



Standard Specification for Packing Material, Graphitic or Carbon Braided Yarn¹

This standard is issued under the fixed designation F 2191; 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 specification covers staple or continuous filament carbon/graphite yarn valve stem compression packing, suitable for use as end-rings on packing systems for valves. Intended services include steam, hydrocarbons, water and non-oxidizing chemicals. Where this specification is invoked as ASTM F 2191, Sections 1-18 apply. Where this specification is invoked as ASTM/DoD F 2191, Sections 1-18 and the Supplementary Requirements are applicable.

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

1.3 *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 limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

- C 135 Test Method for True Specific Gravity of Refractory Materials by Water Immersion²
- C 561 Test Method for Ash in a Graphite Sample³
- C 562 Test Method for Moisture in a Graphite Sample³
- C 816 Test Method for Sulfur in Graphite by Combustion—Iodometric Titration Method³
- C 889 Test Methods for Chemical and Mass Spectrographic Analysis of Nuclear-Grade Gadolinium Oxide (Gd₂O₃) Powder⁴
- D 129 Test Method for Sulfur in Petroleum Products (General Bomb Method)⁵
- D 512 Test Methods for Chloride Ion in Water⁶
- D 1179 Test Methods for Fluoride Ion in Water⁶
- D 1246 Test Method for Bromide Ion in Water⁶
- D 3178 Test Methods for Carbon and Hydrogen in the

Analysis Sample of Coal and Coke⁷

D 3684 Test Method for Total Mercury in Coal by the Oxygen Bomb Combustion/Atomic Absorption Method⁷

D 3761 Test Method for Total Fluorine in Coal by the Oxygen Bomb Combustion/Ion Selective Electrode Method⁷

D 3951 Practice for Commercial Packaging⁸

D 4239 Test Method for Sulfur in the Analysis Sample of Coal and Coke Using High-Temperature Tube Furnace Combustion Methods⁷

2.2 Military Standards:

MIL-STD-129 Marking for Shipment and Storage⁹

MIL-P-24583 Packing Material, Graphitic or Carbon Braided Yarn⁹

MIL-P-24503 Packing Material, Graphitic, Corrugated Ribbon or Textured Tape and Preformed Ring⁹

2.3 Fluid Sealing Association Handbook:

Guidelines for the Use of Compression Packings, Copyright 1997¹⁰

3. Terminology

3.1 *base fiber density*—bulk density of the base fiber before being coated or impregnated and braided into packing; expressed as lb/ft³.

3.2 *braided flexible graphite*—a braid constructed of continuous strands or strips of expanded flexible graphite tape or ribbons which may have been overwrapped or have imbedded reinforcing fibers.

3.3 *carbon fibers*—fibers used in braided packing are produced from viscose rayon, pitch, or polyacrylonitrile (PAN) and are defined as a yarn with a carbon assay of less than 99 %.

3.4 *carbon yarns*—manufactured from continuous or staple carbon fibers that are twisted or plied into continuous individual strands of between 6 and 18 μm in diameter.

3.5 *carbon/graphite fibers*—carbon/graphite fibers used in braided packing are produced from viscose rayon, pitch, or polyacrylonitrile (PAN).

¹ This specification is under the jurisdiction of ASTM Committee F25 on Ships and Marine Technology and is the direct responsibility of Subcommittee F25.02 on Insulation/Processes.

Current edition approved July 10, 2002. Published September 2002.

² *Annual Book of ASTM Standards*, Vol 15.01.

³ *Annual Book of ASTM Standards*, Vol 05.04.

⁴ *Annual Book of ASTM Standards*, Vol 12.01.

⁵ *Annual Book of ASTM Standards*, Vol 05.01.

⁶ *Annual Book of ASTM Standards*, Vol 11.01.

⁷ *Annual Book of ASTM Standards*, Vol 05.06.

⁸ *Annual Book of ASTM Standards*, Vol 15.09.

⁹ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, Attn: NPODS.

¹⁰ Available from the Fluid Sealing Association, 994 Old Eagle School Road, Suite 1019, Wayne, PA 19087-1866.