

01005 Resistor Material Composition

This statement pertains to the following directive: 2002/95/EC of the European Parliament and of the Council of the European Union of January 27, 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment regarding Article 4 and its subsequent annex on the exemption of lead in glass. No. 5 in the annex states that lead in glass of cathode ray tubes, electronic components and fluorescent tubes are exempt from RoHS requirements. Therefore any lead oxide in glass of any size resistor is exempt and all resistors meet RoHS requirements.

Part Name	Material	% of total Wt.	Substance	Substance Name	Wt %	CAS No.	ppm	Mass (mg)	
CR01005 0.035 mg	Substrate	89.5	Al ₂ O ₃	Aluminium oxide	96.0	1344-28-1	859,200	0.030072	
			SiO ₂	Silicon dioxide	2.0	7631-86-9	17,900	0.000627	
			MgO	Magnesium oxide	2.0	1309-48-4	17,900	0.000627	
	Inner term	1.5	Ag	Silver	82.5	7440-22-4	12,375	0.000433	
			Pd	Palladium	5.0	7440-05-3	750	0.000026	
			SiO ₂	Silicon dioxide	6.0	7631-86-9	900	0.000032	
			Resin	Epoxy Resin	4.0	25068-38-6	600	0.000021	
			Cu ₂ O	Copper oxide	2.45	1317-39-1	368	0.000013	
			Ni	Nickel	0.04	7440-020	6	0.000000	
			Cr	Chromium	0.01	7440-47-3	2	0.000000	
	Res element	1.9	RuO ₂	Ruthenium oxide	20.0	12036-10-1	3,800	0.000133	
			PbO	Lead oxide	20.0	1317-36-8	3,800	0.000133	
			SiO ₂	Silicon dioxide	19.0	7631-86-9	3,610	0.000126	
			B ₂ O ₃	Boron trioxide	2.9	1303-86-2	551	0.000019	
			Ag	Silver	25.0	7440-22-4	4,750	0.000166	
			Pd	Palladium	13.0	7440-05-3	2,470	0.000086	
			Sb ₂ O ₃	Antimony trioxide	0.1	1309-64-4	19	0.000001	
	Glass coating	1.45	SiO ₂	Silicon dioxide	86.0	7631-86-9	12,470	0.000436	
			B ₂ O ₃	Boron trioxide	11.0	1303-86-2	1,595	0.000056	
			BaO	Barium oxide	3.0	1304-28-5	435	0.000015	
	Protective coating	1.45	Resin	Epoxy Resin	49.0	29690-82-2	7,105	0.000249	
			Resin	Epoxy Resin	1.0	25068-38-6	145	0.000005	
			C	Carbon black	10.0	1333-86-4	1,450	0.000051	
			SiO ₂	Silica	40.0	7631-86-9	5,800	0.000203	
	Center term		2	Ni	Nickel	100.0	7440-02-0	20,000	0.000700
	Outer term		2.2	Sn	Tin	100.0	7440-31-5	22,000	0.000770
								1,000,000	0.035000

- Notes:
1. MSL: Level # 1 per IPC/JEDEC J-STD-020C
 2. Max. reflow temperature: 260 C for 10 seconds
 3. Outer termination: Matte Tin with typical grain size of 3 ~ 6 μm