Transitioning from RoHS to RoHS2:

The current state of RoHS in the Electronics Industry

A SiliconExpert White Paper exploring the transition from the European RoHS Directive to the RoHS2 Directive and the additional requirements set to roll out in the next several years.

Abstract

Since 2003, electronics manufacturers in Europe have been subject to compliance of the RoHS directive, but RoHS is changing. Over the past few years, legislators have updated the regulations of RoHS, creating RoHS2. Parts of RoHS2 are already in place, with additional requirements set to roll out over the next several years. This paper examines the differences between European RoHS and RoHS2, provides advice for a successful transition, and explores the potential impact the transition will have on electronics manufacturers.

Figure A. When does RoHS go into effect?

Why was RoHS2 created?

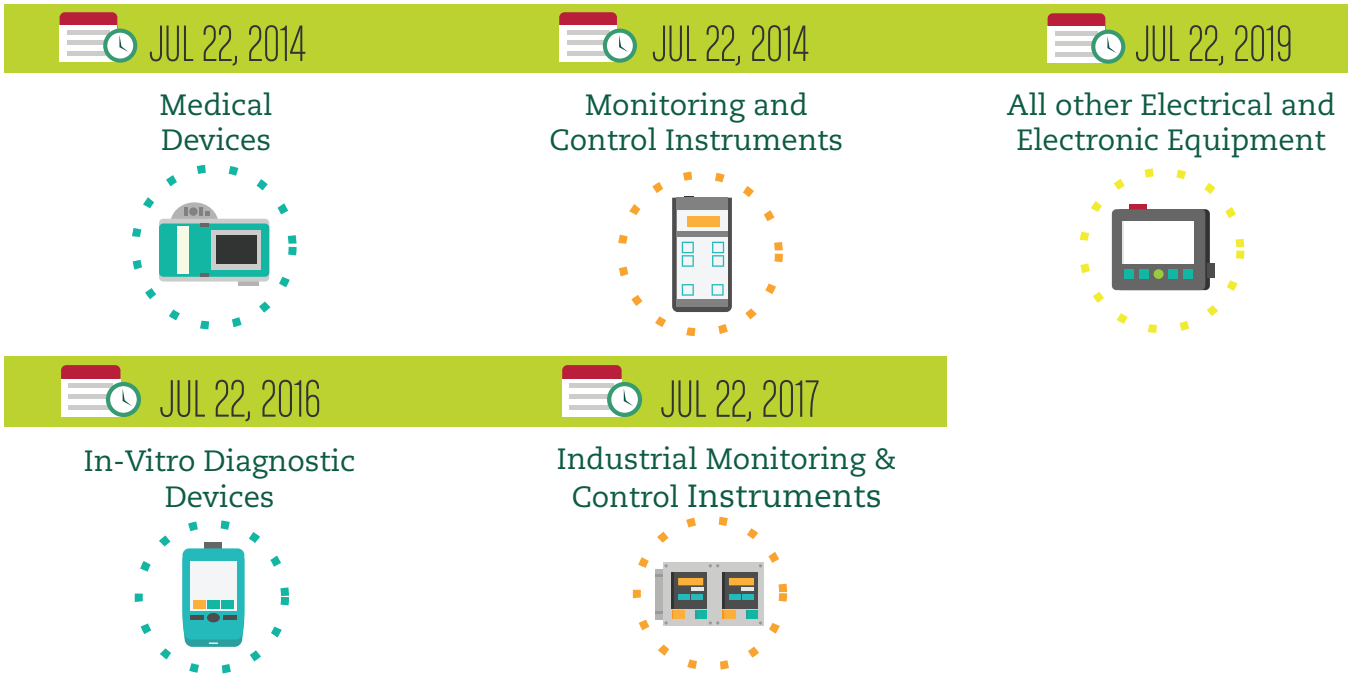
Legislators and manufacturers alike found that some of the legal requirements and exemptions of RoHS lack clarity. Ambiguous language made it difficult for manufacturers to comply with the directive and for legislators to enforce it. RoHS2 aims to add legal clarity and certainty to the directive, while also expanding its scope. The law extends regulations to all products that require electric current to perform at least one function, minus certain exemptions.

How do I know if my product is subject to RoHS2?

Generally, all EEE products will be subject to RoHS2, although many exclusions apply, including permanent exclusions for military, space, large-scale industrial tools, fixed industry tools, non-road mobile machinery, and others. RoHS2 defines a EEE product as follows:
"'Electrical and electronic equipment' or 'EEE' means equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields and designed for use with a voltage rating not exceeding 1,000 volts for alternating current and 1,500 volts for direct current."

The legislation goes on to define "dependent on electric currents or electromagnetic fields" as "needing electric currents or electromagnetic fields to fulfill **at least one** intended function." This is a significant change from RoHS, in which a product was considered EEE only if electricity was required for its **primary** function. As a result, certain previously exempt products, such as a gas cooker with a built-in electronic clock, would now be required to comply. All components of a finished product, including non-electric components like fasteners or plastic casing, will also be subject to RoHS2 compliance.

