Designation: F 1369 – 93a

Standard Specification for Heaters, Convection, Steam and Hot Water[1]

This standard is issued under the fixed designation F 1369; 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 steam and hot water convection heaters with cabinets for use in heating spaces on commercial and naval ships.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 The following precautionary caveat pertains only to the tests portion, Section 12, of this specification: *This standard does not purport to address all of the safety problems, 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:*

A 569 Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip, Commercial Quality[2]

B 5 Specification for Electrolytic Tough-Pitch Copper Refinery Shapes[3]

B 88 Specification for Seamless Copper Water Tube[4]

B 121 Specification for Leaded Brass Plate, Sheet, Strip, and Rolled Bar[3]

B 135 Specification for Seamless Brass Tube[3]

B 152 Specification for Copper Sheet, Strip, Plate, and Rolled Bar[3]

B 209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate[4]

B 687 Specification for Brass-, Copper-, and Chromium-Plated Pipe Nipples[3]

F 593 Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs[5]

F 594 Specification for Stainless Steel Nuts[5]

F 1076 Practice for Expanded Welded and Silver Brazed Socket Joints for Pipe and Tube[6]

2.2 *Uniform Classification Committee Standard:*

Uniform Freight Classification Ratings, Rules and Regulations[7]

2.3 *ANSI Standards:*

B1.1 Unified Inch Screw Threads (UN and UNR Thread Form)[8]

B18.2.1 Square and Hex Bolts and Screws, Inch Series Including Hex Cap Screws and Lag Screws[8]

2.4 *AWS Standards:*

D1.2 Structural Welding Code, Aluminum[9]

D1.3 Structural Welding Code, Sheet Steel[9]

2.5 *Steel Structural Painting Council Standard:*

SSPC PS 4.01 Painting Systems Specification, Four Coat Vinyl Painting Systems with Red Lead Primer (for Salt Water and Chemical Use)[10]

2.6 *Military Standards:*

MIL-S-901 Shock Test H.I. (High Impact) Shipboard Machinery, Equipment and Systems, Requirements for[11]

MIL-STD-167-1 Mechanical Vibrations of Shipboard Equipment (Type I—Environmental, and Type II—Internally Excited)[12]

2.7 *Other Documents:*

NAVSHIPS 0900-001-7000 Fabrication and Inspection of Brazed Piping Systems[12]

Department of Commerce CS 140-47, Testing and Rating Convectors[11]

AISI SS502 Stainless Steel Fasteners: A Systematic Approach to Their Selection[13]

3. Classification

3.1 The convection heaters shall be of the following classes and sizes as specified (see 5.3, 5.4, and 6.1):

3.1.1 *Class 1*—Carbon steel construction.

3.1.2 *Class 2*—Nonmagnetic construction.

3.1.3 *Size 1½* hot water—1200-Btu/h minimum capacity.

3.1.4 *Size 2* hot water—1600-Btu/h capacity.

3.1.5 *Size 2½* hot water—2000-Btu/h capacity.

[1] This specification is under the jurisdiction of ASTM Committee F-25 on Shipbuilding and is the direct responsibility of Subcommittee F25.11 on Machinery.

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[2] *Annual Book of ASTM Standards*, Vol 01.03.

[3] *Annual Book of ASTM Standards*, Vol 02.01.

[4] *Annual Book of ASTM Standards*, Vol 02.02.

[5] *Annual Book of ASTM Standards*, Vol 15.08.

[6] *Annual Book of ASTM Standards*, Vol 01.07.

[7] Available from Uniform Classification Committee, 222 South Riverdale Plaza, Room 1160, Chicago, IL 60606.

[8] Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

[9] Available from American Welding Society, Inc., 550 N.W. Le Jeune Road, P.O. Box 351040, Miami, FL 33135.

[10] Available from Steel Structural Painting Council, 4400 Fifth Avenue, Pittsburgh, PA 15213.

[11] Available from Superintendent of Documents, Government Printing Office, Washington, DC 20402.

[12] Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

[13] Available from American Iron and Steel Institute, 1133 15th St., NW, Suite 300, Washington, DC 20005-2701.

