

List of Prohibited Substances' Controlled Values

NOTE: The regulated values guaranteed in the components supplied to the Panasonic Group and in the products shipped by the Panasonic Group are listed in Table 1 of the "Chemical Substances Management Rank Guidelines"

(1) Controlled Value of Impurities

The controlled values of the Level 1 Prohibited Substances are equivalent to concentrations that would not normally be exceeded without intentional uses, and used for controlled purposes in the Panasonic Group.

In the event the concentration of a prohibited substance contained as an impurity exceeds the controlled value, the supplier is required to re-analyze the substance, clarify the reason for contamination, and reduce the concentration to a level below the controlled value (Controlled value is not intended for requesting the Non-use Warranty from the supplier).

Some division companies and affiliated companies of the Panasonic Group may set their own values according to the division/affiliated company's circumstance such as requests by the customer. The analysis method should comply with the "Analysis Method of Level 1 Prohibited Substances."

Table 1 Controlled values of impurities

Prohibited substance	Applicable part/material	Controlled value (Concentration that will be deemed not to exceed without intentional use or contamination)
Cadmium	<ul style="list-style-type: none"> Resin (incl. Rubber, film) Coatings, inks, pigments, dyes 	Less than 20 ppm ^{*1} (High-precision analysis method ^{*2}) (in state with no volatile elements)
	Lead-free solder <ul style="list-style-type: none"> Bar solder Wire solder Resin flux cored solder Solder paste Solder ball 	Less than 20 ppm (High-precision analysis method ^{*2})
	<ul style="list-style-type: none"> Soldered sections of purchased PC boards Component solder 	
	Metal materials other than lead-free solder	Less than 75 ppm (High-precision analysis method ^{*2})
Lead	<ul style="list-style-type: none"> Resin (incl. rubber, film) Coatings, inks, pigments, dyes 	Less than 100 ppm ^{*1} (High-precision analysis method ^{*2}) (with no volatile elements)
	Lead-free solder <ul style="list-style-type: none"> Bar solder Wire solder Resin flux cored solder Solder paste Solder ball 	Less than 500 ppm (High-precision analysis method ^{*2})
	<ul style="list-style-type: none"> Soldered sections of purchased PC boards Component solder 	Less than 800 ppm (High-precision analysis method ^{*2})
	Metal materials other than lead-free solder	Less than 500 ppm ^{*3} (High-precision analysis method ^{*2})
	Glass (limited to uses in lamps)	Less than 500 ppm (High-precision analysis method ^{*2})
Hexavalent Chromium	Chromate treatment parts/materials (base-layer zinc plating)	Less than 100 ppm ^{*7} (Simple analysis method ^{*6}) ^{*5}

	Surface treatment materials* ⁸ other than base-layer zinc plating	Less than 0.2µg/cm ² * ⁷ (Simple analysis method* ⁶)
	Surface treatment materials other than the above* ⁹ (excluding resins)	Less than 100ppm* ⁷ (Simple analysis method* ⁶)
PBB PBDE	Resin (incl. Rubber, film)	Less than 100 ppm (High-precision analysis method* ²)
Lead, mercury, cadmium, hexavalent chromium	Packaging material For each homogenous material comprising packaging (for example, resin, ink, paint)	Less than 100 ppm (High-precision analysis method* ²) of total quadruple heavy metals
With respect to the "Applicable part/material" or "Prohibited substance" not specifically listed in the table above, the lower limit concentration* ⁴ quantitatively measured by the corresponding high-precision analysis method is to be used as the interim controlled value.		

*1: Does not apply to packaging material.

*2: A controlled method other than the high-precision analysis method may be used for daily control purposes when such method is confirmed to correlate with the high-precision method. (Ex. Symple analysis method, which has been confirmed as correlating with the high-precision analysis)

*3: Because the lead (Ex. lead 0.35wt% or less as iron alloy), which is exempted from application by the RoHS Directive, is applicable as an alloy content, the Directive is not applied to the lead as an impurity.

*4: The value is determined by the sample quantity, analysis sensitivity of the analyzer (detection lower limit), etc. used by generally practiced high-precision analysis, or the detectable lower limit concentration of the target substance per unit sample quantity.

*5: Hexavalent chromium concentration based on zinc plating mass in the denominator

*6: Hot water-extracted diphenylcarbazide absorption method (Panasonic's independently defined method)

*7: In the judgment method (excluding the spot-test method) for hexavalent chromium listed in IEC62321, when the concentration of hexavalent chromium in the specified extraction solution is less than 0.02mg/L, the concentration is assumed to be less than the controlled value of hexavalent chromium used by the Panasonic Group.

*8: When the surface treatment mass cannot be calculated (for example, chromate processing and metal chrome plating on aluminum materials)

*9: When the base layer is something other than zinc plating and the surface treatment mass can be calculated

(2) Controlled Value of Lead in Electroless Nickel Plating

Lead is intentionally used in electroless nickel plating, but its rank as a prohibited substance is suspended at the moment only by maintaining the lead concentration in electroless nickel plating to less than 800 ppm.

Refer to the "Analysis Method of Level 1 Prohibited Substances" for details of the analysis method.

Table 2 Controlled value

Prohibited substance	Applicable part/material	Controlled value
Lead	Electroless nickel plating	Less than 800 ppm (High-precision analysis method)

(3) Controlled Value of Lead Concentration of impurities in the Lead-free Solder used in a Flow-solder Bath in our Company and at a Partner Company.

In a company or partner company production process, the lead concentration of lead-free solder used in a flow-solder bath should be kept below the controlled value in Table 3.

Table 3 Controlled value*¹ of lead concentration
in lead-free solder in a flow-solder bath

Prohibited substance	Applicable part/material	Controlled value
Lead	Lead-free solder in a flow-solder bath	Less than 800 ppm (Simple analysis method* ²)

*1: This controlled value applies to internal production processes and does not specify the controlled value in the production process at a supplier.

*2: The simple analysis method should comply with the "Simple Analysis Method of Lead-Free Solder in a Flow-solder Bath" (internal document).

Revision History

Revised Date	Location	Revised Content
May 15, 2008	(1) Controlled Value of Impurities	<ul style="list-style-type: none"> - Reviewed the description "Deleted "a supplier" from the phrase, "used for controlled purposes in the Matsushita Group and a supplier" - Added a phrase "(Controlled value is not intended for requesting the Non-use Warranty from the supplier)"
May 15, 2008	Table 1 Controlled value of lead in lead-free solder contained in "Soldered sections of purchased PC boards, Component solder"	1000 ppm → 800 ppm (The value has been revised based on the current level of contained lead impurities)