

Requisitos para Re-rating de Vasos de pressão

API 510 - NINTH EDITION, JUNE 2006

Pressure Vessel Inspection Code:

In-Service Inspection, Rating, Repair, and Alteration

1 Scope

1.1 General Application

1.1.1 Coverage

This inspection code covers the in-service inspection, repair, alteration, and rerating activities for pressure vessels and the pressure-relieving devices protecting these vessels. This inspection code applies to all refining and chemical process vessels that have been placed in service unless specifically excluded per 1.2.2. This includes:

- a. vessels constructed in accordance with an applicable construction code
- b. vessels constructed without a construction code (non-code)—A vessel not fabricated to a recognized construction code and meeting no known recognized standard
- c. vessels constructed and approved as jurisdictional special based upon jurisdiction acceptance of particular design, fabrication, inspection, testing, and installation
- d. non-standard vessels—A vessel fabricated to a recognized construction code but has lost its nameplate or stamping.

The ASME Code and other construction codes are written for new construction; however, most of the technical requirements for design, welding, NDE, and materials can be applied to the inspection, rerating, repair, and alteration of in-service pressure vessels.

If an item cannot follow the ASME Code because of its new construction orientation, requirements for design, material, fabrication, and inspection shall conform to API 510 rather than to the ASME Code. If in-service vessels are covered by requirements in the ASME Code and API 510 or if there is a conflict between the two codes, the requirements of API 510 shall take precedence.

As an example of the intent of API 510, the phrase “applicable requirements of the ASME Code” has been used in API 510 instead of the phrase “in accordance with the ASME Code.”

3.56 rerating: A change in either the design temperature rating, the MDMT or the MAWP rating of a vessel. The design temperature and maximum allowable working pressure of a vessel may be increased or decreased because of a rerating. Derating below original design conditions is a permissible way to provide for additional corrosion allowance.

SECTION 8—REPAIRS, ALTERATIONS, AND RERATING OF PRESSURE VESSELS

8.2 Rerating

8.2.1 Rerating a pressure vessel by changing its design temperature, minimum metal design temperature, or its maximum allowable working pressure may be done only after all of the following requirements have been met:

- a. Calculations performed by either the manufacturer or an owner/user engineer (or his designated representative) experienced in pressure vessel design, fabrication, or inspection shall justify rerating.
- b. A rerating shall be performed in accordance with the requirements of the vessel's construction code. Alternately, calculations can be made using the appropriate formulas in the latest edition of the applicable construction Code provided all of the vessel's essential details comply with the applicable requirements of the ASME code. If the vessel was designed to an edition or addendum of the ASME Code earlier than the 1999 Addenda and was not designed to Code Case 2290 or 2278, it may be rerated to the latest edition/addendum of the ASME Code if permitted by Figure 8-1.
- c. Current inspection records verify that the pressure vessel is satisfactory for the proposed service conditions and that the corrosion allowance provided is appropriate. An increase in allowable working pressure or design temperature shall be based on thickness data obtained from a recent internal or on-stream inspection.

- d. The vessel shall be pressure tested using the applicable testing formula from the code used to perform the rerating calculations unless either of the following is true:
1. The pressure vessel has at some time been pressure tested to a test pressure equal to or higher than the test pressure required by the rerate code; and,
 2. The vessel integrity is confirmed by special nondestructive evaluation inspection techniques in lieu of testing.
- e. The rerating is acceptable to the engineer.

8.2.2 The pressure vessel rerating will be considered complete when the inspector witnesses the attachment of an additional nameplate or additional stamping that carries the information in Figure 8-1.

