



ASSOCIATION CONNECTING
ELECTRONICS INDUSTRIES®

IPC J-STD-001D

Requirements for Soldered Electrical and Electronic Assemblies

A joint standard developed by the National Standard for Soldering Task Group (5-22a), and the Soldering Subcommittee (5-22) of the Assembly and Joining Processes Committee (5-20) of IPC

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

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Table of Contents

1 GENERAL	1	3 MATERIALS, COMPONENTS AND EQUIPMENT REQUIREMENTS	5
1.1 Scope	1	3.1 Materials	5
1.2 Purpose	1	3.2 Solder	5
1.3 Classification	1	3.2.1 Solder - Lead Free	5
1.4 Measurement Units and Applications	1	3.2.2 Solder Purity Maintenance	5
1.4.1 Verification of Dimensions	1	3.3 Flux	6
1.5 Definition of Requirements	1	3.3.1 Flux Application	6
1.5.1 Hardware Defects and Process Indicators	2	3.4 Solder Paste	6
1.5.2 Material and Process Nonconformance	2	3.5 Solder Preforms	6
1.6 General Requirements	2	3.6 Adhesives	6
1.7 Order of Precedence	2	3.7 Chemical Strippers	6
1.7.1 Conflict	2	3.8 Heat Shrinkable Soldering Devices	6
1.7.2 Clause References	2	3.9 Components	6
1.7.3 Appendices	2	3.9.1 Solderability	6
1.8 Terms and Definitions	2	3.9.2 Solderability Maintenance	6
1.8.1 Defect	2	3.9.3 Gold Removal	6
1.8.2 Disposition	2	3.9.4 Rework of Nonsolderable Parts	7
1.8.3 Electrical Clearance	2	3.9.5 Component and Seal Damage	7
1.8.4 High Voltage	3	3.9.6 Component Damage	7
1.8.5 Manufacturer (Assembler)	3	3.9.7 Coating Meniscus	7
1.8.6 Objective Evidence	3	3.10 Presoldering Cleanliness Requirements	7
1.8.7 Process Control	3	3.11 Soldering Tools and Equipment	7
1.8.8 Process Indicator	3	4 GENERAL SOLDERING AND ASSEMBLY REQUIREMENTS	7
1.8.9 Proficiency	3	4.1 Electrostatic Discharge (ESD)	7
1.8.10 Solder Destination Side	3	4.2 Facilities	7
1.8.11 Solder Source Side	3	4.2.1 Environmental Controls	7
1.8.12 Supplier	3	4.2.2 Temperature and Humidity	7
1.8.13 User	3	4.2.3 Lighting	7
1.9 Requirements Flowdown	3	4.2.4 Field Assembly Operations	7
1.10 Personnel Proficiency	3	4.3 General Part Mounting Requirements	7
1.11 Acceptance Requirements	3	4.4 Hole Obstruction	8
1.12 General Assembly Requirements	3	4.5 Metal-Cased Component Isolation	8
1.13 Miscellaneous Requirements	3	4.6 Adhesive Coverage Limits	8
1.13.1 Health and Safety	3	4.7 Mounting of Parts on Parts (Stacking of Components)	8
1.13.2 Procedures for Specialized Technologies	3	4.8 Connectors and Contact Areas	8
2 APPLICABLE DOCUMENTS	4	4.9 Handling of Parts	8
2.1 EIA	4	4.9.1 Preheating	8
2.2 IPC	4	4.9.2 Controlled Cooling	8
2.3 Joint Industry Standards	5	4.9.3 Drying/Degassing	8
2.4 ASTM	5	4.9.4 Holding Devices and Materials	8
2.5 Electrostatic Discharge Association	5		

