MechCaL

-2010|2011|2012 Technology Top 100 Winner-

Case Study 2

Euclid 850mm Grid Cooling Fan

Original Metal Fan

» Mass: 80kg

» Catastrophic failure, causing extensive damage downstream and considerable downtime

MechCaL Composite Fan

» Mass: 26kg

» Cost: less than the OEM replacement steel fan Weld fatigue problem eliminated

853mm Fan Performance Comparison

MechCaL's 850mm Mark 1 fan was designed to be a composite replacement for the existing steel unit - no aerodynamic or acoustic changes were made to the straight bladed fan. The Mark 1 is geometrically (and hence aerodynamically and acoustically) identical to the original steel fan and was designed purely as a light-weight composite replacement to eliminate the weld fatigue problem experienced with the heavy steel fans. The MechCaL 850mm Mark 2 fan is completely re-designed fan, optimised for the same application as the Mark 1 fan and is a backward curved radial fan with 11 airfoil profiled blades. The fan is designed to be a drop-in replacement for Mark 1 or steel unit and utilises the existing inlet and scroll. Performance testing shows that the fan meets the Mark 1 2250rpm performance at 1900 rpm yet is 7dB(A) quieter. At 2250 rpm (Mark 1 operating speed), the Mark 2 fan produces ~40% more static pressure for a given volume flow. Structurally, the Mark 2 is stronger than the Mark 1 due to the thickness of the airfoil profiled blades. The Mark 2 fan mass ~20kg compared to the ~80kg of the original steel fan and its inertia is consequently significantly lower resulting in lower start-up, vibrational and gyroscopic loads on the drive and support systems.

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