



# Standard Specification for Dough Divider and Rounding Machines<sup>1</sup>

This standard is issued under the fixed designation F1966; 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.

## 1. Scope

1.1 This specification covers commercial hand operated dough divider machines and semiautomatic and automatic, electrically operated, dough divider and rounding machines with or without interchangeable heads.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

[A167 Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip \(Withdrawn 2014\)](#)<sup>3</sup>

[A240/A240M Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications](#)

[D3951 Practice for Commercial Packaging](#)

[F760 Specification for Food Service Equipment Manuals](#)

[F1166 Practice for Human Engineering Design for Marine](#)

[Systems, Equipment, and Facilities](#)

2.2 *ANSI Standards:*<sup>4</sup>

[Z1.4 Sampling Procedures and Tables for Inspection by Attributes](#)

2.3 *BISSC Standards:*<sup>5</sup>

[Basic Criteria](#)

[No. 8 Dividers, Rounders, and Bun Machines](#)

[No. 29 Electrical Motors and Accessory Equipment](#)

2.4 *NEMA Standards:*<sup>6</sup>

[MG 1 Motors and Generators](#)

[WC 5 Thermoplastic—Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy](#)

[WC 7 Cross-Linked-Thermosetting-Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy](#)

[WD 1 General Requirements for Wiring Devices](#)

2.5 *NSF/ANSI Standards:*<sup>7</sup>

[NSF/ANSI No. 2 Food Equipment](#)

[NSF/ANSI No. 8 Commercial Powered Food Preparation Equipment](#)

[NSF/ANSI No. 51 Food Equipment Materials](#)

[NSF/ANSI No. 169 Special Purpose Food Equipment and Devices](#)

2.6 *ANSI/UL Standards:*<sup>8</sup>

[ANSI/UL 763 Motor-Operated Commercial Food Preparing Machines](#)

[ANSI/UL 969 Marking and Labeling Systems](#)

2.7 *Federal and Military Documents:*<sup>9</sup>

[MIL-STD-1399/300 Interface Standard for Shipboard Systems Section 300A Electric Power, Alternating Current](#)

[MIL-STD-167/1 Mechanical Vibrations of Shipboard Equipment \(Type I—Environmental and Type II—Internally Excited\)](#)

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

<sup>3</sup> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).

<sup>4</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

<sup>5</sup> Available from Baking Industry Sanitation Standards Committee (BISSC), 1400 W. Devon Ave., Suite 422, Chicago, IL 60660.

<sup>6</sup> Available from Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112-5704

<sup>7</sup> Available from NSF International, P.O. Box 130140, 789 N. Dixboro Rd., Ann Arbor, MI 48113-0140.

<sup>8</sup> Available from comm2000, 1414 Brook Dr., Downers Grove, IL 60515, <http://www.shopulstandards.com>.

<sup>9</sup> Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

**MIL-STD-461 Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment**

### 3. Terminology

#### 3.1 Definitions:

3.1.1 *recovered materials*—materials that have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials.

### 4. Classification

4.1 *General*—Dough dividers and dough divider/rounding machines covered by this specification are classified by type and size.

#### 4.2 Type:

4.2.1 *Type I*—Dough divider machine, manually operated,

4.2.2 *Type II*—Dough divider and rounder, semiautomatic, electrically operated,

4.2.3 *Type III*—Dough divider and rounder, fully-automatic, electrically operated, and

4.2.4 *Type IV*—Dough divider machine, fully-automatic, electrically operated.

#### 4.3 Class:

4.3.1 *Class I*—Fixed head,

4.3.2 *Class II*—Fixed variable head, and

4.3.3 *Class III*—Interchangeable head.

#### 4.4 Size:

4.4.1 *Size 1*—36-part dough divider (part sizes up to 4 oz (113.4 g)),

4.4.2 *Size 2*—18-part dough divider machine (part sizes 2 oz up to 6 oz (56.7 to 170.1 g)), and

4.4.3 *Size 3*—Fixed and interchangeable head assemblies that may include the following approximate ranges of part by weight:

36-part 1 oz up to 3 oz (28.4 g up to 85.2 g)

18-part 3 oz up to 7 oz (85.2 g up to 199 g)

9-part 7 oz up to 1 lb 2 oz (199 g up to 510.3 g)

6-part 1 lb 2 oz up to 1 lb 10 oz (510.3 g up to 737.1 g)

4.4.4 This specification does not purport to address all of the sizes that may be available, but is an overview of the most common sizes used in the industry today (see **Appendix X1**).

