PART UF

General

UF-1 Scope 157

Materials

UF-5 General 157
UF-6 Forgings 157
UF-7 Forged Steel Rolls Used for Corrugating Paper Machinery 157

Design

UF-12 General 157
UF-13 Head Design 158
UF-25 Corrosion Allowance 158

Fabrication

UF-26 General 158
UF-27 Tolerances on Body Forgings 158
UF-28 Methods of Forming Forged Heads 160
UF-29 Tolerance on Forged Heads 160
UF-30 Localized Thin Areas. 160
UF-31 Heat Treatment 160
UF-32 Welding for Fabrication 161
UF-37 Repair of Defects in Material 162
UF-38 Repair of Weld Defects 162
UF-43 Attachment of Threaded Nozzles to Integrally Forged Necks and Thickened Heads on Vessels 162

Inspection and Tests

UF-45 General 162
UF-46 Acceptance by Inspector 163
UF-47 Parts Forging 163
UF-52 Check of Heat Treatment and Postweld Heat Treatment 163
UF-53 Test Specimens 163
UF-54 Tests and Retests 163
UF-55 Ultrasonic Examination 163

Marking and Reports

UF-115 General 163

COPYRIGHT American Society of Mechanical Engineers
Licensed by Information Handling Services

Pressure Relief Devices
UF-125 General 163

Table
UF-27 Moduli of Elasticity for Ferrous Materials 159

COPYRIGHT American Society of Mechanical Engineers
Licensed by Information Handling Services

PART UF
REQUIREMENTS FOR PRESSURE VESSELS FABRICATED BY FORGING

GENERAL

UF-1 SCOPE

The rules in Part UF are applicable to forged pressure vessels without longitudinal joints, including their component parts that are fabricated of carbon and low alloy steels or of high alloy steels within the limitations of Part UHA. These rules shall be used in conjunction with the applicable requirements in Subsection A, and with the specific requirements in Subsection C that pertain to the respective classes of all materials used.

MATERIALS

UF-5 GENERAL

(a) Materials used in the construction of forged pressure vessels shall comply with the requirements for materials given in UG-4 through UG-14, except as specifically limited or extended in (b) and (c) below, and in UF-6.

(b) The heat analysis of forgings to be fabricated by welding shall not exceed carbon 0.35%. However, when the welding involves only minor nonpressure attachments as limited in UF-32, seal welding of threaded connections as permitted in UF-43, or repairs as limited by UF-37, the carbon content shall not exceed 0.50% by heat analysis. When by heat analysis the carbon analysis exceeds 0.50% no welding is permitted.

(c) This part contains special requirements applicable to SA-372 materials subjected to liquid quench and temper heat treatment. Such special requirements do not apply to austenitic materials or to materials not exceeding 95 ksi (655 MPa) specified minimum tensile strength. SA-372 materials may be subjected to accelerated cooling or may be quenched and tempered to attain their specified minimum properties provided:

(1) after heat treatment, inspection for injurious defects shall be performed according to UF-31(b)(1)(a);

(2) tensile strength shall not be greater than 20 ksi (137 MPa) above their specified minimum tensile strength.

(d) For vessels constructed of SA-372 Grade J, Class 110 or Grade L material, transverse impact tests shall be made at the minimum allowable temperature in accordance with Part UHT of this Division, except in no case shall the test temperature be higher than −20°F (−29°C). Certification is required. An ultrasonic examination shall be made in accordance with UF-55.

UF-6 FORGINGS

All materials subject to stress due to pressure shall conform to one of the specifications given in Section II and limited to those listed in Table UCS-23 and UHA-23 for forgings or to plates, and seamless pipe and tube when such material is further processed by a forging operation.

UF-7 FORGED STEEL ROLLS USED FOR CORRUGATING PAPER MACHINERY

Materials and rules of construction to be applied in the manufacture of forged steel corrugating and pressure rolls used in machinery for producing corrugated paper are covered in SA-649 in Section II, Part A.

DESIGN

UF-12 GENERAL

The rules in the following paragraphs apply specifically to vessels or main sections of vessels that are forged from ingots, slabs, billets, plate, pipe, or tubes, and shall be used to supplement the requirements for design which are applicable, as given in UG-16 through UG-55, and those given in UCS-16 through UCS-67,

COPYRIGHT American Society of Mechanical Engineers
Licensed by Information Handling Services

and UHA-20 through UHA-34. Sections of vessels may be joined by any method permitted in the several parts of this Division except as limited in UF-5(b) and UF-5(c).

