

TEXTRON SYSTEMS
Supplier Quality
Prohibited Materials/Process Requirements

Title: Prohibited Materials/Process Requirements	Rev. A	Number: SPQA-001
	Authorized: P. Crudele	Date: 5/11/2021

NOTE: The change history of this guide can be found at the end of this document.

1.0 PURPOSE

The purpose of this document is to outline the prohibited materials and process requirements as flowed down by PO Code PM&P2.

2.0 EXTERNAL DOCUMENT REFERENCES

Revision B, SQARD
Revision A, PM&P

3.0 DEFINITIONS

Acronyms/Words	Definitions
SQARD	Supplier Quality Assurance Requirements Document
PM&P	Prohibited Materials and Processes
PO	Purchase Order
SOW	Statement of Work

4.0 Requirements

Prohibited materials shall include the requirements of MIL-STD-11991 Appendix C.

4.1 Prohibited Material Certification (Pure Cadmium, Pure Zinc, Pure Tin)

As required by PO/SOW, all constructions and finishes containing pure cadmium or pure zinc are prohibited. In addition, constructions and finishes containing pure tin are prohibited unless they contain a minimum of 3 weight percent lead. The use of lead free solder alloys is not acceptance unless approved by the Buyer. (Note: Sn96/Ag4, Sn95/Sb5, and Au80/Sn20 are acceptable when indicated in Buyer specifications, or Buyer approved Process Identification Documents [PID].) This requirement shall be flowed down to any sub tiers utilized in fulfilling the requirements of this PO/SOW.

4.2 General – All Parts

- a. For Category A and B hardware pure Cadmium, Zinc or Selenium (high vapor pressure materials). The actual acceptable percentages of zinc and cadmium in alloys or brazes and the extent of over-plating, when required, shall be technically substantiated with data for the intended applications and shall require Buyer PMPWG approval prior to use.
- b. Constructions and finishes containing pure tin, unless alloyed with a minimum of 3 weight percent lead (Note: Sn96Ag4, Sn95Sb5, Au80Sn20, are examples of alloys containing tin that are not alloyed with lead, but are considered acceptable when applied in certain applications). Tin-plated wire is exempt from this prohibition if the tin coating is applied prior to the extrusion or drawing process. Usage of tin-plated wire requires PM&P approval. Solder coating over pure tin-plated surfaces is not acceptable without PM&P approval.
- c. Zinc chromate as a finish coat (acceptable if sealed or not on an exposed surface).
- d. Mercury and compounds of mercury.
- e. Materials that exhibit or are known to exhibit natural radioactivity (such as uranium, potassium, radium, thorium, and/or any alloys thereof).
- f. Corrosive silicone sealants, adhesives, or coatings (acetic acid evolving silicone).

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- g. Aluminum alloys 5083-H32, -H38; 5086-H34, -H38; or 5456-H32, -H38, where the temperature will exceed 150°F.
- h. Asbestos-containing adhesives, sealants, coatings, and encapsulants.
- i. Any non-vented honeycomb core structures within hardware exposed to hard vacuum.
- j. Non-hermetically sealed crystals.
- k. Crimping solder-dipped, solder plated or tin plated stranded wire, or crimping solid conductors. Crimping of solid conductors using MIL-DTL-83513 microminiature and MIL-DTL-32139 nanominiature contacts by QPL manufacturers may be acceptable, but shall be reviewed as a reliability suspect item.
- l. Alloy steel fasteners (as defined in FF-S-86; typically require an applied finish for corrosion protection).
- m. Titanium Contamination Prevention - Care shall be exercised to ensure that cleaning fluids and other chemicals used on titanium are not detrimental to performance. The following materials can induce stress corrosion, hydrogen embrittlement, or reduce fracture toughness and are prohibited from the manufacturing, assembly or contact with titanium or its alloys, except when specific applications have demonstrated performance of not reducing material properties:
 - 1) Hydrochloric Acid
 - 2) Silver
 - 3) Halogenated solvents
 - 4) Methyl Alcohol
 - 5) Mercury and Mercuric Compounds
 - 6) Trichloroethylene/Trichloroethane
 - 7) Carbon Tetrachloride
 - 8) Halogenated Cutting Oils
 - 9) Halogenated Hydrocarbons
 - 10) Cadmium or silver plated clamps, tools, fixtures or jigs
- n. Ultrasonic cleaning of packaged parts with internal wire bonds (examples include, but are not limited to, MIL-PRF-38534, MIL-PRF-38535, etc. type parts)
- o. Silicone grease used as a thermal couplant
- p. Silicone compounds shall not be used as lubricants.
- q. Fluoropolymers shall not be used in radiation environments
- r. For Category A hardware graphite based lubricants shall not be used.
- s. Materials which can undergo reversion in their intended application including manufacturing, test, storage and transportation
- t. Hazardous Materials in accordance with NAS411, and those in the prohibited category of NAS411-1 Target List

