



IEEE Standard for Environmental Assessment of Electronic Products

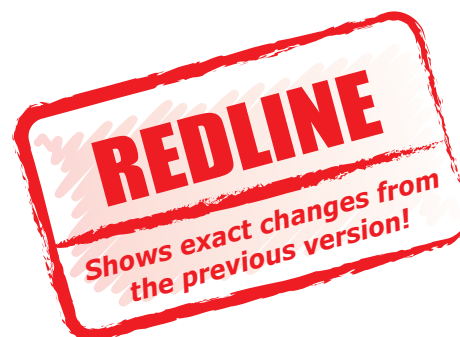
IEEE Computer Society

Sponsored by the
Environmental Assessment Standards Committee

1680TM

IEEE
3 Park Avenue
New York, NY 10016-5997, USA

5 March 2010



IEEE Std 1680TM-2009
(Revision of
(IEEE Std 1680-2006))

This is a Redline Document produced by Techstreet, a business of Thomson Reuters.

This document is intended to provide users with an indication of changes from one edition to the next. It includes a full-text version of the new document, plus an indication of changes from the previous version.

Redlines are designed to save time and improve efficiencies by using the latest software technology to find and highlight document changes. More professionals are using valuable new technologies like redlines, to help improve outcomes in a fastpaced global business world.

Because it may not be technically possible to capture all changes accurately, it is recommended that users consult previous editions as appropriate. In all cases, only the current base version of this publication is to be considered the official document.

Redline Processing Notes:

1. ~~Red Text~~ - Red strikethrough text denotes deletions.
2. Blue Text - Blue underlined text denotes modifications and additions.

IEEE Standard for Environmental Assessment of Electronic Products

Sponsor

Environmental Assessment Standards Committee
of the
IEEE Computer Society

Approved 9 December 2009

IEEE-SA Standards Board

Abstract: Guidance and implementation procedures for the IEEE 1680 family of standards is provided, and the methods by which manufacturers may declare electronic products as conforming with the standards in the IEEE 1680 family of standards and by which such conformance may be verified are defined. The standards within the family will provide clear and consistent performance criteria for the design of electronic products, thereby providing an opportunity to secure market recognition for efforts to reduce the environmental impact of electronic products. This family of standards is intended to provide a tool for government, institutional, and corporate purchasers. Product manufacturers may also use this tool to earn recognition in the consumer market, recognizing that certain criteria may not be applicable to all types of purchasers.

Keywords: computer, computer monitor, electronic product, electronic product design, environment, environmental leadership, environmental performance, notebook computer, personal computer

The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA

Copyright © 2010 by the Institute of Electrical and Electronics Engineers, Inc.
All rights reserved. Published 5 March 2010. Printed in the United States of America.

IEEE is a registered trademark in the U.S. Patent & Trademark Office, owned by the Institute of Electrical and Electronics Engineers, Incorporated.

EPEAT is a registered trademark of EPEAT, Inc.

PDF: ISBN 978-0-7381-6127-3 STD96000
Print: ISBN 978-0-7381-6128-0 STDPD96000

IEEE prohibits discrimination, harassment and bullying. For more information, visit <http://www.ieee.org/web/aboutus/whatis/policies/p9-26.html>.
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 Association (IEEE-SA) Standards Board. The IEEE develops its standards through a consensus development process, approved by the American National Standards Institute, which brings together volunteers representing varied viewpoints and interests to achieve the final product. Volunteers are not necessarily members of the Institute and serve without compensation. While the IEEE administers the process and establishes rules to promote fairness in the consensus development process, the IEEE does not independently evaluate, test, or verify the accuracy of any of the information or the soundness of any judgments contained in its standards.

Use of an IEEE Standard is wholly voluntary. The IEEE disclaims liability for any personal injury, property or other damage, of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, or reliance upon this, or any other IEEE Standard document.

The IEEE does not warrant or represent the accuracy or content of the material contained herein, and expressly disclaims any express or implied warranty, including any implied warranty of merchantability or fitness for a specific purpose, or that the use of the material contained herein is free from patent infringement. IEEE Standards documents are supplied “**AS IS.**”

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, or every ten years for stabilization. When a document is more than five years old and has not been reaffirmed, or more than ten years old and has not been stabilized, 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 any IEEE Standard.

In publishing and making this document available, the IEEE is not suggesting or rendering professional or other services for, or on behalf of, any person or entity. Nor is the IEEE undertaking to perform any duty owed by any other person or entity to another. Any person utilizing this, and any other IEEE Standards document, should rely upon his or her independent judgment in the exercise of reasonable care in any given circumstances or, as appropriate, seek the advice of a competent professional in determining the appropriateness of a given IEEE standard.