Vessels constructed of SA-372 Grade A, B, C, or D; Grade E Class 65 or 70; Grade F Class 70; Grade G Class 70; Grade H Class 70; Grade J Class 65, 70, or 110; Grade L; or Grade M Class A or B must be of streamlined design, and stress raisers, such as abrupt changes in section, shall be minimized. Openings in vessels constructed of liquid quenched and tempered materials, other than austenitic steel, shall be reinforced in accordance with UG-37; UG-36(c)(3) shall not apply.

The nominal wall thickness of the cylindrical shell of vessels constructed of SA-372 Grade J, Class 110 shall not exceed 2 in. (51 mm).

UF-13 HEAD DESIGN

(a) The minimum required thickness of forged heads shall be computed using the formulas of UG-32. When heads are made separate from the body forging they may be attached by any method permitted in the several parts of this Division except as limited in UF-5(b) and UF-5(c).

(b) The juncture of a forged conical head with the body shall be a knuckle, the inside radius of which shall be not less than 6% of the internal diameter of the vessel. The thickness at the knuckle shall be not less than that of the cylinder and shall be faired into that of the head at the base of the cone.

(c) Except for the 3t requirements in UG-32(j) the design of the head shall comply with the applicable provisions of UG-32, UG-33, UG-34, and 1-6.

UF-25 CORROSION ALLOWANCE

(a) Provision shall be made for corrosion in accordance with the requirements in UG-25.

FABRICATION

UF-26 GENERAL

The rules in the following paragraphs apply specifically to forged vessels, main sections of vessels and other vessel parts, and shall be used to supplement the applicable requirements for fabrication given in UG-75 through UG-84 and UCS-79. For high alloy steel forged vessels, the applicable paragraphs of Part UHA shall also apply.

UF-27 TOLERANCES ON BODY FORGINGS

(a) The inner surface of the body shall be true-to-round to the degree that the maximum difference between any two diameters at 90 deg. to each other, determined for any critical cross section, does not exceed 1% of the mean diameter at that section. Chip marks and minor depressions in the inner surface may be filled by welding to meet these tolerances when the welding is done as permitted in UF-32.

(b) If out-of-roundness exceeds the limit in (a) and the condition cannot be corrected, the forging shall be rejected except that if the out-of-roundness does not exceed 3%, the forging may be certified for a lower pressure in the formula:

$$\text{Reduced pressure } P' = P\left(\frac{1.25}{\frac{S_b}{S}+1}\right)$$

and in which

$$S_b = \frac{1.5PR_1t(D_1 - D_2)}{t^3 + 3\frac{P}{E}R_1R_a^2}$$

where

P = maximum allowable working pressure for forging meeting the requirements of (a), psi (kPa)

t = the average (mean) thickness, in. (mm)

D_1, D_2 = the inside diameters, in. (mm), maximum and minimum, respectively, as measured for the critical section, and for one additional section in each direction therefrom at a distance not exceeding $0.2D_2$. The average of the three readings for D_1 and D_2, respectively, shall be inserted in the formula.

S_b = bending stress, psi (kPa), at metal service temperature

E = modulus of elasticity, psi (kPa), at metal temperature from Table UF-27

S = design stress value, psi (kPa), at metal service temperature

R_1 = average inside radius at critical section, in. (mm)
$= \frac{1}{4}(D_1 + D_2)$

R_a = average radius to middle of shell wall at critical section, in. (mm)
$= \frac{1}{4}(D_1 + D_2) + t/2$

COPYRIGHT American Society of Mechanical Engineers
Licensed by Information Handling Services

