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**Understanding the
J-STD-001 Brackets
[A1A2A3]**

**and
How to Interpret Them
and Use Them**

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A Question and Answer Program



Brackets!!!

[A1D2D3]-[N1A2D3]

- Where are they?
- What are they?
- Why are they there ?
- How do we interpret them?
- When do we use them?

Where, What and Why



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- **Where** are they defined:
- Section 1.5 Definition of Requirements:
- **What:**
 - The words **SHALL** or **SHALL NOT** are used in the text whenever there is a requirement for materials, preparation, process control or acceptance of a solder connection.

Where, What and Why



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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 in brackets next to the **shall** requirement.

N = No requirement has been established for this Class

A = Acceptable

P = Process Indicator

D = Defect

Examples:

[A1P2D3] is Acceptable Class 1, Process Indicator Class 2 and Defect Class 3

[N1D2D3] is Requirement Not Establish Class 1, Defect Classes 2 and 3

[A1A2D3] is Acceptable Classes 1 and 2, Defect Class 3

[D1D2D3] is Defect for all Classes.

Why are they there?



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- To define the action to be taken if the statement is incorrect.

How are they used?



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- To explain the requirement of the statement as it is written in the text.
- The conditions in the brackets are invoked when the statement or condition described in the text is not met.

How Does It Make Sense ?

- What do I need to know?
- Read the requirement, if the inspection meets the condition as it is written in the book, then it is acceptable, if it not as written in the book, then the conditions defined in the brackets apply.

Brackets and How Does Make Sense

- Therefore, what is written in the brackets is what count if the requirement statement is not met.
- The following slides describes the definitions as written in the specification.

Brackets and How Does Make Sense

Uninsulated parts mounted over exposed circuitry shall [N1N2D3] have their leads formed to provide a minimum of 0.25 mm [0.01 in] between the bottom of the component body and the exposed circuitry.

Example

- If the script is not followed and the components are not mounted as stated, then the acceptance criteria **shall** be as they are defined within the brackets.
- In this case [N1N2D3], means there is No Requirements for Class 1 and 2 and it is a Defect condition for Class 3 and the condition has to be documented and dispositioned.

Example:



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1.5.1

- Defects **shall [D1D2D3]** be identified, documented, and dispositioned by the manufacturer based on the design, service, and customer requirements.

Example:



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1.5.2 Materials and Processes

- **Nonconformance** Hardware found to be produced using either materials or processes that do not conform to the requirements of this standard **shall [D1D2D3]** be dispositioned when the condition is a defect.

Example: 3.3



- **3.3 Flux** Flux **shall [D1D2D3]** be in accordance with J-STD-004 or equivalent.
- Flux **shall [N1D2D3]** conform to flux activity levels LO and L1 of flux materials rosin (RO), resin (RE), or organic (OR), except ORL1 **shall not [N1D2D3]** be used for no-clean soldering.
- When other activity levels or flux materials are used, data demonstrating compatibility **shall [N1D2D3]** be available for review (see 3.1) and Appendix C
- **Note:** Flux or solder paste soldering process combinations previously tested or qualified in accordance with other specifications do not require additional testing.
- Type H or M fluxes **shall not [D1D2D3]** be used for tinning of stranded wires.

Example:



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4.3 Solderability At start of soldering operations, components and wires to be soldered shall [D1D2D3] meet the solderability requirements of J-STD-002 or equivalent and printed boards shall [D1D2D3] meet the requirements of J-STD-003 or equivalent. When a solderability inspection operation is performed as part of the documented assembly process, before or after soldering, that operation may be used in lieu of solderability testing.

- Component and wire **shall** meet the requirements of J-STD-002, if they don't then the condition is defined as [D1D2D3]
- Board **shall** meet the requirement of J-STD-003, if they don't then the condition is defined as [D1D2D3]

Examples

- **Para 4.18 Solder Connection.**
- All solder connections **shall [D1,D2,D3]** indicate evidence of wetting and adherence where the solder blends to the soldered surface.
- If the condition is not there showing evidence of wetting and adherence the condition then is defective for all (3) classes of products.

6.2.1 Solder Application

- Solder **shall [N1D2D3]** only be applied to one side of a PTH except for intrusive soldering .
- Solder cannot be added from both sides of the board, only one side, so if solder is added to both sides while make a solder joint, then the condition is as defined between the brackets.

Examples

6.13 Lead Trimming

- Tempered leads **shall not [N1D2D3]** be trimmed unless specified on the drawings(s) and the documentation.
- If they are trimmed and it is not specified on the drawings and is not documented on process documentation, then the condition in the brackets apply .

Thank You

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