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An American National Standard

Standard Specification for Commercial Food Waste Pulper and Waterpress Assembly[1]

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1. Scope

1.1 This specification covers commercial pulping and waterpress assemblies intended for grinding of food scraps, paper, cardboard, and disposable plastic food-service ware.

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 The following safety hazards caveat pertains only to the test method portion, Section 13, 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:*[2]

A6/A6M Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling

A29/A29M Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought

A53/A53M Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

A126 Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings

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

A269 Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service

A276 Specification for Stainless Steel Bars and Shapes

A436 Specification for Austenitic Gray Iron Castings

A505 Specification for Steel, Sheet and Strip, Alloy, Hot-Rolled and Cold-Rolled, General Requirements for

A513 Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing

A519 Specification for Seamless Carbon and Alloy Steel Mechanical Tubing

A532/A532M Specification for Abrasion-Resistant Cast Irons

A554 Specification for Welded Stainless Steel Mechanical Tubing

A582/A582M Specification for Free-Machining Stainless Steel Bars

A681 Specification for Tool Steels Alloy

B43 Specification for Seamless Red Brass Pipe, Standard Sizes

B75 Specification for Seamless Copper Tube

D2000 Classification System for Rubber Products in Automotive Applications

D2287 Specification for Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds

D3915 Specification for Rigid Poly(Vinyl Chloride) (PVC) and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds for Plastic Pipe and Fittings Used in Pressure Applications (Withdrawn 2015)[3]

D3951 Practice for Commercial Packaging

E674 Specification for Industrial Perforated Plate and Screens (Round Opening Series)

F104 Classification System for Nonmetallic Gasket Materials

F437 Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80

F439 Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80

F441/F441M Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80

F442/F442M Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe (SDR–PR)

F443 Specification for Bell-End Chlorinated Poly(Vinyl Chloride) (Cpvc) Pipe Schedule 40 (Withdrawn 1986)[3]

[1] This specification is under the jurisdiction of ASTM Committee F26 on Food Service Equipment and is the direct responsibility of Subcommittee F26.01 on Cleaning and Sanitation Equipment.

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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.

2.2 *National Fire Protection Agency Standard:*[4]
NFPA 70 National Electric Code

2.3 *NSF International Standards:*[5]
NSF/ANSI 13 Refuse Processors and Processing Systems
NSF Listings–Food Equipment

2.4 *Underwriters Laboratory Standards:*[6]
UL 430 Waste Disposers
UL 508 Electrical Industrial Control Equipment

3. Terminology

3.1 *General*—Commercial pulpers with waterpresses are intended for grinding food waste, food service paper and cardboard products, food service plastic products, documents including computer printouts, general office and retail store paper, and cardboard waste. Materials are ground in a water-filled tank (pulper) to produce a slurry which is then passed to the waterpress to be de-watered. Pulpers are not intended to be used for grinding glass, china, metal, wood, clam, or oyster shells. Any small pieces of metal inadvertently placed in the pulper, such as cardboard box staples, aluminum refreshment cans, or tin food cans, shall be removable from a trap in the pulper tank.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *pulper*—the pulper tank has a motor driven grinding disk to grind and cut waste material, and mixes this material with water to produce a slurry that is pumped to the waterpress through a sizing screen. Pulpers may consist of the following principle parts: tank, motor, grinding disk, particle sizing ring, trash box, legs, feed chute, stationary, and rotating cutters.

3.3 *waterpress*—the waterpress de-waters the slurry generated in the pulper by use of a vertical, inclined, or horizontal screw and perforated screen, then discharges the pulp down a chute to a waste container. Water removed during this process is pumped to the pulper tank in order to conserve fresh water use. Waterpresses may consist of the following parts: shell, helical transport screw, perforated screen, gearbox, motor, compression cone, discharge housing, chute, and pump.

4. Classification

4.1 *General*—Pulper and waterpress assemblies shall be of the following type, size, and options as specified.

4.2 *Type, Size, and Options* (See Table 1):

4.2.1 *Type A*—Free-standing pulper and waterpress assembly with tray assembly and flanged feet.

4.2.2 *Type B*—Undercounter pulper for 34-in. (86-cm) high counter and waterpress with feed hood and bullet feet.

