PART PMB

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PART PMB
REQUIREMENTS
FOR MINIATURE BOILERS

GENERAL

PMB-1 GENERAL

The rules in Part PMB are applicable to miniature boilers and parts thereof and shall be used in conjunction with the general requirements in Part PG as well as with the special requirements in the applicable Parts of this Section that apply to the method of fabrication used.

A02 PMB-2 SCOPE

PMB-2.1 The classification miniature boilers applies to boilers that do not exceed the following limits:

(a) 16 in. (406 mm) inside diameter of shell

(b) 20 sq ft (1.9 m^2) heating surface (not applicable to electric boilers)

(c) 5 cu ft (0.14 m^3) gross volume,[1] exclusive of casing and insulation

(d) 100 psig (690 kPa) maximum allowable working pressure

PMB-2.2 If a boiler meets the miniature classification, the rules in this Part shall supplement the rules for power boilers and take precedence over them when there is conflict. Where any of the limits in PMB-2.1 are exceeded, the rules for power boilers shall apply.

MATERIALS

PMB-5 GENERAL

A02 **PMB-5.1** Unless specifically permitted elsewhere in this Section, materials used in the construction of pressure parts for miniature boilers shall conform to one of the specifications in Section II and shall be limited to those for which allowable stress values are given in Tables 1A and 1B of Section II, Part D. Miscellaneous pressure parts shall conform to the requirements of PG-11.

PMB-5.2 Seamless and welded shells made from pipe for miniature boilers shall be not less than $^3/_{16}$ in. (4.8 mm) in thickness. Shells or heads made from plate shall be not less than $^1/_4$ in. (6 mm) in thickness. Heads used as tubesheets, with tubes expanded, shall be at least $^5/_{16}$ in. (8 mm) in thickness. A02

PMB-5.3 Steam boiler parts of not over 600 cu in. (9.83 m^3) in volume may be cast from copper alloy complying with requirements of SB-61 or SB-62 of wall thickness not less than $^1/_4$ in. (6 mm). Such steam boiler parts shall be equipped with at least one brass washout plug of not less than $^1/_2$ in. (13 mm) and shall be tested to a hydrostatic pressure of 600 psi (4 140 kPa).

PMB-5.4 Heads or parts of miniature boilers, when not exposed to the direct action of the fire, may be made of cast iron or malleable iron provided it complies with a specification permitted in this Section.

PMB-5.5 Due to the small size of parts of miniature boilers, the requirements of Identification, PG-77.1, need not be met, provided the Manufacturer certifies on the Data Report accompanying the boiler that the material is in accordance with the requirements of this Section. Provisions shall be made by the Manufacturer whereby he shall be able to supply complete information regarding the material and details of construction of any boiler built under the provisions of this Code.

DESIGN

PMB-8 GENERAL

The rules in the following paragraphs apply specifically to the design of miniature boilers and parts

[1] This gross volume is intended to include such gas passages as are integral with the assembled pressure parts and a definition is: the volume of a rectangular or cylindrical enclosure into which all the pressure parts of the boiler in their final assembled positions could be fitted. Projecting nozzles or fittings need not be considered in the volume.

thereof and shall be used in conjunction with the general requirements for design in Part PG as well as with the specific requirements for design in the applicable Parts of this Section that apply to the method of fabrication used.

PMB-9 WELDING

Miniature boilers may be constructed by fusion welding in accordance with all the requirements of this Section except that postweld heat treatment, radiography of the welded joints, and nondestructive examinations described in PG-93.1 are not required.

A02 PMB-10 WASHOUT OPENINGS

PMB-10.1 Every miniature boiler exceeding 12 in. (305 mm) internal diameter or having more than 10 sq ft (0.9 m^2) of heating surface shall be fitted with not less than three brass washout plugs of 1 in. (25 mm), which shall be screwed into openings in the shell near the bottom. Boilers not exceeding 12 in. (305 mm) internal diameter and having less than 10 sq ft (0.9 m^2) of heating surface need have not more than two 1 in. openings for cleanouts, one of which may be used for the attachment of the blowoff valve; these openings shall be opposite to each other where possible. All threaded openings in the boiler shall be provided with a welded reinforcement, if necessary, to give four full threads therein.

