

Brainstorm: RoHS Regulation

Edited by Jason Lomborg

Considering the military's exemption to RoHS regulation and its continued need for leaded parts, where do you think the reduced availability of leaded parts will make the greatest impact on the Mil/Aero market?

Doug Patterson, Aitech Defense Systems, www.rugged.com [1]



Let's face it. RoHS isn't going away, regardless of the added stresses this regulation has put on military and defense systems, especially. So, where will the greatest impact on military and defense systems really be? It's not necessarily going to be on the formation of tin whiskers, a subsystem's reduced operating temperature, the proliferation of counterfeit components or potentially lowered reliability, but rather on the information flow between the customer and the manufacturer.

Communication is key for both sides of today's program hardware equation. The more a customer can incorporate a manufacturer as a partner, and not just a vendor who supplies parts, the better the resulting subsystems will be. Processes that facilitate information exchange must be developed and adhered to or reliability of military and defense systems may begin to decline.

Some areas component manufacturers can concentrate on to help this process along include:

- * Tightly control the component supply-side environment to more easily identify product and process changes;
- * Research Pb-free finishes and stay current on evolving finishes, processes and technologies;
- * Evaluate and update internal process changes to determine which parts or processes need to be altered or added to accommodate Pb-free manufacturing.

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At the same time, customers can:

- * Have a better understanding of the WEEE/RoHS waivers and the longer-term implications from these specifications and requirements before invocation (i.e. do not invoke a lead-free statement unless you really mean it);
- * Thoroughly investigate and understand the costs of WEE/RoHS compliance - from stem-to-stern, womb-to-tomb;
- * Investigate and incorporate tighter procurement and monitoring procedures at incoming inspection to catch counterfeit components before these devices enter stock and inventory.

So, are there specific product-related problems associated with RoHS? Of course...but what is more important is that companies work together to ensure each party has the most accurate information to help reduce, and possibly eliminate, some of the negative effects of the lead-free initiative.

David Beck, American Distributors, www.americandistr.com [2]

This is a reliability issue. We will continue to have availability of the RoHS compliant part but the long term affects of using these parts in place of the leaded components in Mil / Aero applications is not known yet. Initially there was panic in the Mil/Aero market as the thinking went - we can not compromise our standards so leaded product must continue to be made. After further research and the inevitable lack of economic necessity for component manufacturers to support a parallel production scenario, product is challenged on a case by case basis by our OE Engineering and approved based upon criticality to the application and certain reliability calculations. Of course this has a negative effect on MTBF but so far the industry has been tolerant of the change. Therefore, I would suggest that this trend will continue; more research will reveal any critical issues and the long term effect will become more of a reality as the life testing which began several years ago on the RoHS components becomes relevant.

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The military exemption to use lead guarantees the reliability of the electronics and the safety of our armed forces, but makes the manufacturing cycle longer and more difficult. In dealing with RoHS regulations, the

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military is faced with two challenges: part availability and quality control.

Different military sectors requiring electronics include aircraft, ships, ground electronics, and missiles. The variety of aircraft and ship models, as well as the quantity of each model produced yearly is comparatively low. Ground electronics and missiles, however, are produced in large volumes and have high quantities of electronics.

Since ground electronics have been more lenient and have utilized commercial devices in the past, they may be able to incorporate some level of redundancy and back up components. They may also be willing to initiate risk mitigation techniques, such as a conformal coating to contain the whisker. Due to the large number of missile programs and variety of components used in each program, I believe that the missile manufacturers will face the biggest challenge. Of course, aircrafts and ships will face the same challenge,s but on a much smaller scale.

The second challenge is quality control. In the military market, there is a special responsibility placed on quality control of the materials received. Quite often, component suppliers manufacture separate leaded and Pb-free product lines. In this instance, sample inspections are needed to avoid lot mix up. Moreover, the need for special manufacturing lines for leaded products may result in program delays, as manufacturers may be reluctant to switch over to their leaded process as often as necessary. If the availability of leaded parts continues to shrink, we can envision a military market where we revert back to the custom parts with specification control drawings calling for the use of lead.

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