

SEMI PV14-0211

GUIDE FOR PHOSPHORUS OXYCHLORIDE, USED IN PHOTOVOLTAIC APPLICATIONS

This standard was technically approved by the global Photovoltaic Committee. This edition was approved for publication by the global Audits & Reviews Subcommittee on December 21, 2010. Available at www.semiviews.org and www.semi.org in February 2011.

1 Purpose

1.1 This document provides suggested assay, color and maximum impurity levels for one grade of phosphorus oxychloride used in the photovoltaic industry.

2 Scope

2.1 This document refers to an “as supplied” product; not point of use.

2.2 This document is a guide and complete analytical methods are not contained within.

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 Description

3.1 Phosphorus oxychloride (POCl_3) is a clear liquid with a pungent odor.

3.2 It is stable in an inert atmosphere, but reacts violently with water.

3.3 It is also incompatible with metals, acids, bases, alcohols, and amines.

NOTE 1: Users of POCl_3 are encouraged to obtain and read the Material Safety Data Sheet for this chemical. POCl_3 is highly toxic by inhalation or via ingestion. It can also cause burns to the eyes, skin and mucous membrane.

4 Referenced Standards and Documents

4.1 SEMI Standards

SEMI C1 — Guide for the Analysis of Liquid Chemicals

5 Terminology

5.1 None.

6 Properties of Phosphorus Oxychloride

Table 1 Properties of Phosphorus Oxychloride (for information only)

	Metric Units	US Units
CAS Number	10025-87-3	10025-87-3
Molecular Formula	POCl_3	POCl_3
Molecular Weight	153.33	153.33
Boiling point at 1 atm	105.8°C	222.4°F

7 Suggested Assay, Color and Maximum Impurity Levels for Phosphorus Oxychloride

7.1 The suggested assay, color and maximum impurity levels for phosphorus oxychloride for Tier A are listed in Table 2.

Table 2 Suggested Assay, Color and Maximum Impurity Levels for Phosphorus Oxychloride

	<i>Tier A</i>
Assay	99.9% min
Color (APHA)	5 max
Aluminum (Al)	10 ppb max
Antimony (Sb)	10 ppb max
Arsenic (As)	10 ppb max
Barium (Ba)	10 ppb max
Boron (B)	10 ppb max
Cadmium (Cd)	10 ppb max
Calcium (Ca)	10 ppb max
Chromium (Cr)	10 ppb max
Copper (Cu)	10 ppb max
Iron (Fe)	10 ppb max
Lead (Pb)	10 ppb max
Lithium (Li)	10 ppb max
Magnesium (Mg)	10 ppb max
Manganese (Mn)	10 ppb max
Nickel (Ni)	10 ppb max
Potassium (K)	10 ppb max
Sodium (Na)	10 ppb max
Tin (Sn)	10 ppb max
Titanium (Ti)	10 ppb max
Vanadium (V)	10 ppb max
Zinc (Zn)	10 ppb max

8 Tier A Procedures

8.1 Standardized test methods are being developed for all parameters at the purity levels indicated. Until standardized test methods are published, test methodology shall be determined by user and producer. The Liquid Chemicals committee considers a method to be valid if it complies with SEMI C1 requirements for method validation.

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