

Fans for Power Generation



FläktWoods

Centrifugal Fans

FlaktWoods specializes in New Fan Equipment, Retrofits, Repair and Service for Utility and Industrial Power Generation Applications. As the premier North American supplier of fans for these applications, we can help you design, engineer, procure, install, and operate low maintenance, high efficiency, problem-free Utility Fan systems. Join our long list of satisfied customers who have come to appreciate the FlaktWoods difference.

As the largest air and gas movement equipment business in the world, FlaktWoods Group provides Air Climate solutions for people's comfort and health, as well as Air Movement solutions for industrial infrastructures and processes. FlaktWoods Group has a turnover in excess of \$550 Million USD, employs 3500 employees and has operations in more than 30 different countries. Formed out of the former ABB Fan Group and Woods Air Movement, FlaktWoods has a long history in the Utility and Industrial marketplace in North America, beginning with our founding in 1879 as Garden City Fan Company. All of the technology, resources, and personnel of our predecessor companies worldwide have been transferred to our current organization, meaning you can continue to rely on FlaktWoods to be the leading supplier of fans for Utility and Industrial applications.

Product Range/Applications

FlaktWoods offers a complete line of Custom-Designed Centrifugal Fans for demanding Power Generation applications. Blade shapes available include Airfoil, Backward Curved, Backward Inclined, Radial Tip, Radial, and Forward Curved to serve the wide variety of aerodynamic and mechanical requirements. FlaktWoods designs are used successfully on Forced Draft, Primary Air, Secondary Air, Fluidizing Air, Induced Draft, Gas Recirculation and Booster Fan applications throughout the world. Fans offered for Power Generation applications in North America are from our worldwide center of excellence in Centrifugal Fan technology, Solyvent. These fans offer reliable aerodynamic performance, and proven mechanical design, with local North American manufacture.

Design Features

FlaktWoods offers several features in our Custom-Designed Centrifugal Fans that provide a superior design. Two of these are double forged hubs and low maintenance Variable Inlet Vanes. Most of our Custom-Designed DWDI Fans are equipped with double forged hubs for connection of the wheel to the shaft. Each of these hubs is manufactured of a single forging rather than a fabrication, eliminating any welds and associated potential weld flaws. These hubs are designed to provide support well up on the centerplate, improving the rotor first fundamental natural frequency. The hubs are attached to the centerplate with tightly fitted bolts, providing a superior double-shear

connection. Our double forged hubs provide a wheel support system that is superior to fabricated or conical support systems offered by others, and they allow the wheel to be more readily removed in the future should this be necessary.

FlaktWoods also offers a low maintenance Variable Inlet Vane design that has proven to be superior to the standard pin and channel design common in the industry. This design has proven to significantly reduce maintenance costs, lower operating torque and provide more consistent controllability.

Retrofit Applications

In the environment of a deregulated industry faced with increased competition and strict compliance regulations, FlaktWoods has succeeded by providing customers with cost-effective retrofit solutions, providing increased output from existing fans while maintaining as many of the existing components as possible, including ductwork and foundations, to minimize the cost of environmentally driven changes. In several of these applications, FlaktWoods has also been able to provide innovative retrofit equipment that solved severe mechanical problems with the customer's existing fan equipment, providing the end user with a dual benefit. FlaktWoods supplies retrofit equipment for existing fans, regardless of the original manufacturer, and has a proven track record of success in these applications worldwide.



Axial Fans

Product Range/Applications

FlaktWoods offers a complete line of Custom-Designed in-flight Adjustable Axial Fans for demanding Power Generation applications. Blade types available include Aluminum Airfoil Profile Blades and our unique Twin Blade Design. FlaktWoods designs are used successfully on Forced Draft, Primary Air, Secondary Air, Induced Draft, and Booster Fan Applications throughout the world. Fans offered for Power Generation applications in North America are from our worldwide center of excellence in Axial Fan technology, FlaktWoods AB in Sweden. These fans offer reliable aerodynamic performance, and innovative mechanical design, with local North American manufacture of the static components.

