Pressure Vessel Newsletter

Volume 2014, June Issue



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News and Events

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From The Editor's Desk:

The marathon elections lasting over a month are finally over in India. The people have spoken loud and clear, and have given a clear mandate to the new government to steer the country for the next five years. The new government (the new prime minister really) having made development the main (and perhaps the only) plank during the campaign is eager to deliver on those promise.

It is still a few weeks to the announcement of the first Budget; however it is certain that the emphasis will be on generating jobs. The manufacturing industry, which has been languishing for several years now, will be given a big boost to provide the much needed employment. The pressure vessel and the related industries are expected to benefit as a result. How can the pressure vessel fabrication industry capitalize and thrive in this anticipated favorable environment?

The current state of pressure vessel fabrication industry in India is, unfortunately, not very good. Barring a handful of large fabricators, most are not positioned to compete and survive, much less thrive, in the global market place. The need of the hour for the fabricators is to 1) improve working conditions in the shop, 2) place greater emphasis on workmanship, record keeping and overall quality, 3) provide good engineered products, and 4) demonstrate world-class professionalism in their work.

Every society needs to have that special element that differentiates it from others; makes everyone else fight for a distant second place. India's resource is its young human capital. If properly nurtured and provided top notch education, they can help Indian fabricators churn out highly engineered, high quality products, and in the process be the preferred suppliers of pressure vessels and related products to markets all over the world. The task is not easy, but it is not impossible either; it just needs all the stakeholders, especially the pressure vessel manufacturers, to work smarter.



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A fine balancing act, is the essence of life. We know that not all needs are the same nor one size fits all. We therefore don't just offer 'black-box' products that mystify nor try and club all client needs into one. Instead, we work with clients to offer them a well balanced solution. This is achieved through positive interactions, understanding varying needs, proactive-ness and personalized service for diverse situations & requirements.

The difference lies in our ability to connect with vendors, customers or colleagues and help them achieve their efficiency parameters. KEVIN's excellent project management skills, people development & support systems add to our repertoire with focus on growth to achieve wealth and not just profit. This has brought clients back to us, as they perceive it to be fun & fair while engaging with KEVIN. We mass transfer your problems into solutions !



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CODE CASE 2235: USE OF ULTRASONIC EXAMINATION IN LIEU OF RADIOGRAPHY

Paragraph UW-11(a) of ASME Section VIII, Div. 1 mandates full radiography (RT) for their full length for the following welded joints:

- 1) All butt welds in shell and heads of vessels used to contain lethal substances
- All butt welds in shell and heads of vessels in which the nominal thickness at the welded joint exceeds 1¹/₂" (38mm) in most cases (refer to the Code for additional requirements)
- 3) All butt welds in shell and heads of unfired steam boilers having design pressures
 - a) Exceeding 50 psi;
 - b) Not exceeding 50 psi but with nominal thickness at the welded joint exceeding those specified in 2) above
- 4) All butt welds in nozzles or communicating chambers with nominal thickness at the welded joint that exceeds the thicknesses specified in 2) above or attached to shell or heads of vessels under 1), 2) or 3) above that are required to be fully radiographed (refer to the Code for additional requirements)
- 5) All category A and D butt welds in shell and heads of vessels where the design of the joint or the part is based on joint efficiencies permitted by UW-12(a), in which case:
 - a) Category A and B welds connecting the shell or heads of vessels shall be of Type (1) or Type (2) of Table UW-12;
 - b) Category B or C butt welds (but not including those in nozzles and communicating chambers except as required in 4) above) which intersect the Category A butt welds in the shell or heads of the vessel or connect seamless vessel shell or heads shall, as a minimum, meet the requirements for spot radiography. Spot radiographs required by this paragraph shall not be used to satisfy spot radiography rules as applied to any other weld increment.
- 6) All butt welds joined by electrogas welding with any single pass greater than 1½" (38mm) and all butt welds joined by electroslag welding.

