

Workmanship and Quality Standard

APPENDIX WQS-300-1

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AWS D17.1 EXCEPTIONS & CLARIFICATIONS, PACAERO-WENATCHEE

The exceptions noted in the blue font shown below are to be clearly defined and considered part of our terms and conditions (T&C's) of our quote and P.O. acceptance letters. Business development shall include language that states such and provide an internet link to these requirements available through the PacAero-Wenatchee website. Any revisions made herein, business development must be notified to ensure our linked website information is revised and reconciled with these statements accordingly.

PacAero-Wenatchee has provided our customer partners with reliable and hermetic groove, fillet, and seam laser welded joints since the early '90's. Our welding systems, from design through production and final inspection, comply with AWS D17.1M Class C requirements as standard, with the following exceptions and clarifications. If you have any questions, please contact your PacAero-Wenatchee representative for more information.

A1.1. D17.1M § 4.3.2 – Groove Weld Penetration

Note: Ref. WQS-300-1, A1.4.

- a. Incomplete joint penetration (IJP) welds are normal to PacAero-Wenatchee (Ref. Figure 8). Therefore, customers must define on their DWG minimum penetration (or min-max range) per weld joint.

A1.2. “T” and Dissimilar Material Stacks (Bonded Material)

Note: This exception/clarification was submitted to AWS for official interpretation 04/08/25, initially reviewed and received unofficial interpretation agreement 04/15/25. This was placed in queue for official interpretation / TAC review, and potential inclusion into D17.1 revision “N” if officially approved.

- a. Where bonded material makes up a portion of T, T will become the LMC thickness of the material within the bonded stack to be welded.
- b. If more than one joint component is of bonded material, T shall become the LMC thickness of the thinnest material within the bonded joint to be welded.
- c. Maximum penetration in a bonded joint shall never exceed 0.8 T.

A1.3. D17.1M § 4.3.4 – General Drawing Essential Information

- a. DWG essential information will be required to be defined on the DWG provided with PO before the PO will be accepted.

A1.4. D17.1M § 5.4 & 5.4.6.5. – Performance Qualification & Special Applications

Note: Ref. WQS-300-1, A1.1. Due to D17.1M not providing for IJP welding normal to PacAero-Wenatchee, our operator qualification program is as follows:

- a. Operator qualification samples shall be full (T) penetration welds that pass WQS300 & D17.1 Class A requirements, per sample form and thickness (Ref. Table 5.5), per metal group (Ref. Table 5.6), per PacAero-Wenatchee SP-41070, MTH-5 machines.
- b. Qualified operators may produce any IJP depth within the qualified metal group and penetration range defined by Table 5.5.

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A1.5. D17.1M § 5.4.7 – Inspection and Examination Requirements

- a. Unless specifically required (defined) on customer DWG (Ref A1.3), PacAero-Wenatchee substitutes hermetic leak testing to $\leq 1 \times 10^{-9}$ ccs He @1 ATM differential pressure for penetrant testing.

A1.6. D17.1M Table 7.1 – Acceptance Criteria

- a. Arc Strikes/Gouge Marks are not applicable to LBW.
- b. Maximum Weld Reinforcement, T-Joint Penetration, and Double Side Welding approaches are not available at PacAero-Wenatchee.

A1.7. D17.1M Table 5.3, § 7.3 & Annex B – Test Methods including NDT (Non-Destruct Testing)

- a. Penetrant, Radiographic, Tension, Bend, Fracture Toughness, Ultrasonic Testing, Magnetic Particle Examination, and Chemical Analysis are not capabilities available within PacAero-Wenatchee.
- b. Testing outside of PacAero-Wenatchee capabilities will be conducted by an accredited lab of PacAero-Wenatchee or customers choice.
- c. Customer must clearly define specific testing required, inspection class, specimen type, frequency of testing (first article only, monthly, per machine setup, etc.), quantity, and any other requirements critical to need.

Example: Metallographic per Class A, production unit, first article only per WPS revision (PQR).

APPENDIX WQS-300-C

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