



ASSOCIATION CONNECTING  
ELECTRONICS INDUSTRIES®

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# **Material Declaration Handbook**

This handbook has been developed by the Materials Declaration Handbook Task Group (4-34a) of the Materials Identification Subcommittee (4-34) of IPC to aid Printed Circuit Board manufacturers and users of Printed Circuit Boards in completing Material Declarations that follow the format and guidance of the Joint Industry Material Composition Declaration Guide.

Users of this publication are encouraged to participate in the development of future revisions.

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# Material Declaration Handbook

## 1 SCOPE

This handbook has been developed to aid Printed Circuit Board manufacturers and users of Printed Circuit Boards in completing Material Declarations that follow the format and guidance of the Joint Industry Material Composition Declaration Guide for Electronic Products.

**1.1 Purpose** This handbook's purpose is to demonstrate methods for calculating the information required for a Material Declaration. The data and calculations provided are intended as examples. They might or might not apply directly to your product. You will have to research your raw materials and processes to determine the exact parameters that go into the calculations provided.

**1.2 Introduction** Due to various regulations around the world, it has become increasingly important for electronics manufacturers to know the composition of their products. Electronic manufacturers have begun asking their suppliers for "material declarations (MDs)" that tell them the concentrations and locations of various substances in their products. The supply chain for many electronic products contains a wide range of organizational sizes - from global Original Equipment Manufacturers (OEMs) to small (<10 employees) companies that make a limited range of products. The information and abilities required to accurately complete a material declaration may exceed the capabilities of these smaller organizations.

In order to adequately perform a material declaration that is useful for a customer, suppliers must know:

- What substances should be included in the material declarations.
- What format should be used to inform customers about the substances.
- Where are the substances likely to be located in electronic products. If a supplier does not know if or where any substances may be in the part, how do they find out. If they have to send a sample to an analytical laboratory, what tests should be run.

To aid electronic manufacturers in meeting legal and regulatory requirements, accurate data and calculations must be used to generate MDs. Also, the information in MDs should be easily portable up and down the supply chains. To the extent possible, MDs should be standardized on the format and substance list of the Joint Industry Material Composition Declaration Guide for Electronic Products.

**1.3 Definitions, Acronyms, and Abbreviations** The following definitions are used in this handbook:

- **BIPM** – International Bureau of Weights and Measures
- **Chemical Abstract Services (CAS) Numbers** – a unique numeric identifier for chemical compounds and elements
- **FR-4** – a general grade printed circuit board laminate material composed of woven fiberglass fabric saturated with epoxy resin
- **HASL** – abbreviation for Hot Air Solder Levelling – which is the process of putting solder on a printed circuit board and levelling it with hot air
- **Immersion Silver** – abbreviated as Imm. Ag – the process of applying silver as a surface finish on a printed circuit board
- **Immersion Tin** – abbreviated as Imm. Sn – the process of applying tin as a surface finish on a printed circuit board
- **ISO – International Organization for Standardization**
- **Material** – a material is made up of one or more substances (e.g., copper alloy is a material, which in turn is made up of a number of defined substances, copper, nickel, silver, etc.) – (Joint Industry Material Composition Declaration Guide for Electronic Products)
- **MD** – abbreviation for Material Declaration – a document that lists the composition of an electronic product
- **Measurand** – the quantity of interest, such as the mass of copper in a printed circuit board which may be calculated from other quantities (e.g., plated area, etched area, thickness and density of copper, etc.)
- **OSP** – abbreviation for Organic Solderability Preservative – an organic coating applied as a surface finish to a printed circuit board that prevents oxidation of the copper on the surface of the printed circuit board
- **PCB** – abbreviation for Printed Circuit Board
- **Substances** – Substances are chemical elements and their compounds. Chemical Abstract Services (CAS) numbers are provided for these substances where known. – (Joint Industry Material Composition Declaration Guide for Electronic Products)

## 2 WHAT TO DO WHEN YOU RECEIVE A MATERIALS DECLARATION REQUEST FROM A CUSTOMER

This section assumes that your facility has received a request for a Material Declaration (MD) and gives some guidelines on the process that you should go through to adequately address the MD request.

There are several steps in completing an MD:

- Review and assess request
- Secure product expert(s) support
- Gather necessary data