TABLE UF-27
MODULI OF ELASTICITY FOR FERROUS MATERIALS

Customary Units

Material	E = Modulus of Elasticity, psi (Multiply Tabulated Values by 10^6), for Temperature, °F, of														
	70	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
Carbon steels with C ≤ 0.30%	29.5	28.8	28.3	27.7	27.3	26.7	25.5	24.2	22.4	20.4	18.0	...	...	...	...
Carbon steels with C > 0.30%	29.3	28.6	28.1	27.5	27.1	26.5	25.3	24.0	22.3	20.2	17.9	...	...	...	...
Carbon-moly steels	29.2	28.5	28.0	27.4	27.0	26.4	25.3	23.9	22.2	20.1	17.8	...	...	...	...
Nickel steels	27.8	27.1	26.7	26.1	25.7	25.2	24.6	23.9	23.2	22.4	21.5	20.4	19.2	17.7	...
Chrome-moly steels															
½Cr–2Cr	29.7	29.0	28.5	27.9	27.5	26.9	26.3	25.5	24.8	23.9	23.0	21.8	20.5	18.9	...
2¼Cr–3Cr	30.6	29.8	29.4	28.8	28.3	27.7	27.1	26.3	25.6	24.6	23.7	22.5	21.1	19.4	...
5Cr–9Cr	30.9	30.1	29.7	29.0	28.6	28.0	27.3	26.1	24.7	22.7	20.4	...	...	...	...
Straight chromium steels	29.2	28.5	27.9	27.3	26.7	26.1	25.6	24.7	23.2	21.5	19.1	...	...	...	...
Austenitic precipitation hardened, and other high alloy steels	28.3	27.6	27.0	26.5	25.8	25.3	24.8	24.1	23.5	22.8	22.1	21.2	20.2	19.2	18.1

SI Units

Material	E = Modulus of Elasticity, MPa (Multiply Tabulated Values by 1000), for Temperature, °C, of														
	21	93	149	204	280	316	371	427	482	538	593	649	704	776	815
Carbon steels with C ≤ 0.30%	203	199	195	191	188	184	176	167	154	140.7	124	...	...	...	...
Carbon steels with C > 0.30%	202	197	194	190	187	183	174	165	154	139.3	123	...	...	...	...
Carbon-moly steels	201	197	193	189	186	182	174	165	153	138.6	123	...	...	...	...
Nickel steels	192	187	184	180	177	174	170	165	160	154.4	148	141	132	122	...
Chrome-moly steels															
½Cr–2Cr	205	200	197	192	190	185	181	176	171	164.8	159	150	141	130	...
2¼Cr–3Cr	211	205	203	199	195	191	187	181	177	169.6	163	155	145	134	...
5Cr–9Cr	213	208	205	200	197	193	188	180	170	156.5	141	...	...	...	...
Straight chromium steels	201	197	192	188	184	180	177	170	160	148.2	132	...	...	...	...
Austenitic precipitation hardened, and other high alloy steels	195	190	186	183	178	174	171	166	162	157.2	152	146	139	132	125

COPYRIGHT American Society of Mechanical Engineers
Licensed by Information Handling Services

NOTES:
(1) Use $P' = P$ when S_b is less than $0.25S$.
(2) In all measurements, correct for corrosion allowance if specified.

UF-28 METHODS OF FORMING FORGED HEADS

Forged heads shall be made either by closing in extensions of the body of such shape and dimensions as may be required to produce the final form desired, or by separate forgings [see UF-13(a)].

UF-29 TOLERANCE ON FORGED HEADS

Forged heads shall be as true as it is practicable to make them to the shape shown on the design drawings. Any deviations therefrom shall merge smoothly into the general shape of the head and shall not evidence a decrease of strength for the sections as required by the formulas for design.

UF-30 LOCALIZED THIN AREAS

Forgings are permitted to have small areas thinner than required if the adjacent areas surrounding each have sufficient thickness to provide the necessary reinforcement according to the rules for reinforcement in UG-40.

UF-31 HEAT TREATMENT

(a) Normalized or Annealed Material

(1) After all forging is completed, each vessel or forged part fabricated without welding shall be heat treated in accordance with the applicable material specification. When defects are repaired by welding, subsequent heat treatment may be necessary in accordance with UF-37(b).

(2) Vessels fabricated by welding of forged parts requiring heat treatment shall be heat treated in accordance with the applicable material specification as follows:

(a) after all welding is completed; or

(b) prior to welding, followed by postweld heat treatment of the finished weld in accordance with UW-40;

(c) when the welding involves only minor nonpressure attachments to vessels having carbon content exceeding 0.35% but not exceeding 0.50% by ladle analysis, requirements of UF-32(b) shall govern.

(b) Liquid Quenched Material

(1) Vessels fabricated from SA-372 forging material to be liquid quenched and tempered shall be subjected to this heat treatment in accordance with the applicable material specifications after the completion of all forging, welding of nonpressure attachments as permitted by UF-32, and repair welding as limited by UF-37. Seal welding of threaded connections, as permitted in UF-43, may be performed either before or after this heat treatment.

