ASME A112.14.4-2001

GREASE REMOVAL DEVICES

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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FOREWORD

The American National Standards Committee A112, Plumbing Materials and Equipment, was organized July 27, 1955. The first organizational meeting was held on July 22, 1958. At the meeting of May 1, 1964, Panel No. 14 was created to establish standards for roof drains, floor drains, backwater valves, interceptors, and other drainage specialties. Its charter was as follows: the recommendation of suitable existing standards in cooperation with interested sponsors, or the development of adequate new standards as needed for roof drains, floor drains, backwater valves, interceptors, and other items as used in plumbing systems.

The A112 Committee underwent a number of changes over the years and is currently identified as ASME Standards Committee A112. Its project team, with responsibility for Grease Recovery Devices, is designated Project Team 14.4. The Project Team met a number of times to prepare this Standard.

The Project Team that developed this Standard recognizes that in the sewage treatment community and other jurisdictions there exist various maximum limits of FOG (fats, oils, and grease) in the waste stream. The most common of these is 100 m/L (milligrams per liter) or 100 ppm (parts per million). The Project Team decided that until a finite number is universally accepted, a number should not be included in the Standard. Therefore, it will be included in a future version of this Standard.

Suggestions for the improvement of this Standard are welcome. They should be sent to The American Society of Mechanical Engineers; Attn: Secretary, A112 Main Committee; Three Park Avenue; New York, NY 10016-5990.

This Standard was approved as an American National Standard on January 17, 2001.

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Standardization of Plumbing Materials and Equipment

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GREASE REMOVAL DEVICES

1 GENERAL

1.1 Scope

This Standard establishes requirements for grease interceptors that are equipped with automatic grease removal devices (GRD). It includes testing requirements and performance criteria designed to ensure conformance to this Standard.

Such devices are designed for the purpose of automatically removing free-floating grease, fats, and oils from sanitary discharges without intervention from the user except for maintenance.

Semiautomatic devices are not addressed in this Standard.

1.2 Units of Measurement

Values are stated in U.S. Customary units and the International System (SI) units. The U.S. Customary units shall be considered as the standard.

In this Standard, gallons (U.S. liquid) per minute is abbreviated gpm and liters (metric liquid) per minute is abbreviated L/min.

1.3 Reference Standards

A product that is tested to the requirements of this Standard shall satisfy the requirements of the following standards as applicable (the latest edition shall apply):

ASTM A888, Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications

Publisher: American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ANSI/NFPA 70, National Electrical Code

Publisher: National Fluid Power Association (NFPA), 3333 N. Mayfair Road, Milwaukee, WI 53222-3219

ASME A112.14.3, Grease Interceptors
ASME B1.20.1, Pipe Threads, General Purpose (Inch)
Publisher: The American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016-5990

ANSI/UL 499, Electrically Heated Appliances
ANSI/UL 917, Electric Timers and Switches
ANSI/UL 1004, Electric Motors

Publisher: Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062-2096.

1.4 Definition

automatic grease/oil removal device (GRD): a plumbing appliance that is installed in the sanitary drainage system in order to intercept free-floating fats, oils, and grease from waste water discharges. Such equipment operates on a time- or event-controlled basis and has the ability to remove the entire range of commonly available free-floating fats, oils, and grease automatically without intervention from the user except for maintenance. The removed material is essentially water-free, which allows for recycling of the removed product.

2 GENERAL REQUIREMENTS

2.1 Construction

2.1.1 Design Considerations. The GRD shall automatically remove fats, oils, and grease from the separation chamber to a point outside of the GRD. The removal process shall be such that the removed fats, oils, and grease shall be 95% by volume free of water when tested according to this Standard.

2.1.2 Size. The flow and grease retention of each GRD shall be tested and rated in accordance with ASME A112.14.3.

2.1.3 Inlet and Outlet Connections. The inlet and outlet connections of the GRD shall be either female pipe thread or a plain end diameter to allow hubless coupling connections. Tapered threads shall comply with ASME B1.20.1. Hubless connections shall comply with the outside dimension for the given pipe size in accordance with ASTM A888.

