



ZERO MANUFACTURING QUALITY CLAUSES

The following Quality Clauses apply when referenced for Purchase Orders from ZERO Manufacturing. The current revision of this document will be in the footer of every page.

If there are questions about the content of these clauses, please contact your ZERO Manufacturing Representative.

Note:

1. When “ZERO” is referenced in the document, it applies to “ZERO Manufacturing” only.
2. “Sub-tier Supplier” is defined as any subcontractor of the prime Supplier named on the ZERO Manufacturing Purchase Order.

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ZGEN GENERAL QUALITY REQUIREMENTS - Applicable to All Orders. ZG1–ZG30

ZG1 QUALITY SYSTEM:

The Supplier must establish and maintain an effective quality system approved by ZERO. This quality system should ensure that all materials and services meet purchase order. The system should also provide mechanisms for early detection and resolution of nonconformances. Records generated by the quality system must be made available for periodic review as needed or upon request.

ZG2 NONCONFORMING MATERIAL:

The Supplier shall not ship or attempt unauthorized repairs to products with the intention of delivering materials that do not fully meet the purchase order or product specification requirements. If potential nonconformances are detected before shipment, the Supplier must promptly notify ZERO Quality Assurance. Shipping nonconforming material without written prior approval may result in disqualification from future procurement. Additionally, the Supplier must inform ZERO Quality Assurance if previously shipped parts are discovered to be suspect or nonconforming.

ZG3 RESUBMISSIONS OF REJECTED MATERIAL:

All material rejected by ZERO and subsequently resubmitted must be clearly identified as having been previously rejected. **The Supplier should reference the ZERO NCM number on the packing slip and indicate whether the material was reworked or replaced with a new product.** If the material is subject to Government Source Inspection, it must be resubmitted to the Government prior to delivery.



ZG4 PRODUCT OR PROCESS CHANGES:

Any changes to product design, materials, or processes that impact form, fit, function, performance, quality, reliability, or safety must receive written approval from ZERO before implementation. The Supplier should notify ZERO of any changes to facilities or locations where the product was initially produced or if a product recall is necessary due to changes in product or process.

ZG5 CORRECTIVE ACTION REQUESTS:

When nonconforming materials received from Suppliers are detected at ZERO, corrective action will be required. Suppliers must communicate their plans for correcting both the immediate discrepancy and the root cause of the nonconformance to prevent recurrences. Failure to respond promptly may lead to delayed payment and affect the Supplier's Quality Performance Rating.

ZG6 PRESERVATION, PACKAGING, PACKING, AND SHIPPING:

Unless specific packaging instructions are provided in the purchase order, **the Supplier must ensure that shipped materials are clean, dry, and properly packaged to protect against corrosion, deterioration, and physical damage during shipment.** All containers, along with shipping documentation, certifications, test data, and inspection data, should be clearly labeled. **Note that wood pallets made outside the United States must comply with U.S. Regulations regarding infestation treatment and identification.**

ZG7 LABELING:

All containers must be accurately labeled to describe their contents, including liquids such as solvents, coatings, Freon, mold release agents, etc. Labels for hazardous materials must comply with relevant OSHA and EPA regulations, the Code of Federal Regulation (CFR), and the Clean Air Act, Section 611.

ZG8 RECORD RETENTION:

Records must provide objective evidence of inspection, including relevant drawings and specifications. **The retention periods for records are as follows: 10 years for ZERO Designed Product, 10 years for ZERO Customers Designed Product, and 5 years for Commercial Off the Shelf Material.** Records should also include details of any corrective actions taken. These records must be made available for review within 48 hours and shared with ZERO customers upon request.

ZG9 ENVIRONMENTAL REQUIREMENTS:

- Materials supplied under this order must be free from contamination by mercury or any other toxic substance, except with prior approval from ZERO.
- Use of Class 1 Ozone Depleting Substances (ODS) is prohibited. Suppliers must inform ZERO of any products containing or manufactured with ozone depleting substances.

ZG10 WORKMANSHIP:

The Supplier must maintain consistently high-quality workmanship and monitor it to ensure compliance with purchase order and specification requirements.



