

<b>GENERAL DYNAMICS</b> Ordnance and Tactical Systems	ST. PETERSBURG, FLORIDA		
	<b>SUPPLIER QUALITY CLAUSE</b>		
TITLE	QUALITY CLAUSE	REVISION	EFFECTIVE DATE
<b>PRODUCTION PROCESS CONTROL</b>	<b>S17</b>	<b>0</b>	<b>June 9, 2023</b>
<small>Material and/or services supplied to purchase orders must be in accordance with all quality clause requirements and any additional requirements outlined on the Purchase Order.</small>			

## 1.0 REFERENCES

- DI-NDTI-80603 (Latest revision unless specified otherwise): Test Procedure
- MIL-PRF-8625 (As defined in the Technical Data Package List (TDPL)): Anodic Coatings for Aluminum and Aluminum Alloys
- TT-C-490 (As defined in the TDPL): Chemical Conversion Coatings and Pretreatments for Metallic Substrates
- ASTM B633 Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel

## 2.0 REQUIREMENTS

This General Dynamics Ordnance and Tactical Systems (GD-OTS) quality clause describes submittal requirements and formats for the submittal of Process Control Documents (PCD). PCD's are a description of the production processes, procedures, fixtures, production parameters, material handling procedures, and equipment and inspection methods used to produce the products specified within the subcontract. This clause also covers computer-controlled equipment and processes, although those are not generally required to be submitted to GD-OTS, as described below.

This clause contains the format and content preparation instructions for the following Quality Clause Deliverable (QCD) submittals:

- PCD's
- Process Control Document Listing (PCDL)
- Rework/Repair Procedure(s)
- Phosphate or Anodic Coating Application Procedure(s)

The subcontractor shall establish and maintain a program that documents and controls all manufacturing processes affecting quality. Process control documentation shall be submitted to GD-OTS in accordance with the QCD requirements specified in this clause. PCD's and their corresponding manufacturing operations are subject to review on-site by GD-OTS and the United States Government (USG), when appropriate. Any conflict as to the adequacy of the work instructions to provide uniform, homogeneous product shall be resolved to the satisfaction of GD-OTS. Upon written request, these documents shall be furnished to GD-OTS. GD-OTS considers this documentation to be proprietary to the subcontractor and will treat these documents in a manner that prohibits distribution outside of GD-OTS or the USG.

### 2.1 PCD DOCUMENT INSTRUCTIONS

The subcontractor format is acceptable. Microsoft Office software or PDF formats are preferred. The PCD(s) shall document the steps of the manufacturing processes. These documents should be the primary work instruction documents used by those performing the production operations. As such, it is expected that these documents are written with those readers in mind, i.e., to be the most effective for them in manufacturing product fully compliant to all drawings and specifications. This can be one or multiple documents, as appropriate the subcontractor's operation. The PCD shall include the following information:

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- Program name and title of the operation being described. Example: M865 Projectile Assembly.
- The document number that uniquely identifies the PCD and the current revision and/or change number.
- Date of the latest revision/change.
- Detailed manufacturing steps that clearly delineate the tasks required of the operator to complete the operation. Include, where necessary, special notes that provide additional information to the operator required for safety, cautions or other pertinent information not specifically contained in the step-by-step details. All steps shall be presented and numbered in a sequential sequence. The use of photographs to clearly define process steps is encouraged.
- Applicable in-process quality inspections and the processes required to complete them. The PCD shall include the frequency that the inspections will be performed and shall define the actions required in the event that the inspection fails to satisfy requirements. This shall include all steps taken to segregate and control any non-conforming material.
- Indications of individual process steps that are considered important to involve GD-OTS as Class II operations (see definition in section 3.2). If there is history on a particular step being deemed Level 1 by the end customer from past submissions, unless there is reason to reopen that discussion, the supplier should indicate those as well. The classification of Level 2 and Level 1 steps should be very visible in the procedure, preferably at each process step, for easy identification as the document is being used in practice. GD-OTS reserves the right to deem any operation step a Level 2 or 1, but will not do so without input from the supplier and discussion of alternative views.