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2.2 Installation Instructions

Each GRD shall be provided with complete installation instructions, including but not limited to the following:

(a) Flow control and/or vent requirements

(b) Separate trapping requirements

(c) Elevation and accessibility requirements

(d) Safety and health-related instructions

(e) Wiring instructions to reference national or local codes

(f) Cleanout locations

(g) Instructions that show the clearances required for maintenance, cleaning, and prevention of hazards

2.3 Maintenance and Operating Instructions

Each GRD shall be provided with service instructions, which include a trouble shooting guide as well as instructions for performing necessary servicing or obtaining outside servicing. Units shall be provided with complete maintenance and operating instructions.

2.4 Electrical Requirements

All electrical components used in the GRD shall conform to the appropriate standards listed in para. 1.3.

3 TESTING

3.1 General

The following test protocol has been established in order to demonstrate that the GRD is capable of removing accumulated grease in the amount equal to 100% of its rated capacity within 24 hr and to establish that the removed grease contains no more than 5% water by volume.

3.2 Description of Test Setup

3.2.1 Test Stand

(a) The GRD to be tested shall be installed on the test stand as described in ASME A112.14.3 and in Fig. 1. The grease discharge shall be connected to or shall feed a container of sufficient size to hold 150% of the rated capacity of fats, oils, and grease from the GRD. This container shall be positioned in a location recommended by the manufacturer of the GRD in the installation instructions for the product.

(b) The GRD shall be connected to an appropriate electrical supply as described in the installation instructions and as required on the electrical data plate on the GRD, if applicable. The electrical circuit shall be fused or otherwise protected and shall be appropriately grounded. If required by the manufacturer, ground fault protection shall be provided.

(c) All warning devices (which indicate grease levels) shall be installed on the GRD or remotely located as described in the manufacturer's installation instructions.

3.2.2 Grease Delivery System (Grease Metering Sink). A floor sink of sufficient volume to contain 10% of the rated grease capacity of the GRD being tested shall be connected through a ball valve to the horizontal line between the base of the vertical waste riser [ASME A112.14.3, para. 3.2.1.4(d)] and the GRD inlet (See Fig. 1). This floor sink shall be used to meter grease into the GRD.

3.2.3 Test Materials. Lard, as required in ASME A112.14.3, shall be used to conduct this test.

3.3 GRD Conditioning

Prior to starting the test increments, the GRD shall be cleaned of all grease from previous tests and filled with fresh water to the static water level. The water shall be at a temperature of 70±10°F (21±6°C). All electronic and mechanical components shall be set as described in the manufacturer's instructions for normal operation.

3.4 Grease Removal Test

3.4.1 The rated retention capacity of the GRD submitted for test shall be determined in accordance with ASME A112.14.3.

3.4.2 During the test, water at 110±5°F (43±3°C) shall be introduced to maintain static water level within the GRD during continuous operation in accordance with the manufacturer's instructions.

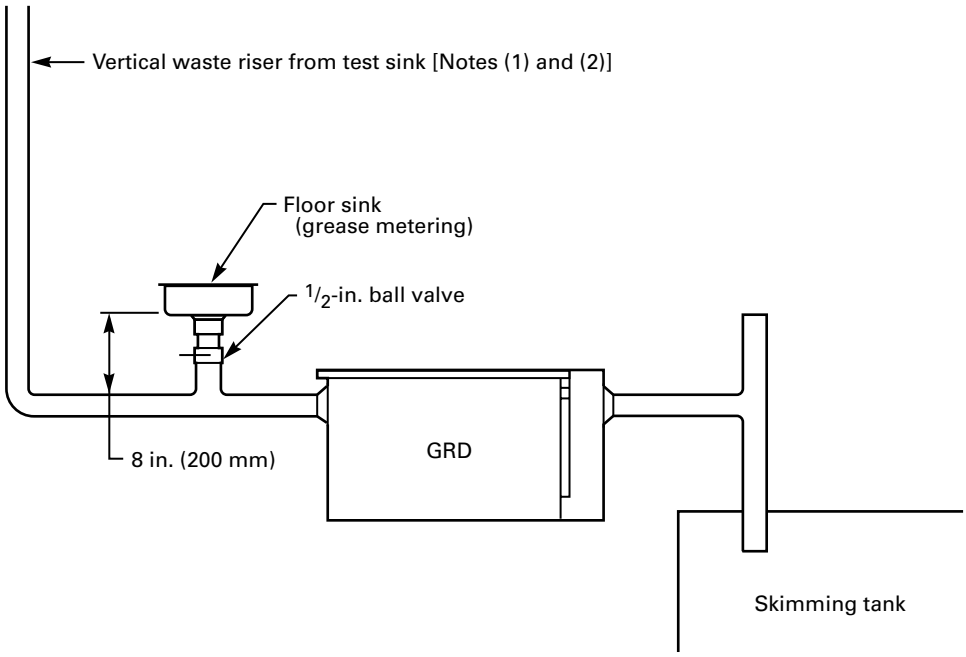
3.4.3 All GRD controls shall be set in accordance with manufacturer's instructions.