4.3 All equipment of the same model designation and options on the same purchase order shall have component interchangeability for serviceability.

TABLE 1 Type, Size, and Options

Options	Type Pulper with Waterpress	A		B	
	Size Pulper Diameter Inches—Maximum	24	30	24	30
	Pulper Motor HP	5	7.5	5	7.5
	Waterpress Motor HP	2	3	2	3
1	Automatic Shutdown Timer	3	3	3	3
2	18 In. Higher than Standard Waterpress	3	3	3	3
3	Tray Flush (Recirculated Water)	3	3	3	3
4	Trough Flush (Recirculated)	2	2	3	3
5	Single Feed Through Connection	2	2	3	3
6	Double Feed Through Connection	2	2	3	3
7	Feed Hood with Tray	4	4	3	3

(1) Pulper cover plate supplied in lieu of feed hood.
(2) Pulper and waterpress type not compatible with optional feature.
(3) Indicates available option for given type pulper with waterpress.
(4) Standard for Type A.

5. Ordering Information

5.1 Purchasers should select the preferred options permitted in this specification and include the following information in procurement documents:

5.1.1 Title, number, and date of this standard.

5.1.2 Classification of size and type (see Section 4).

5.1.3 Electrical power supply voltage range (see 9.1).

5.1.4 Electrical controls when specified to be remote from the unit (see 9.3).

5.1.5 Optional automatic shutdown timer when specified (see Section 4).

5.1.6 Spare and maintenance parts required.

5.1.7 Optional tray flush uses recycled water from the waterpress when specified (see Section 4).

5.1.8 Optional waterpress for high profile pulp discharge 18 in. above standard height optional when specified (see Section 4).

5.1.9 Optional trough flush when specified (see Section 4).

5.1.10 Optional single feed trough connections on when specified (see Section 4).

5.1.11 Optional double feed trough connections when specified (see Section 4).

5.1.12 Optional feed hood with tray for Type B (see Section 4).

5.1.13 Designate special features required for installation, such as location of controls, location of feed-hood and trough openings, waterpress discharge location, and location for cold water and drain connections.

6. Materials

6.1 Unless otherwise specified, pulpers and waterpresses shall be fabricated of materials specified in documents referenced in Section 2. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components or the overall assembly. Unit shall be manufactured for cleanability.

6.1.1 *Corrosion-Resistant Steel*—Shall conform to the requirements of any 300 series steel specified in Specifications A240/A240M, A554, A276, and A582/A582M.

[4] Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02269-9101.

[5] Available from NSF International, P.O. Box 130140, 789 N. Dixboro Rd., Ann Arbor, MI 48113-0140.

[6] Available from Underwriters Laboratories (UL), 333 Pfingsten Rd., Northbrook, IL 60062.

6.1.2 *Corrosion-Resisting Material*—Corrosion-resisting material is other than corrosion resistant steel that is equivalent in the pulper and waterpress application.

6.1.3 *Abrasion-Resistant Cast Iron*—Shall conform to the requirements specified in Specification A532/A532M.

6.1.4 *Austenitic Gray Iron*—Shall conform to the requirements specified in Specification A436.

6.1.5 *Copper Tube*—Shall conform to the requirements specified in Specification B75.

6.1.6 *Brass Pipe*—Shall conform to the requirements specified in Specification B43.

6.1.7 *Alloy Steel*—Shall conform to the requirements specified in Specifications A681, A29/A29M, A6/A6M, A513, A505, and A519.

6.1.8 *Black and Galvanized Pipe*—Shall conform to the requirements specified in Specification A53/A53M.

6.1.9 *Gaskets/Seals*—Shall conform to the requirements specified in Specification D2287, Classification D2000, and Classification F104.

6.1.10 *Perforated Metal*—Shall conform to the requirements specified in Specification E674.

6.1.11 *Stainless Steel Pipe*—Shall conform to the requirements specified in Specification A269.

6.1.12 *Plastic Piping and Fittings*—Shall conform to the requirements specified in Specifications F441/F441M, F442/F442M, F443, F437, F439, and D3915.

