

IEEE Guide for Laboratory Measurement of the Power Dissipation Characteristics of Aeolian Vibration Dampers for Single Conductors

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IEEE Power Engineering Society

Reaffirmed September 26, 2007
Approved September 15, 1993

IEEE Standards Board

Abstract: The current methodologies, including apparatus, procedures, and measurement accuracies, for determining the dynamic characteristics of vibration dampers and damping systems are described. Some basic guidance is provided regarding a given method's strengths and weaknesses. The methodologies and procedures described are applicable to indoor testing only.

Keywords: aeolian, decay method, forced response method, inverse standing wave ratio (ISWR) method, overhead conductors, power dissipation characteristics, power method, vibration dampers

The Institute of Electrical and Electronics Engineers, Inc.
345 East 47th Street, New York, NY 10017-2394, USA

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ISBN 1-55937-366-0

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Introduction

(This introduction is not a part of IEEE Std 664-1993, IEEE Guide for Laboratory Measurement of the Power Dissipation Characteristics of Aeolian Vibration Dampers for Single Conductors.)

This guide describes current methodologies for the testing of vibration dampers in the laboratory. Included within the scope are specific descriptions of the apparatus, procedures, and measurement accuracies for the testing of vibration dampers.

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1. Scope

The purpose of this guide is to describe the current methodologies, including apparatus, procedures, and measurement accuracies, for the testing of vibration dampers. In addition, some basic guidance is also provided to inform the potential user of a given method's strengths and weaknesses (see clause 6).

Due to the variety of vibration damper designs, more than one test method may be required to obtain the necessary information on dissipation characteristics. This guide is written to describe some of the procedures for determining the dynamic characteristics of vibration dampers and damping systems. It is hoped that it will assist in the standardization of the methods included as well as result in providing a more detailed perspective in obtaining reliable information on a vibration damper's dissipation characteristics. Please note that the methodologies and procedures incorporated in this guide are applicable to indoor testing only and are in no way associated with the field testing of vibration dampers. By using the appropriate technique(s) outlined, data can be acquired that can be utilized in the application of dampers; however, this topic is considered beyond the scope of this guide. In general, it is hoped that this guide will provide an improved understanding of vibration testing procedures.

2. Definitions

2.1 decay [test] method: A test that determines the power dissipation characteristics of a damper by the measurement of the decay rate of the amplitude of motion of a span following a period of forced vibration at a natural frequency and a fixed test amplitude.

2.2 dynamics characteristics test: *See: forced response [test] method.*

2.3 forced response [test] method: A test that determines the power dissipation characteristics of a damper by the measurement of the force and velocity imparted to a damper that is mounted directly on the shaker.

2.4 inverse standing wave ratio [test] method: A test that determines the power dissipation characteristics of a damper by the measurement of antinodal and nodal amplitudes on the span at each tunable harmonic.

2.5 power [test] method: A test that determines the power dissipation characteristics of a damper by the measurement of the force and velocity imparted to the test span at the point of attachment to the shaker.