4.10	Heat Sinks	9	6.3	Supported Holes	17
4.11	Machine (Nonreflow) Soldering	9	6.3.1	Solder Application	17
4.11.1	Machine Controls	9	6.3.2	Through-Hole Component Lead Soldering	17
4.11.2	Solder Bath	9	7 SURFACE MOUNTING OF COMPONENTS	18	
4.12	Reflow Soldering	9	7.1	Surface Mount Device Lead Forming	18
4.13	Intrusive Soldering (Paste-in-Hole)	9	7.1.1	Lead Deformation Limits	19
4.14	Solder Connection	9	7.1.2	Flat Pack Parallelism	19
4.14.1	Exposed Basis Metal	10	7.1.3	Surface Mount Device Lead Bends	19
4.14.2	Exposed Surface Finishes	10	7.1.4	Flattened Leads	19
4.14.3	Solder Connection Defects	10	7.1.5	Dual-in-Line Packages (DIPs)	19
4.14.4	Partially Visible or Hidden Solder Connections	10	7.1.6	Parts Not Configured for Surface Mounting ...	19
5 WIRES AND TERMINAL CONNECTIONS	10		7.2	Devices with Externally Deposited Elements .	19
5.1	Wire and Cable Preparation	10	7.3	Leaded Component Body Clearing	19
5.1.1	Tinning of Stranded Wire	10	7.3.1	Axial-Leaded Components	19
5.2	Solder Terminals	11	7.4	Parts Configured for Butt Lead Mounting	19
5.3	Bifurcated, Turret and Slotted Terminal Installation	11	7.5	Hold Down of Surface Mount Leads	19
5.3.1	Shank Damage	11	7.6	Soldering Requirements	20
5.3.2	Flange Damage	11	7.6.1	Misaligned Components	20
5.3.3	Flared Flange Angles	11	7.6.2	Unspecified and Special Requirements	20
5.3.4	Terminal Mounting - Mechanical	11	7.6.3	Bottom Only Terminations	21
5.3.5	Terminal Mounting - Electrical	12	7.6.4	Chip Components - Rectangular or Square End Components - 1, 3 or 5 Side Termination	22
5.3.6	Terminal Soldering	12	7.6.5	Cylindrical End Cap (MELF) Terminations ...	23
5.4	Mounting to Terminals	12	7.6.6	Castellated Terminations	24
5.4.1	General Requirements	12	7.6.7	Flat, Ribbon, "L," and Gull Wing Leads	25
5.4.2	Bifurcated and Turret Terminals	14	7.6.8	Round or Flattened (Coined) Leads	26
5.4.3	Slotted Terminals	15	7.6.9	"J" Leads	27
5.4.4	Hook Terminals	15	7.6.10	Butt Connections (Not Permitted for Class 3 Products)	28
5.4.5	Pierced or Perforated Terminals	15	7.6.11	Flat Lug Leads	29
5.4.6	Cup and Hollow Cylindrical Terminals	15	7.6.12	Tall Profile Components Having Bottom Only Terminations	30
5.5	Soldering to Terminals	15	7.6.13	Inward Formed L-Shaped Ribbon Leads	31
5.5.1	Turret and Straight Pin Terminals	15	7.6.14	Surface Mount Area Array Packages	32
5.5.2	Cup and Hollow Cylindrical Terminals	16	7.6.15	Quad Flat Pack (No Leads) (QFNL)	33
6 THROUGH-HOLE MOUNTING AND TERMINATIONS	16		7.6.16	Components with Bottom Thermal Plane Terminations	34
6.1	Through-Hole Terminations - General	16	8 CLEANING PROCESS REQUIREMENTS	35	
6.1.1	Lead Forming	16	8.1	Cleanliness Exemptions	35
6.1.2	Lead Deformation Limits	16	8.2	Ultrasonic Cleaning	35
6.1.3	Lead Termination Requirements	16	8.3	Post-Solder Cleanliness	35
6.1.4	Lead Trimming	17	8.3.1	Particulate Matter	35
6.1.5	Interfacial Connections	17	8.3.2	Flux Residues and Other Ionic or Organic Contaminants	35
6.1.6	Coating Meniscus In Solder	17	8.3.3	Post-Soldering Cleanliness Designator	35
6.2	Unsupported Holes	17	8.3.4	Cleaning Option	35
6.2.1	Lead Termination Requirements for Unsupported Holes	17			

