

Pacific Aerospace & Electronics

Explosive Metal Forming Capabilities

PA&E Explosive Metals Division:



2249 Diamond Point Road
Sequim Washington



Who we are:

PA&E Bonded Metals Division

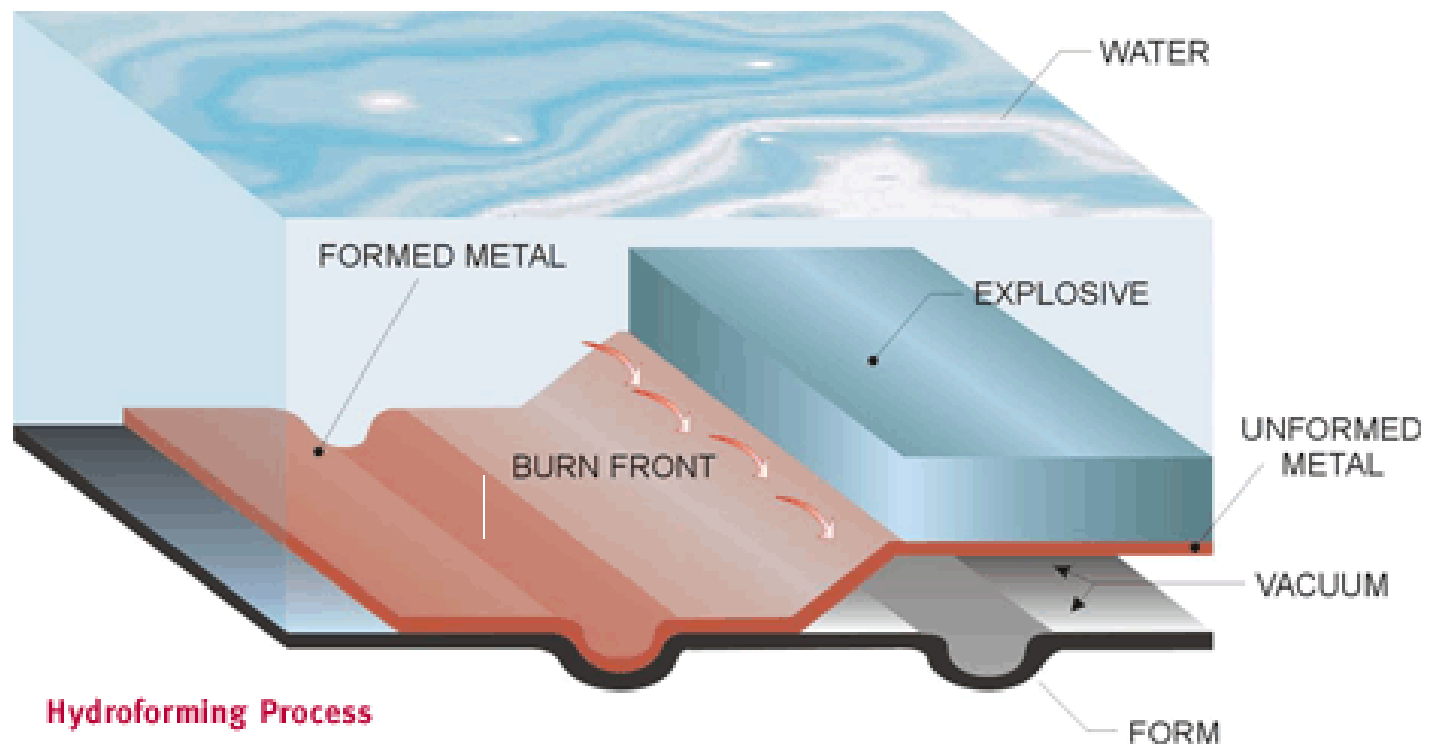
- In operation since 1970
- Formally known as Northwest Technical Industries
- Part of PA&E since 1995

What we do:

We use explosives to weld or bond dissimilar metals together and to explosively form metals into exotic shapes that are difficult or impossible to do by conventional methods. Explosives are also used to compact or consolidate metal powders into near net shapes.

The Explosive Metal Forming Process

This technique uses the energy generated by an explosive detonation to form the metal work piece. This process can deliver a great deal of flexibility in the metal-forming process.



Why Explosive Forming?

- It can simulate a variety of other conventional metal forming techniques such as stamp- or press-forming and spin-forming in a single operation
- It can offer significant cost savings on short-run parts because a one-sided tooling die is generally all that's required
- Explosive hydro-forming can efficiently form large parts – up to 14' square or 10' in diameter

Explosively Forming Metals

Metal Preparation

PA&E Employee Applies Shot Assembly to Bond Inconel to Nickel



Explosively Forming Metals

Detonation



Explosively Forming Metals

Explosively Formed Metal Sheet



Other Examples of Explosion Formed Metal Panels



Boiler Products



Missile Components



Aircraft Radar Shields

Explosively Formed Cones



Rocket Engine
Nozzles



Space Shuttle Skin Before and After Explosive Forming

Turbine Engine Components



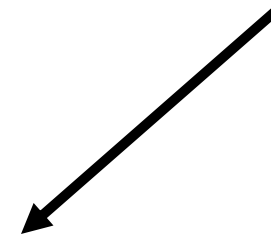
Hastelloy® Tubes



Explosive Forming Die



Finished Parts



Explosive Bonded Metals Examples

Spray Headers, Lined Steel Pipe with Inconel
Ready to be Explosively Formed Together



Explosive Forming Process



Learn More!

Contact PA&E's Bonded Metal Division via:

- E-mail at bondedmetals@pacaero.com
- Phone at: 360-683-4167

Or Visit:

- <http://www.pacaero.com/products/explosive-forming.htm>