

1. Application

This document applies to assemblies, sub-assemblies, and detail parts which have the quality clause QY12.

2. Reference Documents

The following documents support the application/use of the GDLS FPI process. The latest edition of each document as well as any amendments apply at the time of PO acceptance by the supplier

- QCS-16 Coversheet
- QCS-16-2 Non-conformance Summary
- GDLS PQA 3000 – Production Quality Assurance Handbook
- GDLS Quality Clauses

2.1. Hierarchy of Documentation

- The GDLS Purchase Order (PO) takes precedence over all documents. If there are any conflicts between the GDLS PO and any documentation, the PO takes precedence.
- If a conflict between any of the reference documents and this document occur then the requirements of this document will apply. Nothing in this document supersedes applicable laws and regulations unless specific exemption has been obtained.
- If there is a conflict between any of the standards/documents stated and the GDLS print, the GDLS print takes precedence.

3. Definitions

Capability – Ability of an organization, system, or process to produce a product that will fulfill the associated design characteristics defined for that product.

Commercial-Off-The-Shelf (COTS) Items – Commercially available items intended by design to be procured and utilized without modification.

Design Characteristics - Those dimensional, visual, functional, mechanical, and material features or properties, which describe and constitute the design of the article, as specified by drawing. These characteristics can be measured, inspected, tested, or verified to determine conformance to the design requirements. Dimensional features include in-process locating features (e.g., target-machined or forged/cast dimensions on forgings and castings, weld/braze joint preparation necessary for acceptance of finished joint). Material features or properties may include processing variables and sequences, which are specified by the drawing (e.g., heat treat temperature, fluorescent penetrant class, ultrasonic scans, sequence of welding and heat treat). These provide assurance of intended characteristics that could not be otherwise defined.

Designed Tooling - Product specific tooling [e.g., check fixtures, Coordinate Measurement Machine (CMM) program] specifically made to validate the design characteristics of a product.

Drawing Requirements - Requirements of the drawing and associated parts lists, specification, or purchasing document to which the product is to be produced from, including any notes, specifications, and lower-level drawings invoked.

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First Production Run - The initial group of one or more parts that are the result of a planned process designed to be used for future production of these same parts.

No Change Clause - The No Change Clause is a contractual requirement and can be found in the Terms and Conditions under Configuration Control. Supplier shall make no change in design, materials, manufacturing location, manufacturing processes, or sources of supply, after buyer's acceptance of the first production test item or after acceptance of the first completed end item, without the written approval of the buyer.

Product - Any intended output resulting from the product realization process, which in the context of this standard includes finished detailed parts, sub-assemblies, assemblies, forgings, and castings.

Product Realization - A clear idea of what the product will be, usually expressed in drawings, statements of work, functional product specs, or their equivalents.

Reference Characteristics - The characteristics that are used for "information only" or to show relationship; these are dimensions without tolerances and refer to other dimensions on the drawing.

Special Processes - Any processes for production and service provision where the resulting output cannot be verified by subsequent monitoring or measurement and, as a consequence, deficiencies become apparent only after the product is in use or the service has been delivered.

Standard Catalogue Items - A part or material that conforms to an established industry or national authority published specification, having all characteristics identified by text description or industry/national/military standard drawing.

4. Requirements

4.1. Part Requirements

- 4.1.1. The supplier shall perform FPI on new product representative of the first production run. The first production delivery parts require an FPI. The FPI will be done on at least 1 of the first 5 parts that are made using the production process. There will be no shipments until the FPI has been approved by a GDLS SQA Representative.
- 4.1.2. The supplier shall use a representative part from the first production run of a new product to verify that the production processes, production documentation, and tooling have the capability to produce products that meet the established requirements.
- 4.1.3. For assemblies, the assembly level FPI shall be performed on those characteristics specified on the assembly drawing, as well as all requirements listed on each sub-component and sub-assembly of which the assembly is comprised of.
- 4.1.4. The FPI approval is considered extended by GDLS from one purchase order to the next provided that:
 - No Configuration changes have occurred
 - The part is manufactured at the same facility
 - The manufacturing/sub-tier manufacturing process has remained the same
 - There has been no more than a one (1) year break in production

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- No formal corrective action has been required
- The sub-tier suppliers and special process(es) have not changed

4.2. Evaluation Activities

The supplier shall conduct the following activities during product realization, when applicable, in support of FPI to ensure conformance with design characteristics:

- a. Review documentation for the manufacturing process (e.g., routing sheets, manufacturing or quality plans, manufacturing work instructions) to ensure all operations are complete as planned and call out the correct specification, material types, conditions, and approvals.
- b. Review supporting documentation in the FPI package (e.g., inspection data, test data, Acceptance Test Procedures, special process approvals, and certifications) for completeness.
- c. Verify that the raw material and special process certifications call out the correct specification, material types, conditions, and approvals.
- d. Verify that the required customer approved sources are utilized. (e.g., source control prints, high strength fasteners, ASTM A514, etc.)
- e. Verify that the required designed tooling (e.g., part specific gauges) are used.
- f. Verify that every design characteristic requirement is accounted for, and has sufficient supporting evidence for compliance.
- g. Verify the design characteristics that are the output of the manufacturing process are measured, inspected, tested, or verified to determine conformance.
- h. Verify part marking is legible, correct in content and size, and properly located per applicable specifications.
- i. The supplier should complete the FPI activities prior to scheduling the FPI to verify all requirements have been met so the FPI should pass on the first visit.
- j. Any non-conformances found during the supplier FPI should be immediately directed to the GDLS SQA Regional Manager.

4.3. Documentation

4.3.1. Forms

- a. FPI will be performed using the GDLS QCS-16 Coversheet.
- b. A QCS-16 Coversheet will only be completed for the PO level part number.
- c. Field 14 is to have "QY12 FPI" box checked. Default FPI language is to apply to the QCS-16 documentation over any listed FAI requirement.
- d. Field 15 is considered optional.
- e. If applicable, a QCS-16-2 NC Summary form shall be used to document any non-conformances found during the FPI.
- f. All forms shall be completed either electronically or in permanent ink.
- g. All forms shall be completed in the English language.

4.3.2. Verification Activities and Accountability

- a. **Build to Print**
 1. The supplier shall verify every design characteristic during the FPI.
 2. Reference characteristics may be omitted from the FPI.

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3. Characteristics not measurable in the final product shall be verified during the manufacturing process, as long as they are not affected by subsequent operations or by destructive means.
 4. Value Added Suppliers that are purchasing Vendor Item Controlled Drawing parts and/or Source Controlled drawing parts for direct shipment or to be used within an assembly please see section 4.3.2.b and 4.3.2.c
- b. **Vendor Item Control Drawings (VICD)** – When purchasing parts per a VICD it is recommended that the supplier buy from the recommended sources of supply. If the supplier does not purchase from a recommended source of supply and the corresponding part number as shown on the GD drawing, please see section 4.3.2.b.2.
1. If the part(s) purchased come from the supplier listed on the VICD, then at a minimum a certificate of conformance from the manufacturer listed on the VICD will be acceptable for approval of the FPI activity. A CofC will only be accepted from a distributor when the CofC is from an authorized franchise distributor as designated by the manufacturer of the part.
 2. When a supplier chooses to purchase a part that is not listed as a recommended source and part number, or chooses to make the part, the supplier must fully balloon all requirements of the Technical Data Package and supply verification that all TDP requirements have been met. This will include all environmental, qualification, and/or performance testing. Verification can be done by reviewing the manufacturers catalog pages.
 3. The GDLS SQA representative reserves the right to validate any performance requirement is met.
- c. **Source Controlled Drawings (SCD)** – When purchasing parts per a GDLS Source controlled Drawing, the supplier is required to purchase from the approved source of supply and corresponding part number.
1. At a minimum a certificate of conformance from the manufacturer listed on the SCD will be acceptable for approval of the FPI activity. A CofC will only be accepted from a distributor when the CofC is from an authorized franchise distributor as designated by the manufacturer of the part.
 2. Verify on the Certificate of Conformance that required customer approved sources and corresponding part numbers are utilized.
 3. The GDLS SQA representative reserves the right to validate any performance requirement is met.
- d. **Standard Catalogue Items & Commercial Off The Shelf (COTS)** – When these items are part of an assembly and the GDLS PO has the QY12 clause, the supplier may provide a certificate of conformance and/or review catalog data from the manufacturer of the items as a form of part acceptance. When using a catalog page as a form of acceptance, evidence of purchasing source will be required.

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- e. During FPI and each shipment thereafter, the supplier is required to verify no changes have taken place since the last shipment and the parts still meet all requirements of the technical data package. If the manufacturer makes any changes to the design on a suggested source of supply part or an approved source of supply part, the supplier shall notify GDLS as soon as possible. If a change is found, the supplier shall notify the GDLS Buyer per the no change clause.

4.4. Control Of Records

FPI documentation required by this standard shall be considered a quality record. The supplier shall retain all FPI documentation while the product is being produced and, at a minimum, retain the documentation according to applicable customer or regulatory requirements. (Review your GDLS Terms and Conditions)