1. **Revision Log**

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| Revision Log | | | | | |
| Revision Level | Revision Date | Section | Description | | Revised By |
| REL | 05312016 | ---- | Initial Release | | BS |
| A | 3/15/19 |  | Mass updates, complete re-write to standard | | NT |
| B | 9/19/22 | 5.2.1 5.3.1 5.4.1 5.7.1 | Added new preferred brands for equipment | | O. Cutchall |
| C | 12/1/2023 | Header | Replaced GHSP logo with newer version | | BB |
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| Approval: | | CN: RS | | MX: BA | |
| US: JA | | Other (as req’d): | |

1. **Purpose:** 
   1. To define the global standard for the use of Electronics PCBA Manufacturing Equipment within GHSP manufacturing facilities.
2. **Scope:** 
   1. This global standard applies to all GHSP manufacturing facilities.
3. **Definitions:** 
   1. PCBA - Printed Circuit Board Assembly
   2. ESD - Electrostatic Discharge
   3. SMT - Surface Mount Technology
   4. IPC - Association Connecting Electronics Industries.
      1. IPC standards are used by the electronics manufacturing industry. IPC-A-610, Acceptability of Electronic Assemblies, is used worldwide by original equipment manufacturers and EMS companies.
4. **References:**
   1. IPC-A-610, Acceptability of Electronic Assemblies
   2. CP-WI-MFG-X301 Global Standard Production Equipment Safety, Ergonomic, and Delivery Checklist
   3. CP-WI-MFG-X334 Global Standard Strain Guage
5. **Method:**
   1. **IPC Classification**
      1. Product design and/or customer requirements determines the level of assembly standard used during the manufacturing process (IPC Class 1, 2, or 3).
   2. **Surface Mount Technology**
      1. Preferred Brands

*Selection outside the preferred brand requires approval by the Advanced Process Engineer and Global Standards Team*

* Board Conveyance
  + CTI
  + ASYS
  + Simplimatic
* Solder Paste Application
  + Preferred Machine Brands
    - DEK Screen Printers
    - Speed Print Screen Printers
  + Preferred Stencil House
    - Microscreen
    - Blue Mountain
  + Preferred Stencil Cleaning
    - Austin American Technologies
    - DCT
* Automated Optical Inspection (AOI)
  + Omron
  + Koh Young
  + Nordson AOI
* Placement Machines
  + Universal Instruments Company (UIC)
  + Fuji
* Reflow Ovens
  + BTU
  + Vitronics
* Thermal Profiling
  + KIC Thermal Profiling
  1. **Through Hole Technology**
     1. Preferred Brands

*Selection outside the preferred brand requires approval by the Advanced Process Engineer and Global Standards Team*

* Board Conveyance
  + CTI
  + ASYS
  + Simplimatic
* Assembly Equipment
  + Universal Instruments Company (UIC)
  + UMG Technologies
  + Fuji
  + Panasonic
  1. **Soldering Equipment**
     1. Preferred Brands

*Selection outside the preferred brand requires approval by the Advanced Process Engineer and Global Standards Team*

* Board Conveyance
  + CTI
  + ASYS
  + Simplimatic
* Wave Soldering
  + ERSA
  + Electrovert Speedline
  + SEHO
* Selective Soldering Equipment
  + ERSA
  + Apollo Seika
  + Nordson Select Soldering Equipment
* Wave/Selective Tooling
  + Insulfab
  + AGI
  + Garland Service Company
* Hand Soldering Equipment
  + HAKKO
* Thermal Profiling
  + KIC Thermal Profiling
  + Solder Star Thermal Profiling
  1. **Test Equipment**
     1. Preferred Brands

*Selection outside the preferred brand requires approval by the Advanced Process Engineer and Global Standards Team*

* In-Circuit Testing
  + Keysight
  + CheckSum
* Final Testing
  + Keysight
  + National Instruments
* Labeling
  + Zebra
  1. **Conformal Coat Equipment**
     1. Preferred Brands

*Selection outside the preferred brand requires approval by the Advanced Process Engineer and Global Standards Team*

* Board Conveyance
  + CTI
  + ASYS
  + Simplimatic
* Coating Equipment
  + PVA
  + Nordson
* Conformal Coat Tooling
  + Pentagon EMS
  + Insulfab PCB Tooling
  + AGI
  + Garland Service Company
  1. **De-panel/Router Equipment**
     1. Preferred Brands

*Selection outside the preferred brand requires approval by the Advanced Process Engineer and Global Standards Team*

* De-panel/Router Equipment
  + Automated
    - Sayaka
    - ASYS
    - CTI
  + Manual
    - Fancort industries
* De-panel/Router Tooling
  + Insulfab PCB Tooling
  + Garland Service Company

1. **Records:** N/A