(a) After final heat treatment, such vessels shall be examined for the presence of cracks on the outside surface of the shell portion and on the inside surface where practicable. This examination shall be made by liquid penetrant when the material is nonmagnetic and by liquid penetrant or magnetic particle examination when the material is ferromagnetic.

(b) After final heat treatment, liquid quenched and tempered vessels, except those made of austenitic steels and except as provided in (c) below, shall be subjected to Brinell hardness tests at 5 ft (1.5 m) intervals with a minimum of four readings at each of not less than three different sections representing approximately the center and each end of the heat treated shell. The average of the individual Brinell hardness numbers at each section shall be not less than 10% below, nor more than 25% above the number obtained by dividing 500 into the specified minimum tensile strength of the material, and the highest average hardness number shall not exceed the lowest average value on an individual vessel by more than 40. Reheat treatment is permitted.

NOTE: Other hardness testing methods may be used and converted to Brinell numbers by means of the Table in ASTM E 140.

(c) For vessels which are integrally forged, having an overall length less than 5 ft (1.5 m) and a nominal thickness not exceeding $\frac{1}{2}$ in. (13 mm), the requirements of (b) above may be modified by taking a minimum of two hardness readings at each end of the vessel. These four hardness readings shall satisfy the requirements of (b) above as if the four hardnesses were applicable to one section.

(d) In the case of austenitic steels, the heat treatment procedures followed shall be in accordance with UHA-32.

(2) Non-Heat-Treated Material. Postweld heat treatment of vessels fabricated by welding of forged parts not requiring heat treatment shall meet with the requirements of UCS-56.

COPYRIGHT American Society of Mechanical Engineers
Licensed by Information Handling Services

UF-32 WELDING FOR FABRICATION

(a) All welding used in connection with the fabrication of forged vessels or components shall comply with the applicable requirements of Parts UW, UCS, and UHA and UF-5(b) except as modified in (b) and (c) below. Procedure qualification in accordance with Section IX shall be performed with the heat treatment condition of the base metal and weld metal as in UF-31 as contemplated for the actual work.

(b) When the carbon content of the material exceeds 0.35% by ladle analysis, the vessel or part shall be fabricated without welding of any kind, except for repairs [see UF-37(b)], for seal welding of threaded connections as permitted in UF-43, and for minor nonpressure attachments. Minor nonpressure attachments shall be joined by fillet welds of not over $\frac{1}{4}$ in. throat dimensions. Such welding shall be allowed under the following conditions.

(1) The suitability of the electrode and procedure shall be established by making a groove weld specimen as shown in QW-461.2 of Section IX in material of the same analysis and of thickness in conformance with QW-451. The specimen before welding shall be in the same condition of heat treatment as the work it represents, and after welding the specimen shall be subjected to heat treatment equivalent to that contemplated for the work. Tensile and bend tests, as shown in QW-462.1, QW-462.2(a) and QW-462.3(a), shall be made. These tests shall meet the requirements of QW-150 and QW-160 of Section IX. The radius of the mandrel used in the guided bend test shall be as follows:

Specimen Thickness	Radius of Mandrel B[1]	Radius of Die D[1]
$\frac{3}{8}$ in. (10 mm)	$1\frac{1}{2}$ in. (38 mm)	$1\frac{11}{16}$ in. (43 mm)
t	$3\frac{1}{3}t$	$4\frac{1}{3}t + \frac{1}{16}$ in. (1.6 mm)

NOTE:
(1) Corresponds to dimensions B and D in QW-466.1 in Section IX, and other dimensions to be in proportion.

Any cutting and gouging processes used in the repair work shall be included as part of the procedure qualification.

(2) Welders shall be qualified for fillet welding specified by making and testing a specimen in accordance with QW-462.4(b) and QW-180 of Section IX. Welders shall be qualified for repair welding by making a test plate in accordance with QW-461.3 from which the bend tests outlined in QW-452 shall be made. The electrode used in making these tests shall be of the same classification number as that specified in the procedure. The material for these tests can be carbon steel plate or pipe provided the test specimens are preheated, welded and postheated in accordance with the procedure specification for the type of electrode involved.

(3) The finished weld shall be postweld heat treated or given a further heat treatment as required by the applicable material specification. The types of welding permitted in UF-32(b) shall be performed prior to final heat treatment except for seal welding of threaded openings which may be performed either before or after final heat treatment.