Twin Blade Technology

FlaktWoods offers our unique Twin Blade technology for applications where wear or corrosion is an issue. This design consists of two non-profiled and aerodynamically optimized blades mounted on a common blade base. This design allows for reduction of the number of blades and associated blade support components, vastly reducing the number of components within the impeller as compared to conventional airfoil blades. This translates into lower rotor weight, lower inertia, lower starting times and minimization of maintenance and spare parts expense. Since the Twin Blade is a fabrication, it can be made of any weldable material, making it ideal for applications involving higher rates of erosion or corrosion, where the appropriate material can be selected to combat these effects. The Twin Blade also offers superior aerodynamic performance in erosive environments. Conventional airfoil profile blades suffer significant decreases in efficiency as the blade wears. Our tests show that the Twin Blade efficiency does not decrease as wear occurs along the blade surface, yielding lower energy costs over the lifetime of the equipment.

Simplicity of Design

Regardless of the blade style employed, FlaktWoods' in-flight Adjustable Axial is designed to reduce maintenance cost over the lifetime of the equipment through a number of innovative design features. The blades and blade bearings of our in-flight Adjustable Axial can be removed with the rotor in-place and the housing closed, through an access port in the outside of the fan. This is a major improvement over other designs where the impeller must be removed from the fan to change the blade bearings. Our in-flight Adjustable Axial also employs a simplified actuation system, eliminating the need for an external actuator and associated linkage, and the hysteresis associated with these components. The translation of linear to rotary motion within our Impeller is also simplified, reducing the number of moving parts within the Impeller. The FlaktWoods simplified in-flight Adjustable Axial design truly minimizes initial, operating and maintenance costs over the lifetime of the equipment to provide an optimized product from a full life-cycle standpoint.



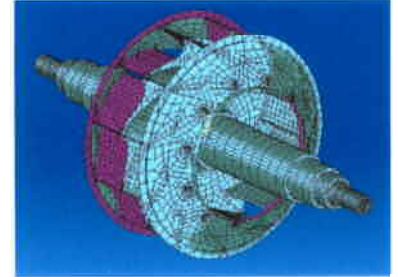
Support Services

Analysis/Testing

FlaktWoods offers a full range of Analysis for our Custom-Designed Fans, Including Finite Element, Modal, Fatigue, Torsional, Design Resonant Speed and Installed Resonant Speed Analysis. Verification of our Analytical results can be provided through a variety of testing, including Laboratory Performance Testing (Either Full Size Fan or Model Fan Testing), Field Performance Testing, Impact Testing to verify modal frequencies, Strain Gauge testing to verify FEA stresses, and Foundation testing to verify the adequacy of existing foundations for increased loading encountered in retrofit situations.

Quality Assurance/Non-Destructive Examination

FlaktWoods employs a quality program that is certified to ISO 9001. We offer a variety of documentation to verify the quality of our products, including Certificates of Conformance, Material Test Reports, Qualified Weld Procedures, Proof of Welder Qualification, and Balance Reports. FlaktWoods also offers a full range of component Non-Destructive examination to further verify equipment quality, including Visual, Magnetic Particle, Ultrasonic, and Radiographic testing.



Service

FlaktWoods has dedicated personnel for service, repair and retrofit applications, including regional service representatives in your area. Our Full Service capabilities include new fan installation supervision and startup, field inspections and maintenance checkups, field testing and balancing, field rework and emergency repair, and turnkey installation.



Proven Experience

The Power Generation market is one of the primary markets served by FlaktWoods. FlaktWoods' experience and expertise in this market is unparalleled. We know how to handle major Power Generation projects and our vast organization of manufacturing locations, technical centers, service locations and sales locations assures you of a successful project. Please contact us for information on how FlaktWoods can serve your Power Generation fan needs in an innovative, timely, and cost-effective manner.

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www.flaktwoods.com

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