PMB-10.2 Miniature boilers of a design employing a removable top cover flange for inspection and cleaning need not be fitted with washout openings.

A02 PMB-11 FEEDWATER SUPPLY

PMB-11.1 Every miniature boiler shall be provided with at least one feed pump or other feeding device, except where it is connected to a water main carrying sufficient pressure to feed the boiler or where it is operated with no extraction of steam (such as in a closed system). In the latter case, in lieu of a feeding device, a suitable connection or opening shall be provided to fill the boiler when cold. Feedwater openings or connections to miniature boilers shall be not less than NPS $\frac{1}{2}$ (DN 15) for iron or steel pipe and NPS $\frac{1}{4}$ (DN 8) for brass or copper pipe.

PMB-11.2 The feed pipe shall be provided with a check valve and a stop valve of a size not less than that of the pipe. The feedwater may be delivered through the blowoff opening if desired.

PMB-12 BLOWOFF

Each miniature boiler shall be equipped with a blowoff connection, not less than NPS $\frac{1}{2}$ (DN 15), located to drain from the lowest water space practicable. The blowoff shall be equipped with a valve or cock not less than NPS $\frac{1}{2}$ (DN 15).

PMB-13 WATER GAGES A02

PMB-13.1 Each miniature boiler for operation with a definite water level shall be equipped with a water gage glass for determining the water level. The lowest permissible water level of vertical boilers shall be at a point one-third of the height of the shell above the bottom head or tubesheet. Where the boiler is equipped with an internal furnace, the lowest permissible water level shall be not less than one-third of the length of the tubes above the top of the furnace tubesheet. In the case of small boilers operated in a closed system where there is insufficient space for the usual water gage glass, water level indicators of the glass bull's-eye type may be used.

PMB-13.2 Miniature boilers shall have the lowest visible part of the water gage located at least 1 in. (25 mm) above the lowest permissible water level specified by the Manufacturer.

PMB-14 FIXTURES AND FITTINGS

All valves, pipe fittings, and appliances connected to a miniature boiler shall be equal at least to the requirements of Class 125 or Class 150 of the appropriate ASME Standard listed in PG-42.

PMB-15 SAFETY VALVES A02

PMB-15.1 Each miniature boiler shall be equipped with a sealed spring loaded safety valve of not less than NPS $\frac{1}{2}$ (DN 15).

PMB-15.2 The minimum relieving capacity of the safety valve shall be determined in accordance with PG-67.2.

PMB-15.3 All other provisions for safety valves in this Section shall be complied with.

PMB-16 STEAM STOP VALVES

Each steam line from a miniature boiler shall be provided with a stop valve located as close to the boiler shell or drum as is practicable, except when the boiler and steam receiver are operated as a closed system.

A02 PMB-17 AUTOMATIC DEVICES

All miniature boilers operated with gas, electricity, oil, or mechanical firing shall be provided with an automatic low-water fuel cutoff, except electric boilers of the electrode type as provided for in PEB-16.

PMB-21 HYDROSTATIC TESTS AND INSPECTION A02

PMB-21.1 In addition to the inspections required elsewhere in this Section, each miniature boiler pressure vessel shall be inspected while being tested at a hydrostatic pressure equal to three times the maximum allowable working pressure.

PMB-21.2 Completed miniature boilers with mechanically assembled boiler external piping (BEP) and trim shall be given a final hydrostatic test at a pressure not less than $1\frac{1}{2}$ times the MAWP of the pressure vessel. Miniature electric boilers that are trimmed to operate at less than the MAWP of the pressure vessel shall be given a final hydrostatic test in accordance with PEB-17.2

PMB-21.3 For completed miniature boilers with welded or brazed boiler external piping (BEP) or trim, the inspection requirements of PG-90.1 and the hydrostatic test requirements of PG-99 apply.