Figure B. What are the official RoHS2 Directive product inclusion dates?



How has RoHS2 expanded the scope of RoHS?

RoHS required compliance from 8 different product categories. RoHS2 expands that list to 11 categories. The new product categories are number 8 Medical Devices and number 9 Monitoring and Control Instruments. Finally, category 11 encompasses all other electrical and electronic equipment (EEE) not covered by other categories ,unless specifically excluded (See Figure B).

The new categories are numbered in this way to correspond with Waste Electrical and Electronic Equipment (WEEE) product categories. Originally RoHS covered only 8 of the 10 WEEE categories, omitting categories 8 and 9.

What new substance restrictions will RoHS2 introduce?

For now, the same substance restrictions of RoHS apply for RoHS2 in Europe. Legislators are currently reviewing and updating these regulations, and plan to publish a new restricted substances list by 22 July, 2014.

As with RoHS, substance restrictions are as follows (See Figure C), though many product exemptions may apply.

What does the new CE Marking Directive entail?

RoHS2 carries a new CE Marking Directive, which requires all EEE products to visibly,

Figure C. RoHS & RoHS2 Substance Restrictions

The same substances from RoHS apply to RoHS2; although product exemptions may apply.

Lead (0.1%) | Cadmium (0.01%) | Mercury (0.1%) | Hexavalent Chromium (0.1%) | Polybrominated Biphenyls (PBB) (0.1%) | Polybrominated Diphenyl Ethers (PBDE) (0.1%)

legibly, and indelibly affix a CE mark to the finished product or its data plate. This directive went into effect on 2 January 2013. As part of the process of obtaining the CE Mark, manufacturers must draw up a Declaration of Conformity (DoC) before a product can be placed on the market. The DoC must contain technical documentation that clearly demonstrates compliance with RoHS2 standards. Only the official CE marking can be used—other markings that may mislead third parties regarding the compliance of the product is prohibited. This requirement is policed by the Trading Standards enforcement agency. The marking directive is considered to be a vital component to the enforceability of RoHS2—for the first time, it will be easy for anyone to immediately identify whether or not a product is compliant.

What impact will RoHS2 have on my business?

While many factors will determine the impact of RoHS2, here are some general effects to consider:

- Increased costs and downtime due to required testing and possible reformulation of a wider range of products
- Longer time-to-market
- Increased man-hours and paperwork (drawing up DoCs, etc.)
- Increased costs due to CE marking procedures

How can I minimize the negative impacts of RoHS2?

If you manufacture products in the newly affected categories, start testing and validation procedures for your products now. Any non-compliant product will be barred from the European Union on 22 July, 2014. According to a report by ERA Technology, testing and validation

can take up to 18 months to complete, so it's vital that manufacturers begin this work as soon as possible to avoid financial loss.

Study the law and your product line carefully, and be sure you know which of your products are subject to RoHS2 and which are exempt. If you are currently designing future products, vet them in the same way now rather than later.

A partner like SiliconExpert can greatly ease that process. SiliconExpert's detailed database of over 250 million electronic parts makes it easy to discover which products are RoHS2 compliant and which aren't. If you need to find a cross for a non-compliant part, SiliconExpert helps you identify and compare crosses with just a few clicks. With SiliconExpert, you can take a proactive approach to the RoHS2 transition, ensuring you're on the path to compliance before product testing even begins.

Above all, be sure you understand the full impact of RoHS2 from the outset. Take the time to analyze any additional costs and man-hours that will be required. Make sure everyone in your business understands any new responsibilities they will need to undertake. And if all else fails, consult legal guidance for help.

Figure D. Use SiliconExpert to Find Parts that Comply with RoHS & RoHS2
Cross reference your original part to a part that complies with the RoHS2 Directive.

Original Part

	Part Number	Manufacturer	Description	DS	RoHS	Lifecycle
☑	BAV99	Micro Commercial Components	Diode Switching 70V 0.2A 3-Pin SOT-23		No	Obsolete Jul 01, 03

Cross Results

	Part Number	Manufacturer	Description	DS	RoHS	Lifecycle
☐	BAV99 BOM	Fairchild Semiconductor	Diode Small Signal Switching 70V 0.2A 3-Pin SOT-23 T/R		Yes	Active
☐	BAV99 RF	Taiwan Semiconductor	Diode Switching 70V 0.2A 3-Pin SOT-23 T/R		Yes	Active
☐	BAV99_D87Z	Fairchild Semiconductor	Diode Small Signal Switching 70V 0.2A 3-Pin SOT-23 T/R		Yes	Active

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With over 350 employees worldwide, SiliconExpert maintains a global presence for its wide range of customers spanning Asia, Europe and Americas, operating in innovative industries such as consumer electronics, telecommunications, automotive, medical and aerospace.