

Application Note AN-2038
RoHS Compliant Transceivers

On 23-Jan-2003 the European Parliament issued directive 2002/95/EC to address the **Restriction** on the use of certain **Hazardous Substances** in electrical and electronic equipment. This is commonly known as the RoHS Directive. This Directive was further refined in 2011, as 2011/65/EU – which is generally referred to as **RoHS Recast**, or **RoHS 2.0**. The revised directive replaces the original as of 01-Jan-2013.

On 31-Mar-2015, the restricted substance list was expanded from six to ten by adding four new type of phthalates by Commission Delegated Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU. The ten restricted hazardous substances are:

Substance	Maximum Concentration Threshold
Lead (Pb)	1000 ppm (0.1% by weight) in homogeneous layers
Mercury (Hg)	1000 ppm (0.1% by weight) in homogeneous layers
Cadmium (Cd)	100 ppm (0.01% by weight) in homogeneous layers
Hexavalent Chromium (Cr-6)	1000 ppm (0.1% by weight) in homogeneous layers
Polybrominated biphenyls (PBB)	1000 ppm (0.1% by weight) in homogeneous layers
Polybrominated diphenyl ethers (PBDE)	1000 ppm (0.1% by weight) in homogeneous layers
Bis(2-ethylhexyl) phthalate (DEHP)	1000 ppm (0.1% by weight) in homogeneous layers
Butyl benzyl phthalate (BBP)	1000 ppm (0.1% by weight) in homogeneous layers
Dibutyl phthalate (DBP)	1000 ppm (0.1% by weight) in homogeneous layers
Diisobutyl phthalate (DIBP)	1000 ppm (0.1% by weight) in homogeneous layers

Allowable Exemptions

RoHS Directive 2011/65/EU allows for several exemptions to the restriction of hazardous substances. Finisar transceivers may claim one or more of the following exemptions permitting the use of Lead (Pb) and / or Cadmium (Cd):

#	Definition and Scope
6a(i)	Lead alloying in steel up to 0.35% Lead by weight and in batch hot dip galvanized steel up to 0.2% Lead by weight
6c	Copper alloys containing up to 4% Lead by weight
7a	Lead in high melting temperature type solders (85% by weight or more Lead)
7c(i)	Electrical and electronic components containing Lead (Pb) in a glass or ceramic matrix
13a	Lead in white glasses used for optical applications
15a	Lead in solders to complete a viable electrical connection within flip-chip IC packages

The application of specific exemptions to a specific Finisar product is defined by the RoHS Certificate of Compliance for that product, and supported by a detailed product material content declaration.

Other Product Application Issues

- For pluggable transceivers (ex... SFP, SFP+, XFP, CFP, QSFP+, CXP), there are no issues with attachment to a customer's host board because there are no solderable pins.
- For solderable transceiver modules (ex... SFFs) Finisar uses gold flash over nickel for all the pins that attach to the host board. The pins of the transceivers are capable of withstanding temperatures of 260°C for 10 seconds.
- The gold plated pins on lead free transceivers are backwards compatible with lead-based solder attachment processes.