#### 4.5 Style:

4.5.1 *Style 1*—Countertop or bench mounted,

4.5.2 *Style 2*—Floor mounted, and

4.5.3 *Style 3*—Portable.

### 5. Ordering Information

5.1 *Ordering Data*—Purchasers shall select the dough divider and rounding machine and any preferred options and include the following information in the purchasing document:

5.1.1 Title, number, and date of this specification,

5.1.2 Type, class, size, and style of machine required,

5.1.3 Quantity to be furnished,

5.1.4 Electrical power supply characteristics: voltage, phase, frequency (see **7.4.1**),

5.1.5 Accessory equipment, number of heads, options, spare parts, and maintenance parts required,

5.1.6 When Federal/Military procurement is required, review and implement the applicable supplementary requirements (see S1 through S9),

5.1.7 When specified, the purchaser shall be furnished certification that samples representing each lot have been either tested or inspected as directed in this specification and the requirements have been met. When specified, a copy of the test results shall be furnished.

5.1.8 Level of preservation and packing required if other than as stated in Practice **D3951** (see **17.1**),

5.1.9 Labeling requirements (if different than **15.1**), and

5.1.10 Whether the equipment shall meet the requirements of ANSI/NSF, ANSI/UL, or BISSC standards, or a combination thereof.

### 6. Material

6.1 *General*—Dough divider, and dough dividing and rounding machines shall conform to NSF/ANSI No. 8 or BISSC Basic Criteria and Standard No. 8. Materials used shall be free from defects that would affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. None of the above shall be interpreted to mean that the use of used or rebuilt products are allowed under this specification unless otherwise specified.

6.1.1 *Stainless Steel*: Stainless steel shall conform to the 300 series of Specification **A167** or **A240/A240M** as applicable.

### 7. Design and Construction

7.1 *General*—Dough divider and rounding machines shall be delivered assembled, ready for mounting, connection to electricity, and use as applicable.

7.2 *Dough Divider*—The Type I machine shall consist of a base, an operating handle, a manually operated dough dividing mechanism (cutting head with stainless steel knives or other material meeting NSF/ANSI No. 51 or BISSC Basic Criteria and Standard No. 8 requirements, and pressure board meeting the same material requirements), a yoke or support, and a removable dough pan. The base of the Type I machine shall be provided with bolt holes for mounting. The overall dimensions of the machine, excluding operating handle, shall fit into a 17 in. (423 mm) by 18-½ in. (470 mm) square area, 22-½ in. (565 mm) in height, ±3 in. (76.2 mm) for each dimension.

7.2.1 *Pan*—The Type I machine shall be provided with a circular dough pan of one piece, deep drawn stainless steel or other material meeting NSF/ANSI 51 or BISSC Basic Criteria and Standard No. 8 requirements. The pan shall be readily-removable and shall have not less than one handle.

7.3 *Dough Divider and Rounder*—The Type II machine shall be semiautomatic consisting of a floor mounted support or stand with integral housing, a manually operated dough divider mechanism (cutting head with stainless steel knives or other

material meeting NSF/ANSI No. 51 or BISSC Basic Criteria and Standard No. 8 requirements, and pressure board meeting the same material requirements), an electric motor operated rounding mechanism (rounder plate), a yoke or support, and a removable work pallet. The Type II machine shall divide the dough by manual operation and shall round the dough by an automatic operation. The handle shall be fully depressed manually to engage the rounding mechanism for the rounding operation. The return of the handle shall disengage the rounding mechanism. The Type III machine shall be similar in operation to the Type II machine with the exception that the Type III machine is completely automatic, dividing and rounding dough automatically. The base of the Type II and III machines shall be provided with bolt holes for floor mounting. The overall dimensions of the Type II and III machines excluding operating handle, shall fit into a 27 in. (686 mm) by 27 in. (686 mm) square area, 59 in. (1499 mm) in height,  $\pm 2$  in. (51 mm) for each dimension.