ZG11 FOREIGN OBJECT DEBRIS PROGRAM:

Suppliers must ensure that products provided to ZERO meet cleanliness requirements necessary to comply with ZERO's Foreign Object Debris (FOD) prevention program. Delivered material must be clean and free from any foreign material or debris that could cause FOD entrapment, such as machined chips, burrs, grinding dust, forming materials, corrosion, oil, or other foreign substances on surfaces.

ZG12 FLOW-DOWN OF REQUIREMENTS:

The Supplier is responsible for ensuring that all applicable requirements are communicated to sub-tier Suppliers. If a sub-tier Supplier controls critical processes, characteristics, or features, the Supplier is responsible for monitoring and ensuring that the sub-tier Supplier meets purchase order requirements. The latest process and drawing revisions must be used.

ZG13 CALIBRATION:

The Supplier **must establish and maintain** a system for controlling and maintaining measuring and test equipment, following ANSI/NCSL Z540-1 or equivalent standards. This Calibration System should be documented, accountable, traceable, and include initial and re-calibration to traceable standards during the equipment's lifecycle.

ZG14 ELECTROSTATIC DISCHARGE DAMAGE (ESD) PROTECTION:

Components and assemblies susceptible to electrostatic discharge damage must be handled and packaged to prevent ESD damage. These units should be wrapped in a static shielding barrier in direct contact with the unit and clearly marked as containing ESD-sensitive devices, following relevant standards.

ZG15 RIGHT OF ENTRY:

The Supplier must grant the right of entry to ZERO, ZERO customers, and regulatory agency personnel for access to facilities where work is performed or scheduled, including sub-tier Supplier facilities. This access should be provided without an increase in price, cost, or fee. Denying access may result in disqualification from future procurement.

ZG16 ORDER OF PRECEDENCE:

Documents should be followed in the following order of precedence: 1) Purchase order and attachments, 2) Drawing/Specification, 3) Customer Specification, 4) Military Specification. The applicable revision is the one in effect on the purchase order issuance date, unless specified otherwise.

ZG17 PART SUBSTITUTION:

Part substitution **is not authorized** without written approval from ZERO.

ZG18 LANGUAGE REQUIREMENT:

All data or correspondence must be provided in English.



ZG19 RAW MATERIALS:

When supplying raw materials (e.g., coils, sheets, rails, bars, rods, etc.) directly to ZERO or using them in the production of machined or sheet metal products for ZERO (excluding standard hardware items), Suppliers must source these materials from manufacturers and distributors approved by ZERO's customer. **All delivered items must maintain clear job/lot traceability.** Suppliers of raw materials must include a Certificate of Compliance with actual physical and chemical test results with each shipment. Material identification by heat lot and/or heat treat load (if applicable) is essential. **For purchase orders with a prime contract number, Suppliers must ensure compliance with DFAR 252.225-7014, and this requirement must be communicated to and followed by all sub-tier Suppliers involved in the supply chain.**

ZG20 SEGREGATION OF LOTS:

Different date codes or production lots should not be co-mingled or combined with resubmitted parts. Parts may be shipped in one shipment provided that different date codes and lots are identified and segregated.

ZG21 CERTIFICATE OF CONFORMANCE REQUIREMENTS:

A Certificate of Conformance (C of C) must accompany each lot. This C of C should include a statement certifying that the items meet purchase order and specification requirements, along with specific details including serial numbers, quantities, part numbers, revisions, date codes, and more.

ZG22 CONTROL / IDENTIFICATION OF ITEMS WITH LIMITED SHELF LIFE:

Items with limited shelf life must be marked with manufacturing dates, storage temperatures, special handling requirements, and expiration dates. Rubber items should show their cure date instead of the manufacturing date. **ZERO will not accept material with less than 90% of its useful life remaining without written authorization.**

ZG23 LOTS HELD MORE THAN 24 MONTHS:

Material held by the Supplier for 24 months or longer, after passing final inspection and testing, must be re-inspected, and tested before shipment to ZERO. If a lot fails during re-inspection, all lots may be subject to 100% inspection for all failed characteristics. The Supplier must notify ZERO about critical characteristic failures that may have occurred in previously shipped lots.

ZG24 SAMPLING INSPECTION:

If the Supplier is conducting sampling instead of 100% lot inspection, the sample plan should not accept lots with known non-conformities (discrepancies). **The use of a C = 0 sampling plan must be incorporated.**

ZG25 FIRST ARTICLE INSPECTIONS:

Suppliers are required to perform a First Article Inspection Report (FAIR) in specific conditions, including the first production lot, first lot after engineering changes, or after a lapse of 24 months or more since the last production lot.

