Information Bulletin No. IB26-008 **November 16, 2026**

INTERPRETATION
Interpretation of Code Requirements in Paragraph UG-84 Relative to the Determination of the Number of Vessel (Production) Impact Test Coupons Required

This information bulletin replaces IB21-020, which has been withdrawn.

1.0 Introduction

When production impact testing is required for a pressure vessel that is to be fabricated in accordance with the rules of ASME Section VIII, Division 1, it is necessary to determine how many vessel (production) test coupons will be required to ensure the proper representation of production welding used in the fabrication of the vessel. The test coupons welding is meant to represent the quality and type of welding that is used in the production welding. Within the Code the "type" of welding means automatic, semi-automatic, or manual welding. The most accurate means of ensuring the test coupon weld represents the production weld is by welding the test coupon in an identical manner to the production weld, hence the use of an "extension of the production weld", or as is commonly known to industry a "run-off tab".

The minimum Code requirement is for one test coupon for each Welding Procedure Specification used for joints of Category A and B, and in the case of a vessel having a longitudinal seam in a cylindrical shell, this coupon must be prepared as an extension to the end of the first longitudinal seam. In addition, if the type of welding used to produce the head-to-shell joint is not the same as that used for the longitudinal seam, then additional production test coupons are required to represent the [1]type of welding used to produce the additional joint(s).

[1] *Type of welding as defined above can invoke additional production test coupons as well as the change of weld process.* In addition, UG-84.8(d)(1) explains that; *if more than one set of essential or supplementary essential variables for a process is recorded on a PQR (e.g., different filler metal F-numbers), the requirements for multiprocess testing [UG-84.8 (d)(2)] shall apply for each set of essential or supplementary essential variables as if that set of variables defined a separate welding process.*

2.0 Background

With respect to the number of vessel (production) test coupons required by the Code paragraphs UG-84.9(a) & (b), there may be some variation amongst Manufacturers and ABSA Authorized Inspectors in the understanding of the combined requirements of these two Code paragraphs.

The key language, extracted from the respective paragraphs, reads as follows:

From UG-84.9(b)(1)*"For Category A joints, where practicable, the test coupon shall be welded as an extension to the end of a production joint so that the test plate weldment will represent the quality and type of welding in the vessel joint."*

From UG-84.9(d)
"(1) For each vessel, one test coupon shall be made for each welding procedure used for Category A and B joints, unless the vessel is one of several as defined in (3) or (4)".

(2) For Category A and B joints the following requirements shall apply:
(-a) If automatic, machine or semi-automatic welding is performed, a test coupon shall be made in each position employed in the vessel welding.

(-b) If manual welding is employed, a manually welded test coupon shall be made in the flat position,

(-c) If welding is to be performed in other positions a test coupon shall be made in the vertical position only

(-c)(-1)(the major layers of welds shall be deposited in the vertical uphill progression). "The vertically welded test plate will qualify the manual welding in all positions."

The issue or possible misunderstanding of Code requirements stems from the fact that many Manufacturers are using a single welding procedure specification (WPS) that includes multiple processes (*e.g.*, GMAW, SMAW, & SAW) and types of welding (*e.g.*, automatic, machine, semi-automatic and manual) to weld all Category A and B joints in any given vessel. Additionally, in some instances these Manufacturers may elect to weld Category A and B joints with different processes or combinations of processes using a multiple-process WPS.

Because of differences in the types of welding used (*i.e.*, automatic, machine, semi-automatic, manual) for Category B joints as compared to the Category A joints, it may not be possible to meet the requirements of UG-84.9(d)(2)(-a) and UG-84.9(d)(2)(-b) with respect to the Category B weld joints using the Category A weld joint run-off-tab test coupon, prepared as required by UG-84.9(a).

