

**BREL International Definition of RoHS Compliant / Pb-Free**

In response to worldwide demand for “environmentally friendly” products, BREL International has elected to adopt RoHS (Restriction of Hazardous substances) as the common standard to be applied when assessing our products’ material content. Specifically, a part family will be RoHS compliant if all ratings within that family meet the following criteria:

Individual capacitors within the family and their homogenous materials conform to:

- <0.1% by weight of mercury
- <0.1% by weight of hexavalent chromium
- <0.1% by weight of PBB
- <0.1% by weight of PBDE
- <0.01% by weight of cadmium
- <0.1% by weight of lead

Unless the following exemptions per annex 7 are applied:

• **Lead in electronic ceramic parts:**

Certain formulations of NP0 ceramic materials used in capacitors contain traces of lead, for example lead zirconate titanate and lead magnesium niobate. The specific chemical composition and manufacturing process of these materials determine their electrical parameters, such as dielectric constant, which are essential for the functioning of the component in which they are used.

Hence, lead used in the ceramic parts of these components in electrical and electronic equipment is exempt from RoHS regulation.

• **Lead in high melting temperature type solders** (i.e. tin-lead solder alloys containing more than 85% lead):

The high melting temperature type solder exemption has been introduced to allow the use of lead in solders for specific applications (such as in chip manufacturing), for which viable lead-free alternatives have not yet been identified. The high electrical conductivity and unique mechanical properties of such a high melting point tin-lead alloy make the material malleable and better able to withstand both temperature and physical stress. Such properties ensure fewer defects during manufacturing and high reliability throughout the life of the component, thereby also resulting in fewer components going into the waste stream. This exemption is applied to certain families of leaded ceramic capacitors.

Supporting Documents give full details of current RoHS conformance by product family.

Should any of our customers require:

- Tighter material limits than specified in RoHS,
- Control limits for additional materials beyond those identified in RoHS,
- Products not invoking the above RoHS exemptions

Please contact BREL International and we will be glad to assist with your product requirements.



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