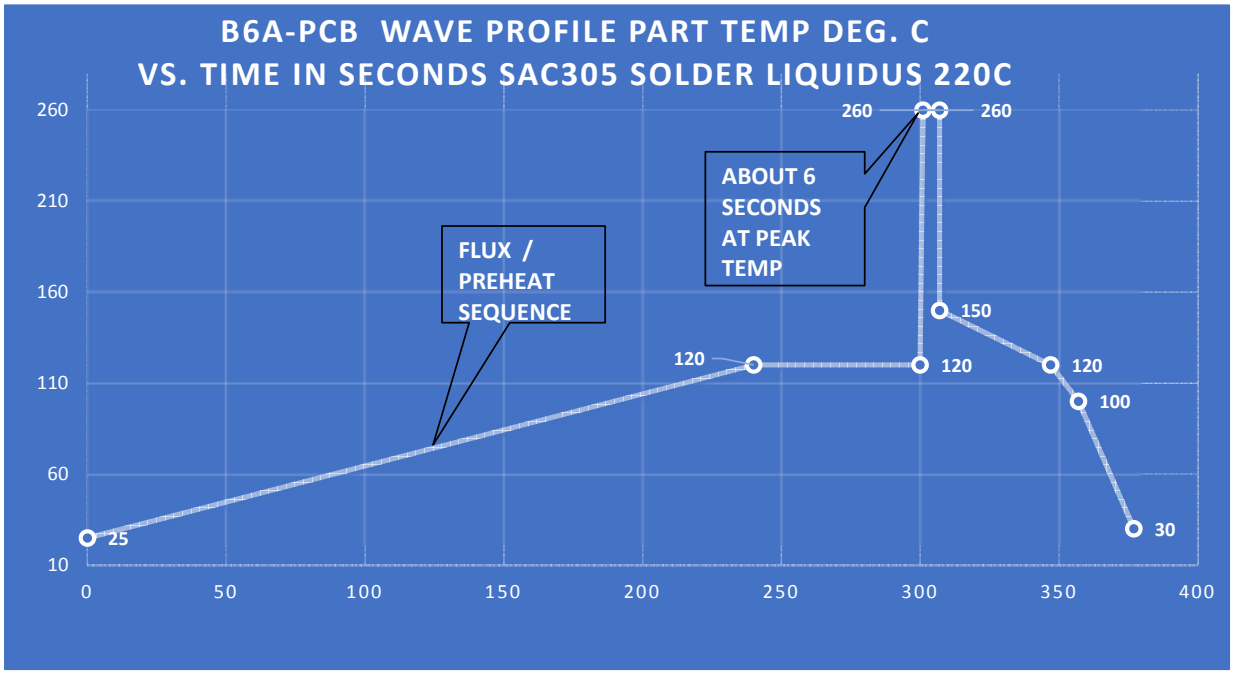
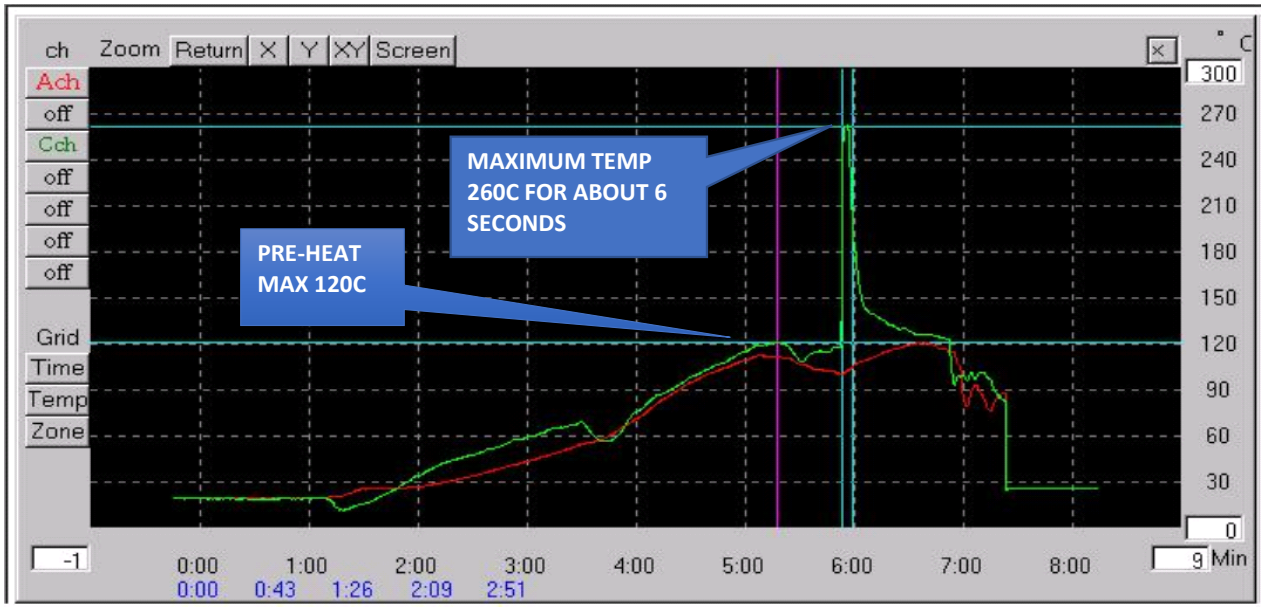
Soldering Recommendations for IHI Aluminum Sn/Ni plated Terminal Lugs

