Heraeus

Feeling good …
with Heraeus Lead Free* Colours

Intense colours with excellent characteristics after firing do not require lead. Heraeus Ceramic Colours offers a number of lead free* colour ranges for the decoration of ceramics and glass.

These colour ranges contain less than 600 ppm residual lead and are in compliance with the latest US requirements.

Meet the lead free* world of Heraeus Ceramic Colours!

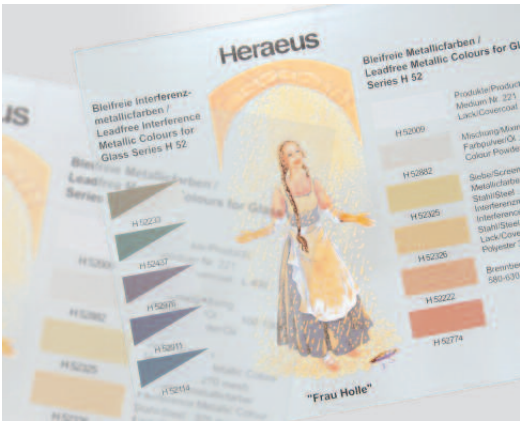
Colour ranges with residual lead below 600 ppm delivered with a certificate

For ceramics:

- Series H 55
  Metallic and interference metallic colours for porcelain, bone china, earthenware and tiles
- Series H 56
  Onglaze colours for bone china
- Series H 57
  Onglaze colours for porcelain, bone china, earthenware and tiles
- Series H 84
  Inglaze colours for porcelain, bone china, earthenware and tiles

For glass:

- Series H 52
  Metallic and interference metallic colours
- Series H 35
  Lead free* zinc based colours
- Lead free* silk matt whites
- Series OGG 91
  Organic colours for direct screen printing
- Series OGG 92/UV
  Organic colours for direct screen printing, UV-curing



Overview about heavy metal limits in USA/EU/P. R. China (CN)

		Flatware	Small Hollow-ware	Large Hollow-ware	Cups Mugs	Pitchers	Food Container Packaging	Test / Remarks
Lead release levels								
USA	**FDA**	ppm	ppm	ppm	ppm	ppm		Official Method Analyses, 15th ed.
	Lead	3.0	2.0	1.0	0.5	0.5		(1990), section 973-32
	Cadmium	0.5	0.5	0.25	–	–		or ASTM C-738
USA	**FDA – Lip / rim area**							ASTM C-927
	(top 20 mm)				ppm			Exemption: glass and ceramic
	Lead	–	–	–	4.0	–	–	ware not for children's use with
	Cadmium	–	–	–	0.4	–	–	less than 60 mm of decoration
								below external rim
USA	**California Prop 65**	ppm	ppm	ppm	ppm	ppm	ppm	No ban! Exceeding releases require
	Lead	0.226	0.1	0.1	0.1	0.1	0.1	permanent warning to customers!
	Cadmium	3.164	0.322	0.084				Official Method Analysis, 15th ed.
								(1990), section 973-32 or
								ASTM C-738
EU		mg/dm²	mg/l	mg/l			mg/l	
	Lead	0.8	4.0	4.0			1.5	For ceramics: DIN EN 1388-1
	Cadmium	0.07	0.3	0.3			0.1	For glass: DIN EN 1388-2
CN		mg/l	mg/l	mg/l	mg/l	mg/l		GB 12651-2003
	Lead	5.0	2.0	1.0	0.5	0.5		
	Cadmium	0.5	0.3	0.25	0.25	0.25		
Allowed residual lead in lead free* colours in % by weight (latest settlement)								
USA		%	%	%	%	%	%	
	Residual lead	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	
	Residual cadmium	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	
USA	**Lip / rim area**							ASTM C-927
	(top 20 mm)		%		%			If the glass is smaller than 60 mm
	Residual lead		< 0.02 [1)]		0.06			and not for chrildren's use
	Residual cadmium		< 0.08 [1)]					< 0.06 % Pb

