10- Corrective Action: When product is found to be nonconforming by Gear Technology a written request for corrective action will be forwarded to the supplier. The

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supplier must respond within the corrective action due date listed on the CAR or provide a written request for extension to Gear Technology's Quality Assurance Department.

The supplier's corrective action response must include the following:

- a) Analysis of the root cause that led to the nonconformance.
- b) Immediate action taken to correct the problem.
- c) Preventative actions taken to prevent its recurrence.
- d) Effectively date of such actions.
- e) Printed and signed signature.

100.5.11- Unauthorized Repair: Supplier shall not affect repair of nonconforming articles without Gear Technology's approval.

Repair is defined as: subjecting a nonconforming article to other than normal processing that may allow the article to be suitable for use but will not completely eliminate the nonconformance.

100.5.12- Statistical Sampling: Unless otherwise specified, supplier may utilize statistical sampling in accordance with ANSI Z1.4 except the reject AQL is zero. Any discrepancy found during sample inspection shall require 100% inspection for the noted discrepancy. The use of statistical sampling plans does not relieve the supplier from the responsibility of delivering only conforming product to Gear Technology. Acceptance of product or articles with statistical sampling techniques does not ensure acceptance by Gear Technology.

100.5.13- Control of Age Sensitive Materials: Supplier shall provide for effective controls of all materials that have limited use or storage life requirements. The age control system must include methods for identifying the age of materials and their expiration dates. No over age materials may be shipped to Gear Technology.

100.5.14- Hazardous Materials: All materials that are volatile, toxic or that emit fumes that are harmful to human health shall be properly contained in accordance with applicable health and safety requirements. The containers shall be plainly marked as to the contents with appropriate warnings, precautions, instructions, safety data sheets, and storage conditions. Safety data sheets must be submitted with each purchase order shipment.

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100.5.15- Material

Substitution: Gear Technology materials may not be substituted unless authorized by the Gear Technology Buyer. Request for material substitution must be submitted in writing.

100.5.16- Minimum Shipping Documentation: The Supplier shall provide a shipping document and certificate of conformance with each purchase order shipment. The following information is required:

- a) Purchase Order number.
- b) Part Number and Revision or item listed on the Gear Technology P.O.
- c) The applicable specifications and their revisions.
- d) The signature of an authorized supplier representative.
- e) Gear Technology Job and Lot number as listed on the P.O.

100.5.17- Performance of Services: The Supplier shall be responsible for flow down of all the requirements and provisions of the Gear Technology purchase order applicable to the supplier's subcontractors.

Services contracted by Gear Technology that is performed at another facility or address, or suppliers subcontractor require Gear Technology Buyer approval. Gear Technology Buyer approval shall be noted on the Gear Technology purchase order.

A copy of the supplier's subcontractor C of C shall be forwarded to Gear Technology upon shipment and noted on the suppliers shipper.

Sub-contract processing of product, that the suppliers were contracted to perform is prohibited without the written approval from the Gear Technology Buyer.

100.5.18 – Preference for Domestic Specialty Metals: Preference for Domestic Specialty Metals DFARS Clause 252.225-7014, Alternate 1 applies. Material shall be

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melted and or products

purchased within the United States unless materials are melted or products purchased from Qualifying Countries listed in DFARS Clause 225.872-1.

100.6 Gear Technology Procurement Quality Clauses:

100.6.1- the following quality control clauses apply when specifically noted on the Gear Technology Purchase Order:

Q1- Material Certifications: A Material certificate shall be provided with each shipment of material. Certificate must be complete, legible, reproducible and authentic. The specification with the latest revision and the name and title of the authorized representative shall appear on the certificate and shall bear the person's signature and the date.

Q2- Material Certifications: Chemical Test Reports. Chemical test reports shall be provided with each shipment of material. Certifications must be complete, legible, reproducible and authentic. The specification with the latest revision and the name and title of the authorized representative shall appear on the certification and shall bear the person's signature and the date.

Q3- Material Certification: Mechanical Test Reports. Mechanical and Physical Test reports shall be provided with each shipment of material. Certifications must be complete, legible, reproducible and authentic. The specification with the latest revision and the name and title of the authorized representative shall appear on the certification and shall bear the person's signature and the date.

Q4- Process Certification: Each process performed shall include a certification with shipment. Certifications must be complete, legible, reproducible and authentic. The specification with the latest revision and the name and title of the authorized representative shall appear on the certification and shall bear the person's signature and the date.

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Process certifications must contain specific process information as listed on the Purchase Order, Drawings and Specifications used to complete the process such as, **Dates, Times and Temperatures, Plating Thickness, Shot Size and Intensity, Qualification Level of Personnel performing tests (Level II / Level III), Test Results, Part Number and Revision, Serial Numbers** and any other information required to complete the certification.

Q5- Approved Sources: Only sources approved by Gear Technology or Gear Technology's Customers can be used. Contact the Gear Tech. Buyer regarding any questions or approvals.

Q6- First Article Inspection: Upon first initial production or any subsequent change to the product or tooling used to produce the product, the Supplier shall perform and document a comprehensive inspection and test to verify compliance to purchase order and specification requirements. The first article part will be tagged and identified as "F.A.I. Part" for shipment to Gear Technology.

