

IPC J-STD-006B
Amendment 1
June 2008

JOINT INDUSTRY STANDARD

Requirements for
Electronic Grade
Solder Alloys
and Fluxed and
Non-Fluxed Solid
Solders for Electronic
Soldering Applications

Amendment 1



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Standards Should:

- Show relationship to Design for Manufacturability (DFM) and Design for the Environment (DFE)
- Minimize time to market
- Contain simple (simplified) language
- Just include spec information
- Focus on end product performance
- Include a feedback system on use and problems for future improvement

Standards Should Not:

- Inhibit innovation
- Increase time-to-market
- Keep people out
- Increase cycle time
- Tell you how to make something
- Contain anything that cannot be defended with data

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Requirements for Electronic Grade Solder Alloys and Fluxed and Non-Fluxed Solid Solders for Electronic Soldering Applications

1.1 Scope

Replace all of this section with the following:

This standard prescribes the nomenclature, requirements and test methods for electronic grade solder alloys; for fluxed and non-fluxed bar, ribbon, and powder solders, for electronic soldering applications; and for “special” electronic grade solders. This is a quality control standard and is not intended to relate directly to the material’s performance in the manufacturing process. Solders for applications other than electronics should be procured using ASTM B-32. This standard is one of a set of three joint industry standards that prescribe the requirements and test methods for soldering materials for use in the electronics industry. The other two joint industry standards are:

IPC/EIA J-STD-004 Requirements for Soldering Fluxes

IPC/EIA J-STD-005 Requirements for Soldering Pastes

Additionally, marking requirements for lead-free materials and assemblies is addressed in this document by direct application of text from IPC/JEDEC J-STD-609, *Lead-Free and Leaded Marking, Symbols and Labels* (see 6.5).

2.1 Joint Industry Standards¹

Replace all of this section with the following:

IPC/EIA J-STD-004 Requirements for Soldering Fluxes

IPC/EIA J-STD-005 Requirements for Soldering Pastes

IPC/JEDEC J-STD-609 Lead-Free and Leaded Marking, Symbols and Labels

3.3 Alloy Impurities

Replace all of this section with the following:

Elements not listed as components that make up the composition of an alloy are considered impurities for that alloy. An alloy variation designator **shall** be used to specify the allowable impurity level of a solder product being offered, in the case of a manufacturer; or the allowable impurity level of a solder product required, in the case of a user. The alloy variation designator will be added to the end of the

alloy name and become part of the name (see 6.3). **NOTE:** Alloys for barrier-free die attachment applications have a different alloy impurity requirement (see 3.3.1). Unless otherwise specified, the percentage by mass of impurity elements in alloys **shall not** exceed the following values. The percentage by mass of impurity elements in variation D alloys **shall** conform to the requirements in 3.3.1.

Ag: 0.10	Cd: 0.002	Pb: 0.07
Al: 0.005	Cu: 0.08	Sn: 0.25
As: 0.03	Fe: 0.02	Zn: 0.003
Au: 0.05	In: 0.10	Sb: 0.20
Bi: 0.10	Ni: 0.01	

6 NOTES

Add the following as a new, last section:

6.5 Labeling for Lead-Free and Leaded Marking, Symbols and Labels

In response to changes in the electronic assembly industry, more assemblies are being assembled with lead-free materials. IPC/JEDEC J-STD-609, *Lead-Free and Leaded Marking, Symbols and Labels* addresses this issue. In addition to the IPC/JEDEC J-STD-609 requirements, solder material manufacturers have designated lead-free products by using a number of labeling/formatting options. Examples include triangular shaped bars for bar solder, green plastic containers for solder paste products as well as other labeling practices including the use of the lead-free symbol that is recommended in the IPC/JEDEC J-STD-609 document (see Figure 6-1). Because specific designations are not called out by this standard, solder manufacturers should mark lead-free products so as to differentiate them from lead-containing solder products.



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Figure 6-1 Recommended Lead Free Marking Symbol

Appendix B-1 Test Report for Solder Alloy Composition and Impurity Level

Note the replacement of three separate element rows (1st, 11th and 12th, below):

Element	Required Percentages		Percentage in Sample	Results	Remarks
	As a Component Element	As an Impurity Element			
<i>Replace the first row (AG) as follows:</i>					
Ag		0.10 Max		<input type="checkbox"/> Pass <input type="checkbox"/> Fail	
<i>Replace the eleventh row (Pb) as follows:</i>					
Pb ¹		0.07 Max		<input type="checkbox"/> Pass <input type="checkbox"/> Fail	
<i>Replace the twelfth row (Sb) as follows:</i>					
Sb ²		0.20 Max		<input type="checkbox"/> Pass <input type="checkbox"/> Fail	