1. **Use between 245C (IPC-STD-002D) and 260C (with brief soak time at 260C)**
2. **Excess temperature or long soak times at peak temperature may compromise the Nickel barrier coating which may lead to nickel barrier peeling, blitering and general dewetting or non wetting.**
3. **Soldering irons may over-temperature the lug since normally are set much higher than 245-260 DEG C**



ACTUAL PRODUCTION WAVE SOLDER PROFILE 260C PEAK FOR B6A-PCB, B6A-PCB-SS LUGS 8 PER PCB



SOLDERABILITY TESTING PER IPC/JEDEC J-STD-002 DIP & LOOK TEST B1, LEADLESS LUGS, SAC305 LEAD FREE

The purpose of Solderability Testing is to evaluate the solderability of solderable pins, leads, wires, tabs, pads and terminals to avoid defects in production.
The leading industry standard for performing solderability testing is IPC/JEDEC J-STD-002(D) "Solderability Tests for Component Leads, Terminations, Lugs, Terminals and Wires".
This standard is based on, and preceded by, the much older but still venerated Mil-Std-883 Method 2003 - "Solderability" which created the “Dip and Look” method still used for solderable components.

The solderability of a surface is defined by its solder wetting, de-wetting and non-wetting characteristics and also uses the fillet wetting shape and angles.

Solder wetting is good when a substantially uniform, smooth, and unbroken film of solder indicates good adherence on the surface just soldered.
Non-wetting, is when the solder has contacted the surface but does not adhere completely to it, exposing patches of the bare metal surface (does not look tinned, high wetting angles nearby).
Dewetting is when the solder recedes, or pulls back, after coating a surface, creating irregular “clumpy” mounds of solder, but leaving behind no exposed metal areas (looks tinned but has high wetting angles preventing retention of solder mass in those locations).

The most commonly used method is the **Dip and Look Method** since it gives a practical, functional pass / fail outcome and is relatively easy for users to set up at low cost in any location.

Another method called the **Wetting Balance Analysis Test** check the amount of favorable surface tension “pull” force from the desirable small wetting angles, versus high wetting angles, which do not exhibit the desired “pull” force. However, this method does not have a universally agreed pass / fail standard for general use, so it used more for analysis and troubleshooting.

For parts which will be stored for a lengthy time, the solderable components should be steam aged before they are Dip and Look tested to assure that they have good shelf life.