**7.3.1 Rounder Plate and Work Pallets**—Type II and III machines shall have a rounder plate and four work pallets constructed of stainless steel or other material meeting NSF/ANSI No. 51 or BISSC Basic Criteria and Standard No. 8 requirements. The rounder plate shall be attached to and driven by an electric motor as specified herein. The pallets shall have recesses of a number corresponding to divider head assembly divisions, embossed on each work pallet for forming the rolls during rounding operation. The pallet design and recesses shall meet NSF/ANSI construction requirements or BISSC Standard No. 8 requirements, or both. Each pallet shall have one handle and shall rest in a fixed position on the rounder plate during operation. Work pallets shall be removable.

#### 7.4 Electrical Requirements:

**7.4.1 Nominal Input Power**—Unless otherwise specified (see 5.1.4), the machine shall be designed to operate on one of the following:

- 7.4.1.1 120 V, 60 Hz, single phase,
- 7.4.1.2 240 V, 60 Hz, single phase,
- 7.4.1.3 208 V, 60 Hz, three phase, or
- 7.4.1.4 220 V, 60 Hz, three phase.

**7.4.2 Motor**—The electric motor used on the semiautomatic and automatic machines shall be a capacitor type or split-phased type and shall conform to NEMA MG 1 and BISSC No. 29. The motor shall be of sufficient horsepower and speed to meet the production capacity. The motor shall have thermal overload protection of the manual reset type.

**7.4.3 Electrical Components**—Unless designed for permanent electrical connection, these machines shall be provided with a cord and plug meeting the requirements of ANSI/UL 763, and the plug shall conform to the appropriate NEMA WD 1 configuration. The cord shall extend not less than 5 ft (1.52 m) outside the machine. Wiring shall be in accordance with NEMA WC 5 or NEMA WC 7.

## 8. Performance Requirements

8.1 When tested in accordance with Section 11, the dough divider and rounder shall operate without failure of the major functional components.

## 9. Workmanship, Finish, and Appearance

9.1 All components and assemblies of the dough divider and rounder shall be free from dirt and other extraneous materials, burrs, slivers, tool and grind marks, dents, and cracks. Castings, molded parts and stampings shall be free of voids, sand pits, blow holes, and sprues. External surfaces shall be free from kinks, dents, and other deformities. Forming and welding shall not cause damage to the metal and shall be done neatly and accurately.

## 10. Sampling

10.1 A representative production model shall be selected for performance testing.

10.2 When specified in the contract or purchase order, sampling for inspection shall be performed in accordance with ANSI Z1.4.

## 11. Test Methods

**11.1 Operational Test**—The dough divider and rounder machine shall be operated, without a load, for not less than 25 cycles and meet the following requirements as applicable. Inability of the machine to operate as specified herein shall constitute failure of the test.

- 11.1.1 Proper operation of motor starting and stopping devices,
- 11.1.2 Proper operation of adjusting and operating devices,
- 11.1.3 Proper operation of parts,
- 11.1.4 No overheating of bearings, and
- 11.1.5 No binding.

**11.2 Performance Test**—The dough divider and rounder machine shall be operated to perform the dough dividing and rounding operation on a pan/pallet of dough into separate and equal pieces by weight  $\pm 5$  %, depending upon the amount of whole dough placed in the dough pan/pallet and size of the machine. Inability of the machine to operate as specified herein shall constitute failure of the test.

## 12. Inspection

**12.1 End Item Testing**—When specified in the contract or purchase order, one production item, selected at random from each lot, shall be tested by the manufacturer in accordance with the applicable paragraphs of Section 11. Performance results shall be recorded in a permanent file, and the information shall be available to the customer upon demand. Any subsequent change in design that would relate to performance shall require a new test record.

**12.2 Component and Material Inspection**—Incoming components and materials shall be inspected by the manufacturer to the design parameters as specified on drawings or purchase documents, or both.

## 13. Rejection and Rehearing

13.1 Material that fails to conform to the requirements of this specification may be rejected. Rejection should be reported to the producer or supplier promptly and in writing. In case of dissatisfaction with the results of the test, the producer or supplier may make claim for a rehearing.