C392-11

Testing of three-phase squirrel cage induction motors during refurbishment

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Preface

This is the first edition of CSA C392.11, *Testing of three-phase squirrel cage induction motors during refurbishment*.

CSA acknowledges that the development of this Standard was made possible, in part, by the financial support of BC Hydro, Manitoba Hydro, Natural Resources Canada (NRCan), and the Ontario Ministry of Energy and Infrastructure (OMEI).

This Standard is considered suitable for use for conformity assessment within the stated scope of the Standard.

This Standard was prepared by the Subcommittee on Motor Refurbishment, under the jurisdiction of the Technical Committee on Industrial Equipment and the Strategic Steering Committee on Performance, Energy Efficiency, and Renewables, and has been formally approved by the Technical Committee.

March 2011

(1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*

(2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*

(3) *This publication was developed by consensus, which is defined by* CSA Policy governing standardization — Code of good practice for standardization *as "substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity". It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this publication.*

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(b) provide an explanation of circumstances surrounding the actual field condition; and
(c) where possible, phrase the request in such a way that a specific "yes" or "no" answer will address the issue.
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(a) Standard designation (number);
(b) relevant clause, table, and/or figure number;
(c) wording of the proposed change; and
(d) rationale for the change.

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0 Foreword

This Standard provides guidance to electric motor service centres in verifying that the refurbishing process has maintained or enhanced the electric motor (hereafter motor) efficiency. It is also intended to provide a reliable evaluation of any changes in the condition of the motor, with respect to its efficiency, that might have resulted from its failure.

The intent of this Standard is not to prescribe which tests should be performed on any given motor requiring repairs; rather, it is to establish a consistent methodology for conducting the tests described herein. The applicability of these tests depends on the type of failure encountered, the repair work to be performed, and the need to confirm that no change in efficiency has occurred as a result of damage to the motor and its repair. The motor end user and the service centre should mutually determine which tests are applicable or useful in a given situation to establish the scope of testing during the repair process.

Motor efficiency can be depreciated by the damage caused during motor operation or failure mode. In cases where the test results do not comply with the pass/fail criteria, it is not the intent of this Standard to require that the motor be removed from service. However, the test results might assist in future repair/replace decisions and future energy conservation planning.

The tests and pass/fail criteria are standard in the motor service centre industry in North America.

There are many additional tests and inspection procedures employed when refurbishing AC motors that are not part of this Standard because they are not directly related to motor efficiency. Many of these additional tests are available in the publications referenced in Clause 2 and Annex C. Not all of these tests can or should be administered on every motor that is to be refurbished. It is the responsibility of the motor service centre in consultation with the end user to determine which tests are applicable.

The tables and calculation procedures, provided in this Standard to estimate the impact on motor nominal efficiency, contain typical data and should be used with the understanding that these procedures are estimates based on the information available and that actual results can vary.

1 Scope

This Standard covers integral horsepower, three-phase, alternating current, squirrel cage induction motors rated 200 to 13 200V at 60 Hz. This Standard also covers motors operating on variable frequency drives.

Note: *This Standard might be useful and may be applied with discretion to products outside the scope of this Standard.*

2 Reference publications

This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below, including amendments published thereto.

CSA (Canadian Standards Association)
C22.2 No. 100-04 (R2009)
Motors and generators