FAQs – Plasma Arc Additive Manufacturing for Large-Scale Components

Last updated March 24, 2026

Is a wire-laser DED system (Meltio M600) acceptable and will the government consider it as an alternative approach within the proposed framework?

Laser wire DED offers higher precision, better microstructure, less distortion and lower heat input with less defects. The current opportunity is only seeking capabilities using plasma arc additive manufacturing. Other technologies will not be acceptable.

Is there a preferred material for the demonstrator block (steel, titanium, aluminum structural alloy or any military-relevant alloys)?

This will help the government develop the optimal process parameters for the preferred material and provide documentation. A structural steel such as an ER70 or ER100 weld wire is the preferred material for the demonstrator block.

What are the dimensions targeted for both the small-scale demonstrator block (multi-pass wall structure) and the large-scale structural demonstrator to validate the scalability and performance.

The Meltio M600 has a build envelope of 300x400x600 mm.

A small-scale coupon has dimensions of at least 300x300x16mm.

A typical multi-pass wall ranges from 13-17 mm or more in width and length ranging from 100 to 600mm.

The government could also use Typical Testing Dimensions.

Test Coupons: For structural testing, multi-wall specimens are often prepared in specific sizes, such as 50 × 50 × 50 mm cubes or prismic, 40 × 40 × 160 mm samples.

Mechanical Testing Dimensions: Specific standards, such as ASTM D638-02a for tensile testing, often dictate a 3.2 mm thickness for printed specimens.

Technology needs to be capable of producing parts at a minimum of 4’x4’. Target demonstrator to be a minimum of 12”x12”x2” or larger to accommodate the required testing to relevant ASTM standards.

Are there any specific geometries as representatives for these structures that ERDC prefers?

Specific components can be discussed upon award. Large, traditionally cast components such as gears, connector arms, or bridge connectors are examples.

Will ERDC guide fatigue loading conditions representative for military structural use?

Yes. ERDC will guide the fatigue loading conditions.

Can we use a foreign company to print our PAAM parts for this?

No. The current opportunity is not evaluating foreign company capabilities.

Can winning funds be used to purchase equipment?

Yes. Funds can be used to purchase equipment however the equipment must be appropriate for the scope of the work proposed, and after contract closure—the government is likely (as appropriate) to take possession of equipment purchased under the contract.

For the Plasma Arc topic, is this one step CSO evaluation (direct award) or a two-step?

The decision to apply the one-step or two-step evaluation will be made after review of the full suite of proposals. Regardless, for planning purposes—if a two-step evaluation is applied, it will be fully virtual.

Are there any particular materials of interest for this project?

Particular materials of interest include structural steels and equivalent weld wires. ER70 and ER100 are examples of materials of interest.