



Title: **PROCUREMENT QUALITY REQUIREMENTS;
CWCEL – LITTLETON;**

Document # **L-DFM00028**
Supercedes # 42028
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SECTION I – GENERAL REQUIREMENTS – This document shall apply in its entirety to every Purchase Order where specified.

001 - OVERALL COMPLIANCE - Supplier shall assure that all parts and materials submitted to CWCEL - Littleton are in strict compliance with applicable drawings, specifications, QPL(s), and other Purchase Order requirements.

- A: Wire Thread Inserts – Workmanship Criteria SECTION V.
- B: Cable & Wire Harness Assy – Workmanship Criteria SECTION VI.

002 - NON-CONFORMING MATERIAL - Non-conforming materials shall not be shipped to Curtiss Wright Controls without prior written authorization from the Curtiss Wright Controls Buyer and submittal of a request for Material Review (Suppliers format acceptable). Approval, if granted, will be for the Lot in question and shall not imply tacit acceptance of future shipments.

003 - ACCEPTANCE AT DESTINATION - All purchased parts and materials are subject to inspection at Curtiss Wright Controls facilities and will be rejected if not in strict compliance with applicable drawings, specifications and other Purchase Order requirements.

004 - SUPPLIER ACCEPTANCE RECORDS - Supplier shall maintain and furnish when requested, documentation verifying that parts and materials submitted to Curtiss Wright Controls are in strict compliance with applicable drawings, specifications and other Purchase Order requirements.

005 - AUDIT BY CURTISS WRIGHT CONTROLS – Curtiss Wright Controls reserves the right to audit Supplier's and/or their Suppliers Quality Control Inspection system and manufacturing processes to verify compliance with requirements.

006 - TRACEABILITY - Supplier shall establish a suitable system for providing traceability of materials and processes used during the performance of this Purchase Order. This requirement must be imposed by the Supplier on all their Subcontractors. Traceability records shall be kept on file for a minimum of seven (7) years following completion of the Curtiss Wright Controls/Government Contract.

007 - SUPPLIER ACCEPTANCE OF MATERIAL - Supplier shall be responsible for verifying that Components received from other Curtiss Wright Controls sources have been inspected. If there is no evidence of such inspection, direction shall be obtained from Curtiss Wright Controls Quality Department by contacting Buyer.

008 - ACCESS TO SUPPLIER'S FACILITY - Authorized representatives of Curtiss Wright Controls and their contractor's organization shall be permitted access to the Supplier facility for audit and surveillance of the Supplier's Quality Control Inspection System and Manufacturing processes during the performance of this order.

009 - PART NUMBER MARKING - Unless specifically prohibited by a Purchase Order, Specification or Drawing, the item Part Number shall be applied to the item. If the item is too small, it shall be packaged and the Part Number shall appear on the package. Part Marking shall be legible, permanent and located in a position to be easily seen without disassembly or defacing the material surface.

010 - CERTIFICATE OF CONFORMANCE - All shipments made against this Purchase Order must contain a Manufacturer's Certificate of Conformance attesting that all applicable specification, drawing and Purchase Order requirements have been met. This Certificate of Conformance must include the Curtiss Wright Controls or Purchase Order Part Number and Revision Letter, the quantity of pieces in the shipment, the Serial Number and/or Date Code. and shall be signed by an Officer of the Supplier. Data supporting the Certificate of Conformance must be on file subject to review by Curtiss Wright Controls, unless specifically required to be delivered. The Supplier shall retain these records for a minimum of seven (7) years following completion of the Curtiss-Wright Controls/Government Contract. Parts painted in accordance with Curtiss Wright requirements shall conform to applicable QPL requirements. Proof of conformance, in the form of paint manufacturers C of C, shall accompany each shipment. Paint gloss measurements shall be recorded and supplied with each delivery.

010.1 – First Article – It is a supplier is responsibility to ensure that an **AS9102** format is submitted for all manufactured parts.