The Suppliers first article inspection report shall contain the following minimum information:

- a) Part Number
- b) Part Name
- c) Drawing Revision
- d) Supplier Name and Address
- e) The Gear Technology Purchase Order
- f) The Gear Technology Job and Lot Number
- g) The Lot Quantity from which the F.A.I. part was selected
- h) The Inspectors printed name, signature (and stamp if used)
- i) All drawing characteristics with their tolerances
- j) All actual dimensions measured
- k) F.A.I. results (Accepted / Rejected)
- l) Serial Number (s) if applicable
- m) Trace ability to Acceptance Test Procedures (if applicable)
- n) Trace ability to Test Equipment (if applicable)

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o) All drawing notes and material requirements

Note: A CMM report will be accepted when annotations are made to comply with requirements (a) thru (n) herein.

Note: The Supplier F.A.I. package will include copies of the F.A.I. Report and all applicable Certifications and Test Reports.

Q7- Final Inspection: Each shipment of product or articles shall include a copy of the Suppliers Final Inspection Report.

The Suppliers final inspection report shall contain the following minimum information:

- a) Part Number
- b) Part Name
- c) Drawing Revision
- d) Supplier Name and Address
- e) The Gear Technology Purchase Order
- f) The Gear Technology Job and Lot Number
- g) The lot quantity / qty. inspected / qty. accepted / qty. rejected
- h) The Inspectors printed name, signature (and stamp if used)
- i) All drawing characteristics with their tolerances
- j) All actual dimensions measured
- k) Final Inspection results (Accepted / Rejected)
- l) Serial Number (s) if applicable
- m) Trace ability to Acceptance Test Procedures (if applicable)
- n) Trace ability to Test Equipment (if applicable)
- o) All drawing notes and material requirements

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Note: A CMM report will be accepted when annotations are made to comply with requirements (a) thru (n) herein.

Note: The Supplier Final Inspection package will include copies of the Final Inspection Report and all applicable Certifications and Test Reports.

Q8- First Article Verification: A Gear Technology Quality Representative shall witness the performance of the first article at the Suppliers facility. Contact your Gear Technology Buyer 48 hours in advance to schedule the required support. The Supplier may have already completed the F.A.I. and repeat the inspections and test as requested during performance of this requirement. Inspection by the Gear Technology Quality Representative does not constitute final acceptance of product.

Q9- Gear Technology Source Inspection: Gear Technology source inspection is required prior to shipment of product from your facility. The Supplier will provide reasonable support including necessary equipment and personnel to complete the source inspection activity. Contact your Gear Technology Buyer 48 hours in advance to schedule the required support. Evidence of Gear Technology Source Inspection will appear on the suppliers shipping documents. Inspection by the Gear Technology Quality Representative does not constitute final acceptance of product.

Q10- Government Source Inspection: Government inspection is required prior to shipment from your plant.

- a) Upon receipt of this order, promptly notify the Government Representative who normally services your plant so that appropriate planning for Government inspection can be accomplished.
- b) On receipt of this order, promptly furnish a copy to the Government Representative who normally services your plant or, if none, to the nearest Army, Navy, or defense Supply Agency inspection office. In the event the Government Representative or office cannot be located, contact your Gear Technology Buyer.
- c) Gear Technology Source Inspection is required on product or articles being submitted to the Government in compliance with the Gear Technology purchase order.

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Contact the Gear Technology

Buyer 48 hours in advance to arrange the required support.

Q11- Quality Assurance System Requirements: The Supplier shall document and maintain Quality Assurance System requirements to ensure product conformance in accordance with:

- a) ANSI/ASQC Q9001
- b) ANSI/ASQC Q9002
- c) SAE AS9100, SAE AS 9003
- d) ISO 9001, ISO 9002

- e) MIL-I-45208A
- f) MIL-Q-9858
- g) MIL-STD-45662A, ISO 10012, or ANSI Z-540 (Calibration)

Q12- Gear Inspection: The supplier shall prepare gear inspection charts to meet the following criteria:

- a) 100% Total Composite Error – Tooth-to-Tooth Action.
- b) 100% Lead Tooth Error.
- c) 100% Profile Tooth Error.
- d) 100% K Chart (When applicable).

Note: Each part will be tagged with a serial number correlating to the numbered charts created by the supplier. Each chart will indicate the increment of measurement for the inspection performed. Original charts shall be provided and must be legible and reproducible.

Q13- Gear Inspection: The supplier shall prepare gear inspection charts to meet the following criteria:

- a) Sample Total Composite Error – Tooth-to-Tooth Action.
- b) Sample Lead Tooth Error.
- c) Sample Profile Tooth Error.
- d) Sample K Chart (When applicable).

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Note: Each part will be tagged with a serial number correlating to the numbered charts created by the supplier. Each chart will indicate the increment of measurement for the inspection performed. Original charts shall be provided and must be legible and reproducible.

Sample requirements by lot size:

- 1) Lot Size of 1 –13 = 100% Composite, 5 charts lead & profile.
- 2) Lot Size of 14 – 100 = 1 chart for every 7 parts produced.
- 3) Lot Size 101 and above = Sample per ANSI Z1.4-1993 Level II
AQL 1.0, except reject number will be zero.

Q14- Statistical Process Control: The supplier shall provide control charts as specified within Gear Technology's purchase order or planning instructions. Supplier shall provide in-process data when requested to verify control charts submitted. Contact your Buyer for Gear Technology Quality Engineering assistance if required.

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