

# SEMI E34-95

## GUIDELINE FOR MASS FLOW DEVICE RETURN

### 1 Purpose

1.1 Mass flow devices (mass flow controllers, mass flow meters and flow control valves) are used as an integral part of the chemical delivery system in semiconductor processing equipment. Many of the chemicals used in semiconductor processes can be hazardous to equipment and personnel. Once exposed to these chemicals, the contaminated mass flow devices can present a hazard to repair personnel and equipment if not handled properly.

1.2 Implementing the procedures outlined in this guideline provide a mechanism to reduce the risk associated with shipping and/or receiving any potentially hazardous mass flow device used to monitor or control gases or liquids.

### 2 Scope

2.1 This guideline is intended to:

2.1.1 Recommend and encourage the purging of devices used with hazardous materials prior to removal to reduce the risk of handling them.

2.1.2 Alert the recipient of possibly hazardous mass flow devices to the nature of the hazard.

2.1.3 Establish mechanism for properly identifying and documenting possibly hazardous mass flow devices by using an orange tag and a health and safety disclosure form.

**NOTICE:** SEMI Standards and Safety Guidelines do not purport to address all safety issues associated with their use. It is the responsibility of the users of the Documents to establish appropriate safety and health practices, and determine the applicability of regulatory or other limitations prior to use.

### 3 Referenced Standards and Documents

49 CFR — Title 49 of the Code of Federal Regulations (CFR)<sup>1</sup>

NFPA 704 — Standard System for the Identification of Fire Hazards of Materials<sup>2</sup>

**NOTICE:** Unless otherwise indicated, all documents cited shall be the latest published versions.

### 4 Terminology

4.1 *hazardous materials* — those chemicals or substances that are physical hazards or health hazards as defined and classified in NFPA 704 whether the materials are in use or in waste conditions.

4.2 *mass flow controller (mfc)* — a self-contained device, consisting of a mass flow transducer, control valve, and control- and signal-processing electronics, commonly used in the semiconductor industry to measure and regulate the mass flow of gas.

4.3 *mass flow meter (mfm)* — a self-contained device, consisting of a mass flow transducer and signal-processing electronics, commonly used in the semiconductor industry to measure the mass flow of gas.

4.4 *material safety data sheet (msds)* — written or printed material concerning a hazardous material which is prepared in accordance with the provisions of 29 CFR 1910.1200.

4.5 *protective container* — a sealable plastic bag or other container which will keep hazardous material from the mass flow device from contaminating the outer package. The container should be transparent, if possible.

4.6 *purge* — to dilute potentially harmful material in the mass flow device by flowing an inert gas through the device. Purging a chemical delivery line containing a mass flow device with an inert substance is intended to dilute hazardous materials and reduce the level of the hazard. To be effective, the inert substance must be able to reach all points within

<sup>1</sup> United States Government Printing Office, Washington, D.C. 20402, USA.

<sup>2</sup> National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269, USA; Telephone: +1.617.770.3000, Fax: +1.617.770.0700, <http://www.nfpa.org>

the chemical delivery system in sufficient quantity to dilute the hazardous material to safe levels. The nature of the hazard and the physical configuration of the chemical delivery system must be considered when developing a purge procedure.

4.7 *safe* — free of conditions that can cause occupational illness, injury, or death to personnel or damage to or loss of equipment or property or the environment.

## 5 Procedure

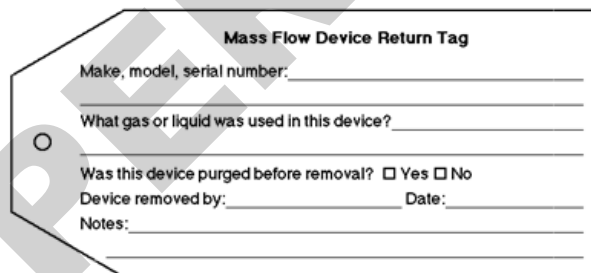
### 5.1 Disclosure Form

- Complete the disclosure form for mass flow device return.
- Send the completed form via Fax or other suitable method to the recipient of the mass flow device.
- Attach a copy of the form to the exterior of the shipping container.
- Enclose another copy inside the package attached to the protective plastic bag containing the mass flow device during shipment.
- Retain the original form for your records.

5.2 *Purging Prior to Removal* — Thoroughly purge the mass flow device following the applicable purge procedure. Purge procedures are usually unique to the equipment and installation. Obtain purging procedures from your facilities manager, corporate safety department, and/or the equipment manufacturer. If a formal purge procedure is available, note on the disclosure form the purge procedure document number and source.

5.3 *Equipment Removal* — **WARNING:** Do not remove the mass flow device until it has been properly purged.

5.3.1 The person removing the mass flow device should fill out an orange-colored device tag indicating the process gas(es) or chemicals used, possible exterior contamination and the purge procedure document number prior to removal of the device. A sample orange device tag is shown in Figure 1.



**Mass Flow Device Return Tag**

Make, model, serial number: \_\_\_\_\_

What gas or liquid was used in this device? \_\_\_\_\_

Was this device purged before removal? ☐ Yes ☐ No

Device removed by: \_\_\_\_\_ Date: \_\_\_\_\_

Notes: \_\_\_\_\_

**Figure 1**  
**Sample Orange Device Tag**

5.3.2 Carefully remove the mass flow device from the installation or system.

5.3.3 The inlet and outlet ports should be sealed to prevent any leakage into or out of the mass flow device.

5.3.4 The person removing the mass flow device should attach the orange tag to the device.

5.4 *Equipment Packaging* — Package all mass flow devices for shipment per government regulations including the following:

5.4.1 Seal the device in a protective container to prevent the contamination of the shipping package. If the orange tag is not visible through the container, an additional tag should be attached to the outside of the container.

5.4.2 Place the device in a shipping container with adequate packing to avoid damage to the device and the protective container during shipment.