- a. First time Delivery to Curtis Wright Littleton.
- b. Part has not been manufactured in a 24 month period.
- c. Changes in physical location of factory.
- d. New Revisions / ECO.

011 - CORRECTIVE ACTION - Acceptance of this Purchase Order obligates the Supplier to perform, upon request, a Corrective Action investigation when discrepant material is received by Curtiss Wright Controls. A written report shall be furnished, within the time period specified, which is specific and conclusive to prevent recurrence of the discrepancy.

SECTION II - ADDITIONAL CLAUSES - The following additional Clauses apply to the Curtiss Wright Controls Purchase Order, if specifically referenced by Number.

012 - QUALITY PROGRAM REQUIREMENTS - Supplier shall comply with the standard titled ISO 9001, which is hereby incorporated into this Contract.

013 - INSPECTION SYSTEM REQUIREMENTS - Supplier shall comply with the applicable requirements of ISO 9001, which is hereby incorporated into this Contract.

014 - SOFTWARE QUALITY ASSURANCE - Supplier shall comply with the applicable requirements of ISO 9001, which is hereby incorporated into this Contract.



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015 - CALIBRATION SYSTEM REQUIREMENTS - Supplier shall comply with the applicable requirements of ISO 9001, which is hereby incorporated into this Contract. For guidance, refer to ISO 10012 - Part I.

016 - DATE CODED MATERIAL - Material with Date Code in excess of "A" or "B" as listed below, shall not be shipped to Curtiss Wright Controls without prior written authorization from the Curtiss Wright Controls Buyer.

- A - One (1) Year
- B - Two (2) Years

017 - COMPONENT LEADS AND TERMINALS - No Gold-Plated Component Leads are acceptable.

018 - ELECTROSTATIC DISCHARGE (ESD) PROTECTION - Supplier shall take necessary actions to provide continuous ESD protection in all work-area activities that process, assemble, install, label, test, inspect, package, or otherwise handle ESD Sensitive (ESDS) devices, units, and assemblies. Primary packaging that is low charging, dissipative, "discharge shielding" shall be used and shall be marked with an ESD cautionary symbol and/or cautionary wording. Additionally, the supplier is required to have an ESD Control Program Plan available for review. It is recommended the ESD Control Program Plan follow the guidelines of MIL-HDBK-263.

A Additional requirements for raw FAB packaging

1. MSL level 2 packaging is required for all deliveries – FAB's must be sealed in a Moisture Barrier bag and containing 1 Humidity Indicator Card (HIC) and 1 desiccant bag

019 - ENVIRONMENTAL STRESS SCREENING (ESS) - Supplier shall submit a statement attesting that each lot of material supplied against this Purchase Order has had the required Environmental Stress Screening Testing (Thermal Cycling, and/or Random Vibration) in accordance with drawing/specification requirements.

020 - PRE-CAP VISUAL INSPECTION - Pre-Cap Visual Inspection, by Curtiss Wright Controls Representatives, of semiconductors, hybrids and other sealed, solid state devices is applicable to this Purchase Order.

021 - SERIALIZATION MARKING - Serialization of product, parts, subassemblies and assemblies manufactured for Curtiss Wright Controls shall be applied only in accordance with specific instructions from Curtiss Wright Controls.

022 - CERTIFICATE OF ANALYSIS & SPECIAL PROCESS - Supplier shall forward one (1) copy of the designated documents with each shipment. This document must (1) be signed by an authorized representative of the Supplier or Laboratory, with appropriate identification of the position held by the signer, (2) include identification numbers (e.g., heat no., batch no., etc.) and (3) include actual measurement results on reports. Materials received without the required documents will be rejected and the invoices not honored until the documents are received.

- A - Chemical analysis report
- B - Physical/mechanical properties test report
- C - Report of actual hardness test results
- D - Report of physical test results for rubber of the same type and cure as shipped parts, including Batch Number(s) and Cure Date(s).
- E - Inspection report
- F - Test report
- G - Plating Process
- H - Heat Treatment process
- I - Weld process
- J - Paint process
- K - Dye Penetrant Inspection
- L - Other, as specified on Purchase Order

023 - CHEMICALS/COMPOUNDS/ADHESIVES - Chemical Expiration Date is to be stamped on the container or if impractical, on the package. Materials with less than 70% remaining useful life will not be accepted. A completed Material Safety Data Sheet (MSDS) shall accompany each shipment of hazardous material.

