IEEE Standard for the Repair and Rewinding of AC Electric Motors in the Petroleum, Chemical, and Process Industries

IEEE Industry Applications Society

Sponsored by the
Petroleum and Chemical Industry Committee

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Approved 9 December 2009

IEEE-SA Standards Board

Abstract: This standard is intended to be a basic or primary document that can be utilized and referenced by owners of ac motors and generators (machines) that need refurbishment, repair, and/or rewinding, as well as service or repair facilities. It has been developed for the petroleum, chemical, and process industries, and it may be adapted to other areas of interest. The use of this standard is expected to result in higher quality and more cost effective, timely repairs. A means of evaluating work performed and repair or service facilities is also provided.

Keywords: ac generator, ac machine, ac motor, induction, refurbish, repair, repair facility, rewind, service facility, synchronous

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Introduction

This introduction is not part of IEEE Std 1068-2009, IEEE Standard for the Repair and Rewinding of AC Electric Motors in the Petroleum, Chemical, and Process Industries.

This document was originally published in 1990 and was revised in 1996. In keeping with the goals of maintaining progressive standards, in 2002 the Standards Subcommittee of the IEEE Petroleum and Chemical Industry Committee assigned a task force to revise and update this standard. References to other documents have been corrected. The wording in this standard was modified to reflect worldwide standards and to promote uniform application of such devices in petroleum and chemical industry facilities.

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Participants

At the time this standard was submitted to the IEEE-SA Standards Board for approval, the Repair and Rewinding of Electric Motors Working Group had the following membership:

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Royce King, *Secretary*
William E. McBride, *PCIC Standards Liaison*

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Bryan Klontz
Bill Lockley
Alan Mixon
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Bill Stewart
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The following members of the individual balloting committee voted on this standard. Balloters may have voted for approval, disapproval, or abstention.

Gabriele F. D. Alleva
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Contents

IEEE Standard for the Repair and Rewinding of AC Electric Motors in the Petroleum, Chemical, and Process Industries

1. Overview

1.1 Scope

This document covers general recommendations for the repair of alternating current (ac) electric motors and includes guidelines for both the user and the repair facility. It is not intended to replace specific instructions contained in the manufacturer's instruction book or in any contractual agreement between a manufacturer and a purchaser of a given machine. For the purpose of this document, the term "motor" is used in lieu of, and shall equate to, the terms wound rotor, generator, and machine.

This standard covers reconditioning, repair, and rewind of horizontal and vertical induction motors and of synchronous motors. It applies to all voltages 15 kV and less, and all ratings above 0.75 kW (1 hp).

This standard applies only to the repair of motors, and in cases involving modifications to the basic design, care must be taken so as not to negatively affect the safety and reliability of the motor.

Excluded from the scope of this standard are the following:

- Specific requirements, certification, and inspection required for explosion proof, dust ignition proof, flameproof, and like motors having a listing issued by a Nationally Recognized Testing Laboratory (NRTL), for example, Underwriters Laboratories, Inc. (UL), Factory Mutual (FM), and Canadian Standards Association (CSA). For motors in this category, the user shall verify if the repair facility shall be certified by such an agency.
- Any specific or additional requirements for hermetic motors, hydrogen-cooled generators, submersible motors, or Class 1E nuclear service motors.
- Direct current (dc) motors.

1.2 Purpose

This standard is intended to be used and referenced by users of motors that need repair as well as by owners and operators of establishments that offer motor repair services. It has been developed primarily for the needs of the petroleum and chemical industry but can be adapted to other applications or industries.

The use of this standard by users and repair facilities is expected to result in higher quality, cost-effective, timely repairs. It also provides a means of evaluating repairs and facilities.

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

ANSI/ABMA 20-1996, Radial Bearings of Ball, Cylindrical Roller and Spherical Roller Types—Metric Design.[1, 2]

API 541-2003, Form-Wound Squirrel-Cage Induction Motors—500 Horsepower and Larger.[3]

API 546-1997, Brushless Synchronous Machines—500 KVA and Larger.

API 547-2005, General-Purpose Form-Wound Squirrel Cage Induction Motors—250 Horsepower and Larger.

ASTM B117-03, Standard Practice for Operating Salt Spray (Fog) Apparatus.[4]

IEC 60034-8, Rotating Electrical Machines—Part 8: Terminal Markings and Direction of Rotation.[5]

[1] ANSI publications are available from the Sales Department, American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036, USA (http://www.ansi.org/).
[2] ABMA publications are available from the American Bearing Manufacturers Association (ABMA), 2025 M Street, NW, Suite 800, Washington, DC 20036 (http://www.abma-dc.org/).
[3] API publications are available from the Publications Section, American Petroleum Institute, 1200 L Street NW, Washington, DC 20005, USA (http://www.api.org/).
[4] ASTM publications are available from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, USA (http://www.astm.org/).
[5] IEC publications are available from the Sales Department of the International Electrotechnical Commission, Case Postale 131, 3 rue de Varembé, CH-1211, Genève 20, Switzerland/Suisse (http://www.iec.ch/). IEC publications are also available in the United States