NGM PHOTONICS

The Future of Welding.
Delivered with Laser Precision.

Laser Welding Solutions for Vessels & Tanks

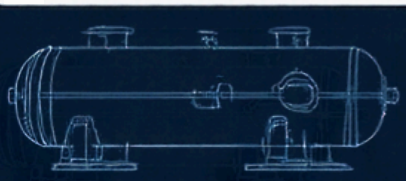
Pressure Equipment & Tank Manufacturing Partner



NGM Photonics partners with tank fabricators, heat exchanger manufacturers, and pressure vessel shops to reduce thermal distortion, reduce cycle times, and optimize fabrication costs. Operating from our Calgary headquarters and Edmonton fabrication facility and backed by an active research partnership with the University of Alberta's Canadian Centre for Welding and Joining (CCWJ), we deliver specialized **Handheld Laser Beam Welding (HLBW)** manufacturing and repair capabilities. Our deep-penetration keyhole laser technology replaces traditional multi- pass arc welds on shell seams, nozzle attachments, cooling panels, and tube-to-tubesheet welds with near-zero heat distortion and exceptional metallurgical integrity.

Metallurgical & Mechanical Proof

- **Exceptional Low-Temp Impact Toughness:** Demonstrated Charpy V-Notch (CVN) of **126 J at -45°C** (exceeding ASME VIII Div. 1 by >4x).
- **Superior Weld Strength:** Achieves **118 ksi (814 MPa) UTS** on structural plate without PWHT or alloy degradation.
- **Reduced HAZ Softening:** Rapid thermal cycle with minimal heat input removes coarse-grained heat-affected zone and improves mechanical properties.
- **In-Situ Mobile Repair:** Fully equipped mobile trucks for drained tank leak remediation, localized crack repair, and tank surface cleaning.



Primary Vessel & Tank Applications

Transformer Tank Seams & Reservoirs

Leak-tight shell seam welding, corner joints, and localized low heat input repairs on thin-walled steel utility reservoirs while preventing nearby coating damage.

Tube-to-Tubesheet Welding

Deep, localized keyhole penetration for strength and seal welds in heat exchangers, condensers, boilers, and process chillers.

Attachments & External Brackets

Precision welding of cooling panels, stiffeners,, and cable-box interfaces preserving shell dimensional fit-up.

Quantifiable Fabrication Impact

55-60%
DIRECT COST SAVINGS

70%
CYCLE TIME CUT

60-80%
CONSUMABLES SAVED

- **Reduces Post-Weld Rework:** Near-zero heat input prevents shell buckling and alignment distortion, removing or reducing post-weld straightening.
- **No Preheat or PWHT:** High travel speeds and localized thermal cycles reduce or completely eliminate the need for costly preheating and post-weld stress relief treatments.
- **Weld Work Content Reduction:** Deep keyhole penetration replaces heavy, multi-pass MIG/TIG bevels with simplified weld preparation and reduced weld metal addition.

Target Equipment & Fabrication Scope

EQUIPMENT	SCOPE	NGM ADVANTAGE
Electrical Transformer Tanks	Tank shells, oil reservoir covers, cooling radiators, stiffeners, cable-box interfaces.	**Leak-tight** seams with near-zero shell distortion; limits coating removal and rework.
Heat Exchangers & Boilers	Tube-to-tubesheet joints, baffle plates, shell joints, and stainless alloy piping.	**High-integrity** seal/strength welds with minimal heat input and reduced risk of adjacent tube failures.
Process Vessels & Skids	Thin-wall stainless vessels, structural skid frames, brackets, and external attachments.	**High travel speeds** for reduced distortion and metallurgical effects on thin, advanced stainless steel alloys.

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ACADEMIC & FACILITY PARTNER
CCWJ, UNIVERSITY OF ALBERTA • EDMONTON