



Standard Practice for Bulk Sampling of Liquid Uranium Hexafluoride¹

This standard is issued under the fixed designation C1052; 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 This practice covers methods for withdrawing representative samples of liquid uranium hexafluoride (UF_6) from bulk quantities of the material. Such samples are used for determining compliance with the applicable commercial specification, for example Specification **C787** and Specification **C996**.

1.2 It is assumed that the bulk liquid UF_6 being sampled comprises a single quality and quantity of material. This practice does not address any special additional arrangements that might be required for taking proportional or composite samples. When the sampled bulk material is being added to UF_6 residues already in a container (“heels recycle”) additional arrangements are required to avoid cross contamination of the bulk UF_6 ; these are addressed in the appropriate section (8.2) of Specifications **C787** and **C996**.

1.3 The number of samples to be taken, their nominal sample weight, and their disposition shall be agreed upon between the parties.

1.4 The scope of this practice does not include provisions for preventing criticality incidents.

1.5 *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 limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

C787 Specification for Uranium Hexafluoride for Enrichment

C996 Specification for Uranium Hexafluoride Enriched to Less Than 5 % ²³⁵U

¹ This practice is under the jurisdiction of ASTM Committee **C26** on Nuclear Fuel Cycle and is the direct responsibility of Subcommittee **C26.02** on Fuel and Fertile Material Specifications.

Current edition approved Jan. 15, 2014. Published February 2014. Originally approved in 1985. Last previous edition approved in 2007 as C1052 – 01 (2007). DOI: 10.1520/C1052-14.

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.

2.2 Other Documents:

USEC-651 Uranium Hexafluoride: A Manual of Good Handling Practices³

ANSI N14.1 Uranium Hexafluoride: Packaging for Transport⁴

ISO/DIS 7195 Packaging of Uranium Hexafluoride (UF_6) for Transport⁴

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *container*—the bulk vessel either holding or receiving by transfer, the UF_6 to be sampled; it may consist of, for example, a fixed vessel in a UF_6 handling plant or a cylinder to be used for the transport of UF_6 .

3.1.2 *sample bottle*—the small vessel into which the sample of UF_6 is withdrawn for transfer to the laboratory for characterization.

4. Summary of Practice

4.1 Two methods of withdrawing a sample are described, namely: (1) direct withdrawal from a filled container and (2) withdrawal from the inlet-line during the filling of a container by liquid transfer. The first method involves tilting or turning the container in such a way that its valve is below the surface of the liquefied UF_6 , and dependent on the equipment, this requires that the container holds more than a specified minimum quantity of UF_6 . Liquid UF_6 is withdrawn into a graduated volume and then transferred to the respective sample bottle(s). In the second method, a small proportion of the UF_6 flowing from one container to another is withdrawn into a graduated volume and then transferred to the respective sample bottle(s).

4.2 For both methods of sampling, the presence of residues may have significant implications for the quality of the UF_6 . For safety and quality reasons, containers and bottles shall be clean, dry, and empty before filling.

4.3 Various types of sample bottles are in use and are described in detail in the applicable national and international

³ Available from United States Enrichment Corp., 6903 Rockledge Dr., Bethesda, MD 20817.

⁴ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.