(4) The finished welds shall be examined after postweld heat treatment by liquid penetrant when the material is nonmagnetic and by liquid penetrant or magnetic particle examination using the prod method when the material is ferromagnetic.

(c) The following requirements shall be used to qualify welding procedure and welder performance for seal welding of threaded connections in seamless forged pressure vessels of SA-372 Grades A, B, C, D, E, F, G, H, and J materials.

(1) The suitability of the welding procedure, including electrode, and the welder performance shall be established by making a seal weld in the welding position to be used for the actual work and in a full-size prototype of the vessel neck, including at least some portion of the integrally forged head, conforming to the requirements of UF-43 and the same geometry, thickness, vessel material type, threaded-plug material type, and heat treatment as that for the production vessel it represents.

(2) The seal weld in the prototype at the threaded connection of the neck and plug shall be cross sectioned to provide four macro-test specimens taken 90 deg. apart.

(3) One face of each cross section shall be smoothed and etched with suitable etchant (see QW-470) to give a clear definition of the weld metal and heat affected zone. Visual examination of the cross sections of the weld metal and heat affected zone shall show complete fusion and freedom from cracks.

(4) All production welding shall be done in accordance with the procedure qualification of (c)(1) above, including the preheat and the electrode of the same classification as that specified in the procedure, and with welders qualified using that procedure.

(5) Seal welding of threaded connections may be performed either before or after final heat treatment.

(6) The finished weld shall be examined by liquid penetrant or magnetic particle examination using the prod method.

COPYRIGHT American Society of Mechanical Engineers
Licensed by Information Handling Services

UF-37 REPAIR OF DEFECTS IN MATERIAL

(a) Surface defects, such as chip marks, blemishes, or other irregularities, shall be removed by grinding or machining and the surface exposed shall be blended smoothly into the adjacent area where sufficient wall thickness permits thin areas in compliance with the requirements of UF-30.

(b) Thinning to remove imperfections beyond those permitted in UF-30 may be repaired by welding only after acceptance by the Inspector. Defects shall be removed to sound metal as shown by acid etch or any other suitable method of examination. The welding shall be as outlined below.

(1) Material Having Carbon Content of 0.35% or Less (by Ladle Analysis)

(a) The welding procedure and welders shall be qualified in accordance with Section IX.

(b) Postweld heat treatment after welding shall be governed as follows.

(1) All welding shall be postweld heat treated if UCS-56 requires postweld heat treatment, for all thicknesses of material of the analysis being used.

(2) Fillet welds need not be postweld heat treated unless required by (1) above or unless the fillet welds exceed the limits given in UCS-56.

(3) Repair welding shall be postweld heat treated when required by (b)(1)(b)(1) above or if it exceeds 6 sq in. (3871 mm^2) at any spot or if the maximum depth exceeds $\frac{1}{4}$ in. (6 mm).

(c) Repair welding shall be radiographed if the maximum depth exceeds $\frac{3}{8}$ in. (10 mm) Repair welds $\frac{3}{8}$ in. (10 mm) and under in depth which exceed 6 sq in. (3871 mm^2) at any spot and those made in materials requiring postweld heat treatment shall be examined by radiographing, magnetic particle or liquid penetrant examination, or any alternative method suitable for revealing cracks.

(d) For liquid quenched and tempered steels, other than austenitic steels, welding repairs shall be in accordance with UF-37(b)(3).

(2) Material Having Carbon Content Over 0.35% (by Ladle Analysis)

(a) Welding repairs shall conform with UF-32(b) except that if the maximum weld depth exceeds $\frac{1}{4}$ in. (6 mm), radiography, in addition to magnetic particle or liquid penetrant examination, shall be used.

(b) For liquid quenched and tempered steels, other than austenitic steel, welding repair shall be in accordance with (b)(3) below.

(3) Welding repairs of materials which are to be or have been liquid quenched and tempered, regardless of depth or area of repairs shall have the repaired area radiographed and examined by magnetic particle or liquid penetrant examination.

UF-38 REPAIR OF WELD DEFECTS

The repair of welds of forgings having carbon content not exceeding 0.35% by ladle analysis shall follow the requirements of UW-38.

