

## **HAM-LET Standard Operational Procedure (S.O.P. # 8184 REV00) for Cleaning and Packaging Components and Parts**

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### **1. Scope:**

This documented SOP describes a set of quick guidelines, requirements and definitions for final cleaning, lubrication, assembly and packaging of standard Ham-Let components and products, as well as methods and practices applied to meet these requirements.

Standard Ham-Let products are designated for industrial applications only.

Ham-Let SOP covers relevant basic industrial procedures.

It is highly recommended for system designer or user (Fabricator, OEM, S/C or end-user) to review this specification in order to determine whether it meets their particular application requirements.

### **2. Objective:**

The objectives of this specification are:

2.1. To ensure absence of oil and grease residues or any other surface contaminants such as stains of any sort, spots, dirt, tarnish marks, burrs, heavy discoloration etc., on Ham-Let standard products and components prior to the final assembly or packaging stage.

2.2. To verify that Ham-Let supplies its customers with high-quality manufactured parts, properly cleaned, assembled, packed and ready for exploitation, in order to guarantee their functionality at customer end.

### **3. Applications/References:**

3.1. Reference standard: ASTM A 380.

3.2. All individual components to be cleaned in accordance with the above reference spec., prior to assembly or packaging.

3.3. All individual cleaned parts and components are protected from dirt, oil, grease etc., during the time between cleaning and assembling or packaging.

### **4. Specification General Requirements:**

This SPEC defines guidelines and basic requirements for cleaning procedures to remove dirt, loose particles, cutting oils, grease and other contaminants, which typically remain on products and components, resulting industrial manufacturing methods.

4.1. Assembled products are properly lubricated, as required by product specifications.

4.2. Finished Goods are properly packed in clean and dry packaging.

All bags, if used, are boxed for protection during shipment, handlings and storage.

All packages are marked for identification.

## 5. Cleaning Process Practice

- 5.1. All components, parts or products are thoroughly cleaned in order to remove any subsequent manufacturing dirt, oil and grease, stains, burrs, loose particles, and spots of any kind, which might remain after processing.
- 5.2. Some copper based alloys (i.e. brasses and bronzes) are chemically treated by immersion in an acidulous solution to remove stains and tarnish from exterior surfaces.  
Copper based alloys, which are not exposed to acidulous solution are properly cleaned by various degreasing methods.
- 5.3. Cleaned components are protected during storage.

## 6. Lubrication, Assembly and Testing Practice:

- 6.1. Various protecting methods and solutions, such as lubricants and coatings, are applied to threads, mating surfaces, o-rings, seals, etc. as well as to products and components, to inhibit galling, reduce wear and friction, and ensure proper sealing respectively. Protection and lubrication methods are tailored to particular products' specifications to ensure proper functionality.
- 6.2. Lubricants and coatings may vary:
  - a. Hydrocarbons-contains (C-H compounds).
  - b. Halocarbon-contains (halogens - C compounds).All compounds may contain inorganic additives or leachable halogens.
- 6.3. Assembly of products is conducted in a clean, dry and specially constructed area, with a controlled atmosphere to prevent presence of dust or other type of atmosphere contamination.
- 6.4. Pressure testing of relevant products is performed with clean dry air, nitrogen (N<sub>2</sub>), or Helium (He) gas, as required by product specifications.  
Regardless testing methods, all tested products are properly dried upon testing phase completion.
- 6.5. Standard quantities of finished products are packed in cardboard boxes, using suitable protection material to protect them from contamination during shipment and storage.
- 6.6. Exposed male threads are capped, when necessary, for protection.
- 6.7. All boxes are identified with Item and Process definitive data.

## 7. Miscellaneous:

- 7.1. No CFS solvents to be used, in any stage, for cleaning.
- 7.2. The basic idea of this SOP is to provide a general measure tool for cleanliness of a product, rather than of revising its production history. It should be noted, of course, that all standard Ham-Let components and products are repeatedly cleaned during the manufacturing process in order to achieve a certain cleanliness level of the finished goods.