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 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. A statement, written or oral, that is not processed in accordance with the IEEE-SA Standards Board Operations Manual shall not be considered the official position of IEEE or any of its committees and shall not be considered to be, nor be relied upon as, a formal interpretation of the IEEE. At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that his or her views should be considered the personal views of that individual rather than the formal position, explanation, or interpretation of the IEEE.

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. Recommendations to change the status of a stabilized standard should include a rationale as to why a revision or withdrawal is required. Comments and recommendations on standards, and requests for interpretations should be addressed to:

Secretary, IEEE-SA Standards Board
445 Hoes Lane
Piscataway, NJ 08854
USA

Authorization to photocopy portions of any individual standard for internal or personal use is granted by The Institute of Electrical and Electronics Engineers, Inc., provided that the appropriate fee is paid to Copyright Clearance Center. To arrange for payment of licensing fee, please contact Copyright Clearance Center, Customer Service, 222 Rosewood Drive, Danvers, MA 01923 USA; +1 978 750 8400. Permission to photocopy portions of any individual standard for educational classroom use can also be obtained through the Copyright Clearance Center.

Introduction

This introduction is not part of IEEE Std 1680-2009, IEEE Standard for Environmental Assessment of Electronic Products.

This standard has been developed due to a growing demand by government, institutional, and corporate purchasers for an easy-to-use evaluation tool that allows the comparison and selection of electronic products based on environmental performance.

This standard is intended to be used by government, institutional, and corporate purchasers in the selection of electronics products based on environmental performance, and by product designers and manufacturers who wish to sell products that meet environmental performance standards to institutional purchasers. Product manufacturers may also use this tool to earn recognition in the consumer market.

Notice to users

Laws and regulations

Users of these documents should consult all applicable laws and regulations. Compliance with the provisions of this standard does not imply compliance to any applicable regulatory requirements. Implementers of the standard are responsible for observing or referring to the applicable regulatory requirements. IEEE does not, by the publication of its standards, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Copyrights

This document is copyrighted by the IEEE. It is made available for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of engineering practices and methods. By making this document available for use and adoption by public authorities and private users, the IEEE does not waive any rights in copyright to this document.

Updating of IEEE documents

Users of IEEE standards should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of amendments, corrigenda, or errata. An official IEEE document at any point in time consists of the current edition of the document together with any amendments, corrigenda, or errata then in effect. In order to determine whether a given document is the current edition and whether it has been amended through the issuance of amendments, corrigenda, or errata, visit the IEEE Standards Association web site at <http://ieeexplore.ieee.org/xpl/standards.jsp>, or contact the IEEE at the address listed previously.

For more information about the IEEE Standards Association or the IEEE standards development process, visit the IEEE-SA web site at <http://standards.ieee.org>.

Errata

Errata, if any, for this and all other standards can be accessed at the following URL: <http://standards.ieee.org/reading/ieee/updates/errata/index.html>. Users are encouraged to check this URL for errata periodically.

Interpretations

Current interpretations can be accessed at the following URL: <http://standards.ieee.org/reading/ieee/interp/index.html>.

Patents

Attention is called to the possibility that implementation of this standard may require use of subject matter covered by patent rights. By publication of this standard, no position is taken with respect to the existence or validity of any patent rights in connection therewith. The IEEE is not responsible for identifying Essential Patent Claims for which a license may be required, for conducting inquiries into the legal validity or scope of Patents Claims or determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance, if any, or in any licensing agreements are reasonable or non-discriminatory. Users of this standard are expressly advised that determination of the validity of any patent rights, and the risk of infringement of such rights, is entirely their own responsibility. Further information may be obtained from the IEEE Standards Association.

Participants

At the time this standard was submitted to the IEEE-SA Standards Board for approval, the 1680 Working Group had the following membership:

Holly Elwood, *Chair*
Wayne Rifer, *Vice Chair*

Fern Abrams
Tashweka Anderson
Darren Arola
Scott Ballantine
Marc Banks
Clifford Bast
John Bekiaris
Cate Berard
Paul Bickford
Michael Biddle
Jason Boehlke
Pamela Brody-Heine
Sandra Cannon
Don Carolla
Scot Case
Dave Cassano
Larry Chalfan
Sue Chiang
Will Cote
Emily Davis
Patricia Dillon
Ric Erdheim
Cindy Erie
Holly Evans
Faridoon Ferhut

Kathleen Fiehrer
Stacey Foreman
Gregoire Gentil
Eric Gilbert
Helen Guo
Pamela Huddleston
Mary Jacques
Wang Jing
Patrick Johnston
Anne W. Kaplan
John Katz
Christopher Kent
Michael Kirschner
Steve Kuo
Vincent Kutura
Susan D. Landry
Peter Leone
Judy Levin
Jason Linnell
Juan Lopez
Graziella Lowe
Ron Mateas
Barbara Matos
H. Scott Matthews
Catalina McGregor
Alexandra J. McPherson

