

SEMI E34-1110

SAFETY GUIDELINE FOR MASS FLOW DEVICE REMOVAL AND SHIPMENT

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NOTICE: This Standard or Safety Guideline has Inactive Status because the conditions to maintain Current Status have not been met. Inactive Standards or Safety Guidelines are available from SEMI and continue to be valid for use.

NOTICE: This Document was completely rewritten in 2010.

1 Purpose

1.1 This Safety Guideline provides procedures to reduce the risk associated with removing, shipping, and receiving mass flow devices that have been exposed to hazardous materials.

NOTE 1: Mass flow devices (mass flow controllers and mass flow meters) are used as an integral part of the chemical delivery systems in semiconductor, flat panel, and solar cell and panel processing equipment. Many of the chemicals used in the associated processes are hazardous to personnel and can damage equipment. Once exposed to these chemicals, a contaminated mass flow device can present a hazard to personnel and might damage equipment.

1.2 This Safety Guideline is intended to:

1.2.1 Encourage the purging of devices used with hazardous materials prior to removal to reduce the risk of chemical injury and equipment damage while handling them.

1.2.2 Establish a process for properly identifying and documenting such mass flow devices by using an orange tag and a health and safety disclosure form.

1.2.3 Establish a means of alerting the recipients of such mass flow devices to the hazards.

2 Scope

2.1 This Safety Guideline applies to mass flow devices that have been exposed to hazardous materials.

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

3.1 None.

4 Terminology

4.1 Definitions

4.1.1 *hazardous materials* — any chemical, substance, or compound which is defined or interpreted to pose risks or hazards to human health or the environment by applicable international, national, regional, or local laws or regulations. [SEMI S12]

4.1.2 *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.

4.1.3 *mass flow device* — a mass flow controller or mass flow meter.

4.1.4 *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.

4.1.5 *material safety data sheet (MSDS)* — written or printed material concerning chemical elements and compounds, including hazardous materials, prepared in accordance with applicable standards. [SEMI S2]

4.1.6 *protective container* — a sealable plastic bag or other container which will keep hazardous material from the mass flow device from contaminating the outer package.

4.1.7 *purge* — to remove hazardous material from, or dilute hazardous material in, a device by flowing an inert gas through the device.

NOTE 2: Purging a chemical delivery line containing a mass flow device with an inert substance is intended to dilute or displace hazardous materials and reduce the level of risk. To be effective, the inert substance must be able to reach all points within the chemical delivery system in sufficient quantity to dilute or displace the hazardous material to acceptable levels. The nature of the hazardous material and the physical configuration of the chemical delivery system must be considered when developing a purge procedure.

5 Procedure

5.1 The personnel removing a mass flow device and shipping it should follow the procedure described in § 5.

5.2 *Purging Prior to Removal* — Mass flow devices that have been exposed to hazardous materials should be purged prior to removal, unless an equipment failure prevents purging.

EXCEPTION: Mass flow devices that have been exposed to only helium, argon, krypton, xenon, nitrogen, or air do not need to be purged. However, it is important to relieve the pressure in such a device before disconnecting it.

NOTE 3: The substances listed in the Exception are sometimes classified as hazardous materials because of the pressures at which they are stored, transported, and used or because they can cause asphyxiation. Those substances are not foreseen to leave hazardous residues on or in mass flow devices.

5.2.1 Purge procedures are usually specific to the equipment and installation. Obtain purging procedures from the facilities manager, safety department, or the equipment manufacturer.

5.2.2 If a formal purge procedure is not available, work with the facilities manager, safety department, or equipment manufacturer to develop one.

5.2.3 Note, on the disclosure form, the purge procedure document number and source.

5.2.4 Thoroughly purge the mass flow device following the applicable purge procedure.

5.3 *Equipment Removal* — Do not remove a mass flow device until it has been properly purged. If it is not possible to purge a device that was exposed to toxic or corrosive materials, follow the instructions of safety or emergency response personnel regarding the device.

NOTE 4: In some circumstances, failure of a mass flow device or obstruction of its internal flow path prevents purging.

5.3.1 Fill out an orange device tag prior to removal of the device. The format of the tag is optional, as long as the tag contains all of the information shown in Figure 1.

Mass Flow Device Return Tag

Make _____ Model _____

Serial Number _____

Gas(es) or liquid(s) used in this device _____

Hazardous materials to which the exterior of the device was exposed _____

Was this device purged before removal? ☐ No ☐ Yes, procedure: _____

Device Removed by: _____ Date: _____

Notes: _____

Figure 1
Sample Device Tag