## 2.2 PCDL DOCUMENT INSTRUCTIONS

The PCDL shall include the following information:

- The name and address of the subcontractor
- A reference to the applicable purchase order or contract
- The document name or number that uniquely identifies the PCDL and the current revision and/or change number
- A listing of all applicable PCDs for this referenced contract or purchase order
- For each PCD in the list, the following information shall be included:
  - Document number and Title / Description
  - Current Revision of Each Document
- For each PCD on the list, there should be an indication of the Classification levels contained in that document. For example, "1, 2, 3" would indicate that documents contains those different classification levels. It's not required for this document to list the step-by-step classifications on the PCDL. A process flow chart which lists the manufacturing operations, inspection stations and acceptance by part number, the part name, operation number and operation nomenclature for components identified by the POI must be included

The following guidelines shall be used when determining the classification of a document or process operation. NOTE: All processes are considered to be Class 1 by default until a PCDL has been submitted

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and approved.

**Class I** processes are defined as any complex production process, parameter, method, procedure, production/inspection equipment, or inspection procedure, which if altered in any way could potentially impact quality, performance, safety, product reliability, storage life, or any characteristic which cannot be easily confirmed by inspection. Processes such as painting, coating, and heat treating, are considered Class I PCD's. Rework and Repair operations are Class I PCD's. All operations that require USG concurrence by specification are included in this category. Changes, additions or deletions to the overall process flow or sequence are Class I changes. Class I PCD changes require a Failure Mode Effects Analysis (FMEA) to be completed and the change shall not increase the Risk Priority Number (RPN) of the affected process(es). All Class I PCD documents shall contain the following statement in capital letters: "NO CHANGE SHALL BE MADE TO THIS DOCUMENT WITHOUT PRIOR GD-OTS CONTRACTING OFFICER APPROVAL". All Class II or Class III PCD documents that contain Class I sub steps shall contain the following statement in capital letters: "THIS DOCUMENT CONTAINS CLASS I STEPS THAT ARE INDICATED BY AN ASTERISK (\*). THESE SUB-STEPS MAY NOT BE CHANGED WITHOUT PRIOR GD-OTS APPROVAL". Other symbols are acceptable with GD-OTS approval.

**Class II** processes are those that have one or more of the following characteristics: specialized tooling or holding fixtures and variable process parameters including environmental factors and techniques that require operator discretion. GD-OTS reserves the right to designate processes as Class II. All Class II PCD documents shall contain the following statement in capital letters: "NO CHANGE SHALL BE MADE TO THIS DOCUMENT WITHOUT PRIOR GD-OTS CONTRACTING OFFICER APPROVAL"; All Class III PCD documents that contain Class II sub steps shall contain the following statement in capital letters: "THIS DOCUMENT CONTAINS CLASS II STEPS THAT ARE INDICATED BY A DOUBLE ASTERISK (\*\*). THESE SUB-STEPS MAY NOT BE CHANGED WITHOUT PRIOR GD-OTS APPROVAL". Other symbols are acceptable with GD-OTS approval.

**Class III** is defined at any process that is not otherwise defined as Class I or Class II. The subcontractor may approve/ implement changes to Class III operations/parameters as needed without GD-OTS approval. GD-OTS does require that the subcontractor maintain revision control of Class III processes as with Class I and II and also reserves the right to review Class III processes.

**NOTE:** All processes are considered Class 1 by default until a PCDL has been submitted and approved.

### 2.3 REWORK AND REPAIR PROCEDURE INSTRUCTIONS

**Rework** is defined as the reprocessing of nonconforming material to make it conform completely to the drawings, specifications or contract requirements. Special PCD's that describe rework process/operations are required to be submitted to GD-OTS. In addition to the content specified above for PCD's, rework process control descriptions shall contain provisions for 100% re-inspection of the feature or dimension being reworked and any feature or dimension being affected by the rework.. Rework procedures must be pre-approved by GD-OTS before implementation.

