

An American National Standard

**IEEE Recommended Practice for
Installation, Application, Operation, and
Maintenance of Dry-Type General
Purpose Distribution and Power
Transformers**

Sponsor
**Transformers Committee
of the
IEEE Power Engineering Society**

Approved March 15, 1979
Reaffirmed December 5, 2006

IEEE-SA Standards Board

Approved September 8, 1981
Approved by ANSI March 8, 1993

American National Standards Institute

© Copyright 1982 by

The Institute of Electrical and Electronics Engineers, Inc.

345 East 47th Street, New York, NY 10017-2394, USA

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

IEEE Standards documents are developed within the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Board. Members of the committees serve voluntarily and without compensation. They are not necessarily members of the Institute. The standards developed within IEEE represent a consensus of the broad expertise on the subject within the Institute as well as those activities outside of IEEE that have expressed an interest in participating in the development of the standard.

Use of an IEEE Standard is wholly voluntary. The existence of an IEEE Standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE Standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard. Every IEEE Standard is subjected to review at least every five years for revision or reaffirmation. When a document is more than five years old and has not been reaffirmed, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of an IEEE Standard.

Comments for revision of IEEE Standards are welcome from any interested party, regardless of membership affiliation with IEEE. Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments.

Interpretations: Occasionally questions may arise regarding the meaning of portions of standards as they relate to specific applications. When the need for interpretations is brought to the attention of IEEE, the Institute will initiate action to prepare appropriate responses. Since IEEE Standards represent a consensus of all concerned interests, it is important to ensure that any interpretation has also received the concurrence of a balance of interests. For this reason, IEEE and the members of its societies and Standards Coordinating Committees are not able to provide an instant response to interpretation requests except in those cases where the matter has previously received formal consideration.

Comments on standards and requests for interpretations should be addressed to:

Secretary, IEEE Standards Board
345 East 47th Street
New York, NY 10017
USA

Foreword

(This Foreword is not a part of ANSI/IEEE C57.94-1982, IEEE Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type General Purpose Distribution and Power Transformers.)

This recommended practice is a revision of ANSI C57.94-1956, Guide for Installation and Maintenance of Dry-Type Transformers and incorporates an expansion of the subjects of installation, application, testing and operation of dry-type transformers. Nonventilated units are specifically covered and new considerations addressed include maintenance accessibility, room requirements, audible sound control and the effect of internal pressure on sealed units.

Suggestions for improvement of this recommended practice will be welcomed. They should be sent to:

Secretary
IEEE Standards Board
Institute of Electrical and Electronics Engineers
345 East 47th Street
New York, NY 10017

At the time it approved this standard, the C57 Committee had the following membership.

L. W. Long, Chair
R. E. Uptegraff, Jr, Vice Chair
L. A. Spragins, Secretary

<i>Organization Represented</i>	<i>Name of Representative</i>
Bonneville Power Administration	George W. Iliff
Electric Light and Power Group	N. Derwianka R. L. Ensign I. H. Kopenen J. P. Markey (<i>Alt</i>) B. F. Smith E. F. Villasuso
Institute of Electrical and Electronics Engineers	S. Bennon W. P. Burt J. C. Dutton Mike Holm L. W. Long D. E. Massey
National Electrical Manufacturers Association	L. C. Aicher W. R. Courtade D. C. Coulter J. D. Douglass W. C. Kendall K. R. Linsley W. J. McNutt Harrol Robin R. L. Schwab R. J. Stahara (<i>Alt</i>) R. E. Uptegraff, Jr
Naval Facilities Engineering Command	H. P. Stickley
Rural Electrification Administration	J. C. Arnold, Jr
Tennessee Valley Authority	L. R. Smith
Underwriters Laboratories	E. J. Huber R. W. Seelbach (<i>Alt</i>)
Water and Power Resources Service	S. J. Baxter
Western Area Power Administration	J. W. Teener

This recommended practice was prepared by the Working Group on Application of the Dry-Type Transformers Subcommittee of the IEEE Transformers Committee which had the following membership:

B. E. Smith, *Chair*

L. G. Ananian
S. J. Antalis
A. Bimbiris

W. B. Burt
E. C. Edwards
G. L. Gaibrois

E. F. Troy
R. E. Uptegraff, Jr
R. H. Vanderwall

When it approved this recommended practice on March 15, 1979, the IEEE Standards Board had the following membership:

Joseph L. Koepfinger, *Chair*
Irvin N. Howell, Jr, *Vice Chair*
Ivan G. Easton, *Secretary*

G. Y. R. Allen
William E. Andrus
C. N. Berglund
Edward Chellotti
Edward J. Cohen
Warren H. Cook
R. O. Duncan
Jay Forster

Harold S. Goldberg
Richard J. Gowen
H. Mark Grove
Loering M. Johnson
Irving Kolodny
W. R. Kruesi
Leon Levy

J. E. May
Donald T. Michael*
R. L. Pritchard
F. Rosa
Ralph M. Showers
J. W. Skooglund
W. E. Vannah
B. W. Whittington

*Member emeritus

CLAUSE	PAGE
1. Scope	1
1.1 Transformers Covered.....	1
1.2 Transformers Not Covered.....	1
1.3 Purpose.....	1
2. References.....	2
3. Definitions.....	3
4. Application.....	3
4.1 Fire Protection.....	3
4.2 Unusual Operating Conditions.....	3
4.3 Surge Voltage Protection	3
4.4 Environmental Considerations.....	4
4.5 Maintenance Accessibility	4
4.6 Personnel and Public Safety.....	5
4.7 Room Requirements.....	5
4.8 Outdoor Applications.....	5
4.9 Loading	6
4.10 Audible Sound Control	6
5. Installation.....	7
5.1 Visual Inspection.....	7
5.2 Handling.....	8
5.3 Grounding	8
6. Testing.....	9
6.1 General	9
6.2 Preservice Tests.....	9
6.3 Periodic Tests.....	9
6.4 Test Procedures	10
7. Operation.....	11
7.1 Safety	11
7.2 Effect of Humidity on Ventilated and Nonventilated Dry-Type Transformers.....	11
7.3 Effect of Pressure on Sealed Dry-Type Transformers.....	11
8. Maintenance	12
8.1 Periodic Inspection and Maintenance	12
8.2 Storage	13
8.3 Drying Core and Coil Assembly.....	13

An American National Standard

IEEE Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type General Purpose Distribution and Power Transformers

1. Scope

1.1 Transformers Covered

This recommended practice covers general recommendations for the application, installation, operation and maintenance of single and polyphase dry-type general purpose, distribution, power, and auto-transformers of the following types:

- 1) Ventilated, indoor and outdoor, self-cooled or forced air cooled
- 2) Nonventilated, indoor and outdoor, self-cooled or forced air cooled
- 3) Sealed, indoor and outdoor, self-cooled

1.2 Transformers Not Covered

This recommended practice does not apply to the following:

- 1) Instrument transformers
- 2) Step voltage and induction voltage regulators
- 3) Arc furnace transformers
- 4) Rectifier transformers
- 5) Specialty transformers

NOTE — Both ventilated and nonventilated transformers may be furnished with windings utilizing materials such as solid insulating material which allow or require different practices from those required in this recommended practice. In such equipment the recommendations in this recommended practice may be modified by specific manufacturer's recommendations.

1.3 Purpose

This recommended practice is intended for general use in the application, installation, operation, and maintenance of dry-type transformers manufactured in accordance with ANSI/IEEE C57.12.01-1979 [10]¹, ANSI C57.12.50-1980 [2], ANSI C57.12.51-1981 [3], ANSI C57.12.52-1981 [4] and ANSI/NEMA ST 20-1972 [13]. Familiarity with other American National Standards applying to dry-type transformers and to their protection is assumed and the provisions of those standards are indicated herein only for clarity.

¹The numbers in brackets correspond to the references listed in Section 2 of this standard.