8.3.5	Test for Cleanliness	35	APPENDIX B	Guidelines for Soldering Tools and Equipment	43
8.3.6	Testing	35	APPENDIX C	Material and Process Compatibility Testing	45
9	PCB REQUIREMENTS	36	APPENDIX D	Minimum Electrical Clearance - Electrical Conductor Spacing	47
9.1	Printed Circuit Board Damage	36	APPENDIX E	Visual Comparisons of SnPb and Lead Free Solder Connections	49
9.1.1	Blistering/Delamination	36			
9.1.2	Weave Exposure	36			
9.1.3	Haloing	36			
9.1.4	Land Separation	36			
9.1.5	Land/Conductor Reduction in Size	37			
9.1.6	Flexible Circuitry Delamination	37			
9.1.7	Flexible Circuitry Damage	37			
9.1.8	Burns	37			
9.1.9	Solder on Gold Contacts	37			
9.1.10	Measles	37			
9.2	Marking	37			
9.3	Bow and Twist (Warpage)	37			
10	COATING AND ENCAPSULATION	37			
10.1	Conformal Coating	37			
10.1.1	Application	37			
10.1.2	Performance Requirements	38			
10.1.3	Conformal Coating Inspection	38			
10.2	Encapsulation	38			
10.2.1	Application	38			
10.2.2	Performance Requirements	38			
10.2.3	Rework of Encapsulant Material	38			
10.2.4	Encapsulant Inspection	38			
11	PRODUCT ASSURANCE	39			
11.1	Hardware Defects Requiring Disposition	39			
11.2	Inspection Methodology	39			
11.2.1	Process Verification Inspection	39			
11.2.2	Visual Inspection	39			
11.2.3	Sampling Inspection	39			
11.3	Process Control Requirements	39			
11.3.1	Opportunities Determination	40			
11.4	Statistical Process Control	40			
12	REWORK AND REPAIR	40			
12.1	Rework of Unsatisfactory Solder Connections	40			
12.2	Repair	40			
12.3	Post Rework/Repair Cleaning	40			
12.4	Rework of Conformal Coating/Encapsulant	40			
APPENDIX A	Summary of Criteria Requiring Disposition to Nonconforming Conditions	41			
				Figures	
			Figure 4-1	Hole Obstruction	8
			Figure 4-2	Acceptable Wetting Angles	10
			Figure 5-1	Flange Damage	11
			Figure 5-2	Flare Angles	11
			Figure 5-3	Terminal Mounting - Mechanical	11
			Figure 5-4	Terminal Mounting - Electrical	12
			Figure 5-5	Insulation Clearance Measurement	12
			Figure 5-6	Service Loop for Lead Wiring	13
			Figure 5-7	Stress Relief Examples	13
			Figure 5-8	Continuous Runs	13
			Figure 5-9	Wire and Lead Wrap Around	14
			Figure 5-10	Side Route Connections and Wrap on Bifurcated Terminal	14
			Figure 5-11	Top and Bottom Route Terminal Connection	15
			Figure 5-12	Hook Terminal Connections	15
			Figure 5-13	Pierced or Perforated Terminal Wire Wrap	15
			Figure 6-1	Lead Bends	16
			Figure 6-2	Vertical Fill Example	18
			Figure 7-1	Surface Mount Device Lead Forming	18
			Figure 7-2	Surface Mount Device Lead Forming	18
			Figure 7-3	Bottom Only Terminations	21
			Figure 7-4	Rectangular or Square End Components	22
			Figure 7-5	MELF Terminations	23
			Figure 7-6	Castellated Terminations	24
			Figure 7-7	Flat, Ribbon, "L," and Gull Wing Leads	25
			Figure 7-8	Round or Flattened (Coined) Leads	26
			Figure 7-9	"J" Leads	27
			Figure 7-10	Butt Joint	28
			Figure 7-11	Flat Lug Leads	29
			Figure 7-12	Tall Profile Components Having Bottom Only Terminations	30
			Figure 7-13	Inward Formed L-Shaped Ribbon Lead	31
			Figure 7-14	BGA Solder Ball Spacing	32
			Figure 7-15	PQFN	33
			Figure 7-16	Component with Bottom Thermal Plane	34
			Figure E-1	SnPb Solder; No Clean Process	49
			Figure E-2	SnAgCu Solder; No Clean Process	49