6.1.13 *Austenitic Gray Iron Pipe Fittings*—Shall conform to the requirements specified in Specification A126.

7. Design and Construction

7.1 The pulper and waterpress shall be complete, ready for water, waste, and electrical connection. Undercounter units shall be ready for connection to tabling or trough mounting. Optional remote controls shall be complete and ready for wall mount and interconnection to the equipment. The pulper and waterpress shall comply with the requirements of UL 430 and UL 508.

7.2 *Valves*—Flow valves or fresh water solenoid valves, or both, and backflow prevention valves or air gap shall be of corrosion-resistant materials. Solenoid valves shall be fully automatic and suitable for 100°F (37.8°C) water. Manual flow valves or fresh water valves, or both, when provided, shall be of corrosion-resistant materials. Valves shall be suitable for 100°F (37.8°C) water. Backflow prevention shall be in accordance with NSF/ANSI 13.

7.3 *Tanks*—Tanks shall be of corrosion-resistant steel with minimum sheet metal thickness of 0.070 in. (1.78 mm).

7.4 *Waterpress*—Waterpress enclosure shall be of corrosion-resistant steel with minimum sheet metal wall thickness of 0.070 in. (1.78 mm). Any waterpress frame structure shall be of corrosion-resistant steel or painted carbon steel. Frame material shall be of 0.120-in. minimum thickness. The waterpress screen shall be of 0.059 (1.50 mm) thickness minimum corrosion-resistant perforated steel. Access port for cleaning the screen and a manual cold water screen flush system shall be provided. The waterpress flight screw shall be of corrosion-resistant steel. Thickness of the flight shall be 0.125-in. (3.18-mm) minimum thickness.

7.5 *Level Sensor*—A level sensor shall be supplied with each pulper for the purpose of controlling water level in the pulper tank. The sensor shall be adjustable.

7.6 *Cutter*—Each pulper shall be supplied with suitable cutters. Cutters shall be of abrasion-resistant iron, tool steel, corrosion-resisting material, or tool steel with carbide cutting edges. Cutters on the disk and sizing ring shall be individually replaceable.

7.7 *Sizing Ring*—Each pulper shall be supplied with a corrosion-resistant steel perforated ring.

7.8 *Pumps*—Shall be of non-ferrous or austenitic gray iron castings. Bearings and motors shall be protected from water contamination by a mechanical shaft seal (see 7.13). Pumps may be direct or belt driven.

7.9 *Gearbox*—Each waterpress flight screw shall be directly driven by a helical or worm gear, single, or double reduction gearbox. The gearbox may be direct or belt driven.

7.10 *Compression Cone*—Waterpress compression cones, if used, shall be of corrosion-resistant steel, non-ferrous corrosion-resistant material, or austenitic gray iron casting. The cone shall be tapered to allow gradual de-watering of the pulp.

7.11 *Trash Box*—Each pulper may be supplied with an externally removable container of corrosion-resistant steel with minimum sheet metal thickness of 0.059 in. (1.50 mm). Minimum usable size of the container shall be 70 in.^{3} (1147 cm^3).

7.12 *Pulper Disk*—The disk shall be of corrosion-resistant steel with a minimum thickness of 0.218 in. (5.54 mm) with at least ten shredding teeth or equivalent shredding mechanism attached.

7.13 *Pulper Motor Shaft Seal*—Shall be a water flushed mechanical seal. The seal is to prevent soil and water leakage down the shaft from the pulper to the motor.

7.14 *Motor*—Thermal overload protection shall be provided either on the motor or in the control circuitry.

7.15 *Support Legs*—Pulper and waterpress shall be supported by at least 4 legs, each with bullet or flange feet that can be adjusted, plus or minus ¾-in. (19 mm) from nominal for leveling the unit. Legs and feet shall be designed for cleanability.

7.16 *Plating, Coating, and Painting*—Pulpers or their individual components shall be plated, coated, or painted for corrosion protection in accordance with the manufacturer's standard practice.

7.17 *Wiring and Circuit Protective Devices*—All wiring and circuit protective devices shall be in accordance with UL 430 or UL 508.