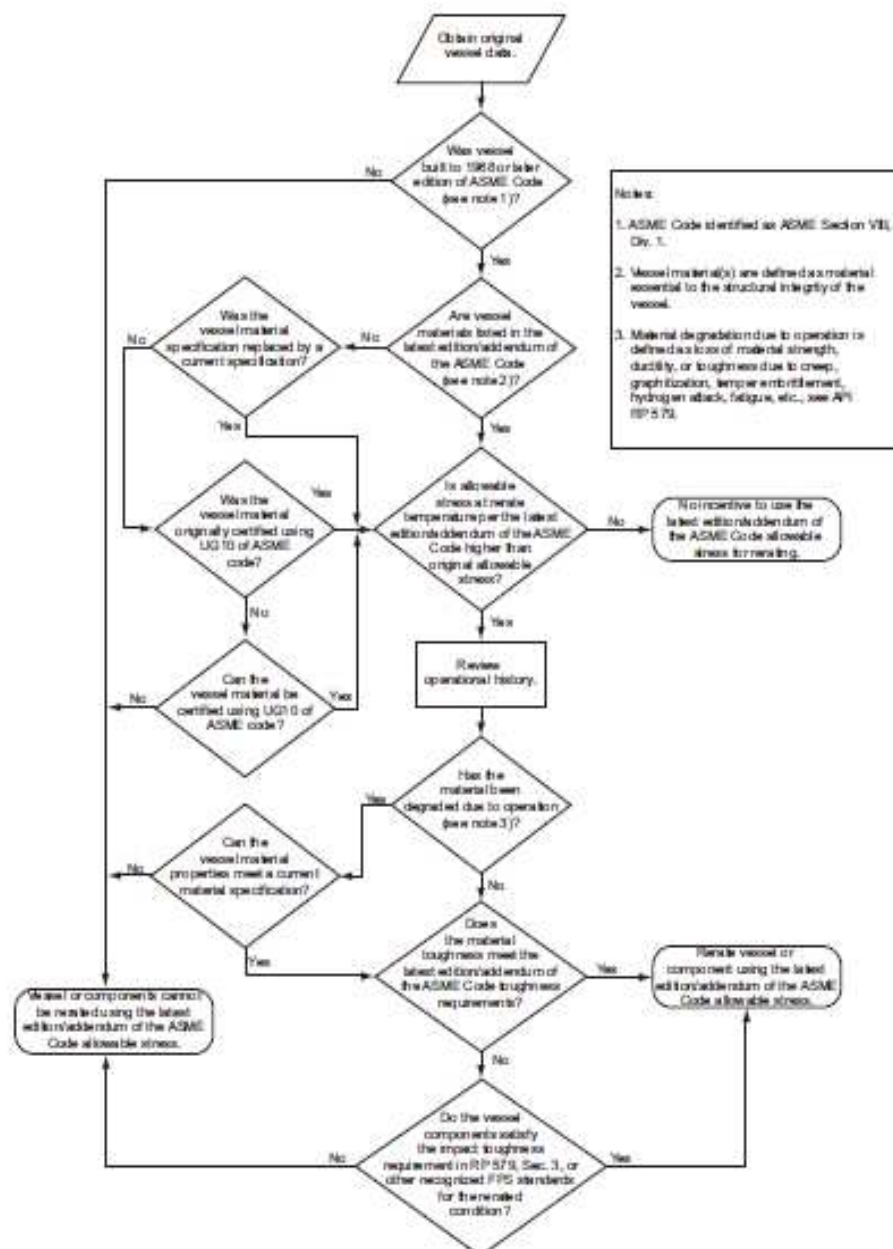


Figure 8-1—Rerating Vessels Using the Latest Edition or Addendum of the ASME Code Allowable Stresses

APPENDIX D—SAMPLE REPAIR, ALTERATION, OR RERATING OF PRESSURE VESSEL FORM

**SAMPLE REPAIR ALTERATION OR
RERATING OF PRESSURE VESSEL FORM
API 510, 9th EDITION**

Form Date _____
Form No. _____
Owner or User Name _____
Vessel Name _____

1. Original Vessel Identification Number _____			
2. Original Vessel Location _____			
3. Manufacturer _____		Serial No. _____	
4. See attachments for additional data?		o Yes o No	
5. Original Construction Code _____			
6. Original Maximum Allowable Working Pressure _____		Year Built _____	
7. Original Design Temperature _____		Year Built _____	
8. Original Minimum Design Metal Temperature _____		At Pressure _____	
9. Original Test Pressure _____		Fluid _____ Position _____	
10. Shell Material _____		Head Material _____	
11. Shell Thickness _____		Head Thickness _____	
12. Original Joint Efficiency _____			
13. Original Radiography		o Yes o No	
14. Original PWHT		o Yes o No	
If yes, Temp (°F) _____ Time (Hrs) _____			
15. Original Corrosion Allowance _____			
16. Work on Vessel Classified as:		o Repair o Alteration o Rerating	
17. Organization Performing Work _____			
18. Construction Code for Present Work _____			
19. New Vessel Identification Number (if Applicable) _____			
20. New Vessel Location (if Applicable) _____			
21. New Maximum Allowable Working Pressure _____			
22. New Design Temperature _____			
23. New Minimum Design Metal Temperature _____		At Pressure _____	
24. New PWHT		o Yes o No	
Temp (°F) _____ Time (Hrs) _____			
25. New Joint Efficiency, if Applicable E = _____			
26. Type of Examination or Inspection Performed:			
o radiographic		o ultrasonic	
o magnetic particle		o penetrant	
o visual		o other	
27. New Pressure Test if Yes, Pressure _____ Test Medium _____ Test Position _____			
28. New Corrosion Allowance _____			
29. Describe work performed (attach drawings, calculations, and other pertinent data):			
Statement of Compliance			
We certify that the statements made in this report are correct and that all material and construction for and workmanship of this o repair o alteration, o rerating conform to the requirements of the _____ Edition of API 510, Pressure Vessel Inspection Code.			
Signed _____		(repair, alteration, or rerating organization)	
Date _____		(authorized representative)	
Statement of Inspection			
I, the undersigned, an inspector employed by _____, having inspected the work described above, state that to the best of my knowledge, the work has been satisfactorily completed in accordance with the _____ Edition of API 510, Pressure Vessel Inspection Code.			
Signed _____		API 510 Certification Number _____	
Date _____			