The FAIR should be provided to ZERO with the shipment, and ZERO may recommend and may require the use of AS9102 format.



ZG26 SUB-TIER SUPPLIER MANAGEMENT CONTROL:

The Supplier must implement and maintain a program for selecting, approving, rating, and managing sub-tier Suppliers. This program should include provisions for root cause corrective action and, when necessary, disqualification of underperforming sub-tier Suppliers. The Supplier's Sub-Tier Supplier Management Program should be available for review by ZERO upon request.

ZG27 FRANCHISED / LICENSED "DISTRIBUTOR" TRACEABILITY:

Distributors must ensure traceability of all purchased product to the original equipment manufacturer (OEM), or original component manufacturer (OCM) mentioned on the Certificate of Conformance. Distributors should not modify, rework, or repair material shipped on this order.

ZG28 CONFIGURATION MANAGEMENT:

The Supplier is responsible for establishing and executing a robust configuration management process to oversee all modifications to deliverable products associated with this purchase order. These changes require approval from ZERO according to the following guidelines:

1. **CLASS I Changes:** As defined in MIL-STD-481, any CLASS I changes must be submitted to ZERO for approval before implementation.
2. **CLASS II Changes:** These changes, which do not fall under the CLASS I category, require specific attention. A copy of all CLASS II changes, as defined in DOD-STD-480, must be provided to ZERO for review a minimum of 30 days before the delivery of any equipment or product incorporating the change. Engineering change documentation should be submitted to Zero's purchasing and engineering teams for review and approval.

ZG29 COUNTERFEIT PARTS AND MATERIALS AVOIDANCE IN ZERO 'S SUPPLIER PRODUCTS:

Components and parts should be procured only through OEMs/OCMs or their authorized dealers or distributors.

- The Supplier must verify the procurement source and associated certifying paperwork.
- Adequate incoming inspection methods should be used to detect potential counterfeit parts and materials.
- The Supplier must ensure that this requirement is flowed down to all sub-tier Suppliers.
- The use of unapproved brokers is prohibited without prior approval from ZERO.

ZG30 AWARENESS OF CONTRIBUTIONS TO PRODUCT SAFETY AND ETHICAL BEHAVIOR:

- External providers must ensure that their personnel are aware of their contributions to product safety during the provision of products and services to ZERO.
- External providers must emphasize the importance of ethical behavior among their personnel, promoting honesty, integrity, and responsible conduct in all interactions related to products and services provided to ZERO.



DETAILED QUALITY REQUIREMENTS - Purchase Order Specific

Z01A ISO9001 Certified Quality Program:

The Supplier must maintain a certified ISO9001 Quality System or an equivalent. This requirement applies when specified on the purchase order.

Z01B AS91XX Quality Program:

The Supplier must have a Quality System compliant with AS91XX. This requirement applies when specified.

Z01C AS91XX Certified Quality Program:

The Supplier's Quality System must be certified to AS91XX or an equivalent. This requirement applies when specified.

Z01D Boeing Quality Management System:

The Supplier's Quality System should follow Boeing D6-82479 Boeing Quality Management System requirements. This requirement applies when specified.

Z01E ZERO Supplier Approved Quality System:

The Supplier must maintain a Quality System acceptable to ZERO for the purchased product(s). Any changes affecting product form, fit, or function must be promptly notified to ZERO.

Z02 STATEMENT OF WORK:

A Statement of Work is in effect for this purchase order. For a copy, please contact your ZERO representative.

Z03 GOVERNMENT SOURCE INSPECTION:

Government Source Inspection is required before shipment. The Supplier must provide the necessary facilities, equipment, data, and perform tests as per applicable requirements. The Government reserves the right to re-inspect or retest items, with final acceptance at ZERO facilities. Please inform your Government Representative for inspection planning.

Z04 ZERO SOURCE INSPECTION:

ZERO Source Inspection is required before shipment. ZERO reserves the right to re-inspect or retest items, with final acceptance at ZERO facilities. Please notify the Buyer on the purchase order for inspection planning. Attach a copy of ZERO Source Inspection Documentation to the shipping document.