Code Case 2235 lists the conditions and limitations under which ultrasonic examination (UT) may be substituted for radiography. The Code Case states that all welds in materials ½ in. (13mm) or greater in thickness in pressure vessels may be examined using UT method in lieu of RT, provided that all of the following requirements are met:

- a) The UT area shall include the volume of the weld, plus 2 in. (50mm) on each side of the weld for material thickness greater than 8 in. (200mm). For material thickness 8 in. (200mm) or less, the UT area shall include the volume of the weld plus the lesser of 1 in. (25mm) or t (the lesser of the two thicknesses) on each side of the weld. Alternatively, examination volume may be reduced to include the actual heat affected zone (HAZ) plus ¹/₄ in. (6mm) of base material beyond the HAZ on each side of the weld, subject to additional requirement being satisfied (please refer to the Code Case for additional requirements).
- b) A documented examination strategy or scan plan shall be provided showing transducer placement, movement and component coverage that provides a standardized and repeatable methodology for weld acceptance. The scan plan shall also include ultrasonic beam angle used, beam directions with respect to weld centerline, and vessel volume examined for each weld. The document shall be made available to the Owner/ User upon request.
- c) The UT shall be performed in accordance with a written procedure. The procedure shall have been demonstrated to perform acceptably on a qualification block(s). The qualification blocks shall be prepared by welding or the hot isostatic process (HIP) and shall contain a minimum of three flaws, oriented to simulate flaws parallel to the production weld's fusion line. The description and the location of the three flaws are provided in the Code Case. If the block can be flipped during UT examination then one flaw may represent both the ID and OD surfaces. Thus only two flaws may be

required. Flaw size shall be no larger than the flaw in Table 1, 2, or 3 for the thickness to be determined.

- d) The UT examination shall be performed using a device employing automatic computer based data acquisition. The initial straight beam material examination for reflectors that could interfere with the angle beam examination shall be performed (1) manually, (2) as part of a previous manufacturing process, or (3) during the automatic UT examination provided detection of these reflectors is demonstrated.
- e) Data is recorded in unprocessed form.
- f) Data analysis and acceptance criteria shall be in accordance with the requirements provided in the Code Case.
- g) The nameplate shall be marked under the certification mark by applying UT, to indicate ultrasonic examination of welded seams required to be inspected in accordance with ASME VIII-1.
- h) This Case Number shall be shown on the manufacturer's data report, and the extent of UT examination shall be noted.

	a/t	L
Surface Flaw	≤ 0.087	≤ 0.25 in. (6.4mm)
Subsurface Flaw	≤ 0.143	≤ 0.25 in. (6.4mm)

Table 1: Flaw Acceptance for 1/2 in. (13mm) to less than 1 in. (25mm) Thick Weld

GENERAL NOTES:

- a) t = thickness of the weld excluding any allowable reinforcement. For a buttweld joining two members having different thickness at the weld, t is the thinner of these two thicknesses. If a full penetration weld includes a fillet weld, the thickness of the throat of the fillet weld shall be included in t.
- b) A subsurface indication shall be considered as a surface flaw if the separation of the indication from the nearest surface of the component is equal to or less than half the through dimension of the subsurface indication.

Table 2: Flaw Acceptance for 1 in. (25mm) to 12 in. (300mm) Thick Weld

	1 in. (25mm) ≤ t ≤ 2½ in. (64mm) [Note (1)]] 4 in. (100mm) ≤ t ≤ 12 in. (300mm) [Not	
Aspect Ratio, a/l	Surface Flaw, a/t	Subsurface Flaw, a/t	Surface Flaw, a/t	Subsurface Flaw, a/t
0.00	0.031	0.034	0.019	0.020
0.05	0.033	0.038	0.020	0.022
0.10	0.036	0.043	0.022	0.025
0.15	0.041	0.054	0.025	0.029
0.20	0.047	0.066	0.028	0.034
0.25	0.055	0.078	0.033	0.040
0.30	0.064	0.090	0.038	0.047
0.35	0.074	0.103	0.044	0.054
0.40	0.083	0.116	0.050	0.061
0.45	0.085	0.129	0.051	0.069
0.50	0.087	0.143	0.052	0.076

