1. **Revision Log**

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| Revision Log | | | | | |
| Revision Level | Revision Date | Section | Description | | Revised By |
| REL | 12/14/2016 | ---- | Initial Release | | JY |
| A | 08/07/2018 | 6.0 | Updated mainstay document numbers to match what is in SharePoint | | VC |
| B | 6/26/19 |  | Mass update, complete re-write to standard | | NT |
| C | 7/27/20 | 4.5 | Updated Work Instruction file name | | NT |
| D | 12/1/23 | Header | Replaced GHSP logo with newer version | | BB |
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| Approval: | | CN: RS,FS | | MX: JH | |
| US: JA | | Other (as req’d): DRW | |

1. **Purpose:** 
   1. To define the global standard for the use of Solder Process within GHSP manufacturing facilities.
2. **Scope:** 
   1. This global standard applies to all GHSP manufacturing facilities.
3. **Definitions:** 
   1. SMT – Surface Mount Technology
      1. A method for producing electronic circuits in which the components are mounted or placed directly onto the surface of a printed circuit boards.
   2. THT - Through Hole Technology
      1. The mounting scheme used for electronic components that involves the use of leads on the components that are inserted into holes drilled in printed circuit boards and soldered to pads on the opposite side.
   3. Post-SMT
      1. All production solder processes that follow surface mount manufacturing (i.e. Wave/Selective Solder Processes).
   4. IPC Standards
      1. Globally recognized standardized publication used in the manufacturing industry.
   5. Pb
      1. Solder alloy that contains lead-based metal.
   6. Pb-Free
      1. Solder alloy that is RoHS compliant and has no lead-based metal.
   7. RoHS – Restriction of Hazardous Substances
      1. Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
   8. Flux
      1. The liquid material used to process and clean metallization to improve solderability between indifferent metallic material.
   9. Profile
      1. The heating (pre-heat) parameters of material in the solder process in which to provide the best solderability factor.
4. **References:**
   1. IPC-A-610
   2. IPC J-STD-001
   3. IPC J-STD-006
   4. CQI-17: Soldering System Assessment
   5. EM-WI-COR-X19 ESD Control Program
5. **Method:**
   1. **Manufacturing**
      1. SMT
         * The solder material to be used shall be compliant with production requirements.
         * Tooling
           + Material dependent on stenciling requirement.
           + 29” x 29” aluminum framing is used for majority of automated stencil printers.
           + Stainless steel or tension steel laser cut material is recommended.
           + Special requirements many include finishing applied to the stencil.
      2. Post-SMT Solder Process
         * Wave/Selective Soldering material to be used shall be compliant with production requirements.
         * Bars are to be marked or shaped different to identify Pb vs Pb-Free material.
         * The liquid flux to be used shall be compliant with the profile requirements of the solder alloy.
         * Tooling
           + Dimensions to be determined by machine conveyance system (fixed or variable).
           + Material to be aluminum or composite pending profile application.
           + Titanium inserts can be used for densely plated solder factors.
      3. Solder Robotics
         * Automated solder processes material to be used shall be Flux-core Wire Roll, compliant with production requirements.
         * Pending application, material shall be RoHS compliant.
         * Tooling to be specified by feed and machine requirements.
         * Profiling shall be developed per application.
      4. Rework and Repair
         * Material
           + Flux-core Wire Roll, matching production material.
   2. **Visual Inspection**
      1. IPC Standards to be followed per procurement requirements (i.e. controlled documents – prints, customer specifications)
         * Class I, II, III accordingly
         * Illumination requirement of minimum 1,000 Lumens
         * Magnification – 4x
           + 10x for referee disposition
      2. Inspectors must be IPC certified
         * Re-certification must be completed bi-annually
6. **Records:**
   1. Solder programs/profiles to be included in the Assembly Equipment Manual.
      1. Anytime a change to the solder program is made, a PCR must be written and approved.
   2. All solder programs/profiles must be stored on the facility server.