

Exemption No. 13b Lead and Cadmium in Optical and Filter Glass

Introduction.

Ceramic Colour Standards manufactured and supplied by Lucideon Limited are optical reflectance materials that are used to calibrate and check the measurement performance of spectrophotometers and optical devices.

Characteristics

They are not part of the instrument but an accessory which is momentarily placed against the instruments measuring aperture/in the measurement path, before the instrument is used, and are usually stored in a separate box.

As such they fall within the EU Taxation and Customs Union Code 9027.90.50, namely;

accessories for instruments and apparatus for physical... analysis (for example..... spectrometers...)...or checking quantities of....light.

The functional part of the standards is a modified glass (glaze) which is permanently bonded to a porous ceramic substrate by high-temperature heat-treatment. The standards have specific colours with the steepest reflectance slopes practically possible to provide a rigorous test of spectrophotometer performance, while remaining stable in colour.

Most such glazes do not require Lead or Cadmium, and most of the standards contained in the range of Ceramic Colour Standards have eliminated these materials. However, there are two standards which use a combination of Lead glaze and Cadmium pigment to produce colours for which there is no suitable Lead and Cadmium-free alternative.

These two standards are the Red and Orange Ceramic Colour Standards.

It is possible to produce red or orange coloured glass or plastic without these elements. In glass the steep reflectance slopes required cannot be achieved without Lead and Cadmium. (See Figure 1). In addition the alternatives often have complex reflectance curves which make results from such standards hard to interpret in terms of instrument performance. In plastics the organic dyes used will produce steep reflectance curves but they are unstable and bleach (lose their colour) under the UV included in spectrophotometer light.

Summary

The Ceramic Colour Standards are physical optical accessories to spectrophotometers, not an integral part of such equipment, and have no electrical parts or contact with electricity.

Most of the standards have eliminated Lead and Cadmium.

Lead and Cadmium have only been used where no suitable alternative is available.

The Cadmium-containing pigment is encapsulated in an inert zirconium silicate crystal. The inert zirconium silicate crystals are encapsulated in the homogeneous glass matrix, which may include lead oxide. The glass surface does not come into contact with people during normal usage.

Figure 1 Comparison of Lead + Cadmium Reflectance Curve (in Blue) with alternative without Lead or Cadmium (in Red)

