



## Ohio Administrative Code

### Rule 4101:4-9-01 Existing boilers and pressure vessels.

Effective: July 1, 2024

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(A) All existing boilers and pressure vessels and the associated equipment, controls, devices, and safeguards are to be maintained in a safe and sanitary condition, in good working order, and free of leaks and defects. The owner or the owner's designated agent is responsible for the maintenance of such boilers and pressure vessels and associated equipment, controls, devices, and safeguards.

If the original stamping, marking, or nameplate becomes illegible, detached, or lost, the owner or user is to have the stamped data, markings, or nameplate replaced in accordance with the applicable part of the "NBIC" as referenced in rule 4101:4-3-01 of the Administrative Code.

(B) The rules of the board are not to be retroactively applied to existing boilers or pressure vessels that are not otherwise being altered, repaired, reinstalled, or relocated. Portions of a boiler or pressure vessel not altered or repaired and not affected by an alteration or repair are not required to comply with the code requirements for a new boiler or pressure vessel.

(C) Routine boiler repairs such as piping or tube replacement or repairs considered general maintenance may be made without permit or inspection. However, routine repairs that involve welding do require a permit and approval is to be obtained from a general or special inspector prior to performing the repair. In the case where the contractor or owner making the routine repair has obtained a "National Board "R" Certificate of Authorization", the authorized inspector is to authorize the routine repair prior to the work being performed. If the repair requires welding, the welding is to be performed in accordance with the provisions of section IX of the "ASME Boiler and Pressure Vessel Code" as referenced in rule 4101:4-3-01 of the Administrative Code.

(D) Where a major repair or alteration (including a re-rating) is necessary or desired on an existing boiler which bears the stamp of the appropriate "ASME" symbol or which is stamped with a state of Ohio boiler number, the repair or alteration is to comply with the requirements of "Part 3" of the "NBIC" as referenced in rule 4101:4-3-01 of the Administrative Code. The repair or alteration is to meet the requirements for the conditions under which it will be operated.



(1) In accordance with rule 4101:4-7-01 of the Administrative Code, unless the contractor or owner has obtained a "National Board "R" Certificate of Authorization", all contractors or owners are to apply for a permit from the division of industrial compliance to make proposed repairs and the repairs are to be approved by a special or general inspector. A repair report, executed and signed by the special or general inspector, is to be filed with the superintendent on forms provided.

(2) In accordance with "Part 3" of the "NBIC," contractors or owners performing boiler alterations are to obtain a "National Board "R" Certificate of Authorization" prior to making any alterations. All alterations are to be authorized and approved by an authorized inspector.

(E) Where a major repair or alteration (including a re-rating) is necessary or desired on an existing boiler or pressure vessel which does not bear the appropriate "ASME" symbol stamp or which is not stamped with a state of Ohio boiler number, the boiler or pressure vessel is to be evaluated by the superintendent and required to meet the applicable requirements of the "ASME Boiler and Pressure Vessel Code" referenced in rule 4101:4-3-01 of the Administrative Code. Otherwise, the boiler or pressure vessel is to be retired from use.

(F) Repairs made to an existing "Ohio Special" boiler or pressure vessel are to be done in accordance with paragraph (C), (D)(1), or (H)(1) of this rule, as applicable.

(G) Alterations, including re-ratings, made to an existing "Ohio Special" boiler or pressure vessel are to be approved, prior to the alteration, by the board of building standards in accordance with the special procedure outlined in rule 4101:4-5-01 of the Administrative Code for boilers and pressure vessels of special design.

(H) Where a major repair or alteration (including a re-rating) is necessary or desired on an existing pressure vessel which bears the stamp of the appropriate "ASME" symbol, the repair or alteration is to comply with the requirements of "Part 3" of the "NBIC" as referenced in rule 4101:4-3-01 of the Administrative Code. The repair or alteration is to meet the requirements for the conditions under which it will be operated.

(1) Unless the contractor or owner has obtained a "National Board "R" Certificate of Authorization",



all contractors or owners are to notify the division of industrial compliance prior to making repairs to an existing pressure vessel and the repairs are to be approved by a special or general inspector. A repair report, executed and signed by the special or general inspector, is to be filed with the superintendent on forms provided.

(2) In accordance with "Part 3" of the "NBIC", contractors or owners performing pressure vessel alterations are to obtain a "National Board "R" Certificate of Authorization" prior to making any alterations. All alterations are to be authorized and approved by an authorized inspector.

(I) Whenever repairs are made to fittings, safety devices, appliances, or controls or it becomes necessary or desirable to replace them, the work is to comply with the requirements for new installations as prescribed in the applicable section of the "ASME Boiler and Pressure Vessel Code" and the applicable part of the "NBIC" as referenced in rule 4101:4-3-01 of the Administrative Code. When an owner wishes to install safety devices and controls which will enable an existing boiler to be operated without continuous, manned attendance by a licensed operator, the requirements of paragraph (B)(4) or (B)(5) of rule 4101:4-10-01 of the Administrative Code are to be met.

(J) An existing stationary boiler or pressure vessel which bears the appropriate "ASME" symbol or which is stamped with a state of Ohio boiler number may be reinstalled or relocated within Ohio, provided that the installation complies with the applicable section of the "ASME Boiler and Pressure Vessel Code" as referenced in rule 4101:4-3-01 of the Administrative Code and an inspection is made by a special or general inspector prior to operation. The fittings and appliances are to comply with the requirements for a new installation.