1) for glassware

Frequently asked questions regarding US heavy metal regulations

In recent months customers around the globe raised more and more questions about new requirements regarding lead release and rest lead content. Focus point of the general attention had been: California's Proposition 65. The lead release limits of FDA versus the limits for California. What is forbidden? In which cases are warning labels required? Are rest lead contents below 600 ppm defined in a new law? Heraeus had been contacted by customers from America, Europe and Asia. We would like to outline the major questions and how we see the situation. We have summarised the major lead and cadmium limits in a table (see previous page).

What is "Proposition 65"?
Does it prohibit the use of lead and cadmium?

Proposition 65 is a Californian law. The objective of the legislators, however, was by no means to define a regulation governing the heavy metal release of decorations from glass and ceramics. The origin is reflected in the name of the law: California's Safe Drinking Water and Toxic Enforcement Act of 1986 (= Proposition 65). It contains a long list of toxic substances. It does not prohibit the use of any such substances. It only requires consumer warnings. So articles decorated with lead and cadmium containing colours exceeding the heavy metal release limits are allowed to be sold in California if the articles are permanently marked with a warning label for the consumer, e. g. "Not for food use – article may poison food".

Are limits for lead and cadmium release defined in Proposition 65?

No. The Proposition does not contain any limits for lead and cadmium release of articles.

Where do the established limits for lead and cadmium release come from?

They go back to a settlement agreed in 1993 between the State of California and a number of defendants. A very comprehensive document defined how consumers must be warned if certain limits for heavy metal release are exceeded. In this settlement the test procedures as well as the limits were defined.

Now a new limit has become the centre of discussions. Lead free* colours should contain traces of impurities of lead below 600 ppm. Where does this limit come from?

This limit also goes back to a settlement. In this settlement from August 2004, claimants and defending companies agreed that the defendants should only use lead free* colours with residual lead below 600 ppm (= 0.06 %). This is a somewhat simplified explanation. In the settlement there is a string of transitional arrangements that cannot be described in short. Principally such a settlement legally binds only the involved parties. But in the situation of USA, the settlement constitutes a judicial precedent. To avoid potential claims, more and more decorators decided to comply with the agreement of the settlement. In consequence, the settlement reached a "quasi standard character"…

What does Heraeus do to help its customers in this situation?

First of all, we try to explain to our customer the legal situation, so that they can base their further decisions on "safe ground". Of course, all Heraeus lead free* colours are produced without any addition of lead. That goes without saying. But traces of impurities, residual heavy metals can be present. So we started to consequently check produced lots of lead free* colour for residual lead. Now our message to customers is: All colour ranges listed in this brochure contain residual lead below 600 ppm. Starting from May 2006, we deliver these colours with a complimentary certificate which states this.

What are the limits of such a certification?

Of course we can only certify, what we have completely under our control. So as long as a jar is unopened, the lead free* colour contained will be in compliance with US requirements. At the moment of opening, the risk of lead contamination goes over to the decorator. In the pasting process, during mixing, during printing later on, during firing in a perhaps heavy metal contaminated kiln, lead could contaminate the decoration. This is out of the control of the colour supplier.

More questions?

Contact Heraeus. Contact the local Heraeus representative.
Or address your question to **ccd-m@heraeus.com.**
Visit our homepage **www.heraeus-ccd.com**
for more information about Heraeus lead free* colours.
We like you to "feel good". Together let us make the world more colourful – without lead!

* Lead free means compliance with US requirement: Residual lead < 600 ppm.

W. C. Heraeus GmbH
Thick Film Materials Division
Business Unit Ceramic Colours
Heraeusstr. 12-14
63450 Hanau, Germany
Phone +49 (0) 6181.35-44 20
Fax +49 (0) 6181.35-96 37
E-mail: ccd-m@heraeus.com
www.heraeus-ccd.com