Figure E-3	SnPb Solder; Water Soluble Flux	49	Table 6-3	Protrusion of Leads in Supported Holes	17
Figure E-4	SnAgCu Solder; Water Soluble Flux	49	Table 6-4	Unsupported Holes with Component Leads, Minimum Acceptable Conditions	17
Figure E-5	SnPb Solder; Water Soluble Flux	49	Table 6-5	Supported Holes with Component Leads, Minimum Acceptable Conditions	18
Figure E-6	SnAgCu Solder; Water Soluble Flux	49	Table 7-1	SMT Lead Forming Minimum Lead Length	19
Figure E-7	SnAgCu Solder; No Clean Process, N2 Reflow	50	Table 7-2	Surface Mount Components	20
Figure E-8	SnAgCu Solder, No Clean Process; Air Reflow	50	Table 7-3	Dimensional Criteria - Bottom Only Terminations	21
Figure E-9	SnPb Solder; No Clean Process	50	Table 7-4	Dimensional Criteria - Chip Components - Rectangular or Square End Components - 1, 3 or 5 Side Termination	22
Figure E-10	SnAgCu Solder; No Clean Process	50	Table 7-5	Dimensional Criteria - Cylindrical End Cap (MELF) Terminations	23
Figure E-11	SnPb Solder; No Clean Process	50	Table 7-6	Dimensional Criteria - Castellated Terminations	24
Figure E-12	SnAgCu Solder; No Clean Process	50	Table 7-7	Dimensional Criteria - Flat, Ribbon, "L," and Gull Wing Leads	25
Figure E-13	SnPb Solder	51	Table 7-8	Dimensional Criteria - Round or Flattened (Coined) Leads	26
Figure E-14	SnAgCu Solder	51	Table 7-9	Dimensional Criteria - "J" Leads	27
Figure E-15	SnPb Solder	51	Table 7-10	Dimensional Criteria - Butt/I Connections (Not Applicable to Class 3)	28
Figure E-16	SnAgCu Solder	51	Table 7-11	Dimensional Criteria - Flat Lug Leads	29
Figure E-17	SnPb Solder; OSP Finish	51	Table 7-12	Dimensional Criteria - Tall Profile Components Having Bottom Only Terminations	30
Figure E-18	SnAgCu Solder; OSP Finish	51	Table 7-13	Dimensional Criteria - Inward Formed L-Shaped Ribbon Leads	31
Figure E-19	SnAgCu Solder	52	Table 7-14	Dimensional Criteria - Area Array/Ball Grid Array	32
Figure E-20	SnAgCu Solder	52	Table 7-15	Dimensional Criteria - PQFN	33
Figure E-21	SnAgCu Solder	52	Table 7-16	Dimensional Criteria - Bottom Thermal Plane Terminations	34
Figure E-22	SnAgCu Solder	52	Table 8-1	Designation of Surfaces to be Cleaned	35

