

SEMI C72-0811 (Reapproved 0317) GUIDE FOR PROPYLENE-GLYCOL-MONO-METHYL-ETHER (PGME), PROPYLENE-GLYCOL-MONO-METHYL-ETHER-ACETATE (PGMEA) AND THE MIXTURE 70WT% PGME/30WT% PGMEA

This Standard was technically approved by the Liquid Chemicals Global Technical Committee. This edition was approved for publication by the global Audits and Reviews Subcommittee on December 8, 2016. Available at www.semiviews.org and www.semi.org in March 2017; originally published August 2011.

1 Purpose

1.1 The purpose of this Document is to provide a guide for propylene-glycol-mono-methyl-ether (PGME), propylene-glycol-mono-methyl-ether-acetate (PGMEA) and the mixture 70wt% PGME/30wt% PGMEA for which a need has been identified.

2 Scope

2.1 The scope of this Document covers PGME, PGMEA, and the mixture 70wt% PGME/30wt% PGMEA which are used as solvents in the semiconductor industry for advanced resist technology.

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 None.

4 Referenced Standards and Documents

4.1 SEMI Standards and Safety Guidelines

SEMI C1 — Guide for the Analysis of Liquid Chemicals

4.2 ASTM Standard¹

ASTM D5127 — Standard Guide for Ultra-Pure Water Used in the Electronics and Semiconductor Industries

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

5 Terminology

5.1 Abbreviations and Acronyms

5.1.1 *PGME* — propylene glycol mono methyl ether (IUPAC: 1-methoxy-propan-2-ol)

5.1.2 *PGMEA* — propylene glycol mono methyl ether acetate (IUPAC: 1-methoxypropan-2-yl acetate)

¹ ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, USA; Telephone: +1.610.832.9585, Fax: +1.610.832.9555, <http://www.astm.org>

6 Properties

Table 1 Properties of PGME (for information only)

Molecular Formula	CH ₃ -O-CH ₂ -CH(CH ₃)-OH
Molecular Weight	90.1 g/mol
CAS Number	107-98-2 1589-47-5 (b isomer <0.5%)
Density	0.92 g/cm ³
Boiling Point	120°C (1013 hPa)
Vapor Pressure	11.5 hPa at 20°C
Melting Point	-97°C
Solubility in Water	Miscible (200 g/L at 20°C)

Table 2 Properties of PGMEA (for information only)

Molecular Formula	CH ₃ -O-CH ₂ -CH(CH ₃)-O-CO-CH ₃
Molecular Weight	132.2 g/mol
CAS Number	108-65-6
Density	0.97 g/cm ³
Boiling Point	146°C (1013 hPa)
Vapor Pressure	4.9 hPa at 20°C
Melting Point	-66°C
Solubility in Water	Miscible (200 g/L at 20°C)

7 Suggested Values

7.1 The suggested values for PGME, PGMEA and the mixture 70wt% PGME/30wt% PGMEA for Tier A are listed in Table 3.

8 Grade 1 Procedures

8.1 This section does not apply to this chemical.

9 Grade 2 Procedures

9.1 This section does not apply to this chemical.

10 Grade 3 Procedures

10.1 This section does not apply to this chemical.

11 Grade 4 Procedures

11.1 This section does not apply to this chemical.

12 Tier A Procedures

NOTE 1: Standardized test methods are being developed for all parameters at the purity level indicated. Until standardized test methods are published, test methodology shall be determined by user and producer. The Liquid Chemicals Global Technical Committee considers a method to be valid only if method validation according to SEMI C1 has been demonstrated.

12.1 Assay — Analyze the sample by gas chromatography (see SEMI C1, Guidelines for Assay by Wide Bore Column Gas Chromatography). The parameters cited have given satisfactory results.

- Column: 50 meters by 45 microns I.D. fused silica capillary, coated with 100% dimethyl-polysiloxane which has been surface bounded.