

High-Efficiency Centrifugal Fans

Custom aerodynamic modeling, CFD performance optimization & precision fabrication for industrial ventilation

3
IMPELLER TYPES

2
DRIVE CONFIGURATIONS

AMCA
PERFORMANCE
STANDARD

ISO 21940
BALANCING STANDARD

PROJECT OVERVIEW

A complete mechanical engineering and manufacturing program dedicated to designing, simulating, and producing industrial centrifugal fans. The project encompasses custom aerodynamic sizing, finite element structural analysis, impeller balancing, and complete fabrication — optimizing fluid dynamics to achieve high total pressure rise while minimizing energy consumption and aerodynamic noise.

KEY FACTS



Impeller Types
3 heavy-duty impeller types



Drive Configuration
Direct-drive & belt-driven



Testing Standard
AMCA-compliant testing

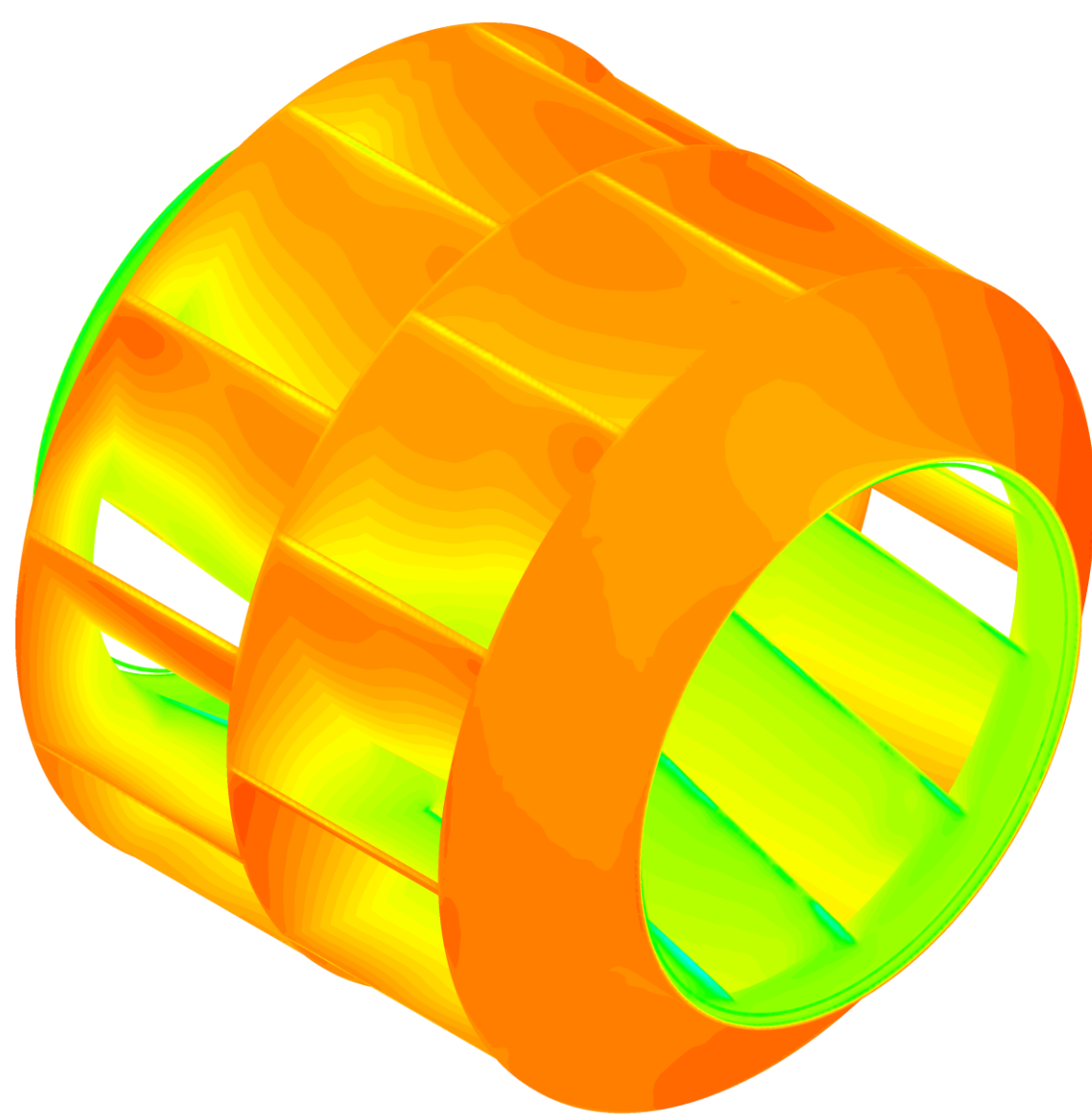


Primary Application
Industrial ventilation systems

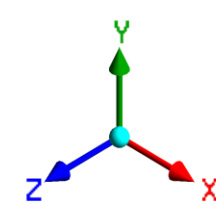
DESIGN PHILOSOPHY

Optimized fluid machinery designed for maximum durability and low operating costs. Our engineering methodology combines precise specific-speed matching, transient CFD flow optimization, and robust structural analysis. By refining impeller design and volute geometry, we eliminate recirculating stalls, boost static efficiency, and ensure stable operation across the full performance curve.