GENERAL NOTES:

- a) t = thickness of the weld excluding any allowable reinforcement. For a buttweld joining two members having different thickness at the weld, t is the thinner of these two thicknesses. If a full penetration weld includes a fillet weld, the thickness of the throat of the fillet weld shall be included in t.
- b) A subsurface indication shall be considered as a surface flaw if the separation of the indication from the nearest surface of the component is equal to or less than half the through dimension of the subsurface indication.
- c) If the acceptance criteria in this table results in a flaw length, I, less than 0.25 in. (6.4mm), a value of 0.25 in. (6.4mm) may be used.

NOTE:

1) For intermediate flaw aspect ration a/l and thickness t (2¹/₂ in. [64mm] < t < 4 in. [100mm]) linear interpolation is possible.

	Surface Flaw, a		Subsurface Flaw, a	
Aspect Ratio, a/l	in.	mm	in.	mm
0.00	0.228	5.79	0.240	6.10
0.05	0.240	6.10	0.264	6.71
0.10	0.264	6.71	0.300	7.62
0.15	0.300	7.62	0.348	8.84
0.20	0.336	8.53	0.396	10.1
0.25	0.396	10.1	0.456	11.6
0.30	0.456	11.6	0.528	13.4
0.35	0.528	13.4	0.612	15.5
0.40	0.612	15.5	0.696	17.7
0.45	0.618	15.7	0.804	20.4
0.50	0.624	15.9	0.912	23.6

Table 3: Flaw Acceptance Criteria for Larger than 12 in. (300mm) Thick Weld

GENERAL NOTES:

a) For the intermediate flaw aspect ratio, a/l linear interpolation is permissible.

b) t = thickness of the weld excluding any allowable reinforcement. For a buttweld joining two members having different thickness at the weld, t is the thinner of these two thicknesses. If a full penetration weld includes a fillet weld, the thickness of the throat of the fillet weld shall be included in t.

c) A subsurface indication shall be considered as a surface flaw if the separation of the indication from the nearest surface of the component is equal to or less than half the through dimension of the subsurface indication.

Source: Cases of ASME Boiler and Pressure Vessel Code



INTRODUCTION TO ASME SECTION VIII, DIVISION 2

Pressure vessels, along with heat exchangers and tanks, are the workhorses for storage and processing applications in the oil & gas, chemical, petrochemical, power, fertilizer, pharmaceutical, food and paper industries. ASME Boiler and Pressure Vessel Code, Section VIII is used as a standard for the design and fabrication of pressure vessels by most companies across the world.

ASME Section VIII, Division 2 employs state-of-art design, analysis and fabrication rules. As a result, design margins are reduced and the required thickness for vessel components is less than that those obtained by Division 1. This can result in substantial savings in the cost of materials, and the overall cost of Division 2 vessels will be lower.

CoDesign Engineering announces a 3-day training course for **"Introduction to ASME Section VIII, Division 2"** on **July 17-19, 2014** in **Mumbai**. This course provides the information that will help you understand the ASME requirements for the construction of a Division 2 pressure vessel. The course explains theories of failure and the design margins of various codes. It describes general requirements, design rules and stress analysis methods, material and fabrication requirements, non-destructive test requirements, pressure testing and pressure relief requirements.