UF-43 ATTACHMENT OF THREADED NOZZLES TO INTEGRALLY FORGED NECKS AND THICKENED HEADS ON VESSELS

Threaded openings, over NPS 3 (DN 80), but not exceeding the smaller of one-half of the vessel diameter or NPS 8, may be used in the heads of vessels having integrally forged heads and necks that are so shaped and thickened as to provide a center opening, which shall meet the rules governing openings and reinforcements contained elsewhere in the Code. Length of thread shall be calculated for the opening design, but shall not be less than shown in Table UG-43. Threaded connections employing straight threads shall provide for mechanical seating of the assembly by a shoulder or similar means. When seal welding is employed in the installation of a threaded nozzle, the work shall be performed and inspected in the shop of the vessel manufacturer. Seal welding shall comply with UF-32.

INSPECTION AND TESTS

UF-45 GENERAL

The rules in the following paragraphs apply specifically to the inspection and testing of forged vessels and their component parts. These rules shall be used to supplement the applicable requirements for inspection and tests given in UG-90 through UG-102. All forged vessels shall be examined as manufacture proceeds, to assure freedom from loose scale, gouges or grooves, and cracks or seams that are visible. After fabrication has passed the machining stage, the vessel body shall be measured at suitable intervals along its length to get a record of variations in wall thickness, and the nozzles for connecting piping and other important details shall be checked for conformity to the design dimensions.

COPYRIGHT American Society of Mechanical Engineers
Licensed by Information Handling Services

UF-46 ACCEPTANCE BY INSPECTOR

Surfaces which are not to be machined shall be carefully inspected for visible defects such as seams, laps, or folds. On surfaces to be machined the inspection shall be made after machining. Regions from which defective material has been removed shall be inspected after removal and again after any necessary repair.

UF-47 PARTS FORGING

(a) When welding is used in the fabrication of parts forgings completed elsewhere, the parts forging manufacturer shall furnish a Form U-2 Partial Data Report.

(b) All parts forgings completed elsewhere shall be marked with the manufacturer's name and the forging identification, including material designation. Should identifying marks be obliterated in the fabrication process, and for small parts, other means of identification shall be used. The forging manufacturer shall furnish reports of chemical and mechanical properties of the material and certification that each forging conforms to all requirements of Part UF.

(c) Parts forgings furnished as material for which parts Data Reports are not required need not be inspected at the plant of the forging manufacturer, but the manufacturer shall furnish a report of the extent and location of any repairs together with certification that they were made in accordance with all other requirements of UF-37 and UF-38. If desired, welding repairs of such forgings may be made, inspected, and tested at the shop of the pressure vessel manufacturer.

UF-52 CHECK OF HEAT TREATMENT AND POSTWELD HEAT TREATMENT

The Inspector shall check the provisions made for heat treatment to assure himself that the heat treatment is carried out in accordance with provisions of UF-31 and UF-32. He shall also assure himself that postweld heat treatment is done after repair welding when required under the rules of UF-37.

UF-53 TEST SPECIMENS

When test specimens are to be taken under the applicable specification, the Inspector shall be allowed to witness the selection, place the identifying stamping on them, and witness the testing of these specimens.

UF-54 TESTS AND RETESTS

Tests and retests shall be made in accordance with the requirements of the material specification.

UF-55 ULTRASONIC EXAMINATION

(a) For vessels constructed of SA-372 Grade J, Class 110 material, the completed vessel after heat treatment shall be examined ultrasonically in accordance with SA-388. The reference specimen shall have the same nominal thickness, composition, and heat treatment as the vessel it represents. Angle beam examination shall be calibrated with a notch of a depth equal to 5% of the nominal section thickness, a length of approximately 1 in. (25 mm), and a width not greater than twice its depth.

(b) A vessel is unacceptable if examination results show one or more imperfections which produce indications exceeding in amplitude the indication from the calibrated notch. Round bottom surface imperfections, such as pits, scores, and conditioned areas, producing indications exceeding the amplitude of the calibrated notch shall be acceptable if the thickness below the indication is not less than the design wall thickness of the vessel, and its sides are faired to a ratio of not less than three to one.

MARKING AND REPORTS

UF-115 GENERAL

The rules of UG-115 through UG-120 shall apply to forged vessels as far as practicable. Vessels constructed of liquid quenched and tempered material, other than austenitic steels, shall be marked on the thickened head, unless a nameplate is used.

PRESSURE RELIEF DEVICES

UF-125 GENERAL

The provisions for pressure relief devices of UG-125 through UG-136 shall apply without supplement.

COPYRIGHT American Society of Mechanical Engineers
Licensed by Information Handling Services