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Status on EU directives RoHS and WEEE

Dear Customer,

Thank you for your inquiry about the status of our products and production processes with respect to the EU Directives RoHS and WEEE.

These directives serve multiple purposes. Among them is the avoidance of waste material originating from electric and electronic devices. The directives also promote re-utilization and material recycling in order to reduce the amount of waste disposal. Further, the directives seek to avoid or limit the use of six hazardous substances - lead (Pb), mercury (Hg), hexavalent chromium (Cr6), cadmium (Cd) and the brominated flame retardants (PBB and PBDE) - in electric and electronic devices produced since July 1st, 2006.

Phoenix Contact products can be divided into two broad categories, products that could be used in both consumer and industrial electro-technical products, and products which are used exclusively in industrial machinery. This distinction is important since both the RoHS and WEEE Directives only refer to "finished products that perform a direct function and are usable by the consumer." Components will only be applicable if they are integrated into the above-mentioned type of products.

In early 2006, the EU commission issued clearer recommendations for interpretation which have been accepted by the European umbrella organization of the electro-technical industry known as "ORGALIME". The following areas of application are not currently part of the scope of the RoHS and WEEE Directives:

- **Large scale stationary industrial tools** (Machines and components as part of the machine)
- **Installation engineering** (Fixed installations in systems and buildings)
- **Production systems and components as part of the installation**
- **Devices for application areas over 1000V** (Production systems and components as part of the installation)
- **Spare parts for products that were put in circulation before July 1, 2006**

Based on this interpretation, which thus far has remained unchanged, it has been clear that not all Phoenix Contact products fall in the scope of the Directives as they currently stand.

I. SUMMARY

Phoenix Contact has been involved with both the RoHS and WEEE Directives since the first drafts of the directives were published in 1998. Various working groups within our company addressed key issues and processes such as:

- Intermediate parts and surfaces
- Plastic granulate
- Electronic components and printed circuit boards (PCB)
- Lead-free manufacturing processes
- Marking of compliant products
- Return and recycling mechanisms

The following Phoenix Contact product families already fulfil the requirements of the directives:

- **COMBICON** Pluggable and fixed PC Board Terminal Blocks and related accessories
- **CLIPLINE** DIN-Rail-mounted terminal blocks and their accessories

We continue to work on converting our entire product lines as follows;

II. DETAILED PROCEDURES

a. INTERMEDIATE PARTS AND SURFACES

- **Hexavalent Chromium (Cr6) conversion Trivalent Chromium (Cr3):**

In order to replace surface passivation systems containing Cr6, extensive tests were conducted and new surface systems were evaluated in 2005. The conversion to a Cr3 surface passivation system has been implemented for complete corrosion protection in accordance with the European Community regulations. The complete conversion of all parts (including our DIN-Rail) was completed in the first quarter of 2006.

- **Copper (Cu)-Alloy with Tin/Lead (Sn/Pb) Surfaces:**

Current-conducting metal parts, such as the soldered surfaces of our contact pins and contact springs are made of pure Tin (Sn) or other alloys. In order to avoid a possible whisker growth, a Nickel (Ni) barrier junction is used. For all products that still contain Lead (Pb), process plans were completed in July 2005.

- **Intermediate parts:**

Intermediate parts such as clamping bodies, screws, current plates using copper alloys require a small percentage of Lead (Pb) for the manufacturing step. They provide better workability during the broaching, threading, and turning steps and allow for longer tool life. The RoHS-Directive currently contains an exemption for lead in a copper alloy to maximum 4% Lead (Pb) content by weight. Phoenix Contact parts that contain Lead (Pb) are RoHS Compliant as the Pb level is between 1.2% to 3% at the homogenous level. All parts have had a Lead-free (Pb-free) surface finish since July 2005.

b. PLASTIC GRANULATE

Plastic granulate used by Phoenix Contact does not contain any of the following:

- Cadmium (Cd),
- Poly-brominated byphenyl (PBB), and
- Poly-brominated Diphenylethers (PBDE)

Phoenix Contact has been in compliance with the RoHS-Directive since 2001 on all plastic granulate. Brominated flame retardant materials (Penta BDE and Octa BDE) indicated in the EU regulation 2003/11/EG have not been used by Phoenix Contact for the past sixteen (16) years.

c. ELECTRONIC COMPONENTS AND PRINTED CIRCUIT BOARDS

The conversion to a lead-free solder process in Germany has been completed. However, in the USA, where we produce many customer-specific products, we still produce the majority of parts in a non-compliant manner. Many of our industrial customers have elected to not transition to a Lead-free (and therefore RoHS-Compliant) assembly until more results are available from the field. In addition, some externally sourced component parts remain unavailable in a RoHS-Compliant version. Therefore, we anticipate that a complete conversion in the USA will occur in late 2008.

d. LEAD FREE MANUFACTURING PROCESSES

Tests of our soldering processes have proven that products from Phoenix Contact can be soldered in a lead-free process. Lead-free solders have been selected for production of electronic products.

Temperature profiles for Reflow Soldering Processes (convection ovens) are under development following the DIN IEC 60068-2-58 and IPC/JEDEC J-STD-20C standards. These standards specify the maximum temperatures and times at which our products are qualified. Adjustments to temperatures and times are dependent on the equipment and processes used for individual circuit boards. Wave Solder Process products are qualified following the DIN EN 61760-1 (Ed. 2 draft) standard.

All of our PCB Headers and connectors are suited for wave solder temperatures of 260 °C, with a maximum impact time of 10 seconds.

In applications where a Surface Mount Technology (SMT/SMD) solderable connector or header is required, we are also able to supply Infrared Reflow (IR) compatible parts from our COMBICON Product range.

At this time, electronic assemblies manufactured by Phoenix Contact USA are produced with a 63/37 eutectic tin/lead solder in both the wave solder and surface mount soldering processes. Phoenix Contact USA will follow the lead of our parent company, Phoenix Contact GmbH, and plan all processes to be RoHS compliant by late 2008.

e. MARKING

In parallel with these activities, an internal database has been generated so that all directive/regulation-compliant products will be reported on a date code basis. The Black and White logo shown below is used on our lowest level box labels to provide visibility to the customer and confirm RoHS-compliance for each specific part number.

The color logo is used on our printed catalog and other marketing activities.

A dedicated web page at www.phoenixcon.com/RoHS has been created to provide additional information.



f. RETURN AND RECYCLING MECHANISMS

The WEEE directive also determines procedures regarding the return and recycling of electric and electronic products across the entire EU. A guideline for conversion to national law is essential. Phoenix Contact will participate actively as soon as the procedure is finalized in order to comply with the schedules determined by the EC Commission and Council.

If you have any further questions regarding this issue, please contact our designated RoHS/WEEE contact Arnold Offner at (800)-888-7388 X 3675 or e-mail us at <RoHS@phoenixcon.com>.

Regards,

A handwritten signature in black ink that reads "David Skelton".

David Skelton
Vice President – Americas Business Unit