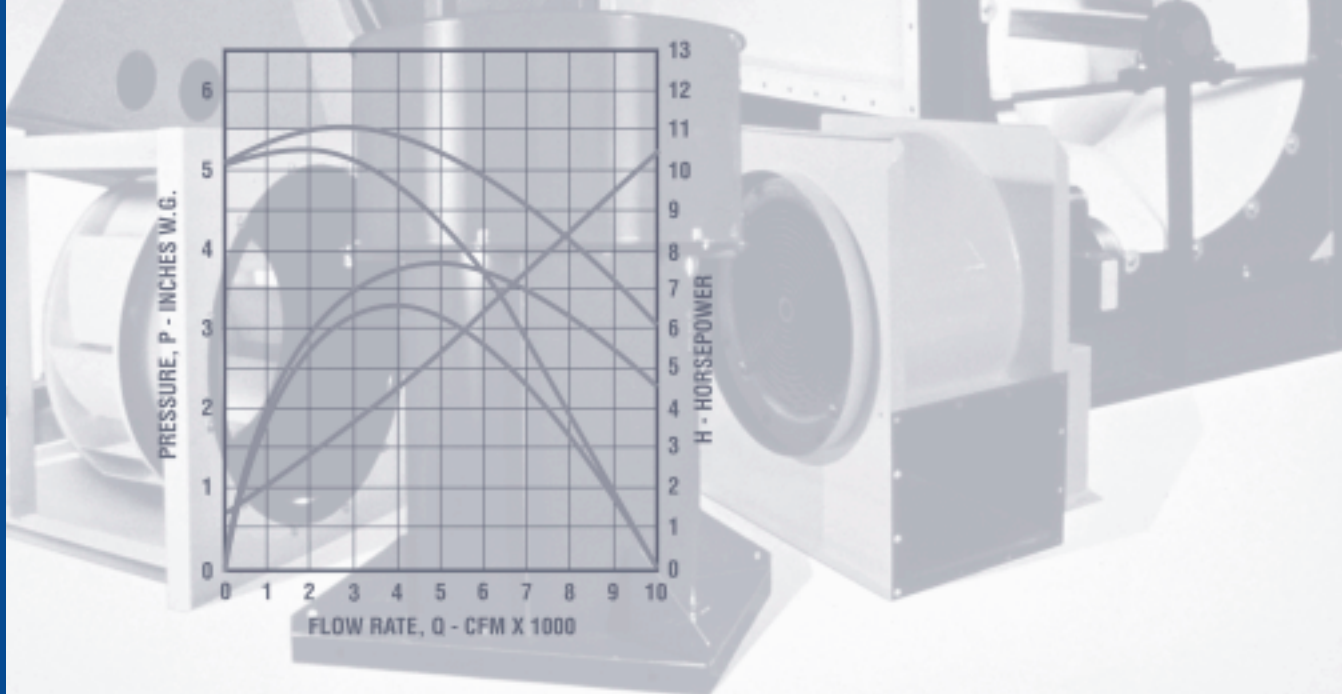


One of a  
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industrial  
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sourcebooks



# Improving Fan System Performance

a sourcebook for industry



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AMCA International is a not-for-profit association of the world's manufacturers of related air system equipment—primarily, but not limited to fans, louvers, dampers, air curtains, airflow measurement stations, acoustic attenuators, and other air system components—for industrial, commercial, and residential markets. The association's mission is to promote the health and growth of industries covered by its scope and the members of the association consistent with the interests of the public.

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## Quick Start Guide

This sourcebook is designed to provide fan system users with a reference outlining opportunities to improve system performance. It is not intended to be a comprehensive technical text on improving fan systems, but rather a document that makes users aware of potential performance improvements, provides some practical guidelines, and details where the user can find more help. The sourcebook is divided into three main sections and appendices.

### ◆ Section 1: Introduction to Fan Systems

For users unfamiliar with the basics of fans and fan systems, a brief discussion of the terms, relationships, and important system design considerations is provided. This section describes the key factors involved in fan selection and system design and provides an overview of different types of fans and the applications for which they are generally used. Users already familiar with fan system operation may want to skip this section. The key terms and parameters used in selecting fans, designing systems, and controlling fluid flow are discussed.

### ◆ Section 2: Performance Improvement Opportunity Roadmap

This section describes the key components of a fan system and the opportunities for performance improvements. Also provided is a figurative system diagram identifying fan system components and performance improvement opportunities. A set of fact sheets describing these opportunities in greater detail follows the diagram. These fact sheets cover:

1. Assessing Fan System Needs
2. Fan Types
3. Basic Maintenance
4. Common Fan Systems Problems
5. Indications of Oversized Fans
6. System Leaks
7. Configurations to Improve Fan System Efficiency
8. Controlling Fans with Variable Loads
9. Fan Drive Options
10. Multiple-Fan Arrangements
11. Fan System Economics

### ◆ Section 3: Programs, Resources, and Contacts

Section 3 provides a directory of associations and other organizations involved in the fan marketplace, along with a listing of the resources, tools, software, videos, and workshops.

### ◆ Appendices

The sourcebook includes two appendices. Appendix A is a glossary that defines terms used in the fan system industry. Appendix B presents an overview of the fan system marketplace.

## The Systems Approach

The cost-effective operation and maintenance of a fan system requires attention not only to the needs of the individual pieces of equipment, but also to the system as a whole. A "systems approach" analyzes both the supply and demand sides of the system and how they interact, essentially shifting the focus from individual components to total system performance. Often, operators are so focused on the immediate demands of the equipment that they overlook the broader question of how system parameters are affecting the equipment. The systems approach usually involves the following types of interrelated actions:

- Establishing current conditions and operating parameters
- Determining present and estimating future process production needs
- Gathering and analyzing operating data and developing load duty cycles
- Assessing alternative system designs and improvements
- Determining the most technically and economically sound options, taking into consideration all of the subsystems
- Implementing the best option
- Assessing energy consumption with respect to performance
- Continuing to monitor and optimize the system
- Continuing to operate and maintain the system for peak performance.