



इलेक्ट्रॉनिकी एवं  
सूचना प्रौद्योगिकी मंत्रालय  
MINISTRY OF  
ELECTRONICS AND  
INFORMATION TECHNOLOGY



## Testing facility for RoHS compliance (Government owned laboratory)

An NABL Accredited Laboratory as per ISO 17025:2017



**E-waste (Management)  
Rules 2022 effective in India  
from 1<sup>st</sup> April, 2023**

**Centre for Materials for Electronics Technology (C-MET)**

(R&D laboratory, Ministry of Electronics and Information Technology (MeitY), Govt. of India)

Website: [www.rohs-cmet.in](http://www.rohs-cmet.in)

## 1. Restriction of Hazardous Substances (RoHS)

Recognizing the toxicity of all hazardous substances and to safeguard the environment, the European Union (EU) has formulated RoHS Directive (2002/95/EC) in the year 2003, which imposes a ban on the use of certain hazardous substances in electronic and electrical equipment. The EU implemented its directive from July 2006. In recent years, many countries have introduced RoHS regulations to minimize human exposure to toxic substances from Waste Electronic and Electrical Equipment (WEEE). China, Japan, South Korea and the California State in the United States have introduced similar regulations. Other economies, notably Australia and Taiwan, are also implementing their own RoHS-like laws. In this context, it is worthwhile to mention that the Ministry of Environment, Forest & Climate Change (MoEF&CC), Govt of India has recently notified E-Waste (Management), Rules 2022. From April 01, 2023 onwards the Central Pollution Control Board (CPCB) and State Pollution Control Board (SPCB) would randomly check the products in the market, once they found they are not RoHS compliant, the producer must recall all these products back, as a result the producer/stockiest/manufacture may lose lakhs/crores of rupees depending upon the quantity they are dealing and also levied for huge penalties including imprisonment.

*If you are an exporter, or part of the EEE supply chain, your products will have to comply with RoHS regulations. Otherwise the firm will be eligible for penalty as per E-Waste, Management Rules 2022, chapter-VII. The challenge is to analyze various materials/ products/ gadgets/ systems and certify as per the requirements of RoHS Directive.*


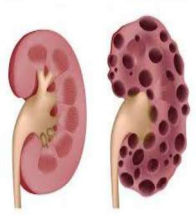



## 2. RoHS limits

Restricted Substance	Abbreviation	Maximum Concentration
		In homogeneous materials
Lead	Pb	0.1 % by Weight ( 1000 ppm)
Mercury	Hg	0.1 % by Weight ( 1000 ppm)
Cadmium	Cd	0.01 % by Weight ( 100 ppm)
Hexavalent Chromium	Cr (VI)	0.1 % by Weight ( 1000 ppm)
Polybrominated Biphenyls	PBB	0.1 % by Weight ( 1000 ppm)
Polybrominated Diphenyl Ethers	PBDE	0.1 % by Weight ( 1000 ppm)
Bis(2-Ethylhexyl) phthalate	DEHP	0.1 % by Weight ( 1000 ppm)
Benzyl butyl phthalate	BBP	0.1 % by Weight ( 1000 ppm)
Dibutyl phthalate	DBP	0.1 % by Weight ( 1000 ppm)
Diisobutyl phthalate	DIBP	0.1 % by Weight ( 1000 ppm)

## 3. Impact

India is grappling with a rapidly growing e-waste problem, ranking as the third-largest generator of e-waste globally. E-waste generation has surged by 72.54% in the last five years, reaching 1.751 million metric tonnes in 2023-24. A significant portion of this waste, estimated at 57%, remains untreated annually, highlighting a substantial gap in effective e-waste management. Every year tonnes of toxic/ hazardous substances are being let into environment by unsafe recovery/recycle practices resulting in the explosion of many deadly diseases and thereby threatening the human existence. Therefore, it has become a major global concern. One way to control this e-waste generation is to control the fresh substances and products entering in to the market containing tolerable toxic substances by implementing an effective RoHS Directive.

### Diseases due to poisoning of Hazardous Substances

Hg	Cd	Cr <sup>6+</sup>	Pb	PBB & PBDE
				
Itai-itai Diseases	kidney Disorder	Bronchial Infection	Limb Paralysis	Thyroxine Disturbance