A – "Each container of a multi-part compound must be marked with the part number"

024 - SAMPLES - Supplier shall forward material samples for analysis as follows:

- A - PC Board Coupons per Curtiss Wright Controls requirements, drawing #20001593.
- B - First Piece from new/reconditioned Mold.
- C - Artwork to be used for screening, when drawn by Supplier
- D - Supplier shall provide material sample for Curtiss Wright Controls chemical and/or physical analysis.
- E - Other, as specified on Purchase Order

025 - NON-DESTRUCTIVE TESTING - Supplier's source for Non-Destructive Test (NDT) shall be surveyed and approved by Curtiss Wright Controls. Suppliers shall be responsible for the testing and/or inspections listed below. Copies of all test documentation (including film, where applicable) shall be submitted with each shipment for review and approval by Curtiss Wright Controls Quality control. The procedures, inspections, reports and films, as applicable, shall be as specified in the drawings, specifications (ASTM Standards, MIL-SPEC's) and other Quality documents.

- A - Radiographic Inspection
- B - Liquid Penetrant Inspection
- C - Ultrasonic Testing
- D - Other, as specified on Purchase Order

SECTION III - ADDITIONAL CLAUSES - The following additional Clauses apply to the Curtiss Wright Controls Purchase Order, if Source Inspection Requirements are specifically referenced by Number.

026 - GOVERNMENT SOURCE INSPECTION REQUIREMENTS

- A - Government Source Inspection (GSI) is required prior to shipment from Supplier's plant. Upon receipt of this Purchase Order, Supplier shall promptly notify the government Representative who normally services Suppliers plant so that appropriate planning for government Inspection can be accomplished.
- B - Government Selective Evaluation (GSE). During the performance of this Purchase Order, Supplier's Quality Control system or Inspection system and manufacturing processes are subject to review, verification and analysis by Authorized Government Representatives. Government Inspection or release of product prior to shipment is not required unless otherwise notified by the government Representative. Provide a copy of this Purchase Order to the government Representative, if required.

027 –CURTISS WRIGHT CONTROLS SOURCE INSPECTION REQUIREMENTS – Curtiss Wright Controls Source Inspection (CWCSI) is required prior to shipment from the Supplier's facility as follows:

- A - First Piece Inspection
- B - In-Process Inspection
- C - Final Inspection
- D - Test (Acceptance/Qualification) Inspection
- E - Initial Shipment only
- F - Each Shipment

Supplier shall notify the Curtiss Wright Controls Source Inspector who normally services this plant, seven (7) days prior to the availability of parts for Inspection. In the event that Source Inspector cannot be contacted, the Supplier shall notify the Curtiss Wright Controls Buyer to coordinate inspection. Supplier shall forward one (1) copy of the record of Source Inspection with the applicable shipment.

SECTION IV - ADDITIONAL CLAUSES - The following Additional Clauses apply to the Curtiss Wright Controls Purchase Order, or if Pre-Production Requirements are specifically referenced by Number.

028 - PRE-PRODUCTION REQUIREMENTS - The Pre-Production Requirements indicated below apply in one (1) or more of the following conditions have occurred:

- A - Part has not been produced within one (1) year.
- B - Manufacturing methods or locations have changed.
- C - Design has changed.

029 - TOOLING DRAWINGS - Before proceeding with Tooling for molds, castings or forgings, Supplier shall submit to the Curtiss Wright Controls Buyer two (2) copies of a "marked up" drawing to show the exact size and configuration of the Part to be supplied, including parting lines, draft angles, etc.

030 - HEAT TREAT PROCEDURES - Prior to production of Part(s), the Supplier shall submit to Curtiss Wright Controls Quality Assurance for approval:

- A - One (1) copy of the Heat Treat Procedure.
- B - One (1) Part heat treated to procedure.