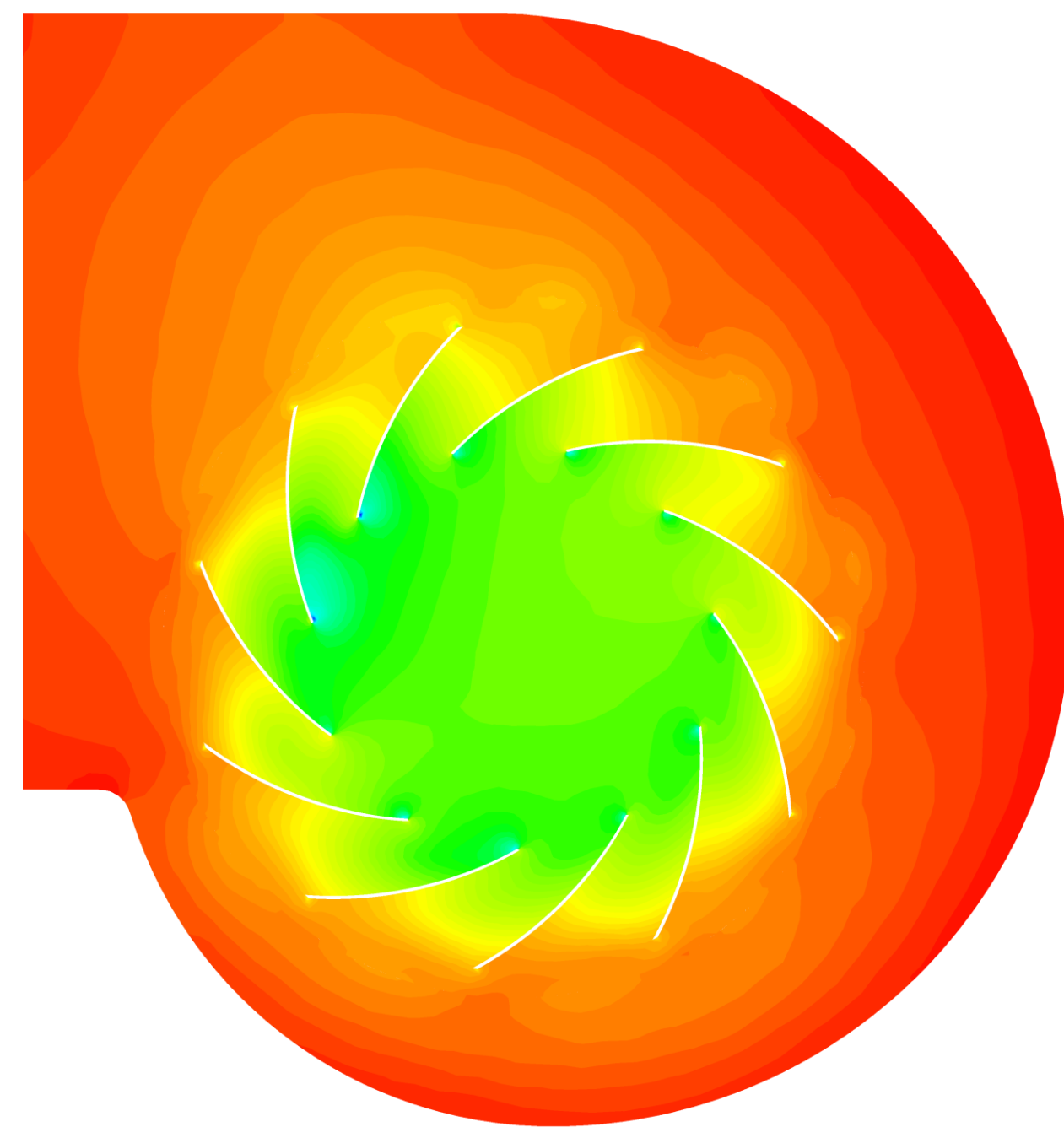
AERODYNAMIC PERFORMANCE ANALYSIS



CFD velocity analysis — flow distribution across the backward-curved impeller



Assembly cutaway



2D section contour

Full 3D computational fluid dynamics modeling evaluates pressure distribution, streamline continuity, and turbulence intensity through the impeller and volute, guiding blade profile refinement to eliminate recirculating stalls and boost static efficiency across the full performance curve.

SCOPE OF WORK

- Aerodynamic sizing & blade profile design — inlet cone, blade angle & volute layout
- Full 3D CFD flow analysis — pressure distribution, streamlines & turbulence intensity
- FEA structural & rotordynamic assessment — modal frequencies, resonance & shaft critical speeds
- Precision fabrication & assembly — CNC laser cutting and dynamic balancing to ISO 21940
- AMCA aerodynamic performance testing across the full flow range
- Vibration spectral analysis & sound pressure level validation

DELIVERABLES

- Comprehensive 3D CAD models & manufacturing shop drawings
- Aerodynamic simulation & performance reports
- FEA structural, vibration & modal analysis documentation
- Precision dynamically balanced impeller & casing assembly
- AMCA-certified fan performance curves