

**Philips Research****Materials Analysis**2005.3045  
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tel.: (+31 4027) 42364  
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The following REED switch products from COTO TECHNOLOGY have been offered for analysis:  
RI-23; RI-27; RI-46; RI-60; RI-70; RI-80; RI-90.

All products have been analysed with reference to the RoHS requirements (Cr(VI), Cd, Hg, Pb, PBB's and PBDE's below predefined levels)

**Analysis methods**

All products consist of a glass body with metal contacts. No plastic parts are present in these products, so no analyses for the presence of PBB's and PBDE's (flame retardants in plastics) are necessary.

The table below shows for every product the amount of glass and metal parts. It also shows which other types of REED switches of COTO TECHNOLOGY are derived from the types that are analysed. Those types have the same construction and "composition" as the analysed types.

REED switch	% (w/w) glass	% (w/w) metal parts	"equivalent" types
RI-23	50.3	49.7	RI-01B; RI-03; RI-06; RI-15; RI-16; RI-20; RI-21; RI-24; RI-25; RI-26;
RI-27	40.8	59.2	RI-01C; RI-05; RI-07; RI-17; RI-29
RI-46	53.3	46.7	RI-08; RI-18; RI-44; RI-45; RI-48
RI-60	34.0	66.0	RI-02 and RI-02SMD versions
RI-70	32.7	67.3	RI-71
RI-80	28.6	71.4	RI-80SMD and modified versions (G1, G2 or J)
RI-90	36.1	63.9	RI-97

For all products the glass and the metal parts have been separated and analysed separately.

The Pb, Cr, Hg and Cd content in the glass has been analysed by using X-ray fluorescence (XRF) after melting the glass to a bead and comparing with glass standards with known amounts of Pb, Cr, Hg and Cd.

The metal parts have been analysed with ICP-AES and ICP-MS (for Pb) after dissolution in acid mixtures, in accordance with method US EPA 3050B, with special precautions for Hg recovery.

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The results are shown in the table below, for the total device and also separately for the glass and metal parts.

REED switches	Pb ppm	Cd ppm	Hg ppm	Cr ppm *)
RI-23 total device	7	1	< 1	26
<i>RI-23 glass</i>	9	< 2	< 2	8
<i>RI-23 metal parts</i>	5	2	< 1	44
RI-27 total device	2	1	< 1	60
<i>RI-27 glass</i>	< 2	< 2	< 2	4
<i>RI-27 metal parts</i>	3	2	< 1	98
RI-46 total device	10	1	< 1	25
<i>RI-46 glass</i>	16	< 2	< 2	7
<i>RI-46 metal parts</i>	4	2	< 1	44
RI-60 total device	2	2	< 1	56
<i>RI-60 glass</i>	< 2	< 2	< 2	11
<i>RI-60 metal parts</i>	4	2	< 1	80
RI-70 total device	9	2	< 1	14
<i>RI-70 glass</i>	20	< 2	< 2	41
<i>RI-70 metal parts</i>	4	2	< 1	2
RI-80 total device	5	2	< 1	3
<i>RI-80 glass</i>	9	< 2	< 2	7
<i>RI-80 metal parts</i>	4	2	< 1	2
RI-90 total device	5	1	< 1	34
<i>RI-90 glass</i>	9	< 2	< 2	7
<i>RI-90 metal parts</i>	2	2	< 1	50
Detection limit for total device	1	1	1	1

\*) Since for all of the devices the total Cr content does not exceed the level of Cr(VI) that is allowed according to the present RoHS regulation, no further analyses have been made for specific Cr(VI).

### Conclusion.

All REED switches analysed meet the present RoHS requirements. Based on the analyses this can also be concluded for the "equivalent" types mentioned in the first table.

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