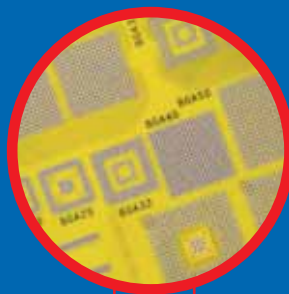
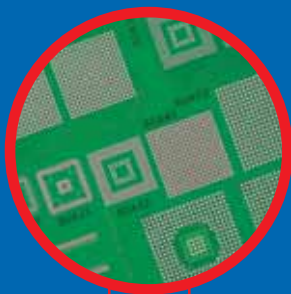




DAPC
DYNAMIC & PROTO CIRCUITS INC

RoHS

Manufacturing with Compliant Lead-free Materials and Finishes.



MANUFACTURING INNOVATIONS

THE RoHS DIRECTIVE AND DAPC

As a leading manufacturer of high reliability and quality Printed Circuit Boards, Dynamic & Proto Circuits comprehensive line includes double-sided boards, complex multi-layers, backplanes, heatsinks and a variety of special materials as well as BGA, micro BGA technology and lines and spacing to 3 mil in prototypes.

DAPC is committed to the continuous improvement of its manufacturing systems and support processes with the objective of providing our customers with the highest level of service. Because of this commitment, DAPC is fully equipped to manufacture your PCB designs to the European RoHS Directive.

Due to forward thinking and concerted effort, DAPC met all Lead-free manufacturing requirements a full six months before the July 1, 2006 deadline.

What the RoHS Directive means?

Electrical and Electronic products and/or components produced without the intentional use of the six Hazardous Substances, in any raw materials, processing or assembly.

The two new EU legislation requirements include:

RoHS – European Union **R**estriction **o**f the use of certain **H**azardous **S**ubstances for the Electrical and Electronic Equipment (2002/95/EC). It is a directive to remove six banned substances in electrical and electronic equipment and to contribute to the environmentally sound recovery and disposal of waste electrical and electronic equipment. The Directive has been amended with the publication of 2003/11/EC and 2005/717/EC.

WEEE – **W**aste **E**lectrical and **E**lectronic **E**quipment Directive (2002/96/EC). The Recycling of components containing Hazardous Substances will have to be removed from any end of life electrical and electronic equipment that is destined for a landfill, incineration or recovery.

In keeping with Industry requirements DAPC complies with the labeling of products and with their material content levels.

CAPACITIES

PROTOTYPES AND PREPRODUCTION 2 – 10 DAYS

PRODUCTION 4 – 6 WEEKS

Substantial investments in equipment ensures a smooth and uniform gold surface every time.



Our modern metallurgical laboratory verifies conformance with the RoHS Directive.



What are the six banned substances included in the RoHS Directive?

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent Chromium (Cr Vi)
- Polybrominated Biphenyls (PBBs)
- Polybrominated Diphenyl Ethers (PBDEs)

What has DAPC done to become RoHS compliant?

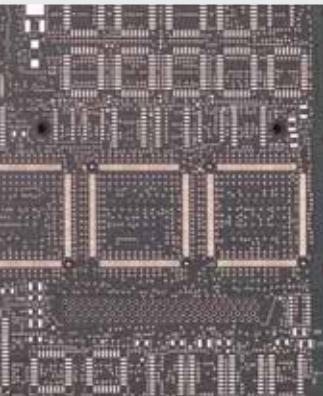
DAPC started manufacturing lead-free boards using Panasonic's R-1755 and Isola's IS410 as well as lead-free solder finishes of immersion gold and immersion silver. These boards can withstand the required processing temperatures for lead-free solder. DAPC has had UL approval on Panasonic's R-1755 and Isola's IS410 for over 2 years now in preparation for being RoHS compliant.

Being RoHS compliant not only means lead-free but that DAPC manufactures printed circuit boards to meet all the concentration levels for mercury, cadmium, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers at the homogenous level.

Customer Needs and DAPC Support

Dynamic & Proto Circuits Inc already has experience manufacturing printed circuit boards that meet RoHS Directives. However, we are constantly working to increase the number of options available to you, our customer. Asking for a RoHS printed circuit board is not enough. It is possible for a PCB to be RoHS compliant but not be suited for the elevated temperature stresses of lead-free assembly.

Surface finishes and manufacturing materials are available to build your Lead-free PCB today.



What does one need to do to ensure printed circuit boards meet RoHS Directives:

- Specify “**For Lead-Free Assembly**”
- Specify that the printed circuit board be manufactured with substrate materials that will support the use of Lead-free solder process for assembly
- Specify that only RoHS compliant surface finish be applied to the printed circuit board
- Specify only white or black nomenclature ink if nomenclature ink is required. (Colored inks often contain lead, hexavalent chromium, and/or cadmium.)



Our extensive experience in manufacturing lead-free printed circuit boards has allowed us to compile the following list of lead-free and RoHS compliant materials and finishes. DAPC fabricates and supports RoHS by using the following materials and finishes.

LEAD-FREE MATERIALS

PANASONIC 1755/1650
ISOLA IS410 or IS420

NELCO N7000-1, N7000-2V0
ROGERS 4000 series

NELCO N4000-11,-12,-13

DAPC FINISHES AVAILABLE FOR RoHS COMPLIANT PCB'S

	ENIG (Electroless Nickel Immer- sion Gold)	Electrolytic Ni/Au	Immersion Silver (Ag)	Immersion Tin (Sn)	OSP (Organic Surface Preservative)	Soft Wire-Bondable Gold
Brand Name	KAT/UIC Uyemura	Orosene 990/ Technic	Sterling/ MacDermid	9099MS/ OMG Fedelity 9099MS Tin	Entek Cu56/ Enthone	N/A/ Subcontracted
Handling Concerns	Organic & Finger Prints	Organic & Finger Prints	Sulfites & Chlorides	Organic & Finger Prints & Excessive Heat Cycles	Organic & Finger Prints	Organic & Finger Prints
Hold Time Between Reflow Cycles	No Concerns	No Concerns	No Concerns	24 Hours	24 Hours	No Concerns
Multi Thermal Cycles Assembly Applications	Good	Good	Good	Fair*	Fair**	Good
Shelf Life	Good	Good	Good	Fair	Good	Good
Solderability	Excellent	Fair	Excellent	Excellent	Good	Good

*(Inter-metallic increase with each heat cycle) **(Dependent on thickness of deposit)

All Soldermask Colors are RoHS Compliant

All Laminates are RoHS Compliant

Six RoHS Compliant Surface Finishes

RoHS Nomenclature Ink

Lead-free Options

DAPC currently produces boards that are RoHS compliant. All our lead-free boards are manufactured using customer specified RoHS compliant materials and we offer the following surface finishes:

- ENIG (Electroless Nickel Immersion Gold)
- Electrolytic Ni/Au
- Immersion Silver
- Immersion Tin
- OSP (Organic Surface Preservative)
- Soft Wire-Bondable Gold

Using these materials, the boards are able to withstand temperatures of 260°C and above. All soldermask colors are RoHS compliant as well.

Attention to detail matters. Many of the nomenclature inks available are pigmented using the banned substances like cadmium, chromium, and/or lead compounds. Currently, white and black nomenclature are the only color nomenclature inks that DAPC recommends that are RoHS compliant.





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