In an attempt, therefore, to meet all of the requirements with only one test coupon, and thus save on the cost of additional mechanical testing, some Manufacturers have proposed to prepare a test coupon, which is attached to the first longitudinal seam to be welded, with all of the types of welding that will be used in production, as required by UG-84.9(d)(2)(-a) and UG-84.9(d)(2)(-b). This test coupon could conceivably represent the quality and type of welding in the vessel Category A joint(s). The thinking appears to be that, provided the welding type used in the Category A joint is present including the specific weld process associated with each type of welding, the vessel impact test coupon, would satisfy UG-84.9(a) & (b). Interpretation VIII-1-21-12 supports this approach. A test coupon completed with the first production longitudinal seam that includes two or three types of welding could represent additional Category A joints made

with a single type of welding. The run-off tab (test plate) shall be welded as an extension to the end of the production joint so the test coupon will represent as nearly as practicable the quality and type of welding in the vessel joint to meet Code requirements. A test coupon welded with the first longitudinal seam that is a composite of all types of welding that exist in the remaining Category A and Category B joints is allowed based on the interpretation.

To promote uniformity of application of the above Code requirements in Alberta, this document describes the interpretation of the Code rules that shall be enforced during ABSA shop inspections.

3.0 Interpretation

The decision process illustrated in Figure 1 of this interpretation shall be applied for ABSA shop inspections.

This decision diagram indicates that unless it is impracticable to do so, a vessel production test coupon will be required to be prepared in order to represent the quality and type of welding in the vessels' initial Category A weld joint(s). It may be possible that under some circumstances, when the type of welding would be different and therefore not meet the requirements of UG-84.9(d)(2)(-a) and UG-84.9(d)(2)(-b), that more than one test plate could be required to adequately represent the types of welding used in all of the vessel Category A weld joints. After this Code requirement relative to Category A weld joints has been met, it will then be necessary to determine if the remainder of the Code requirements related to the type of welding used in all Category A and B joints are satisfied. If all Code requirements cannot be met with the Category A weld joint test plate(s), then additional test coupons shall be prepared as required by the Code paragraphs for the Category B joints and any remaining Category A joints.

Examples of the Application of the Interpretation:

Given: A simple vessel that requires production impact testing, having a cylindrical shell and semi-ellipsoidal heads. The selected welding procedure is qualified for GMAW, SMAW and SAW.

1. The longitudinal joint and all the circumferential joints will be made using a GMAW root, followed by 3 passes of SMAW with the remainder of the weld completed by SAW.

   Under these circumstances one test coupon welded as an extension to the longitudinal joint may be used to represent all welding on the vessel.

2. The longitudinal joint will be made using SAW only. The circumferential joints will be made using a GMAW root (flat position), followed by 3 passes of SMAW (flat position) with the remainder of the weld completed by SAW.

   Under these circumstances one test coupon welded as an extension to the longitudinal joint is required to represent the type of welding within the

longitudinal joint. An additional test coupon is required to represent the types of welding in the circumferential joints.

3. The first longitudinal joint will be made using a GMAW root, followed by 3 passes of SMAW with the remainder of the weld completed by SAW. The remaining longitudinal joints will be made using SAW only. The circumferential joints will be made using a GMAW root (flat position), followed by 3 passes of SMAW (flat position) with the remainder of the weld completed by SAW.

   Under these circumstances the test coupon welded as an extension to the first longitudinal joint could be used to represent the type of welding within the remaining longitudinal and circumferential joints.

   Manufacturers are cautioned to ensure that when a test coupon contains more than one welding process the following from UG-84.8(d)(2) shall apply;

   (-a) The test specimens shall be full-size or the largest obtainable subsize test specimen based on the thickness of the test coupon.

   (-b) The weld metal test specimens shall contain as much of the weld metal from each process as practical.

   (-c) When the test coupon contains more than two welding processes, additional weld metal impact test specimens shall be removed from the thickness depth where each process is located.

   (-d) HAZ test specimens shall be removed from the thickness depth associated with deposited weld metal from each process and may contain HAZ material from more than one welding process.

   (-e) When test specimens contain weld metal or HAZs from more than one welding process, the test results shall apply to all the welding processes contained in the specimens.

   (-f) Procedure qualifications completed using sub size test specimens tested in accordance with the 2017 Code Edition or later Editions remain acceptable.