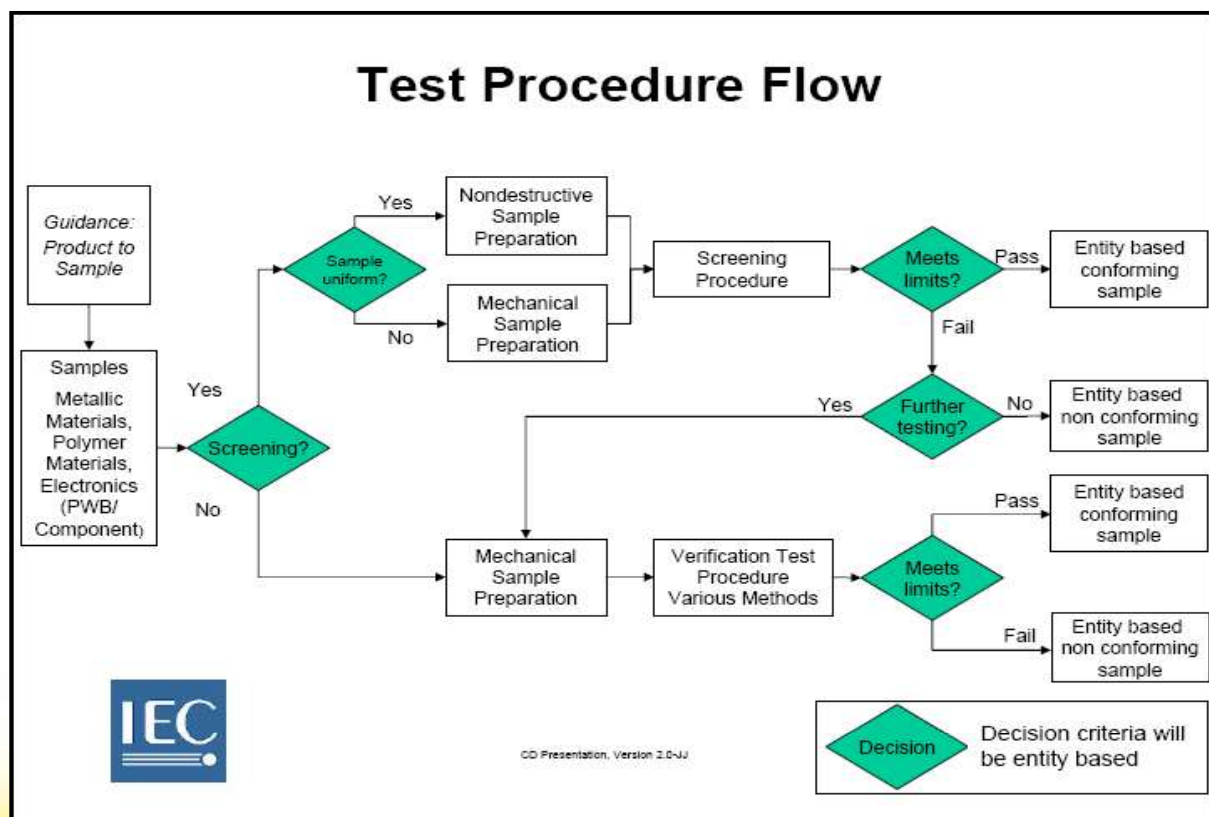


#### 4. About C-MET

Centre for Materials for Electronics Technology (C-MET) is a premier electronic materials research and development laboratory in the country, established under Ministry of Electronics & Information Technology (MeitY), Government of India. C-MET, Hyderabad laboratory has established a state of the art chemical testing facility for the analysis of electronic and related samples to help the industries and developed a mechanism to identify and quantify the substances banned under **Restriction of Hazardous Substances (RoHS), Directive**. This is the only RoHS testing facility in India established with Government of India financial support.

C-MET possesses one of the best human resources in testing of trace impurities in samples of different origin. C-MET has developed requisite Infrastructure, state of the art characterization facility and Standard Operating Procedures (SOPs) as per IEC 62321 standard. RoHS analysis of variety of samples are being carried out using Energy Dispersive X-ray Fluorescence Spectrometer (EDXRF), Atomic Absorption Spectrometer (AAS) with hydride generator, Inductively Coupled Plasma Mass Spectrometer (ICPMS), Gas Chromatography Mass Spectrometer (GCMS), Ion-Chromatograph (IC), UV-Visible Spectrophotometer (UV-Visible), etc. This RoHS test facility is accredited as per ISO 17025:2017 standard by National Accreditation Board for Testing & Calibration Laboratories (NABL), Government of India, with certificate No: TC-7463 in the field of chemical analysis of electronic materials (polymers, metals, etc.).

#### 5. Test procedures



**Fig : RoHS flow chart for non-destructive, mechanical sample preparation and verification test procedure by various methods.**

## 6. Test charges:

C-MET undertakes the quality RoHS analysis with minimum testing charges and time frame to help the Micro, Small and Medium Scale Entrepreneurs (MSMEs). Presently the testing charges for metallic samples, Rs. 3000/- and plastic samples are Rs.4000/- for the analyses of Pb, Cd, Cr<sup>+6</sup>, Hg, PBB, PBDE, DEHP, BBP, DIBP & DBP using Quality Assurance (QA) procedures implemented by well qualified and trained chemists, following ISO/IEC procedures with progressive research outlook is our main advantage. Depending upon the no of samples the discounts offered are as follows:

Sample quantity	Charges	
	Metallic samples	Plastic samples
Up to 25 samples	Rs. 3000 + GST(18%)(per sample)	Rs. 4000 + GST (18%)(per sample)
25-50	20 % discount (on total cost)	20 % discount (on total cost)
50-100	30 % discount (on total cost)	30 % discount (on total cost)
100 - above	40 % discount (on total cost)	40 % discount (on total cost)

## Characterization Equipment



Fig : EDXRF (NEX DEVS)



Fig : ICP-OES (Avio220 Max)



Fig : GC-MS (7010D)



Fig : IC (850 Professional IC)



Fig : UV-Visible (UV-2450)



Fig : MDS (Anton Paar)



RoHS Testing Facility at C-MET, Hyderabad

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