



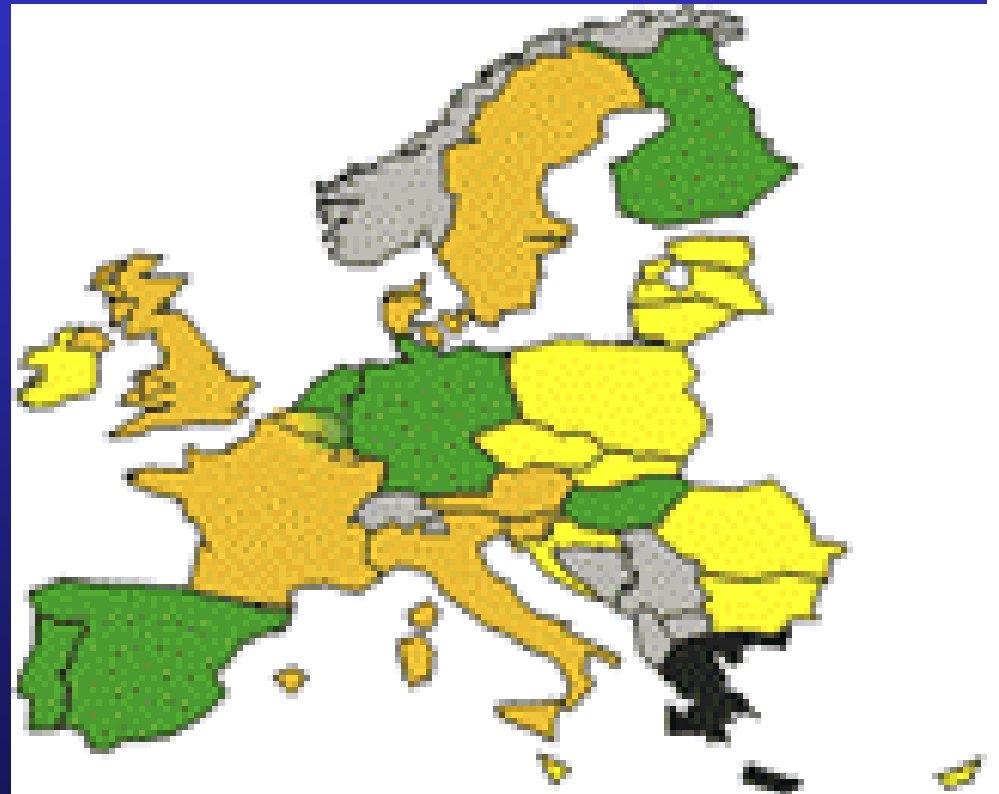
THE MILWAUKEE ELECTRONICS CO.

RoHS: Think you are exempt?



**You May Not Have a Choice**  
**Implications to your business**

- RoHS substances
- Who will it impact
- Future impact
- Implications to remaining leaded
- How MEC can help



| Banned/Restricted Substance           | Use/Where Found in Electronics  |
|---------------------------------------|---|
| Cadmium                               | Batteries, paints, pigments (yellow); additives in plastics (especially poly vinyl chloride [PVC, used in cable assemblies]); phosphorescent coatings; detectors/devices/LEDs                   |
| Mercury                               | Switches, pigments, paints, polyurethane materials (high gloss PU windows); lamps, bulbs/lighting (displays, scanners, projectors).   |
| Hexavalent chromium                   | Metal finishes for corrosion protection (chasses, fasteners); aluminum conversion coatings, alloys; pigments, paints  |
| Polybrominated biphenyls (PBBs)       | Used as flame retardants (plastics, housings, cables, connectors, fans, components, paints)   |
| Polybrominated diphenyl ethers (PBDE) | Same as PBBs  |
| Lead                                  | Solder and interconnects, batteries, paints, pigments, piezoelectric devices*, discrete components, sealing glasses, CRT glass*, PVC cables (UV/heat stabilizer), metal parts, chasses, washers |

*\*Exempt under RoHS Directive.*

**TABLE 1:** Substances banned by RoHS Directive.

## RoHS

### Who is affected?

|  | IT, telecoms and consumer equipment | Electrical / electronic tools (large industrial tools are exempt) | Monitoring and control instruments* | Toys, leisure, sports and medical equipment* |
|--|-------------------------------------|---|-------------------------------------|--|
| Power supplies                                 | ●                                   | ●   | ●                                   | ●  |
| Housings and electrical/mechanical attachments | ●                                   | ●   | ●                                   | ●  |
| Motors and drives                              | ●                                   | ●   | ●*                                  | ●  |
| Printed circuit boards                         | ●                                   | ●   | ●                                   | ●  |
| Electronic components                          | ●                                   | ●   | ●                                   | ●  |
| Displays                                       | ●                                   | ●   | ●                                   | ●  |
| Switches, sockets, connectors and wiring       | ●                                   | ●   | ●                                   | ●  |

*\*Under the ROHS Directive, certain exemptions apply to medical equipment systems and monitoring and control equipment.*



- Component Manufacturers are moving at an accelerated pace to convert their parts to lead-free.
- Those manufacturers may in the short term supply leaded components.

- Leaded components remain available

## Future Implication

- Higher prices as demand shrinks
- Longer lead times as priorities shift
- Uncertainty as obsolescence looms

- Leaded components become obsolete and substitutes available

## Future Implication

- Substitute qualification
- Significant change order processing
- High Pressure on the design community

- Leaded components become obsolete and substitutes not available

## Future Implication

- Product obsolescence decision
- Re-design in a critical time mode
- High Pressure on the design community

- BGA conversion to lead-free without leaded version available

## Future Implication

- Costly two process assembly
- PCB will need to be changed to lead-free
- BGA's will require manual assembly
- Quality due to manual assembly will suffer

- First Steps

MEC can provide the resources to verify printed circuit board Bills of Material for component compliance at reasonable cost.

- Non-Conformance

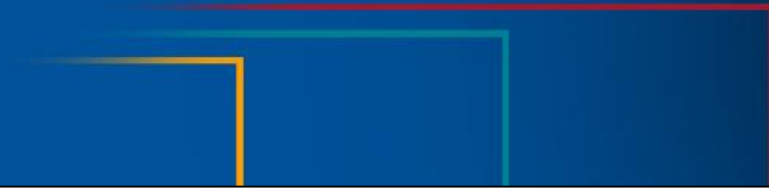
Count on MEC to provide recommendations to those components not meeting RoHS.

- Action Plan

MEC will provide a plan to get your product ready to meet RoHS.

The following could result from these actions

- Component cost increases, principally the PCB.
- PCB Layout changes to accommodate component pad needs.
- PCB Tooling costs due to board layout change.
- Component lead time.
- Obsolete material issues.
- Circuit redesign due to discontinuance of part.



Thank You for Listening