Glenn Nomi
Chris O'Brien
Jeffry Omelchuck
Anne Peters
Traci Phillips
Colleen Pickford
Theodore Reichelt
Jose Reyes
Lauren Roman
Mario Rufino
Donna Sadowy
Joshua Saunders
Mark Schaffer
Steve Scherrer
Glade Squires
Toni Stein
Patrick Summers
Dani Tsuda
Lucian Turk
Bruce Turner
Sarah Westervelt
Kristie Wiedemann
Pete Wixted
Jonathan Wood
Keiko Yokoyama

The following members of the individual balloting committee voted on this standard. Balloters may have voted for approval, disapproval, or abstention.

Adewole Akpose	Werner Hoelzl	James Sanders
James Arnold	Atsushi Ito	Joshua Saunders
Clifford Bast	Mark Jaeger	Bartien Sayogo
Anne Brinkley	John Katz	Mark Schaffer
John L. Chalfan	Yuri Khersonsky	Steve Scherrer
Keith Chow	Michael Kirschner	Michael Scholles
Kevin Coggins	Steven Kuo	Stephen Schwarm
Daniel Conte	Ming-Shen Lai	Jeffrey Sisson
Geoffrey Darnton	Susan Land	Steven Smith
Paris Dieker	Susan D. Landry	Kapil Sood
Patricia Dillon	Dewitt Latimer	Roger J. Sowada
Thomas Dineen	David J. Leciston	Patrick Summers
Paul Eastman	Jose Morales	David Tepen
Holly Elwood	Robert Myers	Michael Thompson
Cindy Erie	Michael S. Newman	Thomas Tullia
Holly Evans	Jeffry Omelchuck	Lucian Turk
Faridoon Ferhut	Colleen Pickford	Bruce Turner
John Frey	Theodore Reichelt	John Walz
Mark Garvin	Wayne Rifer	Kristi Wiedemann
Stephen Greene	Robert Robinson	Forrest Wright
Randall Groves	Benjamin Rolfe	Keiko Yokoyama
John Harauz	Mario Rufino	Janusz Zalewski
	Randall Safier	

When the IEEE-SA Standards Board approved this standard on 9 December 2009, it had the following membership:

Robert M. Grow, *Chair*
Thomas Prevost, *Vice Chair*
Steve M. Mills, *Past Chair*
Judith Gorman, *Secretary*

John Barr	Alexander Gelman	David J. Law
Karen Bartleson	Jim Hughes	Ted Olsen
Victor Berman	Richard H. Hulett	Glenn Parsons
Ted Burse	Young Kyun Kim	Ronald C. Petersen
Richard DeBlasio	Joseph L. Koepfinger*	Narayanan Ramachandran
Andy Drozd	John Kulick	Jon Walter Rosdahl
Mark Epstein		Sam Sciacca

*Member Emeritus

Also included are the following nonvoting IEEE-SA Standards Board liaisons:

Howard L. Wolfman, *TAB Representative*
Michael Janezic, *NIST Representative*
Satish Aggarwal, *NRC Representative*

Lisa Perry
IEEE Standards Program Manager, Document Development

Malia Zaman
IEEE Standards Program Manager, Technical Program Development

Contents

1. Overview	1
1.1 Scope	1
1.2 Purpose	1
1.3 Application	2
1.4 Conformance with the IEEE 1680 family of standards	2
1.5 Product Registration Entity and Market Surveillance Entity	4
1.6 Verification of conformance with this standard.....	5
1.7 Qualified Verifier	5
2. Normative references.....	6
3. Definitions and special terms	6
3.1 Definitions	6
3.2 Special terms.....	7
4. Environmental performance criteria	7

IEEE Standard for Environmental Assessment of Electronic ~~Personal Computer Products, Including Laptop Personal Computers, Desktop Personal Computers, and Personal Computer Monitors~~

IMPORTANT NOTICE: This standard is not intended to ensure safety, security, health, or environmental protection in all circumstances. Implementers of the standard are responsible for determining appropriate safety, security, environmental, and health practices or regulatory requirements.

This IEEE document is made available for use subject to important notices and legal disclaimers. These notices and disclaimers appear in all publications containing this document and may be found under the heading "Important Notice" or "Important Notices and Disclaimers Concerning IEEE Documents." They can also be obtained on request from IEEE or viewed at <http://standards.ieee.org/IPR/disclaimers.html>.