4.3 Capacitors

- a. Aluminum electrolytic capacitors.
- b. Paper capacitors.
- c. Metallized paper in molded case capacitors.
- d. Glass capacitors with lead-to-foil weld, or radial leads, or CYR41, 42, 43, 51, 52 and 53 styles.
- e. All non-metallurgical bonded mica capacitors.
- f. Mica capacitors except MIL-PRF-87164 types.
- g. Wet tantalum electrolytic capacitors in metal-clad cases.
- h. Silver-cased electrolytic (wet slug) tantalum capacitors.
- i. Capacitors using base-metal electrodes (BME; oxygen vacancy issue).
- j. Metallized Film Capacitors with no insulator between babbitt terminations and end seals (electrical shorting prevention).

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- k. Single-sealed CLR-style capacitors as identified by their compression seal dash numbers.
- l. Fringe capacitor designs to achieve low capacitance values using X7R material.
- m. Feed-thru capacitors and EMI filters with tubular ceramic construction that requires installation using torque fastening methods.

4.4 Connectors

- a. Silver or silver-plating, as finish or as an underplate, on contacts.
- b. Wire-wrap contacts.
- c. Non-captivated RF connector contacts.
- d. RF cable assemblies using the cable center conductor as the mating-interface pin-contact in the connector.
- e. Plastic composite connectors exposed to atomic oxygen environment.
- f. Insulation Displacement Connection (IDC) wire terminations.
- g. Lock washers (split, internal tooth, external tooth, etc.). Lock washers are normally supplied with jackpost hardware kits and should be discarded.
- h. Lubricants used on electrical contacts.
- i. Open barrel crimp-contact terminations. MIL-DTL-83513 microminiature and MIL-DTL-32139 nanominiature contacts which are crimped and installed into connectors by QPL manufacturers may be acceptable and shall be reviewed as a special attention item.
- j. Card edge connectors which use PWB pads (lands) as contacts.
- k. E-clips, C-clips, or snap rings for jackscrew hardware, on connectors.
- l. Crimping solder-dipped, solder plated or tin plated stranded wire, or crimping solid conductors. Crimping of solid conductors using MIL-DTL-83513 microminiature and MILDTL-32139 nanominiature contacts by QPL manufacturers, or solid conductors used in filtered connector contacts, may be acceptable, but shall be reviewed as a reliability suspect item.
- m. Polyvinylchloride (PVC).
- n. Polyamide (nylon) connector insert material and cable ties.
- o. Fuzz buttons.
- p. Unpassivated metal film resistors.
- u. Filtered pins with tubular ceramic elements that require installation using torque fastening methods.

4.5 Fuses

- a. Fuses that use fuse holders.

4.6 Printed Boards (PBs)

- a. Weld repair of internal and external circuit traces on bare boards or any other repair performed.
- b. Eyelets or "Z-wire" type PWB structures.
- c. Non-conformal coated populated PWBs unless conformal coating adversely affects performance.

4.7 Relays

No items currently listed.

4.8 Resistors, Resistor Networks, and Thermistors

- a. Non-hermetic hollow core (glass or ceramic).

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- b. Carbon film types (i.e., pyrolytic carbon film deposited on glass or ceramic core; RCR, MIL-R-39008C).
- c. Devices constructed with a deposited thin metal film (<350 angstroms) over a solid core that do not have a protective undercoating between the metal film and the outer jacket shall not be used (i.e., RLR, MIL-PRF-39017).
- d. Film chips with copper or nickel conductor films.
- e. Unpassivated nichrome film.
- f. Hermetic hollow core types with internal (inside surface of the core) metallization (susceptible to film corrosion due to contamination from the manufacturing process).

4.9 RF and EMI Filters

- a. EMI or RFI filters with tubular ceramic elements that require installation using torque fastening methods.
- b. Filters using capacitors with base metal electrodes (BME; oxygen vacancy issue).

4.10 Semiconductors and Microcircuits

- a. Die protection via organic materials without underlying passivation.
- b. Discrete semiconductors not equivalent to or better than MIL-PRF-19500 JANS quality level (Category A equipment only).
- c. Microcircuits not equivalent or better than MIL-PRF-38535 Class V standard.
- d. Non-hermetic microcircuits and semiconductors.

4.11 Switches

No items currently listed.

4.12 Wire and Cable

- a. MIL-DTL-16878 types.
- b. All PTFE insulated wire or cable used in applications which have a high probability of producing cold flow of the insulation.
- c. All PVC insulated types.
- d. Aluminum wire or cable (except semi-rigid aluminum conductors that are copper clad or plated).
- e. MIL-DTL-76, types.
- f. Crimping solder-dipped, solder plated, or tin plated stranded wire, or crimping solid conductors.

APPENDIX A: Change History			
Version	Date	Author	Description
-	4/27/2021	J. Seibert-Wong	Initial Release
A	5/11/2021	P. Crudele	Minor update