SEMI F34-0998
GUIDE FOR LIQUID CHEMICAL PIPE LABELING

1 Purpose

1.1 This document establishes a recommended scheme for labeling liquid process chemical piping systems used in semiconductor manufacturing facilities and equipment.

1.2 Consistent labeling system facilitates rapid identification of piping contents and avoids confusion within the industry by eliminating the need for each company or locality to develop their own guides.

2 Scope

2.1 This guide applies to components typically found in a liquid process chemical piping system for semiconductor manufacturing processes. The following list of included components is not exhaustive:

- Piping
- Valves
- Filters
- Regulators
- Tubing

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 Limitations

3.1 This guide does not replace or supersede any labeling or identification requirements established by local, state, or national authorities. Local laws and regulations should be reviewed to ensure compliance.

3.2 This guide does not apply to containers regulated by the United States Department of Transportation (DOT), International Air Transport Association (IATA) or other regulatory bodies.

3.3 This guide was prepared to address piping systems conveying liquid process chemicals located within semiconductor facilities. See §§ 6.6 and 6.11 for application inside equipment.

4 Referenced Standards and Documents

4.1 *ANSI Standard*[1]

ANSI/ASME A13.1 — Scheme for the Identification of Piping Systems

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

5 Terminology

5.1 *Definitions*

5.1.1 *liquid chemical distribution system* — the collection of components and subsystems used to control and deliver liquid process chemicals from a source location to a point of use in a semiconductor manufacturing facility.

[1] American National Standards Institute, 25 West 43rd Street, New York, NY 10036, USA; Telephone: 212.642.4900, Fax: 212.398.0023, http://www.ansi.org

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6 Recommendations

6.1 Piping system labels and identification, should be designed, and implemented in accordance with the following recommendations.

6.2 The following color schemes should be used to identify all liquid process chemical piping systems. When a chemical has characteristics of more than one category, the color scheme should be determined by the most significant health or safety hazard of the chemical.

6.3 Background colors may be applied to the piping by using pigments, paints, or other means acceptable to the owner; or may be applied as the background color for labels or tags used to identify the contents of the piping system.

6.4 Primary label information consists of the name of the material contained in the piping system; spelled out in the predominant language of the country or region where the piping system is used. Additional languages may be used to supplement the primary language.

Table 1 Piping and Label Color Codes

Chemical Category	*Background Color*	*Text Color*
Highly Toxic, Poisonous	Black	White
Flammable, Combustible, and Pyrophoric	Red	White
Acidic	Orange	Black
Basic (Caustic)	Magenta	White
Oxidizer	Yellow	Black
Non-Toxic, Non-Flammable, Low to Moderate Physical Hazard	Green	White

6.5 Additional information such as the chemical category, chemical formula, acronyms, hazard ratings, or other information may be added, provided that it does not interfere with the primary information required. A separate label may be used for the additional information.

6.6 The color field label length and lettering sizes shown in Table 2 should be used for all diameters of pipe and tubing. For pipe diameters smaller than 12.7 mm (0.5 in.), the label should be large enough to wrap at least half way around the pipe, and not obstruct the text. If labeling inside equipment, the size of the labels may be adjusted, provided they remain easily seen and readable. Consideration should be given to using tags instead of labels.

NOTE 1: Labeling sizes for piping 19 mm (0.75 in.) or larger in outside diameter were taken directly from ANSI A13.1. Smaller sizes were developed for this guide.

6.7 The height of the label should be at least two times (2×) the height of the text, with the text centered in the label. The label should allow a length of background color on each end of the text at least one half pipe diameter in length but not less than 12.7 mm (0.5 in.).

6.8 The orientation of text on the label should conform to local customs, conventions, or practices.

6.9 Directional flow arrows should be applied to all piping systems indicating the direction of material flow within the system. The arrow(s) should be included as part of the primary label but may be applied separately within close proximity to the primary label (e.g., less than 5 cm (2 in.) for pipe diameters up to 5 cm (2 in.); less than 15 cm for larger pipe diameters).

6.10 Labels should be applied to the piping system at the following minimum locations:

- On both sides of a barrier penetration (i.e., walls, floors, ceilings, equipment enclosures, etc.). The labels should be applied within 1 meter (3.3 feet) or as close as practical to the barrier.
- As close as practical to all changes in direction where the length of run in the new direction is 1 meter (3.3 feet) or greater. Where several directional changes are made within a short length of run, labels need not be applied at every change in direction, but should be applied at sufficient intervals to readily identify the piping.
- On long runs, the labels should be applied at intervals not exceeding 6 meters (20 feet). Shorter intervals should be used for small diameter pipe and where several pipes are run in close proximity.

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