Contents of the training course will be as follows:

Day One

- Introduction and General Requirements
- Material Requirements
- Design by Rule Requirements: Internal Pressure; External Pressure and Buckling

Day Two

- Design by Rule Requirements: Design Rule for Openings
- Design by Analysis Requirements

Day Three

- Fabrication Requirements
- Inspection and Examination Requirements
- Pressure Testing and Overpressure Protection Requirements
- FINAL TEST

The instructor, Mr. Ramesh Tiwari, is an ASME member and an internationally recognized specialist in the area of pressure vessels, heat exchangers, materials, and codes and standards. He holds Bachelor's and Master's degrees in mechanical engineering from universities in India and United States. He is also a registered Professional Engineer in the State of Maryland in the United States. Mr. Tiwari is a member of ASME Boiler & Pressure Vessel, Section VIII Subgroup on Heat Transfer Equipment, and a member of ASME International Working Group on B31.1 for Power Piping in India. In this capacity, he has made invaluable contribution in resolving technical issues in compliance with the ASME codes for Code users. Mr. Tiwari has over 24 years of design engineering experience on a variety of projects spanning industries such as oil & gas, power, nuclear, chemical, petrochemical, pharmaceutical, food etc. He has provided engineering advice and code interpretations to senior management and guidance to several companies he has worked for in the US, India and Germany. He has initiated and implemented numerous innovative ideas to improve working process and quality; and developed and conducted training programs for peers as well as clients. Mr. Tiwari is the editor-in-chief of a monthly pressure vessel newsletter which is read widely and respected worldwide since late 2007. He is also approved pressure vessel instructor at NTPC, NPTI (National Power Training Institute), Great Lakes IEMR and at several other companies, both public and private.

Registration fee for the training course is Rs. 25,300 for professionals, and Rs 16,000 for students (inclusive of service tax). Early bird discount of 15% is available until June 19, 2014. An additional discount of 15% is available for group registration of 2 or more participants. Registration fees includes training, a book containing collection of selected pressure vessel articles, copy of the presentation, certificate from CoDesign Engineering, and beverages and lunch on all days. It excludes travel to and from Mumbai, accommodation, and meals and beverages other than those provided during the course. We invite you to make nominations.

In case of any queries, including the registration process, please email at <u>learning@codesignengg.com</u>, or call at +91 98109 33550.

OVERVIEW OF TUBE VIBRATION

Tube vibration results from a combination of shell-side mechanical design and conditions that force the tubes to vibrate. It affects the shell side of the bundle, the tubes and the tube-to-tubesheet connections. Provided below is an overview of the kinds of damage that vibration inflicts, mechanisms that force the tubes to vibrate, and the information required for analysis.

Structural damage and operating problems caused by tube vibration

Vibration damages the structure and may cause operating problems. The kinds of structural damage it breeds and the operating problems it creates are listed below:

- Interspan-collision tube damage
- Water damage
- Fatigue failure of tubes and tube-to-tubesheet joints
- Tubesheet ligament cracking
- Root bend tearing in tube-to-tubesheet welds
- Intensified stress corrosion
- High operating noise
- Increased shell side pressure drop

Causes of vibration induction

Tubes are induced to vibrate by shell flow, hydraulically coupled induction, and mechanically coupled induction. Shell flow is the most frequent cause of tube vibration. Following is a brief description of the effects of bundle geometry and shell flow and the motions that result:

The tube can be considered to be a continuous beam subjected to steady and fluctuating loads. Steady loads on the beam are due to shell flow in the dominant direction (axial flow). Fluctuating loads on the beam are due to instantaneous shifts in the flow direction (cross-flow direction changes). Large tube motions occur at the beam's fundamental frequency. Large tube motion causes the following kinds of damage:

- o Wear of tubes on tubes
- o Wear of tubes on baffles or supports
- o Wear of baffles or supports on tubes
- o Pounding of baffles by tubes
- o Pounding of tubes by baffles

Small motions occur at harmonic frequencies and result in damages such as tube-to-tubesheet joint fatigue, tube-to-tubesheet weld root-bead tears, and ligament cracks. Small motion damage may be catastrophic.

