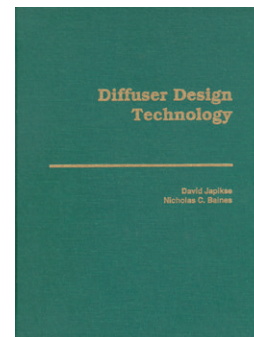


Diffuser Design Technology

This volume is the most comprehensive review of diffuser technology ever published. Over 1,500 original research papers have been examined, and their results have been summarized and collated into a single reference volume with a critical commentary by the authors. This provides an overview which will help to focus attention on the essential characteristics of diffusers and their applications, and a broad perspective by which new researchers and engineers can obtain an effective orientation to the basic characteristics of diffuser fluid dynamic problems. Originally published for a limited readership in 1984, this has now been completely revised and updated with the latest findings and understanding of the subject.



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David Japikse, Nicholas C. Baines

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Elements of Diffuser Technology

- The Impact of Diffusers
- State-of-the-Art Diffuser Performance Levels
- Diffuser Performance Parameters
- Essential Phenomena in Diffusers
- Estimating the Performance of Diffusing Elements in Series

References

Channel Diffuser Technology

- Introduction
- Passage Divergence and Length (Area Ratio)
- Throat Aspect Ratio
- Passage Shape
- Aerodynamic Blockage
- Inlet Distortions
- Reynolds Number Influence
- Inlet Mach Number Effects
- Influence of Inlet Turbulence Intensity and Scale
- The Influence of Rotation on Diffuser Performance
- Diffuser Fluctuations
- Regime Mapping

References

Conical Diffuser Technology

- Introduction
- Passage Divergence and Length (Area Ratio)
- Passage Shape
- Aerodynamic Blockage
- Inlet Swirl
- Inlet Distortions
- Reynolds Number Effects
- Inlet Mach Number Effects
- The Influence of Inlet Turbulence Intensity and Scale
- The Influence of Rotation on Diffuser Performance
- Diffuser Fluctuations
- Regime Mapping

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Annular Diffusers with Axial Inlets

- Introduction
- Passage Divergence and Length (Area Ratio)
- Wall Contouring
- Aerodynamic Blockage
- Inlet Swirl
- Inlet Turbulence
- Mach Number Influence
- Influence of Struts
- Influence of Upstream Blades
- Distortions
- Flow Regimes

References

Radial Flow Vaneless Diffusers

- Introduction
- Passage Divergence, Length, and Aero Ratio: Zero Swirl
- Wall Contouring
- Inclined Centerline Diffusers
- Aerodynamic Blockage
- Swirl
- Inlet Distortion
- Reynolds Number Influence
- Inlet Mach Number Effect
- Inlet Turbulence Intensity
- Regime Mapping

References

Calculation Methods for Diffusers

- Historical Review of Two-Dimensional Boundary Layer Methods - Weak Interaction Models
- Advanced Two-Dimensional Boundary Layer Techniques - Strong Interaction Models
- Three-Dimensional Boundary Layer Techniques
- Navier-Stokes Solutions
- Closure

References

Flow Structure of Research Diffusers

- Introduction
- Historical Overview
- Study with Equilibrium Boundary Layers
- Study with Non-Equilibrium Boundary Layers
- Closure

References

Diffuser Augmentation

- Augmentation by Boundary Layer Suction
- Diffuser Augmentation by Wall Injection
- Surface Treatments
- Flow Field Inserts
- Summary

References

Appendix A: Compendium of Diffuser Maps

- A.1 Channel Diffuser Maps
- A.2 Conical Diffuser Maps
- A.3 Annular Diffuser Maps
- A.4 Vaneless Diffuser Maps

Appendix B: Miscellaneous References