(K) A secondhand boiler or pressure vessel stamped with the appropriate "ASME" symbol or having the standard stamping of another state that has adopted rules of construction equivalent to those of Ohio may be installed for use in the state of Ohio provided that application is made for the installation, the manufacturer's data report, indicating that the boiler or pressure vessel was inspected during construction by an authorized inspector, is filed in the office of the superintendent, and an inspection is made by a special or general inspector prior to operation. The inspector is to submit a report to the superintendent which contains a facsimile of the code stamping, a statement concerning any corrosion or other deteriorating conditions and the extent and location of any welded or riveted repairs. Upon approval of a secondhand boiler by the superintendent, a certificate of operation is to



be issued.

(L) Except as permitted in paragraph (K) of this rule, an existing boiler or pressure vessel that does not bear the appropriate "ASME" symbol, was not registered with the "National Board," does not have a state of Ohio boiler number stamped upon it, or does not have an "Ohio Special" serial number tagged upon it is prohibited from reinstallation or relocation within the state of Ohio.

(M) The maximum allowable steam working pressure for cast iron boilers, except for hot water boilers, is to be fifteen psig.

(N) The maximum allowable working pressure on the shell or drum of an existing nonstandard boiler is to be determined by the strength of the weakest section of the structure, computed from the thickness of the plate, the tensile strength of the plate, the efficiency of the longitudinal joint or the tube ligaments, the inside diameter of the weakest course and the factor of safety allowed by these rules.

(S)(t)(E)/(R)(F) = Maximum allowable working pressure, psig.

Where:

S = ultimate tensile strength of shell plates, psi.

When the ultimate tensile strength, "S", of steel or wrought-iron shell plates is not known, it is to be taken as fifty-five thousand psi for steel and forty-five thousand psi for wrought-iron.

t = minimum thickness of shell plate, in weakest course, inch.

E = efficiency of longitudinal joint.

For riveted construction, "E" is to be determined by rules given in paragraph "PR-15" of the 1971 edition of the "ASME Boiler and Pressure Vessel Code, section I."

For tube ligaments, "E" is to be determined by rules "PG-52" or, "PG-53" of the "ASME Boiler and



Pressure Vessel Code, section I" and "PR-25", of the 1971 edition of the "ASME Boiler and Pressure Vessel Code, section I."

R = inside radius of the weakest course of the shell or drum in inches.

F = factor of safety permitted.

(1) When computing the ultimate strength of rivets in shear, the following values in pounds per square inch of the cross-sectional area of the rivet shank (after driving) is to be used:

Type of rivet	Strength
Iron rivet in single shear	38,000
Iron rivet in double shear	76,000
Steel rivets in single shear	44,000
Steel rivets in double shear	88,000

(2) When the diameter of the rivet holes in the longitudinal joints of a boiler is not known, the diameter and cross sectional area of rivets, after driving, may be ascertained from the following table or by cutting out one rivet in the body of the joint:

Thickness of plate, inches.	1/4	9/32	5/16	11/32	3/8	13/32
Diameter of rivet after driving, inches.	11/16	11/16	3/4	3/4	13/16	13/16
Thickness of plate, inches.	7/16	15/32	1/2	9/16	5/8	-
Diameter of rivet after driving, inches.	15/16	15/16	15/16	17/16	17/16	-

(3) The resistance of steel to crushing is to be taken as ninety-five thousand psi.

(4) The lowest factor of safety permissible on existing installations is to be 4.5 excepting for horizontal return tubular boilers having continuous longitudinal lap seams more than twelve feet in



length where the factor of safety is to be 8, and when this latter type of boiler is removed from its existing setting, it is not to be reinstalled for pressure in excess of fifteen psig. Reinstalled or secondhand nonstandard boilers are to have a minimum factor of safety of 6 when the longitudinal seams are of lap riveted construction, and a minimum factor of 5 when the longitudinal seams are of butt and double strap construction. A boiler constructed of wrought iron is to have a factor of safety of 7. Upon inspection of the boiler, if conditions are found which justify a reduction of the safe working pressure, the factor of safety as stated above is to be appropriately increased.

(O) The maximum allowable working pressure of a nonstandard low pressure steam boiler is not to exceed fifteen psig.

(P) The maximum allowable working pressure of a nonstandard boiler constructed principally of cast iron or constructed of a cast iron shell or heads and steel tubes is not to exceed thirty psig for hot water service.

(Q) The maximum allowable working pressure of a nonstandard water tube boiler, the tubes of which are secured to cast iron or malleable iron headers, or which have cast iron mud drums, is not to exceed one hundred sixty psig for steam service.

(R) If in the judgment of the inspector a low pressure boiler is unsafe for operation at the pressure previously approved, the pressure is to be reduced, proper repair made, or the boiler retired from service.

(S) Nonstandard pressure vessels except those exempt in section 4104.04 of the Revised Code and paragraph "U-1" of the "ASME Boiler and Pressure Vessel Code, section VIII", are prohibited for use in excess of fifteen psi internal or external pressure.

(T) Any owner or operator who in any manner loads the safety valve or valves to a greater pressure than that allowed by the certificate of operation is subject to the penalty provided in section 4104.99 of the Revised Code.