



## Designation: C 1051 – 85 (Reapproved 1994)<sup>ε1</sup>

AMERICAN SOCIETY FOR TESTING AND MATERIALS  
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# Standard Specification for Sodium (Na) as a Coolant for Liquid Metal-Cooled Reactors<sup>1</sup>

This standard is issued under the fixed designation C 1051; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

<sup>ε1</sup> NOTE—Sections 9 and 10 were renumbered and keywords were added editorially in August 1994.

## 1. Scope

1.1 This specification is for sodium intended for use in liquid metal-cooled reactors and for related, non-reactor test and experimental systems.

1.2 The values stated in SI units are to be regarded as the standard.

1.3 The following precautionary caveat pertains only to Section 7 of this specification: *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:

C 997 Test Methods for Chemical and Instrumental Analysis of Nuclear-Grade Sodium and Cover Gas<sup>2</sup>

G 68 Practice for Liquid Sodium Corrosion Testing of Metals and Alloys<sup>3</sup>

### 2.2 U.S. Government Document:

Title 49, Code of Federal Regulations, Hazardous Materials Regulations of the Department of Transportation, Parts 171–179<sup>4</sup>

## 3. Terminology

### 3.1 Descriptions of Terms Specific to This Standard:

3.1.1 *batch*—the quantity of sodium contained in drums filled from a single sodium source produced under a specific purchasing agreement; the drums to be of the type approved for sodium shipment.

3.1.2 *filter*—a flow through device containing a metal screen or frit constructed of a suitable material, such as Type 304 or Type 316 stainless steel, which is used to retain particulate material that may be present in liquid sodium.

3.1.3 *line volume*—the internal volume enclosed by piping surfaces of a sodium delivery system which historically could

have become contaminated with sodium not meeting the chemical purity specification for use in Class I or Class II systems.

3.1.4 *lot*—the quantity of sodium contained in a filled tank car of the type approved for sodium shipment under 49CFR173.

## 4. Classification

4.1 *Class I System*—All sodium systems associated with a liquid metal cooled reactor.

4.2 *Class II System*—Non-reactor related test and experimental sodium systems.

## 5. Ordering Information

5.1 The buyer shall furnish the seller with the following information in a purchasing agreement:

5.1.1 Quantity of sodium to be delivered and whether the chemical requirements for Class I or Class II systems are applicable.

5.1.2 ASTM designation and year of issue of this standard and all other applicable standards.

5.1.3 Name of buyer, delivery site, and delivery date.

5.1.4 Type of shipping container and type of cover gas to be used.

5.1.5 Method of shipment.

5.1.6 Minimum cleaning and inspection plan requirements for shipping containers and sodium transfer piping.

5.1.7 Any specific sampling, testing, certification, cleanliness, packaging, shipping, or quality verification plans or requirements that may have been mutually agreed to by the buyer and seller.

## 6. Filtering and Chemical Composition

6.1 *Filtering Requirements*—Sodium intended for use in Class I and Class II systems shall be melted and filtered at a temperature not greater than 150°C (300°F) through a filter of 28- $\mu$ m porosity. This filtration is to occur prior to any sampling of the sodium for chemical analysis and before loading the sodium into any shipping container.

6.2 The chemical requirements of sodium for use in Class I or Class II system shall be as follows:

6.2.1 *Class I*—The total sodium plus potassium content of this material shall be no less than 99.90 weight %. The impurity content of this material shall not exceed the limits specified in Table 1.

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee C-26 on Nuclear Fuel Cycle and is the direct responsibility of Subcommittee C26.02 on Fuel and Fertile Material Specifications.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 12.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 03.02.

<sup>4</sup> Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.