1. Overview

1.1 Scope

The IEEE 1680™ family of standards defines environmental performance ~~This Standard standards- criteria for personal computer- electronic products, including desktop computers, notebook computers, and computer monitors that are marketed to institutions, and includes key concepts and implementation procedures relating to reduction or elimination of environmentally sensitive materials, materials selection, design for end of life, life cycle extension, energy conservation, end of life management, corporate performance.~~ The scope of this document is to provide guidelines and implementation procedures for the standards included in the IEEE 1680 family of standards. Each standard in the IEEE 1680 family of standards shall address criteria for a specific product or group of products in at least the following eight categories of environmental performance: reduction or elimination of environmentally sensitive materials, materials selection, design for end of life, life cycle extension, energy conservation, end-of-life management, corporate performance, and packaging.

1.2 Purpose

This standard provides guidelines and implementation procedures for this IEEE 1680 family of standards. The standards within the family will provide clear and consistent performance criteria for the design of ~~This Standard provides a clear and consistent set of personal computer products that are marketed to institutions, and provides~~ electronic products, thereby providing an opportunity to secure market recognition for efforts to reduce the environmental impact of electronic products. This family of standards is intended to provide a tool for government, institutional, and corporate purchasers. Product manufacturers may also use this tool to earn recognition in the consumer market, recognizing that certain criteria may not be applicable to all types of purchasers. Applicability will be specified in each individual standard.

The environmental performance criteria of the IEEE 1680 family of standards are intended to define a measure of environmental leadership in: the design and manufacture of ~~personal computer~~ electronic products ~~that are marketed to institutions~~; the delivery of specified services that are associated with the sale of the product ~~to institutions~~; and in associated corporate performance characteristics.

This family of standards is defined with the intention that the criteria are technically feasible to achieve, but that only products demonstrating the leading environmental performance currently available in the marketplace would meet them at the time of their adoption. As the environmental performance of products that are available in the marketplace improves, it is intended that the criteria will be updated and revised to set a higher performance standard for leadership products.

This standard is intended to serve as a baseline for further environmental standards for additional electronic products to be developed in the future. References to IEEE Std 1680 likewise reference, unless otherwise specified, the individual product standards in the IEEE 1680 family of standards.

1.3 Application

The environmental performance criteria are contained in the standards that are members of this IEEE 1680 family of standards. The principles and procedures identified in Clause 1 apply to ~~notebook personal computers, desktop personal computers, and personal computer monitors.~~ The principles and procedures identified in Clause 1, Clause 2, and Clause 3 apply to personal computer electronic products and will apply to future standards developed for additional electronic products.

Different configurations of a product, as defined in the standards in this family, may include options for processors, memory, hard disks, etc. A product, for the purpose of this family of standards, is every configuration that could be offered in a specific marketing model and chassis type. If ~~there is a specific configuration within a marketing model and chassis type that would change~~ configurations do not meet the environmental performance substantially, especially if that configuration would no longer meet a criterion criteria as declared, then the manufacturer ~~could not claim conformance to this Standard for that configuration, even if the same model in other configurations did conform to this Standard.~~ The manufacturer shall clearly report such special to the Product Registration Entity which configurations ~~that do not conform to meet the Standard to the Product Registration Entity criteria as declared.~~

A product includes ~~a desktop computer, a notebook computer or monitor,~~ an electronic product and all the peripherals that are integral to its operation. For example, the desktop computer together with the keyboard, the mouse, and the power cord would be a product.

1.4 Conformance with the IEEE 1680 family of standards

A manufacturer may designate one or more specific geographic regions, or countries, for which a product declaration is applicable. In order to ~~conform to this Standard~~ be conformant in a designated region or country, each unit of ~~a~~ the product that is sold in that region or country must satisfy all of the applicable requirements provided in Clause 4. ~~A subclause of Clause 4 is applicable to the product if the product falls within the scope of products defined by the "Applies to" section of the subclause. A product satisfies the criterion if it meets the requirement shown in the "Product Criterion" section of the subclause. The "References and Details" section of the subclause provides critical information that is valuable for interpreting the requirements of the Product Criterion. The "Verification Requirements" section of the subclause specifies the data and information that a manufacturer must supply to a Product Registration Entity if requested for verification purposes.~~ contained in the product standards in the IEEE 1680 family. The Market Surveillance Entity (MSE) will determine the regions or countries that are in the geographic scope of this family of standards to which subscribers may then declare product conformance. Those regions or countries shall be listed on the MSE's Registry.¹ The criteria in a product declaration shall consist of two types: 1) criteria that are independent of a region or country and therefore shall be declared as meeting the criteria per Clause 4 wherever sold; and 2) criteria that are dependent on a region or country, a subscriber shall declare conformance by country for each of these criteria. Clause 4 of the standard shall designate the independence or dependence of regional or country level designation as listed on the MSE's Registry. All required criteria per Clause 4 must be met in any region or country for a product declaration to be valid in that region or country.