



Coordinated Motion Bore Cladding



The new CMC Series from AMET is the most elegant and advanced cladding system available. The design and technology provide the latest control and motion technology for complex cladding applications.

ADVANCED **M**ANUFACTURING **E**NGINEERING **T**ECHNOLOGIES
WORLD CLASS WELDING AUTOMATION

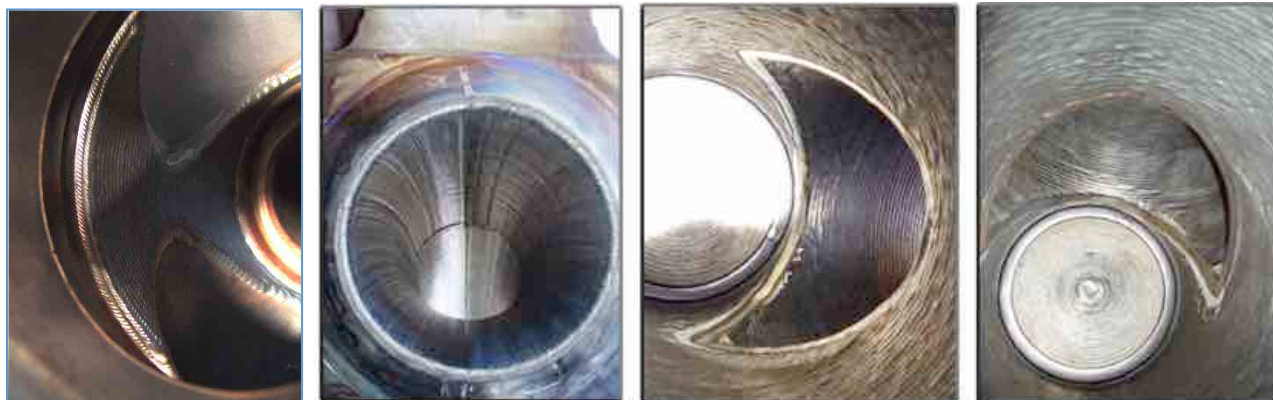
4 Coordinated Motion Axes

XM - Integrated

Intuitive Touch Interface

AMET's unique precision 4-axis fixture combined with our advanced process and motion control capabilities provide unparalleled cladding and overlay performance for critical components with, or without, intersecting bores.

- Elegant, simplified solution to complex bore clad applications.
- Industry proven XM Controller. Operator friendly interface.
- Precision AMET servo-controlled continuous rotating head.
- Automatic Torch Centering.
- Precision rotating Column and Boom with continuous rotating weld head provides:
 - Precision harmonic drive rotation for accurate and rigid position performance and velocity control.
 - Selectable Spiral or Step cladding capability.
- Precision programmable current pulsation and sloping provide ideal pool control with minimal dilution, especially at the starts / stops on intersecting bores.



The AMET Advantage

- Advanced "Vectored" AVC combined with precision fixturing and servo-drives, allows for unparalleled voltage control for arc length.
- Advanced "Centering" software eliminates the need to accurately place large parts.
- Integrated camera and video display combined with position data display help with setup and operation.
- Integrated data acquisition, tolerance checking, and Ethernet connectivity provide convenient process verification on critical components.
- AMET's direct digital communication with Lincoln Power Wave®¹ S350 and S500 power supplies via ArcLink™²

¹ Power Wave is a registered trademark of the Lincoln Electric Company

² ArcLink is a trademark of The Lincoln Electric Company

Scope of Operation

The CMC-66 Coordinated Motion Cladding System is based around a continuously rotating GTAW weld head for the cladding, overlay, or hard-surfacing of cylindrical components. A standard cladding system uses a rotary turntable to rotate the part around a bore torch. There are several important advantages of a continuously rotating head design:

- Very large and heavy parts require a large turntable, especially if the bore to be clad is at one end creating a large overhung load.
- Aligning the bore to be centered can be challenging, again, especially if the bore to be clad is significantly offset from the center of mass.
- Preheating the part, when necessary, is significantly easier if the part is stationary eliminating the need for high current slip rings to power heating blankets.
- Since parts are placed on the floor within the envelope of the rotating column and boom, multiple parts can be being prepared or preheated while a part is being clad, improving system utilization.

This combination of technologies allows parts to be placed, and processed, anywhere within the operating envelope of the tool. Automatic torch centering determines the bore position through touch sensing, and a vectored solution is automatically determined using all 4 servo axis of motion. Multiple parts can be placed and preheated while a part is being clad. AMET's precision Hot Wire power supply provides a digitally controlled AC power supply for resistance pre heating the filler metal, increasing deposition rates without increasing welding current.

The XM Controller provides menu-based weld programming of weld parameters, with integrated data logging and real time tolerance checking. **AutoClad LX** Software provides standardized menus specific to various bore cladding geometries. Bore Geometry is selected from menus, and specific diameters, heights and angles entered through the XM interface.



Standard Cladding System – CMC-66S

Spiral or Step Cladding of Circumferential, Oval, or "Race-track" Bores.



Standard Cladding System – CMC-66SB

Includes CMC-66S plus hardware and Software for:

- Intersecting Bores
- Seal Welds



Complex Bore Cladding System – CMC-66LX

Includes CMC-66SB plus hardware and software for:

- Off-Angle Bores
- Off-Center Bores

Coordinated Motion Cladding System Specifications

Part Number	CMC-66
GTAW Power Supply	Lincoln Power Wave S350 with ArcLink – 350A / 24V / 40% Duty Cycle
Hotwire Power Supply	250A, 20 VAC 100% Duty Cycle. Frequency range: 50 to 300 Hz
Welding Positions	Vertical
Water Circulator	Lincoln Cool Arc55
Diameter range	2.25" to 72" Bore Diameter (2.25" and 4" Bore Torches available)
Bore Height	63"
Mast Rotation Angle	270°
Head Rotation Angle	Continuous
Dimensions (LxWxH)	10'-10.25" x 6'-5" x 15'-2.24"
Weight	8500 lbs

