

## ANHYDROUS AMMONIA

**Pipe Welding and Welder Qualifications****Welding and Welder Qualifications Required**

Minnesota Rules, Part 1513.0160, Subpart 3, states that welding of anhydrous ammonia piping must be done by a welder qualified in accordance with ASME Code, Section IX, "Welding Qualifications." ASME Code, Section IX, Part QW-103.1, states that "Each manufacturer or contractor is responsible for the welding done by their organization and shall conduct the tests required in this Section to QUALIFY the welding procedures used in the construction of the weldments built under this Code, and the performance of welders and welding operators who apply these procedures." The following three steps applies to meeting the welding and welder qualification requirements.

**Developing Welding Procedures – WPS**

ASME Code, Section IX, Part QW-200.1, states that "Each manufacturer and contractor shall prepare written Welding Procedure Specifications." The Welding Procedure Specifications (WPS or ASME form QW-482) is a written document that provides direction to welder or welding operator for making production welds to Code requirements. Within a WPS are welding specifications or variables which provide detailed directions to assure the repeatability of production welds by a qualified welder or welding operator.

The WPS may be developed and qualified by the contractor, manufacturer, welding consultant or authorized testing agency. Alternatively a pre-qualified WPS may be obtained through the American Welding Society.

**Qualifying the WPS – PQR**

Each newly developed WPS must be qualified to demonstrate that welds made by a specific welding procedure meets Code requirements. The document used to qualify a WPS is the Procedure Qualification Record (PQR or ASME form QW-483). The PQR is a record of the WPS essential variables for the welding of a test specimen or coupon. The PQR also serves to record the test results performed on the welded specimen (coupon). The test weld on the coupon is prepared as specified in ASME Code, Section IX. The testing requirements outlined in Section IX are quite complex. For this reason, a contractor or manufacturer will likely require the services of an authorized testing agency to provide ASME Code information, perform the required tests on the coupon, and assist in compiling the PQR and other applicable documents.

**Qualifying Welders and Welding Operators**

As mentioned in the previous section, the coupon is tested to qualify the weld procedure, normally by an authorized testing agency. The welder (welder or welding operator) who successfully performs the weldment on this coupon will be considered qualified in the positions recorded on the PQR. The Welder Performance Qualification (WPQ or ASME form QW-484) is a record of the welders successfully weldment.

Each welders must qualify for each weld procedure (WPS) used. Upon successful weldment on a coupon, a separate WPQ is compiled for each welder.

The weldment testing requirements for WPQ as outlined in ASME Code, Section IX, are less stringent than those required for procedure qualification (PQR). For this reason, either an authorized testing agency or contractor/manufacturer may perform the required tests upon the coupons. However, contractors or manufacturers not thoroughly familiar with Section IX may be best served by obtaining the services of a welding consultant or authorized testing agency to assist in meeting the WPQ requirement.

**Summary**

In order to comply with Minnesota Rules, Part 1513.0160, a welding contractor or manufacturer must:

- Develop a weld procedure specification, compiled on a WPS/ASME Form QW-482;
- Qualify the WPS by welding a coupon and having the coupon tested per ASME Code, Section IX, at an authorized testing agency;
- Record successful weld test results on the PQR/ASME Form QW-483 to qualify the WPS;
- Qualify each welder for each qualified WPS by welding a coupon that successfully passes the testing requirements outlined in ASME Code, Section IX. Record the successfully results of the welder performance test on the WPQ/ASME Form QW-484;
- Maintain current QW-482s, QW-483s and QW-484s for inspection.
- Maintain a continuity record for each welder and for each weld procedure used for a period not exceeding 6 months; and
- Maintain these records and welding documentation for inspection.

**Want more information or have questions:**

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