Shell flow mechanisms that force tubes to vibrate

Some of the mechanisms that force tubes to vibrate are:

<u>Vortex shedding</u>: Vortices shed by velocity curl-back on the wake side of the tube alternately build up and are shed. The shedding is accompanied by harmonic lift forces transverse to the general flow direction. The frequency of tube movement that results varies with 1) the cross flow velocity, 2) the tube diameter, and 3) the Strouhal number N_s (= frequency x tube outside diameter / velocity). Tube movement frequency is affected by the spanwise correlation. The magnitude of motions resulting from harmonic lift forces due to vortex shedding varies with 1) the lift frequency, 2) the shell-side fluid density, 3) the square of shell-side cross-flow velocity, and 4) the shell-side Reynolds number N_{Re} (= tube outside diameter x cross flow velocity x density / viscosity). Movement magnitude is affected by the spanwise correlation.

The spanwise correlation that affects the frequency and magnitude is a function of the amplitude response and the synchronizing effect of other excitations.

Turbulent buffeting:

The stream buffets the tubes because of 1) white noise (general background turbulence), 2) diffused vortices from upstream, 3) slit-cavity-slit flow, and 4) axial drag. In axial drag, stream friction along the tubes cyclically compresses the tubes axially, then releases them. The factors that affect axial drag are 1) tube flexural

rigidity, 2) tube length and diameter, 3) tube static column loading, and 4) transverse span loads applied by other excitations

Fluid-elastic whirling (fluid-elastic swirling)

A row or rows of tubes react to cross-flow with coupled orbital motions in this mechanism. Fluid-elastic whirling directly extracts energy from the shell fluid, thereby increasing shell-side fluid pressure drop. Simultaneous lift and drag forces initiate the motion; the character of the oscillations is determined by the cross flow velocity. At a velocity defined as the *critical velocity*, the oscillations increase in magnitude without limit. At 55 to 100% of the critical velocity, the oscillations are sporadic.

Other mechanisms that force tube vibrations are acoustical coupling, hydraulically coupled vibration induction, and mechanically coupled vibration induction.

Amplification and Damping

Vibration amplifies the deflection of the tube under static load (its own weight plus the weight of fluid it carries). The amount of amplification is called the "gain". Damping reduces the live deflection.

At a given vibration frequency, the amplitude factor is the ratio of the dynamic load deflection to the static load deflection. Theoretical curves of the amplification factor versus the ratio (forcing frequency)/(natural frequency) coincide at ratios below 0.8 and above 1.15 for multispan beams. For ratios between these boundaries, it is safe to use the curve for a single san beam. Damping absorbs energy and sets the amplification factor. It consists of structural and fluid damping.

Structural parameters are 1) the number of spans in the tube run; 2) the weight of the tube run; 3) the tube layout pattern; 4) the tube and the baffle hardnesses; 5) the ratio of lift to drag forces; and 6) the shell fluid lubricity.

The fluid parameters are 1) the fluid density; 2) the fluid viscosity; and 3) the quantity flowing.

Source: Yokell, Stanley, <u>A Working Guide to Shell-and-Tube Heat Exchangers</u>

CHARPY IMPACT TESTS

When impact tests are required by the rules in Subsection C of ASME VIII-1, Charpy V-notch impact tests in accordance with provisions of UG-84 shall be made on weldments and all materials for shells, heads, nozzles, and other vessel parts subject to stress due to pressure.

Test Procedure

Impact test procedures and apparatus shall conform to the requirements of SA-370 or ISO 148. Impact test temperature shall not be warmer than the minimum design metal temperature.

Test Specimen

- 1) Each set of impact test specimens shall consist of three specimens.
- The impact test specimen shall be of V-notch type and shall conform in all respects to Figure 1. The standard (10mm x 10mm) specimens, when obtainable, shall be used for nominal thickness of 7/16 in. (11mm) or greater.



