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IEEE Standard for Petroleum and Chemical Industry—Premium-Efficiency, Severe-Duty, Totally Enclosed Squirrel Cage Induction Motors from 0.75 kW to 370 kW (1 hp to 500 hp)

IEEE Industry Applications Society

Developed by the
Petroleum and Chemical Industry Committee

IEEE Std 841™-2021
(Revision of IEEE Std 841-2009)

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Approved 25 March 2021

IEEE SA Standards Board

Abstract: This standard applies to premium-efficiency, totally enclosed fan-cooled (TEFC) and totally enclosed non-ventilated (TENV), horizontal and vertical, single-speed, squirrel cage polyphase induction motors, 0.75 kW to 370 kW (1 hp to 500 hp), and up to 4000 V nominal, in National Electrical Manufacturers Association (NEMA) frame sizes 143T and larger, for petroleum, chemical, and other severe-duty applications (commonly referred to as premium-efficiency severe-duty motors). Excluded from the scope of this standard are motors with sleeve bearings and additional specific features required for explosion-proof motors.

Keywords: IEEE 841™, NEMA frame motors, polyphase induction motor, severe duty motors, squirrel cage motors, totally enclosed fan-cooled (TEFC) motors, totally enclosed air over (TEAO) motors, totally enclosed nonventilated (TENV) motors

The Institute of Electrical and Electronics Engineers, Inc.
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PDF: ISBN 978-1-5044-7628-7 STD24745
Print: ISBN 978-1-5044-7629-4 STDPD24745

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Introduction

This introduction is not part of IEEE Std 841-2021, IEEE Standard for Petroleum and Chemical Industry—Premium-Efficiency, Severe-Duty, Totally Enclosed Squirrel Cage Induction Motors from 0.75 kW to 370 kW (1 hp to 500 hp).

This standard applies to premium-efficiency, severe-duty, totally enclosed fan-cooled (TEFC) and totally enclosed non-ventilated (TENV), horizontal and vertical, single-speed, squirrel cage polyphase induction motors, 0.75 kW to 370 kW (1 hp to 500 hp), and up to 4000 V nominal, in National Electrical Manufacturers Association (NEMA) frame sizes 143T and larger, for petroleum, chemical, and other severe-duty applications (commonly referred to as premium-efficiency severe-duty motors). Excluded from the scope of this standard are motors with sleeve bearings and additional specific features required for explosion-proof motors.

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IEEE Standard for Petroleum and Chemical Industry—Premium-Efficiency, Severe-Duty, Totally Enclosed Squirrel Cage Induction Motors from 0.75 kW to 370 kW (1 hp to 500 hp)

1. Overview

1.1 Scope

This standard applies to premium-efficiency totally enclosed fan-cooled (TEFC) and totally enclosed non-ventilated (TENV), horizontal and vertical, single-speed, squirrel cage polyphase induction motors, 0.75 kW to 370 kW (1 hp to 500 hp), and up to 4000 V nominal, in National Electrical Manufacturers Association (NEMA) frame sizes 143T and larger, for petroleum, chemical, and other severe-duty applications (commonly referred to as premium-efficiency severe-duty motors). Excluded from the scope of this standard are motors with sleeve bearings and additional specific features required for explosion-proof motors.

1.2 Purpose

The purpose of this standard is to define a specification that deals with mechanical and electrical performance, electrical insulation systems, corrosion protection, and electrical and mechanical testing for severe-duty totally enclosed squirrel cage polyphase induction motors, 0.75 kW to 370 kW (1 hp to 500 hp), for petroleum, chemical, and other severe-duty applications (commonly referred to as premium-efficiency severe-duty motors). Many of the specified materials and components in this standard stem from experience with severely corrosive atmospheres and the necessity for safe, quiet, reliable, premium-efficiency motors.

1.3 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (*shall* equals *is required to*).[1,2]

[1]The use of the word *must* is deprecated and cannot be used when stating mandatory requirements; *must* is used only to describe unavoidable situations.
[2]The use of *will* is deprecated and cannot be used when stating mandatory requirements; *will* is only used in statements of fact.