

Table K323.3.1 Impact Testing Requirements

Test Characteristics		Column A Pipe, Tubes, and Components Made From Pipe or Tubes	Column B Other Components, Fittings, Etc.	Column C Bolts
Tests on Materials	Number of tests	As required by the material specification, or one test set per lot [see Note (1)], whichever is greater, except as permitted by Note (2) .		
	Location and orientation of specimens [see Note (3)]	(a) Transverse to the longitudinal axis, with notch parallel to axis. [See Note (4) .] (b) Where component size and/or shape does not permit specimens as specified in (a) above, paras. K323.3.3(b) , (c) , and (d) apply as needed.	(a) Transverse to the direction of maximum elongation during rolling or to direction of major working during forging. Notch shall be oriented parallel to direction of maximum elongation or major working. (b) If there is no single identifiable axis, e.g., for castings or triaxial forgings, specimens shall either meet the longitudinal values of Table K323.3.5 , or three sets of orthogonal specimens shall be prepared, and the lowest impact values obtained from any set shall meet the transverse values of Table K323.3.5 . (c) Where component size and/or shape does not permit specimens as specified in (a) or (b) above, paras. K323.3.3(c) and (d) apply as needed.	(a) Bolts ≤ 52 mm (2 in.) nominal size made in accordance with ASTM A320 shall meet the impact requirements of that specification. (b) For all other bolts, longitudinal specimens shall be taken. The impact values obtained shall meet the transverse values of Table K323.3.5 .
Tests on Welds in Fabrication or Assembly	Test pieces [see Note (5)]	Test pieces for preparation of impact specimens shall be made for each welding procedure, type of electrode, or filler metal (i.e., AWS E-XXXX classification) and each flux to be used. All test pieces shall be subject to heat treatment, including cooling rates and aggregate time at temperature or temperatures, essentially the same as the heat treatment which the finished component will have received.		
	Number of test pieces [see Note (6)]	(1) One test piece with a thickness T for each range of material thicknesses which can vary from $\frac{1}{2}T$ to $T + 6$ mm ($\frac{1}{4}$ in.). (2) Unless otherwise specified in this Chapter [see Note (4)] or the engineering design, test pieces need not be made from individual material lots, or from material for each job, provided welds in other certified material of the same thickness ranges and to the same specification (type and grade, not heat or lot) have been tested as required and the records of those tests are made available.		
	Location and orientation of specimens	(1) Weld metal impact specimens shall be taken across the weld with the notch in the weld metal. Each specimen shall be oriented so that the notch axis is normal to the surface of the material and one face of the specimen shall be within 1.5 mm ($\frac{1}{16}$ in.) of the surface of the material. (2) Heat-affected zone impact specimens shall be taken across the weld and have sufficient length to locate the notch in the heat-affected zone, after etching. The notch shall be cut approximately normal to the material surface in such a manner as to include as much heat-affected zone material as possible in the resulting fracture. (3) The impact values obtained from both the weld metal and heat-affected zone specimens shall be compared to the transverse values in Table K323.3.5 for the determination of acceptance criteria.		

NOTES:

- (1) A lot shall consist of pipe or components of the same nominal size, made from the same heat of material, and heat treated together. If a continuous type furnace is used, pipe or components may be considered to have been heat treated together if they are processed during a single continuous time period at the same furnace conditions.
- (2) Impact tests are not required when the maximum obtainable longitudinal Charpy specimen has a width along the notch less than 2.5 mm (0.098 in.). See [para. K323.2.2\(c\)](#).
- (3) Impact tests shall be performed on a representative sample of material after completion of all heat treatment and forming operations involving plastic deformation, except that cold bends made in accordance with [para. K304.2.1](#) need not be tested after bending.
- (4) For longitudinally welded pipe, specimens shall be taken from the base metal, weld metal, and the heat-affected zone.
- (5) For welds in the fabrication or assembly of piping or components, including repair welds.
- (6) The test piece shall be large enough to permit preparing the number of specimens required by [para. K323.3](#). If this is not possible, additional test pieces shall be prepared.