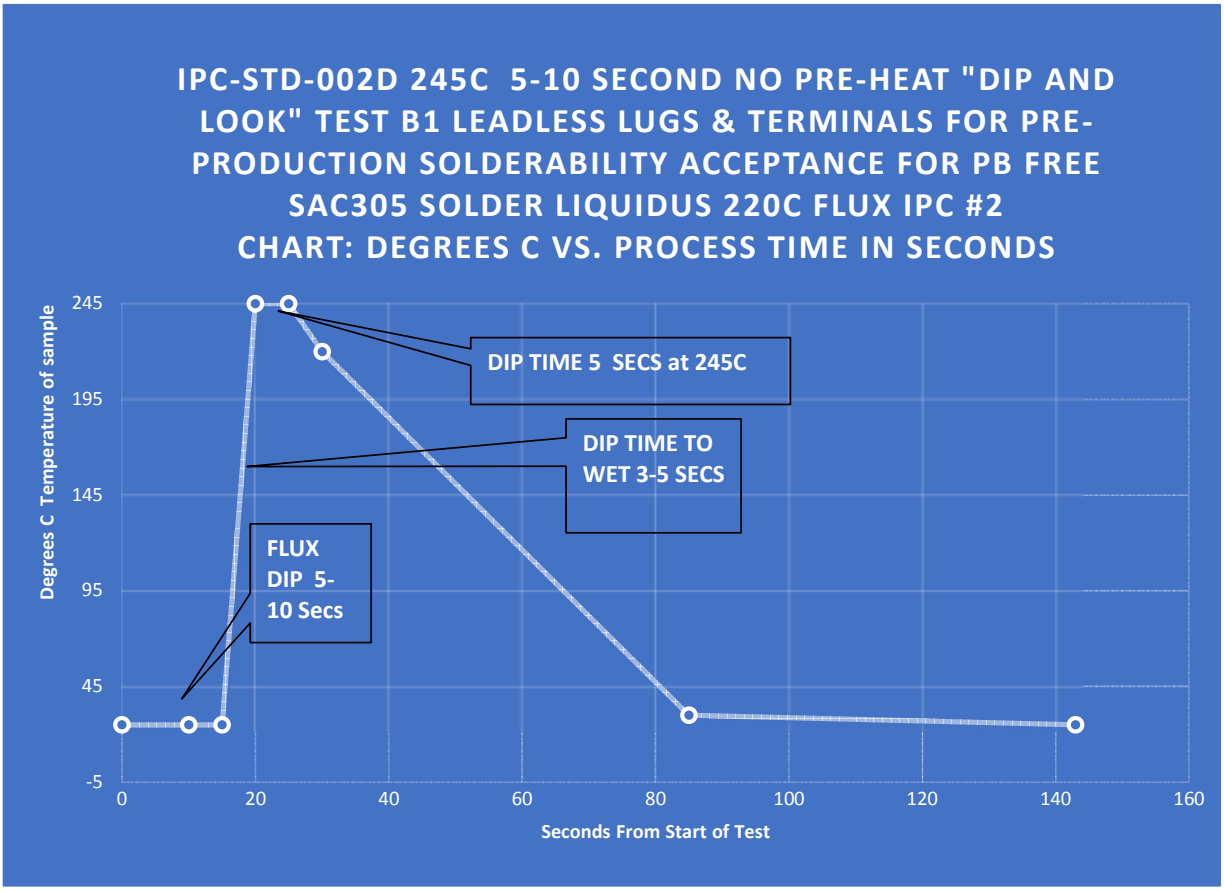
For parts which are about to be used in production then, a simple Dip and Look Test based on the manufacturer’s guidelines for processing may be used.

Once a part has been successfully soldered, the solderability is no longer a concern.

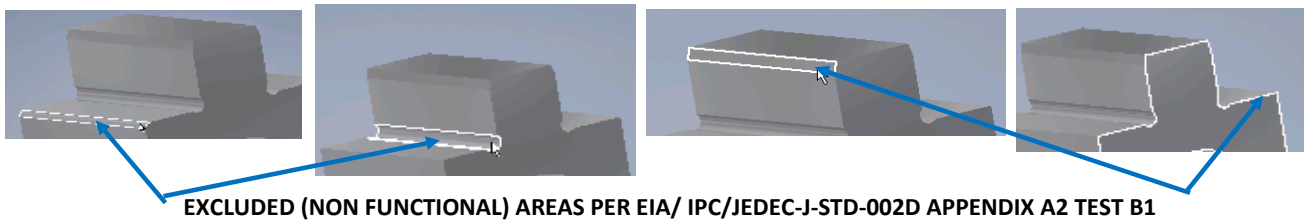
IPC/JEDEC J-STD-002 allows certain variable and recommendations to be based on “AABUS” (“As Agreed By User And Supplier”.

As customized and specialty products are offered by manufacturers to meet the needs of many different client users at the same time, the manufacturer-supplier’s has expectations for the correct process needed for good results using the product and may be set by the supplier in which case it should be clearly stated.

IHI B-Series solderable body, screw type lug parts, do not have wire leads and are evaluated for the solderability of the flat surfaces that are used to retain the part to the PCB copper foil surfaces.
IHI uses Test B1 for Leadless Lugs and Terminals since this applies to the critical flat surfaces for both THT and SMT applications. Acceptance and Rejection is a combination of **1.** 95% coverage of critical area per individual termination. **2.** 80% coverage of critical area of exposed pad. **3.** No coverage minimum % on exposed metal on "unplated or sheared surfaces". See IPC/JEDEC J-STD-002 Test B1 and Appendix A, & B.



This EIA/ IPC/JEDEC-J-STD-002D standard is for parts that have no wire leads and maybe larger and more complex in terms of soldered geometry. Reference Fig. A2 page 30 Test B1 "excluded areas" on passive components. Acceptance and Rejection: 1. 95% coverage of critical area. 2. 80% coverage of exposed pad. 3. No coverage % on exposed metal on "unplated or sheared surfaces". By design and bulk processing method IHI does not require parts to meet solderability requirements on external corners, and clearance undercuts, "excluded" as shown below. The flat surfaces are the intended wetting areas for proper application of the lug and IPC solder testing per B1 test



EXCLUDED (NON FUNCTIONAL) AREAS PER EIA/ IPC/JEDEC-J-STD-002D APPENDIX A2 TEST B1