031 - SPECIAL PROCESS PROCEDURES - Prior to production of Part(s), the Supplier shall submit to Curtiss Wright Controls for approval:

- A - One (1) copy of Supplier's Welding Procedure.
- B - One (1) copy of Supplier's Brazing Procedure
- C - One (1) copy of Supplier's Phosphate Coating Procedure.
- D - Welders must be certified for steel to: Mil-Std- 2219_
- E - Welders must be certified for aluminum to: Mil- Std -8604
- F – Must be certified to: AWS-D1.2 structural
- G – Must be certified to: D17.1 AWS (aluminum)

Note: The name and location of the welding/brazing/soldering source, if other than the Supplier, shall be identified on the Procedure. No parts will be accepted or authorized to be produced until the Procedure has been approved by Curtiss Wright Controls.

032 - FIRST PIECE/ARTICLE REPORTS - Supplier shall submit to Curtiss Wright Controls for approval, Inspection/Test Report(s) indicating actual numeric values. Supplier shall be responsible for scheduling test activities at his plant or at an outside laboratory. Supplier shall notify Curtiss Wright Controls fifteen (15) days prior to the test to allow Curtiss Wright Controls time to witness and verify actual testing. All FAI request shall comply to AS9102 requirements.

- A - First Piece Inspection Report
- B - First Article Inspection/Test

033 - FIRST PIECE SAMPLE - Supplier must submit a First Piece Sample and shall not proceed with production until notified by the Curtiss Wright Controls Buyer that the Sample is acceptable.

034 - QUALITY MANAGEMENT - Notify buyer immediately should a change occur in Quality Management.

035 - QUALITY SYSTEM - Notify buyer immediately should a change occur in your quality system (loss of Registration, Certification, or Qualification.)

SECTION V – WIRE THREAD INSERTS CLAUSES AND WORKMANSHIP CRITERIA - The following additional Clauses apply to the Curtiss Wright Controls Purchase Order, for any part containing wire thread insert(s).

Gaging Practice:

Accuracy of the finished thread, when the insert is installed, is dependent upon the accuracy of the tapped (threaded) hole. If the finished, tapped hole “gages” satisfactorily, the installed insert will be within its required thread tolerance class.

A complete Gage consists of a gage handle, a “GO” thread plug member and a “HI” thread plug member. Each member shall be of the specified tolerance class. The gage handle should be marked either “Screw Thread Insert” or “STI”.

Gaging shall be performed on the first and last tapped hole produced by each tap. The threaded test hole shall be gaged and shall conform to the applicable tolerance class.

Gaging failure on the last tapped hole produced by a tap is a failure for all the preceding tapped holes produced by that tap.

Surface Finish of the Base Material:

When anodizing, chemical conversion (chromate) or other finishes are specified for the base material, the drilled hole diameter, blind hole depth, countersink and tapped (thread) hole dimensions must be met with the finish applied.

Insert Installation:

- a) With Countersunk hole: The top edge of the insert shall be installed 0.75 to 1.5 turns below surface of the tapped hole.
- b) Without Countersunk hole: The top edge of the insert shall be installed 0.25 to 0.5 turns below surface of the tapped hole.
- c) Tang removal: The tang shall be removed from the insert after installation (not required with tangless inserts).

Military Specifications:

MS33537 Standard Assembly Dimensions for Screw Thread Insert, Helical Coil, Inch Series, Coarse and Fine Thread
*canceled and superseded by NASM33537.

MS21209 Insert, Screw Thread, Coarse and Fine, Screw Locking, Helical Coil, Cres
*canceled and superseded by NASM21209



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SECTION VI – CABLE AND HARNESS ASSEMBLIES CLAUSES AND WORKMANSHIP CRITERIA - The following additional Clauses apply to the Curtiss Wright Controls Purchase Order, for any cable and wire harness assemblies.

