

Caddock Resistor Products and the EU RoHS Directive

This document describes the Compliance of Caddock High Performance Film Resistors to the EU RoHS Directive, 2011/65/EU including the substances included in Directive 2015/863/EU, and other Hazardous Substances frequently mentioned by customers.

“RoHS Compliant” Caddock Resistor Products are those that comply with the European Union’s (RoHS) “Restriction on the Use of Hazardous Substances in Electrical and Electronic Equipment”, Directive 2011/65/EU (including Directive 2015/863/EU), which means that either:

- 1) the levels of Restricted Substances listed in Annex II of 2011/65/EU in the resistor product are below the maximum concentration values as described by 2011/65/EU, or
- 2) an “Application Exemption” described in Annex III of 2011/65/EU applies. Exemption 7(c)-I allows “lead in glass”. Caddock resistor products have some lead oxide in the glass of the resistance films. The resistance film is deposited on a ceramic substrate to form a resistor element.

The following Caddock Catalog Resistor products, manufactured January 1, 2013 or later, are “RoHS Compliant”. Many of these models have been RoHS compliant since 2005:

- Type CC Resistors
- Type CHR Resistors
- Type HVD Voltage Dividers
- Type MG Resistors
- MK200 and MK700 Series Resistors (See Note 1)
- Model MP2060
- MP800 Series
- MP900/9000 Series
- Type MS Resistors
- Type MV Resistors
- Type SR Resistors (See Note 1)
- Type TF Resistors
- Type TG Resistors
- Type THV Voltage Dividers
- TK200 and TK700 Series Resistors (See Note 1)
- Type USF Resistors
- Type USG Resistors
- Type USVD Voltage Dividers
- Type T912 and T914 Resistor Networks
- Type 1776 Decade Voltage Dividers
- Type 1787 Resistor Networks
- Type VMN Resistor Networks
- Type T1794 Resistor Networks

Note 1: These resistors are RoHS Compliant, but require extra care during “Lead(Pb)-Free” wave soldering. The temperature of the resistor terminal adjacent to the resistor body must be maintained below 219°C during soldering.

Notes on Terminal Finish and Soldering:

For the Standard Catalog Terminal finish and the compatibility with Lead (Pb)-Free Soldering Processes, please see the Caddock Applications Note AEN-0104.

Some Caddock Resistor Products are supplied to specific customers (using a Caddock assigned ordering part number) with a non-standard Sn/Pb Hot Solder Dipped Lead Finish based on the customer requirement for this lead finish. Parts supplied with this non-standard Sn/Pb Hot Solder Dipped Lead Finish are Non-Compliant with the EU RoHS Directive.

“RoHS Non-Compliant” Caddock Resistor Products

The following products are Non-Compliant with the EU RoHS Directive. The following resistor products continue to be available for use in the many equipment categories that are specifically listed as exempt in Article 2 (Scope) of the Directive 2011/65/EU.

- *Type ML Resistors (Can be replaced with Type MS)
- *Type MM Resistors (Can be replaced with Type MS)
- **Type MX Resistors (Can be replaced with Type MG)

* These products use a thermoset molding material with a Lead (Pb) Catalyst in a concentration greater than 0.1%.

** The Type MX Resistors have an Sn/Pb Lead Finish

Caddock SMT Resistors that are Not Compatible with High Temperature Lead-Free Solder Reflow Processes.

These resistors are RoHS Compliant, but are not compatible with high temperature lead-free solder reflow processes. The bodies of these resistors must not exceed 219°C.

Type CD, Model MP725

Caddock’s Statement about other Hazardous Materials

The following materials are not included, by design, in any Caddock resistor product:

Asbestos, Formaldehyde, Mercury, or Radioactive Substances.

Additional Caddock Documents:

AEN-0104: “Terminal Finish and Solder Process Information for Caddock Resistor Products”

AEN-0107: “Caddock REACH Compliance Statement”

For questions regarding RoHS Compliance please contact Caddock Applications Engineering.

The EU RoHS Directive and Legislation are subject to change. If there are any changes in the legislation that affect any Caddock resistor products, Caddock will provide timely notification on the Caddock website: www.caddock.com