Designation: C 1572 – 04

Standard Guide for Dry Lead Glass and Oil-Filled Lead Glass Radiation Shielding Window Components for Remotely Operated Facilities[1]

This standard is issued under the fixed designation C 1572; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 *Intent*:

1.1.1 This intent of this standard is to provide guidance for the design, fabrication, quality assurance, inspection, testing, packaging, shipping, installation and maintenance of radiation shielding window components. These window components include wall liner embedments, dry lead glass radiation shielding window assemblies, oil-filled lead glass radiation shielding window assemblies, shielding wall plugs, barrier shields, view ports, and the installation/extraction table/device required for the installation and removal of the window components.

1.2 *Applicability*:

1.2.1 This standard is intended for those persons who are tasked with the planning, design, procurement, fabrication, installation, and operation of the radiation shielding window components that may be used in the operation of hot cells, high level caves, mini-cells, canyon facilities, and very high level radiation areas.

1.2.2 This standard applies to radiation shielding window assemblies used in normal concrete walls, high-density concrete walls, steel walls and lead walls.

1.2.3 The system of units employed in this standard is the metric unit, also known as SI Units, which are commonly used for International Systems, and defined, by ASTM/IEEE SI-10 Standard for Use of International System of Units. Common nomenclature for specifying some terms; specifically shielding, uses a combination of metric units and inch-pound units.

1.2.4 This standard identifies the special information required by the Manufacturer for the design of window components. A1.1 shows a sample list of the radiation source spectra and geometry information, typically required for shielding analysis. A2.1 shows a detailed sample list of specific data typically required to determine the physical size, glass types, and viewing characteristics of the shielding window, or view port. A3 shows general window configuration sketches. Blank copies of A1.2 and A2.2 are found in the respective Annexes for the Owner–Operator's use.

1.2.5 This standard is intended to be generic and to apply to a wide range of configurations and types of lead glass radiation shielding window components used in hot cells. It does not address glovebox, water, x-ray glass or zinc bromide windows.

1.3 *Caveats*:

1.3.1 Consideration shall be given when preparing the shielding window designs for the safety related issues discussed in the Hazards Sources and Failure Modes, Section 11; such as dielectric discharge, over-pressurization, radiation exposure, contamination, and overturning of the extraction table/device.

1.3.2 In many cases, the use of the word "shall" has been purposely used in lieu of "should" to stress the importance of the statements that have been made in this standard.

1.3.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.*

2. Referenced Documents

2.1 *Industry and National Consensus Standards*—Nationally recognized industry and consensus standards which may be applicable in whole or in part to the design, fabrication, quality assurance, inspection, testing, packaging, shipping, installation and maintenance of radiation shielding window components are referenced throughout this standard and include the following:

2.2 *ASTM Standards:* [2]

D 1533 Test Method for Water in Insulating Liquids by Coulometric Karl Fisher Titration

E 165 Test Method for Liquid Penetrant Examination

E 170 Terminology Relating to Radiation Measurement and Dosimetry

ASTM/IEEE SI-10 Standard for Use of the International System of Units

[1] This guide is under the jurisdiction of ASTM Committee C26 on Nuclear Fuel Cycle and is the direct responsibility of Subcommittee C26.14 on Remote Systems.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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