AHRI Guideline G (I-P)

2016 Guideline for

Mechanical Balance of Impellers for Fans

Air-Conditioning, Heating, and Refrigeration Institute

2111 Wilson Boulevard, Suite 500
Arlington, VA 22201, USA
www.ahrinet.org

PH 703.524.8800
FX 703.562.1942

Documents
Document Sharing Hub

Full document details: AHRI Guideline G-2016 (I-P) - Mechanical Balance of Impellers for Fans

IMPORTANT

SAFETY DISCLAIMER

AHRI does not set safety standards and does not certify or guarantee the safety of any products, components or systems designed, tested, rated, installed or operated in accordance with this standard/guideline. It is strongly recommended that products be designed, constructed, assembled, installed and operated in accordance with nationally recognized safety standards and code requirements appropriate for products covered by this standard/guideline.

AHRI uses its best efforts to develop standards/guidelines employing state-of-the-art and accepted industry practices. AHRI does not certify or guarantee that any tests conducted under the standards/guidelines will not be non-hazardous or free from risk.

Note:

This guideline supersedes AHRI Guideline G-2011.

For SI, see AHRI Guideline G (SI)-2016.

Price $10.00 (M) $20.00 (NM)
Printed in U.S.A.

©Copyright 2016, by Air-Conditioning, Heating, and Refrigeration Institute
Registered United States Patent and Trademark Office

Documents Document Sharing Hub

Full document details: AHRI Guideline G-2016 (I-P) - Mechanical Balance of Impellers for Fans

TABLE OF CONTENTS

SECTION		PAGE
Section 1.	Purpose	1
Section 2.	Scope	1
Section 3.	Definitions	1
Section 4.	Instrumentation and Measurement	3
Section 5.	Balancing Methods	4
Section 6.	Unbalance Limit	5

TABLES

Table 1.	Summary of Balancing Methods	5
Table 2.	Unbalance Limits	6

APPENDICES

Appendix A.	References – Normative	7
Appendix B.	References – Informative	7
Appendix C.	System Vibration – Informative	8

Documents
Document Sharing Hub

Full document details: AHRI Guideline G-2016 (I-P) - Mechanical Balance of Impellers for Fans

MECHANICAL BALANCE OF IMPELLERS FOR FANS

Section 1. Purpose

1.1 *Purpose*. The purpose of this document is to provide fundamental information and to guide the industry on Balance as applied to Impellers used in air moving systems. It includes terminology used and methods of Balancing practiced by the industry.

1.1.1 *Intent.* This document is intended for the guidance of component suppliers and equipment manufacturers.

1.1.2 *Review and Amendment.* This document is subject to review and amendment as technology advances.

Section 2. Scope

2.1 *Scope*. This document is intended to apply specifically to system vibration and mechanical Balancing as related to Impellers for Fans. The principles presented can however be generally applied to many rotating components (Rotors).

This document covers Impellers and propellers while fan systems are covered by Air Movement and Control Association International, Inc. (AMCA) Standard 204. For information on system vibration, see Appendix C.

Section 3. Definitions

All terms in this document will follow the standard industry definitions in the *ASHRAE Terminology* website (https://www.ashrae.org/resources--publications/free-resources/ashrae-terminology) unless otherwise defined in this section.

3.1 *Balance.* The unique and ideal condition of a Rotor when it has neither static nor dynamic Unbalance. Such a Rotor does not impart any vibratory force or motion to its Bearings as a result of centrifugal forces.

3.2 *Balancing.* A procedure by which the mass distribution of a Rotor is checked and, if necessary, adjusted in order to ensure that the vibration of the Journals and/or forces on the Bearings at a frequency corresponding to operating speed are within specified limits.

3.2.1 *Dynamic (Two-plane) Balancing.* A procedure by which the mass distribution of a Rigid Rotor is resolved into two planes and adjustments made by adding or removing mass in those planes in order to reduce the primary force and secondary force couple caused by the initial Unbalance.

3.2.2 *Static (Single-plane) Balancing*. A procedure by which the mass distribution of a Rigid Rotor is resolved into one plane and adjustments made by adding or removing mass in that plane only in order to reduce the initial Unbalance force.

3.3 *Balancing Machine.* A machine that provides a measure of the Unbalance in a Rotor which can be used for adjusting the mass distribution of that Rotor.

3.3.1 *Centrifugal (Rotational) Balancing Machine*. A Balancing Machine that provides for the support and rotation of a Rotor and for the measurement of once per revolution vibratory forces or motions due to Unbalance in the Rotor.

3.3.2 *Gravitational (Non-rotating) Balancing Machine*. A Balancing Machine that provides for the support of a Rigid Rotor under non-rotating conditions and provides information on the amount and angle of the static Unbalance.

3.3.3 *Dynamic (Two-plane) Balancing Machine*. A Centrifugal Balancing Machine that furnishes information for performing Two-plane Balancing.

3.3.4 *Static (Single-plane) Balancing Machine*. A Gravitational or Centrifugal Balancing Machine that provides information for accomplishing Single-plane Balancing.

Documents
Document Sharing Hub
Full document details: AHRI Guideline G-2016 (I-P) - Mechanical Balance of Impellers for Fans