

Joint Research Centre

Certified reference materials for testing compliance with the RoHS Directive

Quality assurance tools for your measurements

European Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) bans from 1 July 2006 onwards the use of Pb, Cd, Hg, Cr(VI) and certain polybrominated flame retardants in electric and electronic devices unless no technical substitutes exist.

The JRC Institute for Reference Materials and Measurements produces certified reference materials that can be used to ensure the quality of test results in connection with the RoHS directive.

Metal matrices

Code/ Material	RoHS relevant substances -Certified values		
BCR-288 Pb (discs)	Cd	0.03	g/kg
ERM-EB325 Zn (discs)	Cd	0.1	g/kg
	Pb	0.14	g/kg
BCR-326 Zn (discs)	Cd	0.2	g/kg
	Pb	0.3	g/kg
BCR-327 Zn (discs)	Cd	0.3	g/kg
	Pb	0.4	g/kg
BCR-355 ZnAl ₄ (discs)	Cd	0.06	g/kg
	Pb	0.06	g/kg
BCR-545 welding dust on filter (for qualitative spot test)	Cr(VI)	40	g/kg
BCR-691 set of five bronze discs	Pb	2-90	g/kg



Confidence in measurements

All certificates and detailed production information can be found at <https://crm.irmm.jrc.ec.europa.eu>



BCR-691; bronze discs

BCR-126A; lead crystal glass



BCR-288, BCR-326, BCR-327, BCR-355
and ERM-EB325; metals discs

Polymer matrices

Code/ Material	RoHS relevant substances - Certified/informative values		
VDA1-4 set of 4 polyethylene granulates	Cd	0.04 g/kg to 0.4 g/kg	
ERM -EC680m LDPE granulate	As	4.7	mg/kg
	Br	181	mg/kg
	Cd	20.8	mg/kg
	Cr	9.6	mg/kg
	Hg	2.56	mg/kg
	Pb	11.3	mg/kg
	S	86	mg/kg
	Sb	9.6	mg/kg
	Sn	20.7	mg/kg
	Zn	194	mg/kg
ERM -EC681m LDPE granulate	As	71.0	mg/kg
	Br	1.43	g/kg
	Cd	146	mg/kg
	Cl	0.38	g/kg
	Cr	45.1	mg/kg
	Hg	9.9	mg/kg
	Pb	69.7	mg/kg
	S	0.64	g/kg
	Sb	86	mg/kg
	Sn	99	mg/kg
Zn	1.07	g/kg	
ERM-EC590 LDPE granulate	Br	2.13	g/kg
	BDE-47	0.23	g/kg
	BDE-99	0.30	g/kg
	BDE-100	0.063	g/kg
	BDE-153	0.047	g/kg
	BDE-154	0.026	g/kg
	BDE-183	0.132	g/kg
	BDE-197+204	0.076	g/kg
	BDE-209	0.65	g/kg
	BB-209	0.63	g/kg
ERM-EC591 PP granulate	Br	2.08	g/kg
	BDE-28	0.0025	g/kg
	BDE-47	0.245	g/kg
	BDE-99	0.32	g/kg
	BDE-100	0.066	g/kg
	BDE-153	0.044	g/kg
	BDE-154	0.027	g/kg
	BDE-183	0.087	g/kg
	BDE-197+204	0.052	g/kg
	BDE-209	0.78	g/kg
BB-209	0.74	g/kg	

Ceramic matrices

Code/ Material	RoHS relevant substances - Certified values		
BCR-664 glass	Cd	0.006	g/kg
	Pb	0.05	g/kg
BCR-126A lead crystal glass	Pb	240	g/kg

How to order reference materials

From JRC in Geel

Tel.: +32 14 571 705 • Fax: +32 14 590 406
<https://ec.europa.eu/jrc/en/reference-materials>
 E-mail: jrc-irmm-rm-distribution@ec.europa.eu

From authorised distributors

LGC Standards GmbH (DE)
<http://www.lgcstandards.com/>
 E-mail: de@lgcstandards.com

Sigma-Aldrich Chemie GmbH (CH)
<http://www.sigmaaldrich.com/irmm>
 E-mail: flukatec@sial.com

Sigma-Aldrich RTC Inc. (USA)
<http://www.RT-Corp.com>
 E-mail: RTCSalesgroup@sial.com

ARMI (USA)
<http://www.armi.com>
 E-mail: Info@ARMI.com

Industrial Analytical (RSA)
<http://www.industrialanalytical.co.za>
 E-mail: info@industrialanalytical.co.za



Accredited CRM Producer: the JRC-IRMM is accredited to ISO Guide 34:2009 for the production of reference materials under the code BELAC 268-RM

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