



Standard Guide for General Design Considerations for Hot Cell Equipment¹

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1. Scope

1.1 Intent:

1.1.1 The intent of this guide is to provide general design and operating considerations for the safe and dependable operation of remotely operated hot cell equipment. Hot cell equipment is hardware used to handle, process, or analyze nuclear or radioactive material in a shielded room. The equipment is placed behind radiation shield walls and cannot be directly accessed by the operators or by maintenance personnel because of the radiation exposure hazards. Therefore, the equipment is operated remotely, either with or without the aid of viewing.

1.1.2 This guide may apply to equipment in other radioactive remotely operated facilities such as suited entry repair areas, canyons or caves, but does not apply to equipment used in commercial power reactors.

1.1.3 This guide does not apply to equipment used in gloveboxes.

1.2 Applicability:

1.2.1 This guide is intended for persons who are tasked with the planning, design, procurement, fabrication, installation, or testing of equipment used in remote hot cell environments.

1.2.2 The equipment will generally be used over a long-term life cycle (for example, in excess of two years), but equipment intended for use over a shorter life cycle is not excluded.

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 **IEEE/ASTM SI 10**: American National Standard for Use of the International System of Units (SI): The Modern Metric System.

1.3 Caveats:

1.3.1 This guide does not address considerations relating to the design, construction, operation, or safety of hot cells, caves, canyons, or other similar remote facilities. This guide deals only with equipment intended for use in hot cells.

1.3.2 Specific design and operating considerations are found in other ASTM documents.

1.4 *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 ASTM Standards:²

A193/A193M Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications

A240/A240M Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications

A276 Specification for Stainless Steel Bars and Shapes

A320/A320M Specification for Alloy-Steel and Stainless Steel Bolting for Low-Temperature Service

A354 Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners

A479/A479M Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels

A489 Specification for Carbon Steel Lifting Eyes

A490 Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength

C859 Terminology Relating to Nuclear Materials

C1217 Guide for Design of Equipment for Processing Nuclear and Radioactive Materials

C1572 Guide for Dry Lead Glass and Oil-Filled Lead Glass Radiation Shielding Window Components for Remotely Operated Facilities

C1615 Guide for Mechanical Drive Systems for Remote Operation in Hot Cell Facilities

C1661 Guide for Viewing Systems for Remotely Operated Facilities

C1725 Guide for Hot Cell Specialized Support Equipment and Tools

D676 Method of Test for Indentation of Rubber by Means of a Durometer; Replaced by D 2240 (Withdrawn 1964)³

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.

³ The last approved version of this historical standard is referenced on www.astm.org.