**Repair** is defined as the reprocessing of non-conforming material in accordance with approved written procedures and operations to reduce, but not completely eliminate the nonconformance. The purpose of repair is to bring nonconforming material into a usable condition. Repair is distinguished from rework in

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that the item after repair still does not completely conform to all of the applicable drawings, specifications or contract requirements. The subcontractor should be advised that repair as defined in this section will only be considered as a last resort under very unusual circumstances, such as those where no other recourse is possible. Repair procedures must be submitted and pre-approved prior to implementation.

## 2.4 PHOSPHATE OR ANODIC COATING APPLICATION PROCEDURES

Preproduction approval is required for all parts finished with Phosphate Coatings in accordance with TT-C-490 Types I and V and parts finished with Anodic Coatings in accordance with MIL-PRF-8625 types I, II and III and ASTM B633 Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel. The document format shall comply with DI-NDTI-80603. The following additional requirements apply:

- If the corrosion resistance requirement given in the applicable specification is more stringent than the Corrosion Resistance requirement given for the part elsewhere in the Technical Data Package, then the applicable specifications Corrosion Resistance Requirement shall apply.
- Only the procedures described in an approved PCD shall be used for Production. Any changes made to the Processes described in the PCD shall require new Pre-Production approval of the modified PCD and parts finished in accordance with the updated PCD.
- Pre-Production approval is required for each option year of the contract.
- Coated samples or panels may be required to be provided in addition to procedure approval. If direction on coated samples is not provided in the Statement of Work (SOW), the GD-OTS Supply Chain Representative (SCR) shall be contacted for specific contract requirements regarding panels/samples and the address that they are to be mailed to for USG validation of compliance.
- Pre-Production approval is required for both PCD and representative parts, either as panels or sample parts. Production commenced without Pre-Production approval is at the subcontractor's own risk.

## 2.5 COMPUTER-CONTROLLED EQUIPMENT AND PROCESSES

The subcontractor shall establish and maintain a program that documents and controls the software and programs used to produce the production quantity specified within the subcontract. All changes to the software / programs affecting production processes/procedures, fixtures, production parameters, material handling procedures, Programmable Logic Controller (PLC), and Computer Numerical Control (CNC) tools shall be documented and controlled. The supplier shall complete a risk assessment and ensure that there is no impact to the product. Submittal of this documentation is not required however it shall be in place at the subcontractor's facility prior to the start of production and shall be available for review upon request by GD-OTS and the USG.

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### 3.0 QUALITY CLAUSE DELIVERABLES

Microsoft Office or PDF formats are preferred. All subcontractor data submittals shall be in English. This data item shall be submitted to GD-OTS in accordance with the QCD Deliverables as indicated below. The method of submission to GD-OTS St. Petersburg is specified in the General Supplier Quality Clause "S1" located on GD-OTS's Supplier Portal <https://www.gd-ots.com/suppliers/quality-clauses/> under GD-OTS St. Petersburg, FL.

NO.	TITLE	GD-OTS APPROVAL REQUIRED	SUBMITTAL TIMING/FREQUENCY
S17-1	PCDL	Yes <sup>1</sup>	Unless otherwise directed in the Subcontract / PO or other related document provided by GD-OTS, QCD is due 60 calendar days prior to a First Article (FA), Physical Configuration Audit (PCA), or Production (whichever comes first).
S17-2	PCD	Yes <sup>1</sup>	Unless otherwise directed in the Subcontract / PO or other related document provided by GD-OTS, QCD is due 60 calendar days prior to a FA, PCA, or Production (whichever comes first).
S17-3	Rework/Repair Procedure	Yes	As needed for addressing non-conformance. Must be submitted and approved prior to performing any rework and/or repair.
S17-4	Phosphate or Anodic Coating Application Procedure	Yes	Unless otherwise directed in the Subcontract / PO or other related document provided by GD-OTS, QCD is due 90 calendar days prior to a FA, PCA, or Production (whichever comes first).

<sup>1</sup> Approval is required for Class I and Class II processes only. See classification definitions described in the instructions above. If no classifications are pre-approved, processes are considered Class 1 by default.

### 4.0 REVISION HISTORY

REV	DATE	CHANGE
0	06/09/2023	ECN23315-Initial Release