Simple Beam Impact Test Specimens (Charpy Type Test)

Figure 1: Impact Test Specimen

- 3) For material from which full size (10mm x 10mm) specimans cannot be obtained, the specimen shall either be the largest possible standard subsize specimen obtainable or specimen of full material nominal thickness which may be machined to remove surface irregularities. Alternatively, such material may be reduced in thickness to produce the largest possible Charpy subsize specimen. Toughness tests are not required where the maximum obtainable Charpy specimen has a width along the notch less than 0.099 in. (2.5mm).
- 4) The applicable minimum energy requirement for materials having a specified minimum tensile strength less than 95,000 psi (655 MPa) shall be that shown in Figure 2, multiplied by the ratio of the actual specimen width along the notch to the width of a full size (10mm x 10mm) specimen.
- 5) For all Charpy impact tests the following test temperature criteria shall be observed:
 - a. For materials of nominal thickness equal to or greater than 0.394 in. (10mm) Where the largest obtainable Charpy V-notch specimen has a width along the notch of at least 0.315 in. (8mm), the Charpy impact test using such a specimen shall be conducted at a temperature not warmer than the minimum design metal temperature (MDMT). Where the largest possible test specimen has a width along the notch less than 0.315 in. (8mm), the test shall be conducted at a temperature lower than the MDMT by the amount shown in Table 1.
 - b. For materials of nominal thickness less than 0.394 in. (10mm) Where the largest obtainable Vnotch specimen has a width along the notch of at least 80% of the material nominal thickness, the charpy impact test of such a specimen shall be conducted at a temperature not warmer than the MDMT.

Where the largest possible test specimen has a width along the notch of less than 80% of the material nominal thickness, the test for materials having minimum tensile strength of less than 95,000 psi (655 MPa), shall be conducted at a temperature lower than the MDMT by an amount

equal to the difference between the temperature reduction corresponding to the actual material thickness and the temperature reduction corresponding to the Charpy specimen width actually tested.





6) When the average value of three specimens equals or exceeds the minimum value permitted for a single specimen and the value for more than one specimen is below the requred average value, or the value for one specimen is below the minimum value permitted for a single specimen, a retest of three additional specimens shall be made. The value of each of these retest specimens shall equal or exceed the required average value.

Table 1: Charpy Impact Test Temperature Reduction Below MD	ЭМТ
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Thickness, in. (mm)	Temperature Reduction, ^o F (^o C)
0.394 (Full size standard bar) (10)	0 (0)
0.354 (9)	0 (0)
0.315 (8)	0 (0)
0.295 (3/4 size bar) (7.5)	5 (3)
0.276 (6)	8 (4)
0.262 (2/3 size bar) (6.7)	10 (6)
0.236 (6)	15 (8)
0.197 (1/2 size bar) (5)	20 (11)
0.158 (4)	30 (17)
0.131 (1/3 size bar) (3.3)	35 (19)
0.118 (3)	40 (22)
0.099 (1/4 size bar) (2.5)	50 (28)

GENERAL NOTE: For materials having a specified minimum tensile strength of less than 95,000 psi (655 MPa) when the subsize charpy impact width is less than 80% of the material thickness.

NOTE:

1) Straight line interpolation for intermediate values is permitted.

Impact Tests of Materials

Reports or certificates of impact tests by the material manufacturer will be acceptable evidence that the material meets the requirements of UG-84. The manufacturer of the vessel may have impact tests made to prove the suitability of a material which the material manufacturer has not impact tested provided the number of tests and the method of taking the test specimens shall be as specified for the material manufacturer.

Procedural Requirements

Impact testing of each form of material shall comply with the applicable product form procedural requirements of the specification as listed below:

Plates	
Parts UCS and UHT	SA-20, 55
Part UHA	SA-480
Pipe	SA-333
Tubes	SA-334
Forgings	SA-350
Castings	SA-352
Bolting Materials (and bars)	SA-320
Piping Fittings	SA-420

The manufacturer of small parts, either cast or forged, may certify a lot of not more than 20 duplicate parts by reporting the results of one set of impact specimens taken from one each part selected at random, provided the same specification and heat of material and the same process of production, including heat treatment, were used for all of the lot. When the part is too small to provide three specimens of at least minimum size shown in Figure 1, no impact test need be made.