Z05 CUSTOMER SOURCE INSPECTION:

ZERO Customer Source Inspection is required before shipment. ZERO Customer reserves the right to re-inspect or retest items, with final acceptance at ZERO facilities. Please notify the Buyer on the purchase order for inspection planning.

Z06 DELEGATED INSPECTION:

ZERO delegates inspection to the Supplier's personnel following ZERO procedures. Personnel selection, evaluation, and certification will be done by ZERO Quality Assurance. The Supplier will be informed in writing of qualified personnel. Inspection details will be coordinated between the Supplier and ZERO.



Z07 CERTIFICATE OF CONFORMANCE CALIBRATION C OF C REQUIREMENTS:

The Supplier must have a calibration system per ANSI/NCSL Z540-1-1994 standards or equivalent ISO Standards. Calibrate and provide a Certificate of Calibration with Measurement and Laboratory Traceability in accordance with standards.

Z08 PRODUCT PROCESS BASELINE:

The Supplier must maintain a documented revision-controlled process baseline for the ordered part number, identifying critical processes, materials, and sub-tier Suppliers. No changes may be made without written approval from ZERO.

Z09 FUNCTIONAL AND DIMENSIONAL REPORTS:

Submit a signed legible copy of actual test results with each lot. Actual readings are required for quantitative measurements. Notations for readings within specification limits are accepted only for automatic or "go/no-go" equipment without quantitative readout.

Z10 CHEMICAL / PHYSICAL REPORTS:

Provide a test report verifying physical and chemical properties specified in documentation with each lot.

Z11 FIRST ARTICLE INSPECTION REPORT (FAIR):

A First Article Inspection Report compliant with AS9102 latest revision is required with this shipment.

Z12 TEST DATA:

Test data, traceable to serial numbers or lots, is required with each shipment. When testing is performed by an outside lab, the lab must be traceable and identified on the test data sheets.

Z13 SPECIAL PROCESSES:

Special Processes must adhere to specified standards and drawing requirements. Suppliers must ensure certified personnel and equipment are used.

Z14 NON-DESTRUCTIVE TEST REQUIREMENTS (NDT):

Items requiring NDT inspection must be submitted in accordance with applicable specifications and standards. Include a signed report with the delivered material.

Z15 HEAT TREATING REQUIREMENTS:

Maintain a cross-reference between heat treat lots and raw material heat numbers as applicable. Treat each traceable lot according to specifications and ship separately with necessary documentation.

Z16 FASTENER QUALITY ACT:

Comply with the Federal Fastener Quality Act of 1990. Provide inspection, testing, and certification from an approved test facility with each lot.

Z17 SPECIAL PROCESS APPROVED SUPPLIERS:

Use Special Process Suppliers approved by ZERO CUSTOMER LISTED ON PURCHASE ORDER. (E.g., Boeing, Lockheed, Woodward, Honeywell, etc.)



Z18 SERIALIZATION MARKING:

Materials procured under this purchase order must be uniquely serialized. Individual serial numbers or number series must be marked on the Certificate of Conformance.

Z19 GENERAL STATISTICAL PROCESS CONTROL (SPC):

Implement and maintain SPC, documented to include key characteristic and/or process selection, statistically based control charting, continuous improvement, management supervision, corrective action, training, and flow down to sub-tier Suppliers when applicable.

Z20 PART NUMBER SPECIFIC STATISTICAL PROCESS CONTROL (SPC):

Implement and maintain SPC specific to this part number.

Z21 KEY CHARACTERISTIC STATISTICAL PROCESS CONTROL (SPC):

Implement and maintain variation reduction for key characteristics, meeting specified Cpk requirements.

Z22 DRAWING APPROVAL:

Forward Supplier drawings to ZERO Quality Assurance for review and approval before fabrication. Maintain approved configuration and revisions.

Z23 PROCEDURES AND PROCESSES:

Forward Supplier procedures/processes, as identified by ZERO, to ZERO Quality Assurance for review and approval before fabrication. Maintain approved documentation configuration control.

Z24 UNIQUE PACKAGING REQUIREMENTS:

Special packaging is required; refer to the purchase order or contact ZERO for instructions.

Z25 UNIQUE PART NUMBER REQUIREMENTS:

Contact your ZERO Procurement representative for assistance or a copy of the special instructions/requirements.

Z26 BAR CODE REQUIREMENTS:

Standard bar coding is required, and the bar code must be readable upon receipt.