

RoHS, Restriction of Hazardous Substances, originated with Directive 2002/95/EC of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Directive 2002/95/EC requires European Union Member States to ensure that new electrical and electronic equipment (EEE) put on the market does not contain lead [Pb], mercury [Hg], cadmium [Cd], hexavalent chromium [Cr⁶⁺], polybrominated biphenyls [PBB], or polybrominated diphenyl ethers [PBDE] unless the specific applications of Pb, Hg, Cd & Cr⁶⁺ are exempted. Additionally, the 2002/95/EC Directive necessitates the need for the European Commission to periodically review the impact on the environment and on human health of these six substances and other hazardous substances & materials used in EEE along with the list of exemptions before deciding on the prohibition and the substitution thereof by more environment-friendly alternatives.

Directive 2011/65/EU of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment, known as RoHS Recast or RoHS 2, consolidates the original RoHS directive with its later amendments. This includes, but is not limited to changes to the exemption list, adding restricted substance maximum concentration values tolerated by weight in homogeneous materials, defining procedures, documentation and labeling, etc. EU Directive 2011/65/EU replaces Directive 2002/95/EC as the primary RoHS legislation and extends the rules to products & applications that were not subject to the original directive along with greater consideration of environmentally sound recovery and disposal of waste EEE.

Commission Delegated Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances adds bis(2-ethylhexyl) phthalate [DEHP], butyl benzyl phthalate [BBP], dibutyl phthalate [DBP], and diisobutyl phthalate [DIBP] to the list of restricted substances and maximum concentration values tolerated by weight in homogeneous materials bringing the total number of restricted substances to ten (10).

Restricted Substance	Abbreviation	Maximum concentration in homogeneous materials
Lead	Pb	0.1% by weight (1,000 ppm)
Mercury	Hg	0.1% by weight (1,000 ppm)
Cadmium	Cd	0.01% by weight (100 ppm)
Hexavalent chromium	Cr ⁶⁺	0.1% by weight (1,000 ppm)
Polybrominated biphenyls	PBB	0.1% by weight (1,000 ppm)
Polybrominated diphenyl ethers	PBDE	0.1% by weight (1,000 ppm)
Bis(2-ethylhexyl) phthalate	DEHP	0.1% by weight (1,000 ppm)
Butyl benzyl phthalate	BBP	0.1% by weight (1,000 ppm)
Dibutyl phthalate	DBP	0.1% by weight (1,000 ppm)
Diisobutyl phthalate	DIBP	0.1% by weight (1,000 ppm)

No KOA products use mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers, bis(2-ethylhexyl) phthalate, butyl benzyl phthalate, dibutyl phthalate, or diisobutyl phthalate.

KOA Part #s include a designator for the termination material. Components with lead-free terminations (any designator other than 'L') are RoHS-compliant in all industries, but may include lead [Pb] in exempt applications. Please refer to the following tables for specific compliance details; Annex I for Exemption-Free RoHS-compliance and Annex II for RoHS-compliance with exemption 7(c)-I.

Annex I

The following series are EU RoHS Directive 2015/863 **compliant without exemption** for all industries when specified with any termination designator other than 'L':

AC(X)	J	LR72	PSF4	RN73H	SLW07
BGR	JL	LT	PSG4	RNS	SLW1
BLR	KL73	LT73	PSI	RNX	SLZ1
BPR	KT11835	LT73V	PSJ2	RT(X)	SPR
BSR	LCM	LWA	PSL2	RW	TF
BWR	LF	MF	RB(X)	SDT101	TLR
CC	LFF	MHL	RCS	SDT73	TLRH
CCF	LKS	MLT	RCT	SF	TLRZ
CCP	LP	MO	RCU	SHDR	TPR
CF	LP73	MOS	RCW	SL07	TSL1
CNN	LPC10065	MRP	RD(X)	SL1 (3mΩ to 100mΩ)	UR73
CSR	LPC12065	MRS	RD41	SL2 (3mΩ to 360mΩ)	WF
CW	LPC4045	NPO	RIA	SL3	X5R
CZB	LPC4235	NV73	RM41	SLN2	X7R
CZP	LPC4545	PSB	RN41	SLN3	Y5V
DN(X)	LR	PSE	RN73	SLN5	Z

Annex II

The following series are EU RoHS Directive 2015/863 **compliant with exemption 7(c)-I**, *Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectric devices, or in a glass or ceramic matrix compound*, for all industries when specified with any termination designator other than 'L':

BR	HPC	PCF	RK73B	SA	WK73R
CN	HV73	RCR	RK73G	SDT310	WK73S
CNB	KQ	RF	RK73H	SG73	WU73
CND	LA73	RF25CC	RK73Z	SG73P	XR73B
CNZ	LPC9040	RF26	RK92	SG73S	XR73H
CPCN	NT73	RF73	RKC	SL1 (110mΩ to 22MΩ)	XR73Z
CR	NVD	RK	RKH	SL2 (390mΩ to 22MΩ)	
GS	NVF	RK26	RKL	SR73	



Matthew L. Kervin
KOA Speer Electronics
Engineering Department
Bradford, PA 16701
office: 814-362-5536 x447
email: mkervin@koaspeer.com