The welding procedure and the welders have been qualified in accordance with NB-4321.

The material is identified and is compatible with the material to which it is attached.

The welding material is identified and compatible with the materials joined.

The welds are postweld heat treated when required by NB-4620.

(b) Removal of nonstructural temporary attachments shall be accomplished as follows.

(1) The immediate area around the temporary attachment is marked in a suitable manner so that after removal the area can be identified until after it has been examined in accordance with (3) below.

(2) The temporary attachment is completely removed in accordance with the procedures of NB-4211.

(3) After the temporary attachment has been removed, the marked area is examined by the liquid penetrant or magnetic particle method in accordance with the requirements of NB-5110, and meets the acceptance standards of NB-5340 or NB-5350, whichever is applicable.

(4) As an alternative to (a)(4), postweld heat treatment may be deferred until after removal of the attachment.

GENERAL NOTE: See NB-3661.2 for limitation on socket weld pipe size.

NOTES:

(1) The size of an equal leg fillet is the leg length of the largest inscribed right isosceles triangle. Theoretical throat = 0.7 \times \text{size of weld}.

(2) The size of an unequal leg fillet weld is the shorter leg length of the largest right triangle that can be inscribed within the fillet weld cross section.

(3) \(x_{\text{min.}} = 1.4 t_n\) or the thickness of the hub, whichever is smaller, but not less than \(3/8\) in. (3 mm), where \(t_n\) = nominal pipe wall thickness

(4) \(C_x\) \min. = 1.09 \(t_n\) where \(t_n\) = nominal pipe wall thickness

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**Figure NB-4427-1**

Fillet and Socket Weld Details and Dimensions

(a) Equal Leg Fillet Weld [Note (1)]

(b) Unequal Leg Fillet Weld [Note (2)]

(c) Socket Welding Flange [Note (3)]

(d) Socket Welding Fittings [Note (4)]
ceed 2 in. (51 mm) in length. In making socket welds, a gap as shown in Fig. NB-4427-1 shall be provided prior to welding. The gap need not be present nor be verified after welding. For sleeve type joints without internal shoulder, the gap shall be between the butting ends of the pipe or tube.

(b) Socket welds smaller than those specified in Fig. NB-4427-1 may be used provided the requirements of NB-3000 are met.

NB-4428 Seal Welds of Threaded Joints

Where seal welding of threaded pipe joints is performed, the exposed threads shall be either removed entirely or covered with weld metal.

NB-4429 Welding of Clad Parts

The joint types and welding procedures used for cladding shall be such as to prevent the formation of brittle weld composition.

NB-4430 WELDING OF ATTACHMENTS

NB-4431 Materials for Attachments

Nonpressure-retaining attachments (NB-1132.1) welded to pressure-retaining components shall be of materials which meet the requirements of NB-2190. Materials for pressure-retaining attachments shall meet the requirements of NB-2120.

NB-4432 Welding of Structural Attachments

The rules of NB-4321 governing welding qualifications shall apply to the welding of structural attachments to pressure-retaining material.

NB-4433 Structural Attachments

Structural attachments shall conform reasonably to the curvature of the surface to which they are to be attached and shall be attached by full penetration, fillet, or partial penetration continuous welds. When fillet and partial penetration welds are used on components, the requirements of NB-3123.2 shall be met. Attachments to the internal surfaces of reactor vessels shall be made only with full penetration welds. Figure NB-4433-1 illustrates some of the typical details for attaching structural attachments to a component using full penetration welds. Valve seats may be attached to the pressure boundary part by fillet or partial penetration welds provided the valve seat is shouldered against the pressure boundary part.

NB-4434 Welding of Internal Structural Supports to Clad Components

Internal structural supports on clad components shall be welded to the base metal and not to the cladding, except for weld overlay cladding.

NB-4435 Welding of Nonstructural and Temporary Attachments and Their Removal

(a) Nonstructural attachments (NB-1132.1) welded to the pressure-retaining portion of the component need not comply with NB-2000 and may be welded with continuous or intermittent fillet or partial penetration welds, provided the requirements of (1) through (4) below are met.

