

RECENT COMPRESSOR ROTOR OVERHAULS

By Marc Rubino

RMS has been involved in several inspections and overhauls of Ingersoll-Rand MTA-5124 centrifugal compressor rotors. This article serves as a brief description of this notable equipment. These units are multi-stage uncooled, single flow centrifugal air blowers and are usually driven by steam turbines. The typical application of MTA-5124 rotors RMS has overhauled is for blast furnace air blowers at steel mills. These large blowers provide a constant source of air needed for combustion during the smelting process (extracting iron from its ore) within blast furnaces. The MTA-5124 was designed to deliver over 113,000 SCFM of air at 35 PSIG.

The inspection and repair of these rotors is no easy task as they are bulky assemblies. The largest impeller diameter is approximately 65", the overall rotor length is nearly 13 feet, and the estimated weight is 19,000 lbs. Regardless, RMS possesses the shop capability to refurbish these rotors for continued service.



by the thickness of the rings. These rings are often replaced due to deformation from the shrink fits and / or shearing via thermal ratcheting—the tendency for parts to move axially on a rotor due to thermal growth.



The bores of the impellers, sleeves, and balance piston are evaluated for roundness and concentricity. If determined unacceptable, the bores are reworked via machining to reestablish concentricity. Another typical repair to these rotors is re-riveting the impeller blades. Rivets that warrant replacement include rivets with eroded, cracked, or voided heads. RMS also has encountered these rotors with riveted impellers replaced with fabricated impellers. Once all repairs are completed, the rotor is reassembled and balanced to RMS and API 687 criteria.

The typical inspection scope includes abrasive cleaning, recording as-assembled dimensions and runouts, de-stacking the entire assembly, nondestructive and visual examination of each rotor component, and an evaluation of shrink fits of impellers, sleeves, and the balance piston. The rotor parts mate to support rings in their bores and the rings themselves rest on the shaft. So the interference of parts to the shaft is achieved

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