

## India RoHS and WEEE

The Indian Government has published its proposals for legislation on the disposal of waste electrical and electronic equipment. This includes what is referred to as reduction in the use of hazardous substances. This refers to schedule III which lists 20 individual substances and threshold limits but the intention of this requirement is not clear. For example, the proposals:

- do not say whether these substances are restricted or that manufacturers should attempt to avoid them,
- do not state whether the threshold values refer to the concentrations in the finished product, in homogeneous materials or something else,
- provide no exemptions or any mechanism for requesting exemptions,
- lack clarity about limits. Several of the substances have a range of threshold values in Schedule III. For example, it includes cadmium oxide as “ $\geq 0.1\%$  to 25% depending on risk phrase or perception”

The scope of the proposed legislation is similar to the EU WEEE directive and includes medical devices and monitoring and control instruments. However, EU-RoHS substance restrictions do not apply to medical devices or monitoring and control instruments at present.

The substances in Schedule III are:

Substance	Threshold limit	Uses
Short chain chloro paraffins (SCCP)	$\geq 25\%$	Plasticiser and fire retardant, In cutting oils
Antimony trioxide	$\geq 1\%$	Flame retardant and used to make some types of glass (little evidence of risk)
Beryllium metal	$\geq 1\%$	X-ray transparent windows
Beryllium oxide	$\geq 0.1\%$	Dielectric that is the best thermal conductor, also the most expensive so used only if there are no alternatives
Cadmium	$\geq 0.1\%$	Plating and in some alloys
Cadmium oxide	$\geq 0.1\%$ to 25%	Electric contacts
Cadmium sulphide	$\geq 0.1\%$ to 25%	Photocells, some types of audio opto-coupler and in some types of photovoltaic modules
Chromium VI	$> 0.1\%$ to 0.25%	Passivation coatings and used to make hard chromium plating

Substance	Threshold limit	Uses
Copper beryllium alloys	>0.1% to 3%	Springs, for example used in connectors. This is the most expensive spring alloy so is used only if there are no alternatives
Decabromodiphenyl ether	None	Flame retardant (restricted by EU-RoHS)
Lead	None	Solders, radiation shielding, counterweights
Lead oxide	>0.5% to >=25%	Uncommon in electronics
Liquid crystals	None	Liquid crystal displays
Mercury	>=3% to >=0.25%	Tilt switches, sensors, thermometers, mercury wetted reed relays, thermostats. Largely replaced in the USA and EU.
Mineral wool	>=1% to >=20%	Heat shields, thermal insulation
Octabromodiphenyl ether	>=5%	Flame retardant banned in the EU
Polychlorinated biphenyls	>=0.25%	Should no longer be used due to worldwide ban
PVC	None	Wire insulation, mouldings (not a hazardous substance but emits toxic dioxins and furans if burned in open fires)
Refractory ceramic fibres	>=1% to >=20%	Heat shields, thermal insulation
TBBPA	None	Flame retardant in HIPS, reactive FR in PCB laminate, EU risk assessment concluded that this poses no risk

It is understood that this legislation is being promoted by “Green Groups” such as Greenpeace and a few manufacturers who have “green policies” that already restrict most of the substances in Schedule III. The list of substances contains some surprises. For example it includes deca-BDE and octa-BDE but not penta-BDE. It includes TBBPA, which is not thought to pose a risk, while HBCDD is not listed even though is an EU REACH SVHC. It lists substances which have no alternatives and so reduction in use would not be possible. One of the aims of this legislation is to require all Indian recyclers to register and be authorised. This is intended to eliminate the dangerous backyard recycling that is still carried out in India and to ensure that all Indian WEEE is recycled safely. This would eliminate the need to restrict

organohalogens such PVC and TBBPA as these substances can be recycled safely by modern recycling processes.

The proposals would require manufacturers and importers to supply only “RoHS-compliant” products (whatever this means) and to provide written documentation with regard to compliance and to include details on these substances in the product information booklet. These requirements would enter force three years after adoption of this legislation.

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