
MIL-GRADE: ANSWERING THE CALL

“...by using performance and commercial specifications [vs] military specifications.”

“With the decline in procurement dollars for the Air Force, it is imperative that action be taken to acquire our weapon systems at the lowest possible cost while still acquiring effective systems using the latest technologies. This paper addresses one approach of reforming the acquisition system by using performance and commercial specifications vice military specifications.” From: *Will Commercial Specifications Meet Our Future Air Power Needs?* Lt Col William P. McNally, USAF

Full text: <https://apps.dtic.mil/dtic/tr/fulltext/u2/a399042.pdf>

MILITARY STANDARDS CONVERSION: A NEW WAY OF DOING BUSINESS

“I have repeatedly stated that moving to greater use of performance and commercial specifications and standards is one of the most important actions that DoD must take to ensure we are able to meet our military, economic, and policy objectives in the future. Moreover, the Vice President's National Performance Review recommends that agencies avoid government-unique requirements and rely more on the commercial marketplace.”

Military Standards Conversion: A New Way of Doing Business - William J. Perry, Secretary of Defense, 1994 to 1997 under President Bill Clinton

Full text: <https://www.sae.org/standardsdev/military/milperry.htm>

CIRCUIT CONNECT, INC.
4 State Street, Nashua NH 03063

Circuit Connect

BARE/READY-TO-ASSEMBLE/USA MADE

MIL-GRADE

PRINTED CIRCUIT BOARDS

MIL-Grade PCBs at Commercial prices

Since 2017, Circuit Connect has offered MIL-grade printed circuit boards at commercially-graded prices. This service benefits the growing market of Commercial customers seeking superior product reliability and performance, plus the many Military clients able to waive the MIL Qualified Supplier requirement.

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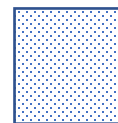
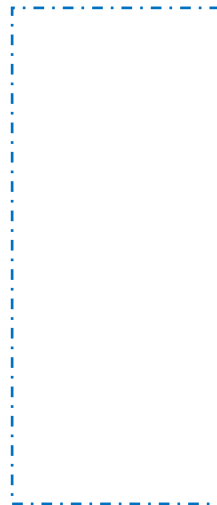
When we state that our PCBs are “MIL-Grade”, we mean-it! The materials, workmanship, inspection schedules, cleanliness standards, lab analysis and more all follow the explicit requirements of MIL-PRF-31032. But because we don't bear the expense of MIL-qualification, you save \$\$\$ in every order.

For more information on our MIL-Grade service contact Bob Lazzara at:

BobL@Circuit-Connect.com

Or visit us at:

www.CIRCUIT-CONNECT.com



MIL-SPEC MATERIALS + MIL STD PROCESSING MINUS MIL QUAL = LOW COST MIL-GRADE PRINTED CIRCUIT BOARDS

MICROSECTION ANALYSIS

Inspection Requirements	MIL-PRF-31032 Paragraph
Laminate Voids	3.6.1.3
Lifted Lands	3.6.2.5
Plating & Coating Thickness	3.6.2.1.3
Resin Recession	3.6.1.4
Solder Resist Thickness	3.5.4.5
Thermal Stress	3.7.6.2.1
External Conductor Thickness	3.6.2
Dielectric Layer Thickness	3.6.1.1
Delamination	3.5.1.3
Copper Plating Thickness	3.6.4.1
Copper Plating Voids	3.6.4.1.1
Plated Hole Wall Deficiencies	3.6.4.3
Metallic Cracks	3.6.4.4
Annular Ring (Internal)	3.6.2.4
Internal Conductor Thickness	3.6.2.2
Etchback	3.6.3.2
Smear Removal	3.6.3.1
Wicking	3.6.4.5
Plating Separations	3.6.4.2.1
Internal Registration	3.6
Conductor Edge Outgrowth	3.7.4.2
Plating Adhesion	3.7.4.2
Solderability (Hole)	3.7.4.6.1
Solderability (Surface)	3.7.4.6.2
Solder Resist Adhesion	3.7.4.3

IN-PROCESS INSPECTION

Inspection Requirements	MIL-PRF-31032 Paragraph or Reference
Material	Drawing
Cleanliness	3.7.3.1.1
Conductor Spacing	3.5.2.4.1
Conductor Width	3.5.2.4.2
Conductor Imperfections	3.5.2.3
Plating Adhesion	3.7.4.2

ANSWERING THE CALL

“As the U.S. Department of Defense grows evermore budget-constrained, DoD insiders increasingly call for the “demilitarization” of MIL-qualification in favor of high reliability/severe service *commercial* standards and practices. Circuit Connect’s *MIL-Grade Service* answers that call.” - Bob Lazzara, President, Circuit Connect

Buying Commercial: Gaining the Cost/Schedule Benefits

"...commercial or foreign-derivative systems presents a significant opportunity to the DOD. The challenge is to reap the advantages - including predictable and lower costs and short realization schedules, as well as low risk and demonstrated performance - without the missed benefits that previous attempts have experienced." from *Buying Commercial: Gaining the Cost/Schedule Benefits for Defense Systems*, Feb 2009, Defense Science Board, Washington DC.

Full text: <https://apps.dtic.mil/dtic/tr/fulltext/u2/a494760.pdf>

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FINAL INSPECTION

Inspection Requirements	MIL-PRF-31032 Paragraph
Design and Construction	3.3
Material	3.4
Edges of Base Material	3.5.1.1
Surface Imperfections	3.5.1.2
Subsurface Imperfections	3.5.1.3
Foreign Inclusions	3.5.1.3.1
Subsurface Spots	3.5.1.3.2
Measling & Cracking	3.5.1.4
Annular Ring (External)	3.5.2.5.1
Conductor/ Edge	3.5.2.4.1
Conductor Width	3.5.2.4.2
Conductor Pattern Imperfections	3.5.2.3
Conductor Finish Coverage	3.5.2.2.1
Solderable Surface Mount Lands	3.5.2.5.2/3
Dimensional	3.5.3
Hole Size	3.5.3.3
Lifted Lands	3.6.2.5
External Dimensional	3.7.1
Soldermask Coverage	3.5.4.2
Discoloration	3.5.4.3
Soldermask Registration	3.5.4.4
Cleanliness	3.7.3.1
Bow & Twist	3.7.4.4
Marking (Legend)	3.8
Traceability Marking	3.8.1
Workmanship	3.9