3.1.6 *Size 3½* hot water—3200-Btu/h capacity.
3.1.7 *Size 4½* hot water—4500-Btu/h capacity.
3.1.8 *Size 6* hot water—6100-Btu/h capacity.
3.1.9 *Size 8* hot water—8400-Btu/h capacity.
3.1.10 *Size 11* hot water—11 000-Btu/h capacity.
3.1.11 *Size 15* hot water—14 500-Btu/h capacity.
3.1.12 *Size 20* hot water—20 000-Btu/h capacity.
3.1.13 *Size 1½* steam—490-Btu/h capacity at 180°F (82°C) forced hot-water mean temperature.
3.1.14 *Size 2* steam—645 Btu/h-capacity at 180°F (82°C) forced hot-water mean temperature.
3.1.15 *Size 2½* steam—740-Btu/h capacity at 180°F (82°C) forced hot-water mean temperature.
3.1.16 *Size 3½* steam—1210 Btu/h-capacity at 180°F (82°C) forced hot-water mean temperature.
3.1.17 *Size 4½* steam—1700 Btu/h-capacity at 180°F (82°C) forced hot-water mean temperature.
3.1.18 *Size 6* steam—2310 Btu/h-capacity at 180°F (82°C) forced hot-water mean temperature.
3.1.19 *Size 8* steam—3100 Btu/h-capacity at 180°F (82°C) forced hot-water mean temperature.
3.1.20 *Size 11* steam—4150 Btu/h-capacity at 180°F (82°C) forced hot-water mean temperature.
3.1.21 *Size 15* steam—5310 Btu/h-capacity at 180°F (82°C) forced hot-water mean temperature.
3.1.22 *Size 20* steam—7350 Btu/h-capacity at 180°F (82°C) forced hot-water mean temperature.

4. Ordering Information

4.1 *Ordering Data*—Procurement documents should specify the following:
4.1.1 Title, number, and date of the specification,
4.1.2 Class and size required, steam or hot water (see Section 3), and
4.1.3 Whether special government requirements are to be included (see Supplementary Requirements S1 and S2).

5. Materials and Manufacture

5.1 Materials used in the construction of the heaters shall be in accordance with the information given in Table 1.

TABLE 1 List of Materials

No. Required	Part No.[A]	Description	Material	Remarks
1	1	cabinet rear/sizes	steel, Specification A 269 brass, Specification B 121 aluminum, Specification B 209	see 5.3 and 5.4
1	2	cabinet front	steel, Specification A 569 brass, Specification B 121 aluminum, Specification B 209	see 5.3 and 5.4
1	3	grille outlet	...	...
1	4	grille, inducted air	...	...
as required	5	fins	copper, Specification B 152	0.012 min
2	6	coil header	brass, Specification B 135	...
4	7	supply and return connection	brass, Specification B 135	½ in. NPS
2	8	plugs	brass, Specification B 135	½ in. NPS
2	9	street ell	brass, Specification B 135	½ in. NPS
2	10	front fastener screws	CRES, AISI SS502	...
1	11	damper	steel, Specification A 569 brass, Specification B 121 aluminum, Specification B 209	see 5.3 and 5.4
1	12	damper control knob	plastic, commercial	...
4	13	spacers	steel, Specification A 569 brass, Specification B 121 aluminum, Specification B 209	see 5.3 and 5.4
2	14	mounting strips	steel, Specification A 569 brass, Specification B 121 aluminum, Specification B 209	see 5.3 and 5.4
1	15	name plate	...	see 14.1
1	16	stiffener	steel, Specification A 569 brass, Specification B 121 aluminum, Specification B 209	on Size 6 and above see 5.3 and 5.4
2	17	coil end plate support	steel, Specification A 569 brass, Specification B 121 aluminum, Specification B 209	see 5.3 and 5.4
2	18	coil support bracket	steel, Specification A 569 brass, Specification B 121 aluminum, Specification B 209	see 5.3 and 5.4
2	19	gasket, insulating	...	...
as required	20	coil mounting fastener	CRES, AISI SS502	...
1	21	damper pin	CRES, AISI SS502	...
1	22	damper operating screw	CRES, AISI SS502	...
as required	23	tube	brass, Specification B 135	...
1	24	snap bracket	steel, Specification A 569 brass, Specification B 121 aluminum, Specification B 209	see 5.3 and 5.4
2	25	clip	CRES, AISI SS502	...
2	26	front fitting guide	steel, Specification A 569 brass, Specification B 121 aluminum, Specification B 209	see 5.3 and 5.4
2	27	slot guide	CRES, AISI SS502	...

[A] Refers to the part numbers shown in Figs. 1 and 2.