



Grinder System Application

Blade Edge Repair

Description

Regrinding of compressor blade leading and trailing edges.

Application

Refurbishing cell for the leading and trailing edges of compressor blades.

Allows turbine compressor blades to be repaired and reused rather than discarded and replaced with new components.

Process

Each blade is fixtured in a precision coupling type system following the weld operation.

This system allows the fixtured blade to be moved from one station to the next without losing part location.

A non-contact laser inspection system measures the airfoil shape of the worn blade. Blades exceeding allowable limits are discarded. Accepted blades are forwarded to the grinding station.

The grinding station uses the inspection data to automatically create tool paths and generate CNC programs for the grinder.

The weld bead is ground to size without touching the core blade material.

A washdown station removes all coolant and grinding swarf from the ground blade.

A finish buffing operation is used to blend or feather the remaining weld bead into the airfoil shape.

Material

Airfoil blades made from titanium and nickel.

Weld material is titanium; Ti-64

Cycle Time

35 blades per hour based upon a single edge repair of 50% of the blade length and a two machine cell.

Machine Features and Benefits

Available on Huffman's Five or Six-Axis Grinders.

Scale feedback is required on both the linear and rotary axes.

10 hp (7.5 kW) grinding spindle with variable-speed drive.

Requires a diamond grinding wheel for titanium materials.

A contact probe is used for part dimension verification.

