



Frank Quast

A shining Success Story

**RoHS conforming Surface Design
for rectangular Connectors**

Today's connectors have advanced to form a universal interface for power and data transmission. On the job in virtually all industrial branches, connectors must perform under the most extreme ambient conditions. Apart from the concept of modularity, the design and construction of these interfaces are the guarantees for this success. The external form and appearance is an important aspect in this context. It is the calling card, so to speak, by which the component makes an impression on users within the very first few seconds. In addition to purely optical impressions, the surface is also determined by technical requirements and/or legislative guidelines, which may be subject to change.

THE ROHS BACKGROUND STORY

The RoHS regulation (Restriction of Hazardous Substances) is the EU directive 2002/95/EG stipulating the ban of certain substances in the manufacture and processing of electronic devices and components. This includes lead, mercury, cadmium, hexavalent chrome, polybrominated biphenyls (PBB) and polybrominated diphenyl ether (PBDE). The EU standard was adopted on January 1, 2003. The transition phase for the affected manufacturers and branches extends up to July 1, 2006. In other countries, such as Japan, the United States and China, similar regulations are also being discussed, are in the process of being implemented, or have already become valid.



Powder surface



Galvanic surface



HARTING surface concept

The RoHS regulations also effect the powder surface that have been in use since years at HARTING and does not present any problems with regard to RoHS guidelines and stipulations. It offers good surface attachment to the aluminum base material and conveys an attractive, advantageous look.

GALVANIC SURFACES

Special applications, which, in addition to protection class IP65 and ruggedness, also make demands on EMC, call for connectors with a conductive surface. Here, the so-called chromating processes dominate the markets. Especially the chromating process for yellow coatings offer good properties with regard to corrosion resistance and low surface resistance. According to the individual manufacturing process parameters, the appearance differs between gold/brown and bronze color tones. The fact that the surface may show traces of hexavalent chrome, however, has emerged as a disadvantage in this context. With a look to the RoHS regulations coming into effect, HARTING has decided against chromating processes for yellow chromings, and has qualified a new surface for the EMC product line.

EMC stands for electromagnetic compatibility and refers to the capability of a device, equipment, facilities and systems to perform satisfactorily within an electromagnetic environment without causing electromagnetic disturbances, which would be unacceptable for all of the devices, equipment and systems operating in this environment.

THE HARTING SURFACE CONCEPT

An intensive, several year search process for a connector housing surface for aluminum alloys had revealed that the procedures available from electroplaters and lac-

quer suppliers would not deliver satisfactory results for connectors. In most cases, the combined requirements profile of conductivity, manufacturing procedures, appearance and corrosion resistance lead to solutions that were not economically efficient. The “industrial EMC connector” would have either lost performance capabilities, or would have been burdened with a parts price that would have made the product unattractive on the relevant markets.

The key information on a technically sophisticated solution in combination with economic viability came from the automotive industry. In this area, leading German automobile manufacturers had gained positive experience with high-grade aluminum components that are successfully deployed in the open engine compartment area. This concentration on the basic material was also successful in the case of the HARTING EMC connectors. Since August 2005 the corrosion resistant rectangular connectors are being manufactured out of a high-grade, corrosion resistant aluminum alloy. Thanks to a special procedure, the aluminum surface has been additionally compacted and optically enhanced.

DESIGN AND CONSTRUCTION RESULTS

The result is a conducting surface with good conducting properties and full RoHS conformity. The former gold/brown connectors have gained a silver surface and impress as a shining example of outstanding HARTING quality.



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