Crimp Terminations:

Mechanical crimp terminations shall be verified by either one of the following or combination thereof:

- Periodic "Go / No-go" gauging of the crimp tool(s). Reference MIL-DTL-22520 or commercial equivalents.
- Crimp barrel measurements.
- Tensile "Pull Test". Reference MIL-DTL-22520 tables for minimum tensile strength values.

Crimp "Pull Test" shall be conducted on samples only, and not performed on deliverable assemblies. Supplier shall keep records of these tests as part of their quality records. These records shall be available for review by Curtiss-Wright Controls.

Acceptance Testing:

All cable / wire harness acceptance tests shall be performed using the appropriate mating connector with the correct pins and sockets. Probing of pins is not allowed (i.e. use of non-mating hardware).

Acceptability Requirements:

Acceptability requirements for cable and wire harness assemblies provided on this order shall be per:

- Master drawing or master assembly drawing requirements;
- IPC/WHMA-A620; *Requirements and Acceptance for Cable and Wire Harness Assemblies*.

A Certificate of Compliance is required with each shipment stating that all items have been fabricated and meets the requirements of all applicable Quality Clauses.

Solder and Flux:

Solder used shall be Sn 63/ Pb 37 WRMA unless otherwise specified

Flux used shall be Mil-F-14256 compliant unless otherwise specified

Specifications and Standards:

DoD:

MIL-DTL-22520	Crimping Tools, Wire Termination, General Specification for (Detail Specification)
QPL-22520-31	Qualified Products List of Products Qualified under Detail Specification MIL-DTL-22520

Commercial Industry:

IPC/WHMA-A620	Requirements and Acceptance for Cable and Wire Harness Assemblies
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TITLE: PURCHASE ORDER QUALITY REQUIREMENTS ATTACHMENT Q

SHEET: _____

REVISION HISTORY

QA #

DATE	ORIGINATOR	REV	DESCRIPTION OF CHANGE	PUR	MFG ENG	DOC CONT
3-Mar-05	M. WERNER	-	INITIAL RELEASE IN NEW FORMAT	<i>AWR</i>	<i>RGs</i>	<i>WJ</i>
	M. WERNER	A	ADDED LAST SENTENCE TO PARAGRAPH 10 PG 1	<i>AWR</i>	<i>RGs</i>	<i>WJ</i>
1/19/05	L. Strawbridge	B	Change "VISTA" to "Curtiss Wright"	<i>AWR</i>	<i>RGs</i>	<i>WJ</i>
3/20/05	B. Smith	C	ADD point mfr C of C reqmt. ADD Gloss Readings reqmt	<i>BO</i>	<i>EGs</i>	<i>WJ</i>
10/30/06	M. WERNER	D	ADDED WORKMANSHIP CRITERIA FOR: A) WIRE THREAD INSERTS - AS PAGE 3; AND B) CABLE & WIRE HARNESS ASSY. - AS PAGE 4.	<i>AWR</i>	<i>RGs</i>	<i>WJ</i>

Date	ECN	Rev	Originator	Description of Change	See Change Document for Approvals
1/11/10	L-4438	-	V.Ferrari	Added Electronic Systems logo and reference to the text,Removed "Inc." from Curtiss-Wright Controls,Changed all CWEC to CWCEL,Fixed minor formatting issues,Added Welding specs from blank.and obsolete the old p/n 42028 and assigned with CW p/n.	
8/3/10	L-4890	A	R.Taylor	Deleted Year 2000 from ISO 9001	
9/21/10	COMBINED WITH REV.C	B	V.Ferrari	Added "Manufacturer's" to C of C requirement.	
10/13/2010	L-4997	C	V.Ferrari	Added MIL-HBK-263 recommendation to ESD requirement.	
1/25/11	L-5404	D	A.Hoffman	Remove "Prior to production of Part(s)" from paragraph 032 added AS9102 requirement	
3/28/11	L-5678	E	A.Hoffman	Add section A to paragraph 023	
7/30/11	L-6193	F	A.Hoffman	Added section 010.1 and 018 section A	