8. Operation Requirements

8.1 Pushing of "fill'' button shall fill the system with water. Pushing "start'' button shall start the pulper and waterpress motors. Pushing the "stop'' button stops all motors and all water valves close.

9. Electrical Requirements

9.1 The equipment and controls shall meet the requirements of UL 430, UL 508, and NFPA 70. The pulper and waterpress assembly shall operate on one of the following power characteristics specified: (*1*) 200/60/3; (*2*) 230/60/3; or (*3*) 460/60/3.

9.2 *Controls*—All control equipment shall be capable of operation in an ambient room temperature of 115 ± 9°F (46 ± 5°C). "Start-Stop'' push buttons shall be mounted in NEMA 12 Controller enclosure.

9.3 *Wiring and Circuit Safety Devices*—All wiring between the machine components shall have provisions for connection at a recognized junction on the machine.

10. Lubrication Requirements

10.1 Means for effective and adequate lubrication shall be provided when required. Lubricating points shall be readily accessible, and the pulper shall be lubricated with the proper amount of lubricant prior to delivery.

11. Finish Requirements

11.1 The pulpers shall be treated and painted in accordance with the manufacturer's standard practice. All surfaces of the machine, other than corrosion-resisting materials, shall be protected against corrosion in the use environment and shall present a neat appearance.

12. Performance Requirements

12.1 The pulper and waterpress assemblies shall meet the capacity requirements given in Table 2 and shall not leak when tested at 125 % of the manufacturer's recommended supply line pressure.

12.2 *Performance*—See Table 2.

13. Test Methods

13.1 *Significance*—The purpose of this test is to demonstrate the ability of the unit to meet the capacity requirements and to insure that there is no leakage during operation.

13.2 *Procedure*—The machine shall be tested at full load capacity in accordance with manufacturer's operating instructions. The machine shall function as intended without interruption or malfunction.

13.3 *Performance Profiles*—A new standard is to be developed for energy consumption, water consumption, and productivity profiles.

TABLE 2 Performance Requirements

Type Pulper with Waterpress	A		B	
Pulper Diameter Size Inches—Maximum	24	30	24	30
Food Service Capacity lbs/hr	700	900	700	900
Document Destruction Capacity lbs/hr	300	500	N/A	N/A
General Waste Capacity lbs/hr	500	700	N/A	N/A
50 % Paper or News Print and Balance General Food Waste Capacity lbs/hr	525	725	525	725

14. Certification

14.1 Certification of compliance with the standards cited in this specification shall be provided to the purchaser if required in the purchase document.

14.2 *UL Listing*—Acceptable evidence of meeting the requirements of UL 430 and UL 508 shall be UL Listing, or UL Label, or certification by an independent nationally recognized testing laboratory, acceptable to the user, to the UL standards.

14.3 *NSF Certification*—Acceptable evidence of meeting the requirements of NSF/ANSI 13 shall be the NSF Certification Mark on the finished waste pulper and listing in the NSF Listings–Food Equipment, or certification by an independent nationally recognized testing laboratory, acceptable to the user, to the NSF/ANSI standard.

15. Product Marking

15.1 *Machine Identification*—Identification shall be permanently and legibly marked directly on the pulper or on a corrosion-resisting material securely attached to the machine at the source of manufacture. Identification shall include the manufacturer's model, serial number and name, and trademark to be readily identifiable. In addition, information required by UL shall be included on the data plate.

15.2 *Instruction Plate*—An instruction plate of corrosion-resisting material shall be attached to each machine and be visible to the operator.

16. Machine Manuals

16.1 The following information shall be supplied in the manuals:

16.1.1 Installation instructions,

16.1.2 Operating guide,

16.1.3 Maintenance and service procedures, and,

16.1.4 Service parts list.

16.2 Manuals shall be in accordance with Specification F760.

17. Packaging and Packing Materials

17.1 The pulper and waterpress shall be packaged and packed in accordance with Practice D3951.

18. Quality Assurance

18.1 Unless otherwise specified in the contract or purchase order, the manufacturer is responsible for the performance of all requirements as specified in the contract or order. The manufacturer may use his own or any other facility suitable for the testing of the machine requirements specified herein.

19. Keywords

19.1 food waste pulper; pulper; waterpress