(1) The welding procedure and the welders have been qualified in accordance with NB-4321.

(2) The material is identified and is compatible with the material to which it is attached.

(3) The welding material is identified and compatible with the materials joined.

(4) The welds are postweld heat treated when required by NB-4620.

(b) Removal of nonstructural attachments, when temporary, shall be accomplished as follows.

(1) The immediate area around the temporary attachment is marked in a suitable manner so that after removal the area can be identified until after it has been examined in accordance with (3) below.

(2) The temporary attachment is completely removed in accordance with the procedures of NB-4211.

(3) After the temporary attachment has been removed, the marked area is examined by the liquid penetrant or magnetic particle method in accordance with the requirements of NB-5110, and meets the acceptance standards of NB-5340 or NB-5350, whichever is applicable.

(4) As an alternative to (a)(4) above, postweld heat treatment may be deferred until after removal of the attachment.
Fig. NB-4427-1

(a) Equal Leg Fillet Weld

(b) Unequal Leg Fillet Weld

(c) Minimum Welding Dimensions for Socket Welding Flanges

(d) Minimum Welding Dimensions for Socket Welding Fittings

FIG. NB-4427-1 FILLET AND SOCKET WELD DETAILS AND DIMENSIONS
(See NB-3661.2 for Limitation on Socket Weld Pipe Size.)
Figure NC-4427-1
Fillet and Socket Weld Details and Dimensions

(a) Equal Leg Fillet Weld [Note (1)]

(b) Unequal Leg Fillet Weld [Note (2)]

(c-1) Slip-On Flange [Note (3)]

(c-2) Socket Welding Flange [Note (3)]

(c-3) Socket Welding Fittings [Note (4)]

NOTES:
(1) The size of an equal leg fillet weld is the leg length of the largest inscribed right isosceles triangle. Theoretical throat = 0.7 × size of weld.
(2) The size of an unequal leg fillet weld is the shorter leg length of the largest right triangle that can be inscribed within the fillet weld cross section.
(3) \( x, \) min. = \( 1.4t_n \) or the thickness of the hub, whichever is smaller, but not less than \( \frac{1}{8} \) in. (3 mm), where \( t_n \) = nominal pipe wall thickness.
(4) \( C_x \), min. = \( 1.09t_n \) where \( t_n \) = nominal pipe wall thickness.
NOTES:
(1) The size of an equal leg fillet is the leg length of the largest inscribed right isosceles triangle. Theoretical throat = 0.7 × size of weld.
(2) The size of an unequal leg fillet weld is the shorter leg length of the largest right triangle that can be inscribed within the fillet weld cross section.
(3) \( x_{\text{min}} = 1.4t_n \) or the thickness of the hub, whichever is smaller, but not less than \( \frac{1}{8} \) in. (3 mm), where \( t_n = \) nominal pipe wall thickness
(4) \( C_v \) min. = \( 1.09t_n \) where \( t_n = \) nominal pipe wall thickness
Figure NE-4427-1
Fillet and Socket Weld Details and Dimensions

(a) Equal Leg Fillet Weld [Note (1)]

(b) Unequal Leg Fillet Weld [Note (2)]

(c-1) Slip On Flange [Note (3)]

(c-2) Socket Welding Flange [Note (3)]

(c-3) Socket Welding Fittings [Note (4)]

NOTES:
(1) The size of an equal leg fillet is the leg length of the largest inscribed right isosceles triangle. Theoretical throat = 0.7 × size of weld.
(2) The size of an unequal leg fillet weld is the shorter leg length of the largest right triangle that can be inscribed within the fillet weld cross section.
(3) \( x_{\text{min}} = 1.4t_n \) or the thickness of the hub, whichever is smaller, but not less than \( \frac{1}{8} \) in. (3 mm), where \( t_n \) = nominal pipe wall thickness.
(4) \( C_x_{\text{min}} = 1.09t_n \) where \( t_n \) = nominal pipe wall thickness.