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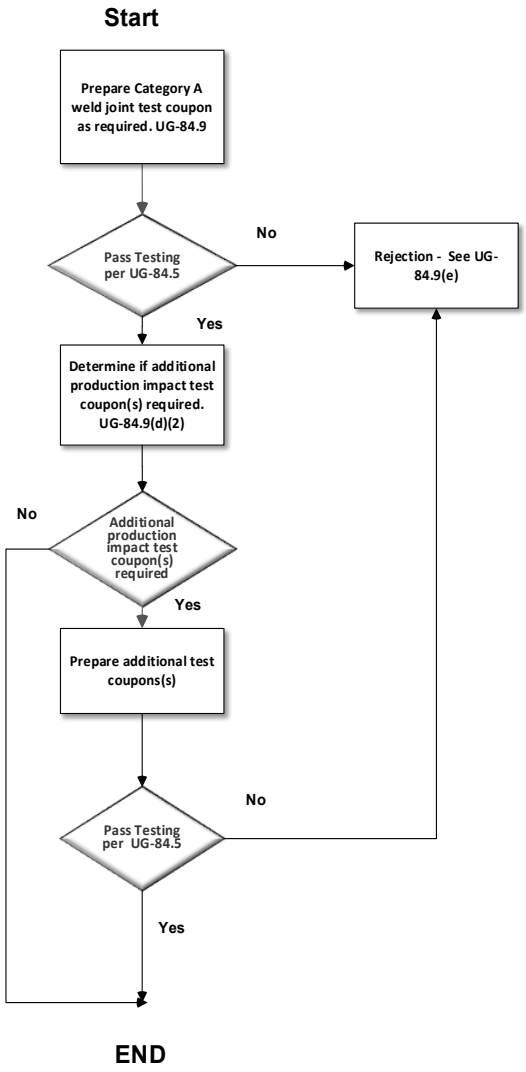
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Figure 1

ASME Section VIII, Division 1, Paragraph UG-84.9 (Production) Impact Test Plates

Example 1

a) Vessel contains both category A and category B weld joints.
b) Category A and B joints are welded using the same multi process (GMAW-SMAW-SAW) WPS.
c) The vessel is not one of several per UG-84.9 [(d)(3) or (4)]



UG-84.9(a)(1). For category A joints the production test coupon shall where practicable, be welded as an extension to the end of a production joint so that the production test coupon will represent as nearly as practicable the quality and type of welding in the vessel joint.

Note: This requires all weld processes that will be used in the Category A joint to be included in the production test coupon.

UG-84.9(e)Test Failure. If the production impact test coupoon fails to meet the impact testing requirements, the welds represented by the test specimen shall be unacceptable. Reheat treatment and retesting or retesting only are permitted.

UG-84.9(d)
In addition, Category A and B joints the following requirements shall, apply:
(2)(-a) If automatic, machine, or semiautomatic welding is performed, a test coupon shall be made in each position employed in the vessel welding.
(2)(-b) If manual welding is employed, a manually welded test coupon shall be made in the flat position.
(2)(-c) If welding is to be performed in other positions, a test coupon shall be made in the vertical position.
(2)(-c)(-1) The major layers of welds shall be deposited using vertical uphill progression.
(2)(-c)(-2) An acceptable coupon qualifies.

Note:
A long seam with an attached production test coupon is welded using only the SAW weld process. The circumferential seams are to be welded using a semiautomatic (GMAW) and manual welding (SMAW) process. By adding additional weld processes as per UG-84.9(d) above, this would require an additional test coupon to represent the addition of other weld processes. It would be acceptable to add these additional weld processes to the initial long seam with the attached production test coupon to cover the manual and semi-automatic processes that will be used in any additional longitudinal and circumferential seam provided the impact test coupon follows the requirements of UG-84.8(d). A production impact test coupon welded with a WPS qualified with multiple weld processes, can be used to qualify other weld joints that have omitted one or more of the weld processes. This is supported by interpretation BPV VIII-1-21-12.