Tables

Table 1-1	Design and Fabrication Specification	2	Table 8-2	Cleanliness Testing Designators	35
Table 3-1	Solder Limits for Tin/Lead Alloys	5	Table 10-1	Coating Thickness	38
Table 4-1	Solder Acceptability, Intrusive Soldering, Supported Holes	9	Table 11-1	Magnification Aid Applications for Solder Connections	39
Table 5-1	Damaged Strand Limits	11	Table 11-2	Magnification Aid Applications - Other	39
Table 5-2	Terminal Soldering Requirements	12			
Table 5-3	Staking Requirements of Side Route Straight Through Connections - Bifurcated Terminals	14			
Table 5-4	Solder Height Requirements Wire to Post	15			
Table 6-1	Lead Bend Radius	16			
Table 6-2	Protrusion of Leads in Unsupported Holes	17			

Requirements for Soldered Electrical and Electronic Assemblies

1 GENERAL

1.1 Scope This standard prescribes practices and requirements for the manufacture of soldered electrical and electronic assemblies. Historically, electronic assembly (soldering) standards contained a more comprehensive tutorial addressing principles and techniques. For a more complete understanding of this document's recommendations and requirements, one may use this document in conjunction with IPC-HDBK-001, IPC-A-610 and IPC-HDBK-610.

When J-STD-001 is cited or required by contract, the requirements of IPC-A-610 do not apply unless separately or specifically required. When IPC-A-610 is cited along with J-STD-001, the order of precedence is to be defined in the procurement documents.

1.2 Purpose This standard describes materials, methods and acceptance criteria for producing soldered electrical and electronic assemblies. The intent of this document is to rely on process control methodology to ensure consistent quality levels during the manufacture of products. It is not the intent of this standard to exclude any procedure for component placement or for applying flux and solder used to make the electrical connection.

1.3 Classification This standard recognizes that electrical and electronic assemblies are subject to classifications by intended end-item use. Three general end-product classes have been established to reflect differences in producibility, complexity, functional performance requirements, and verification (inspection/test) frequency. It should be recognized that there may be overlaps of equipment between classes.

The user (see 1.8.13) is responsible for defining the product class. The product class should be stated in the procurement documentation package.

CLASS 1 General Electronic Products

Includes products suitable for applications where the major requirement is function of the completed assembly.

CLASS 2 Dedicated Service Electronic Products

Includes products where continued performance and extended life is required, and for which uninterrupted service is desired but not critical. Typically the end-use environment would not cause failures.

CLASS 3 High Performance Electronic Products

Includes products where continued high performance or performance-on-demand is critical, equipment downtime cannot be tolerated, end-use environment may be uncommonly harsh, and the equipment must function when required, such as life support or other critical systems.

1.4 Measurement Units and Applications All dimensions and tolerances, as well as other forms of measurement (temperature, weight, etc.) in this standard are expressed in SI (System International) units (with Imperial English equivalent dimensions provided in brackets). Dimensions and tolerances use millimeters as the main form of dimensional expression; micrometers are used when the precision required makes millimeters too cumbersome. Celsius is used to express temperature. Weight is expressed in grams.

1.4.1 Verification of Dimensions Actual measurement of specific part mounting and solder fillet dimensions and determination of percentages are not required except for referee purposes. For the purposes of determining conformance to this specification, all specified limits in this standard are absolute limits as defined in ASTM E29.

1.5 Definition of Requirements The word **shall** is used in the text of this document wherever there is a requirement for materials, preparation, process control or acceptance of a soldered connection.

Where the word **shall** leads to a hardware defect for at least one class, the requirements for each class are annotated in text boxes located adjacent to that occurrence in the text. These boxes are summarized in Appendix A. Appendix A identifies each listed condition for each class as either "Defect," "Process Indicator," "Acceptable," or "No Requirement Specified." In case of a discrepancy between requirements in the text boxes and Appendix A, requirements listed in the text boxes take precedence.

Line drawings and illustrations are depicted herein to assist in the interpretation of the written requirements of this standard. Text takes precedence over the figures.

IPC-HDBK-001, a companion document to this specification, contains valuable explanatory and tutorial information compiled by IPC Technical Committees that is relative to this specification. Although the Handbook is not a part of this specification, when there is confusion over the specification verbiage, the reader is referred to the Handbook for assistance.