For small vessels, one set of impact specimens of the material may represent all vessel from the same heat of material not in ecess of 100 vessels or one heat treatment furnace batch, whichever is smaller.

Location, Orientation, Temperature, and Values of Weld Impact Tests

All weld impact tests shall comply with the following:

- 1) Each set of weld metal impact specimens shall be taken across the weld with the notch in the weld metal. Each specimen shall be oriented such that the notch is normal to the surface of the material and one face of the specimen shall be within 3/16 in. (1.5mm) of the surface of the material.
- 2) Each set of HAZ impact specimens shall be taken across the weld and of sufficient length to locate, after etching, the notch in the HAZ. The number of HAZ impact specimen sets to be removed, and the location of their removal shall be as shown in Figure 3 and Table 2. The notch shall be cut approximately normal to the material surface in such a manner as to include as much HAZ as possible in the resulting fracture.
- 3) For welds made by solid-state welding process, such as for electric resistance welded (ERW) pipe, the weld impact tests shall consist only of one set of three specimens acorss the weld with the notch at the weld centerline. Each specimen shall be oriented so that the notch is normal to the surface of the material and one face of the specimen shall be within 1/16 in. (1.5mm) of the surface of the material. The weld impact tests are not required if the weld and the base metal have been: annealed, normalized, normalized and tempered, double normalized and tempered, or quenched and tempered.
- 4) The test temperature for weld and HAZ shall not be higher than required for the base materials.
- 5) Impact values shall be at least as high as those required for the base materials.



Figure 3: HAZ Impact Specimen Removal

Table 2: Required HAZ Impact Test Specimen Set Removal

	Removal Depth and Number of Specimen Sets		
Base Metal Thickness, t	Single Sided Weld	Two-Sided Weld	
t ≤ 3/4 in. (19mm)	1/4 t to 1/2 t (one set)	Middle 1/2 t (one set)	
3/4 in. (19mm) < t < 1½ in. (38 mm)	1/4 t to 1/2 t (one set)	1/4 t to 1/2 t (two sets)	
t ≥ 1½ in. (38 mm)	1⁄4 t to 1⁄2 t (two sets)	1⁄4 t to 1⁄2 t (two sets)	

GENERAL NOTE: Testing shall be performed on sets of three impact test specimens. Each specimen shall be full size, or the largest subsize specimen that may be removed from the available material thickness. The specimen sets shall be removed at the indicated depth from the weld surface.

Rejection

If the vessel test plate fails to meet the ipact requirements, the welds represented by the plate shall be unacceptable. Reheat treatment and retesting or retesting only are permitted.

Source: ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 – Paragraph UG 84

NEWS AND EVENTS

J. Robert Sims Named ASME President-Nominee

The ASME Nominating Committee has announced the selection of J. Robert (Bob) Sims Jr. as ASME president-nominee for 2014-2015. The Committee has also announced the nominees for seven other ASME positions, including the next three members of the Board of Governors.

Sims, a senior engineering fellow with Becht Engineering Co. Inc., is a renowned authority in risk-based technologies, high pressure equipment, mechanical integrity evaluation and Fitness-For-Service analysis, including brittle fracture analysis. Before joining Becht Engineering in 1998, he worked for more than 30 years with Exxon (now ExxonMobil), the last 10 years as a pressure equipment specialist with worldwide responsibility for standards and improving equipment integrity.

Congratulations...

2014 ASME Pressure Vessel and Piping Conference

Hyatt Regency Orange County, July 20 -24, 2014 Annaheim, California

2014 Abu Dhabi International Petroleum Exhibition & Conference

November 10-13, 2014 Abu Dhabi, UAE



BUILDING A BETTER TOMMORROW

It is becoming less practical for many companies to maintain in-house engineering staff. That is where we come in – whenever you need us, either for one-time projects, or for recurring engineering services. We understand the codes and standards for pressure vessels, and can offer a range of services related to them. Training & Development Consulting Services



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