

# Composite material repair available at AEDC



## Blade Shop provides maintenance for wind tunnel compressors

AEDC was one of the first flight simulation testing sites in the world to use composite materials for rotor blades and spacers in the compressors that help run its large wind tunnels.

With this advancement came the need for an advanced, on-site repair facility.

For the past 50 years, a two-man Blade Shop has been maintaining and repairing the rotor blades and spacers for the axial flow compressors (C1, C2, C3 and C4) located in the Propulsion Wind Tunnel (PWT) facility's 16-foot transonic (16T) and 16-foot supersonic (16S) tunnels. These tradesmen are among the best composite repair technicians in the country and are able to complete any repairs necessary to keep the 16T and 16S compressors operating.

Each of the four compressors has a one-of-a-kind blade and spacer combination expressly designed for the operat-

ing characteristics of the compressor. Because unique materials are used in each compressor component, each must be repaired in a different way.

The Blade Shop is able to safely and efficiently make these repairs while ensuring the longevity of AEDC equipment.

Outside of the Blade Shop, the tradesmen serve as area-wide experts on compressor components. They are heavily involved in the daily and weekly inspections of the C1 compressor, as well as the C1 1800 air on hours (AOH) major preventative maintenance (PM), where a third of the compressor must be removed and inspected for damage. They are also heavily involved in the 16S Return to Service Effort and will continue to be

involved as 16S becomes operational.

In addition to work in the PWT facility, the Blade Shop has also played a vital role in composite repair efforts across Arnold Air Force Base. This work includes repairing composite rotor blades located in the cooling towers and repairing fiberglass components of the motors and pumps located at the secondary pumping station.

The PWT Blade Shop is one of the many assets at AEDC that make the complex unique. Having immediate access to the composite repair technicians in the Blade Shop reduces lost test time, saves money and ensures AEDC's reputation as the premier flight simulation facility in the world.



An AEDC craftsman stands in the bell mouth of C1 at the Propulsion Wind Tunnel facility.

## Blade Shop Capabilities

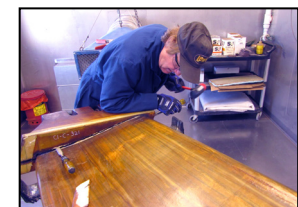
- ✓ Vacuum bagging
- ✓ Scarf repair
- ✓ Wet layup using dry fiberglass cloth
- ✓ Layup using pre-impregnated composite fibers where the epoxy is already present
- ✓ Composite-to-metal bonding
- ✓ Chemical cleaning
- ✓ Non-Destructive Inspection (NDI)
- ✓ Non-Destructive Testing (NDT)
- ✓ Material preparation
- ✓ Instrumentation installation
- ✓ Grinding



An AEDC craftsman applies adhesive to bond foam seal to a C1 spacer.



Installing foam seal to a C1 spacer.



A damaged blade cuff is removed from a C1 rotor blade.