

AWS D1.1 Certification in the 2G Position, Unlimited Thickness Requirements

To earn an AWS D1.1 certification for unlimited thickness in the **2G (horizontal)** plate position, you must pass a physical weld test evaluated by a Certified Welding Inspector (CWI). The test verifies your ability to produce sound welds according to a specific Welding Procedure Specification (WPS).

Key Certification Requirements

- **The Test:** You must deposit a sound weld on a steel plate groove test (usually a beveled butt joint with backing) in the 2G position. For unlimited thickness, the test plate thickness is typically between $\frac{3}{8}$ and 1 inch.
- **The Process:** You must qualify with your specific welding process (e.g., SMAW, GMAW, FCAW, or GTAW). If you change the process, shielding gas, or electrode type, a new test is required.
- **Testing Facilities:** You must schedule your test at an **AWS Accredited Testing Facility (ATF)**.
- **Evaluation:** The weld coupon will undergo either **Visual Inspection** and **Bend Tests** (or Radiographic/Ultrasonic Testing) to check for cracks, incomplete penetration, and excessive porosity.
- **Validity and Limits:** Passing in the 2G position qualifies you for flat and horizontal positions on plate and structural tubular connections.

AWS D1.1 (Unlimited Thickness) Certification: Requirements

AWS D1.1, *Structural Welding Code — Steel*, is the American Welding Society's primary code governing structural steel welding in the United States. "Unlimited thickness" is not a separate certificate — it is the qualification range a welder earns by passing a performance test on a **1-inch (25 mm) thick test plate**, per AWS D1.1 Table 4.11 / Table 6.2. Key requirements, confirmed against AWS code text and industry qualification guides (Welding Answers, Quality Inspection Forms, AWS technical forum):

- **Test coupon thickness governs qualification range.** Testing on plate ≥ 1 in. (25 mm) qualifies the welder for **1/8 in. minimum to unlimited maximum** thickness in production. Testing on thinner plate only qualifies up to roughly 2× the tested thickness (e.g., a 3/8 in. test plate qualifies only up to 3/4 in. production thickness) — so "unlimited thickness" specifically requires the 1-inch plate test.
- **Position tested (2G = horizontal) determines position qualified.** A 2G groove-weld test on the 1-inch plate qualifies the welder for **flat (1G) and horizontal (2G)** production positions on both plate and structural tubular connections — but not vertical (3G) or overhead (4G), which require separate tests.
- **Process-specific.** The qualification is tied to the exact welding process used in the test (SMAW, GMAW, FCAW, or GTAW). Changing process, shielding gas, or electrode classification outside the range covered by the original Welding Procedure Specification (WPS) requires re-qualification (AWS D1.1 Table 6.12 / Table 4.12, "Qualification Variables").
- **Testing venue and oversight.** The test must be performed under a qualified Welding Procedure Specification and evaluated by a **Certified Welding Inspector (CWI)**, typically at an **AWS-Accredited Testing Facility (ATF)** or under equivalent third-party/employer-witnessed oversight.
- **Pass/fail criteria.** Every test weld undergoes **visual inspection** (no cracks, adequate weld reinforcement/undercut limits) plus either:
 - **Guided bend tests** (face, root, and/or side bends, per AWS D1.1 Clause 4/6 Table 4.11), which must show no discontinuities exceeding defined length limits, **or**
 - **Radiographic (RT) or ultrasonic (UT) testing** in lieu of bend tests, checking for cracks, incomplete fusion/penetration, and porosity per AWS D1.1 Clause 8 acceptance criteria.
- **Any full-penetration (CJP) qualification on unlimited thickness also automatically qualifies the welder for fillet welds of any size on any material thickness** (AWS D1.1 Table 4.11, Note d) — a practical bonus that makes the unlimited-thickness 2G ticket broadly useful on a fab floor.

Why Valmont and Sabre specifically need this certification

Both companies fabricate heavy steel structures where individual weld joints routinely exceed the standard 3/4-inch thickness range covered by lower-tier certifications, making the unlimited-thickness qualification a practical necessity rather than a nice-to-have:

- **Valmont Industries** — the world's largest maker of steel/concrete power transmission poles and towers ([Valmont Utility](#)), spanning 69 kV to 765 kV structures, plus distribution poles, substation structures, highway lighting/high-mast poles, and (in select regions) wind turbine masts. Base-plate-to-shaft welds on tall transmission poles and heavy substation members are thick-wall, full-penetration joints that require unlimited-thickness qualification.
- **Sabre Industries** — designs and manufactures tubular steel transmission/distribution structures up to **765 kV**, substation structures, and telecom infrastructure (self-supporting towers, monopoles, guyed structures) for the wireless/cell-tower industry ([Sabre Industries](#)). Monopole base plates and heavy guyed-tower components are analogous thick-section, code-critical welds.

More broadly, unlimited-thickness AWS D1.1 certification is standard in **structural steel fabrication for bridges, high-rise buildings, heavy equipment, wind-energy towers, and any application where plate sections regularly exceed roughly 3/4 inch** — any employer building code-governed structural steel connections at that thickness will require it of its welders.

Industries that heavily rely on large steel units of 1 inch thickness or greater include:

- **Construction:**
 - **Bridges and Infrastructure:** Thick steel plates are crucial for bridge construction, providing the strength and durability needed to withstand heavy loads and harsh environmental conditions. They are used for foundational support, bridge decks, and other structural components.
 - **Buildings and Structures:** Steel plates are used to create the fundamental structures for floors, roofs, and walls in buildings and warehouses. [According to California Steel Services](#), they are also used in building frameworks, especially in high-rise construction, for their strength and stability.
 - **Roadwork:** Skid-resistant steel road plates are used as temporary fixes over holes and compromised areas during road repair and construction, allowing traffic to continue uninterrupted.
- **Heavy Machinery Fabrication:**
 - Thick steel plates are essential for constructing heavy machinery such as excavators, cranes, mining equipment, and agricultural machinery like harvesters, plows, and tillers.
 - Their durability and strength make them ideal for load-bearing components, ensuring the longevity and efficient operation of these machines.
 - Wear plates, often made of abrasion-resistant steel, are particularly useful in mining equipment like crushers, conveyor systems, and truck beds, to extend the lifespan of these components subjected to constant wear and tear.
- **Shipbuilding and Offshore Structures:**
 - Thick steel plates are widely used in shipbuilding and offshore structures like oil rigs and platforms due to their strength, durability, and resistance to harsh marine environments.

- They are a key component in ship hulls, notes SteelPRO Group, and other critical components of offshore platforms, including foundations, legs, and decks.
- **Energy Industry:**
 - **Oil and Gas:** Thick steel plates are used in oil and gas pipelines to maximize strength, ensure longevity, and prevent corrosion. They are also used for pressure vessels like gas tanks and boilers that need to withstand extreme temperatures and pressures.
 - **Wind and Solar Towers:** Steel plates are commonly used in the construction of towers for wind turbines and solar energy systems.
- **Military and Defense:**
 - Steel plates produced to military specifications are used in armored vehicles like tanks, personnel carriers, ships, and other military buildings and equipment for protection and fortification.

In essence, any industry requiring robust, durable, and reliable materials for heavy loads, structural integrity, or protection against harsh environments will likely utilize large steel units with a thickness of 1 inch or greater. These industries include construction, heavy machinery manufacturing, shipbuilding, offshore oil and gas, energy production (wind and solar), and defense.