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# PURPOSE

To establish the minimum requirements for the safe use and handling of lead-containing solder.

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# SCOPE

The provisions of this specification apply to solder operations using lead–containing solder. Examples of such operations include hand soldering, solder pot use or wave solder machine operations. Other applications using lead–containing materials will be subject to review and approval of the Chemical and Material Screening Coordinator (CMSC) in accordance with TI ESH Specification 03.01A, “Chemical and Material Screening”.

The provisions of this standard apply to all TI employees, suppliers, vendors, and visitors at TI sites worldwide.

# reference documents

## TI Standard Policy and Procedure (SP&P) 04-04-01: "Environmental, Health and Safety"

## TI ESH Specification 03.01A, “Chemical and Material Screening”

## TI ESH Specification 03.01D: "Chemical Exposure Assessment"

## TI ESH Specification 03.01D Appendix A: TI Occupational Exposure Limits

# Definitions

[TI ESH Standards Glossary of Definitions](https://sps01.itg.ti.com/sites/wwf/esh/standards/Knowledge_Bank/00.01.xlsx)

# Requirements

Sites that use lead-containing solder shall develop and implement a lead solder safety process which establishes the minimum requirements for the safe use, handling, and disposal of lead-containing solder and its by-products.

## Control Methods

### Work Practices

#### Sites shall implement measures to minimize and/or eliminate potential lead exposures and to keep areas as free of accumulations of lead as reasonably possible. These measures include:

##### Procedures for the proper handling and use of lead-containing solder compounds.

##### Personal protective equipment requirements.

##### Written housekeeping procedures.

#### Operating temperatures for lead-containing soldering operations compounds shall be no greater than 900 oF (482 oC). Note: Pb/Sn solder alloys do not produce lead fume at temperatures below 1000oF (538 oC).

#### The use of butane soldering irons is prohibited.

#### Areas where lead –containing solder is used or stored shall have a visible and legible caution sign to inform employees of the use of lead in the work area;

##### In the U.S., signs shall read as shown below, or shall contain similar wording that meets this intent:

**CAUTION**

**LEAD WORK AREA**

**NO FOOD OR DRINK ALLOWED**

**SAFETY GLASSES REQUIRED**

##### Non-U.S. sites shall provide signs that meet the intent of this wording in their local language.

#### Use of compressed air, dry sweeping or any other methods that could cause lead particulate to become airborne is prohibited.

#### Where vacuuming methods are selected, high efficiency particulate air (HEPA) vacuums shall be used and emptied in a manner that minimizes the reentry of lead-containing solder material into the workplace.

#### Cleaning methods using brushes or abrasive pads shall be performed using wet methods.

### Exposure Monitoring

#### If personal air monitoring reveals employee exposure at or above the occupational exposure limit (OEL) for lead (see ESH Specification 03.01D Appendix A: TI Occupational Exposure Limits), monitoring shall be repeated at least quarterly until 2 consecutive full shift samples are below the action level. The gap between the 2 consecutive samples taken must be at least one week (7 days) apart from each sample , or

#### If monitoring reveals exposure below the OEL, but at or above the action level (AL) for lead (25 micrograms per cubic meter), full shift monitoring shall be repeated at least every 6 months until 2 consecutive samples are below the action level. The gap between the 2 consecutive samples taken must be at least one week (7 days) apart from each sample .

#### If monitoring reveals exposure below the AL, full shift re-testing shall only be required when processes, equipment or other material changes occur which may impact employee exposure.

### Provisions for Surface Wipe Testing

#### Wipe samples shall be collected at least annually on the SEG using the same housekeeping procedures to ensure the effectiveness of housekeeping practices.

#### If wipe testing results do not confirm the effectiveness of housekeeping practices, the housekeeping practices shall be reviewed and modified as appropriate.

### Medical Surveillance

#### Notify the local occupational health personnel, the WWESH Medical Surveillance Program Administrator and the TI Medical Director when an employee’s representative exposure is above the AL or OEL for lead. Notification shall be made to [medicalsurveillance@list.ti.com](mailto:medicalsurveillance@list.ti.com) within 2 working days from receipt of the results.

## Training

### Employees who work with lead-containing solder shall receive lead awareness training. The training shall be provided before initial assignment and a refresher training course shall be provided every 36 months.

Note: Training may be accomplished by inclusion in Hazard Communication Training or other equally effective means.

### Employees whose exposure to lead is determined to be above the AL shall receive training on an annual basis until such time as the exposure is reassessed to be below the AL.

## Recordkeeping

### Monitoring records shall be in accordance with TI ESH Specification 03.01D: “Chemical Exposure Assessment” and shall be maintained in accordance with TI ESHMS 4.5.4 “Records Management”.

### In the US, monitoring records for lead shall be maintained for at least 40 years or for the duration of employment plus 20 years, whichever is longer.

# STANDARD Approval

This standard has been approved by Zane Broadhead, TI Vice President.

# Revision history

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| --- | --- | --- | --- | --- |
| **Rev#** | **Date** | **Nature of Revision** | **Author/Editor** | **Approver** |
| A | 02/23/2006 | Original | Dale Moore |  |
| B | 12/01/2006 | Periodic review in conjunction with 2006 review of the 03.01 series of standards; elimination of 3.1.b.4; elimination of 3.1.c lines 1-2; and revision of 3.2a | Dale Moore |  |
| C | 01/18/2010 | 3.1.a.3.a - signage wording flexibility language added | Gene Schaefers |  |
| D | 06/12/2013 | Document reformatted | Mike Alton | ELC |
| E | 11/11/2016 | Prohibit butane soldering irons; changed verbiage for clarification. | Hayden Baker | ELC |
| F | 09/25/2019 | Added additional notification requirements for measured exposures above the action limit.. | Hayden Baker | ELC |