3.5 Accept/Reject Criteria

3.5.1 After completion of the removal test, the volume of grease removed by the GRD shall be not less than 50% of its rated capacity.

3.5.2 During the test interval, at no time shall accumulated grease within the GRD exceed its rated retention capacity.

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NOTES:
(1) Diameter of 2 in. (51 mm) for flows of 50 gpm (189 L/min) or less
(2) Diameter of 3 in. (76 mm) for flows over 50 gpm (189 L/min)

FIG. 1 INSTALLATION OF GREASE DELIVERY SYSTEM (GREASE METERING SINK)

3.6 Test Procedure

3.6.1 Additional plumbing connections necessary for proper grease removal operation shall be made in accordance with manufacturer's instructions, including, but not limited to electronic controls.

3.6.2 An amount of grease equal to 150% of the rated retention capacity of the GRD as defined in ASME A112.14.3 shall be divided into ten equal parts by weight to be introduced via the floor sink (Fig. 1).

3.6.3 Start test timer and begin operation of the GRD in accordance with manufacturer's instructions. Introduce one of the ten equal parts of the grease into the floor sink at a maximum interval of 1 hr until each of the ten parts have been introduced. During the test, water shall be introduced as necessary to maintain minimum static water level within the GRD in accordance with the manufacturer's recommendations. Cease operation of the GRD at the end of the manufacturer's recommended operational cycle, but not more than 24 hr after the start of the test.

3.6.4 The grease removed during the test shall be retained for measurement.

3.6.5 For timer-operated devices, during the testing outlined in para. 3.6.3, record the actual time that the GRD is in the grease removal mode. Take this time and continue operation of the unit for 10% of this time without the addition of any more grease. Water shall be introduced into the unit to maintain its normal static level.

3.7 Water Content Test

3.7.1 The grease removed during the grease removal test procedure shall be evaluated as to percent of water content. The water content of the removed grease shall not exceed 5% by volume. See ASME A112.14.3, para. 3.4 for dewatering procedures.

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4 MARKING REQUIREMENTS

4.1 Marking on the Unit

Products shall be marked with the following information:

(a) Manufacturer's name or trademark or other recognized identification

(b) Model number or designation

(c) Rated flow(s) in accordance with ASME A112.14.3, para. 7.9

(d) Identification of "Inlet" and "Outlet"

(e) Statement of conformance with ASME A112.14.3 and ASME A112.14.4

4.2 Other Marking

Other marking (for mounting on the unit or in an accessible location) shall contain the following information:

(a) Electrical requirements

(b) Daily maintenance procedures

(c) Operating instructions

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Air Gap Fittings for Use With Plumbing Fixtures, Appliances, and Appurtenances A112.1.3-2000
Performance Standard and Installation Procedures for Stainless Steel Drainage Systems for Sanitary, Storm, and Chemical Applications, Above and Below Ground A112.3.1-1993
Macerating Toilet Systems and Related Components A112.3.4-2000
Water Heater Relief Valve Drain Tubes ..... A112.4.1-1993(R1998)
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Floor-Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use A112.6.1M-1997
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