ANSI/APSP/ICC-15 2011

Approved American National Standard

ANSI

American National Standard for

Residential Swimming Pool and Spa Energy Efficiency

Includes Addenda A
Approved January 9, 2013

APSP
The Association of Pool & Spa Professionals®

ICC INTERNATIONAL CODE COUNCIL®

ANSI/APSP/ICC-15 2011

American National Standard for Residential Swimming Pool and Spa Energy Efficiency

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Includes Addenda A
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American National Standards Institute

Addenda A to:

American National Standard for Residential Swimming Pool and Spa Energy Efficiency

Following approval by the APSP-15 Committee and the ANSI Standards Consensus Committee, and after public review, Addenda A was approved by the American National Standards Institute on January 9, 2013. The original edition of this standard was approved by the American National Standards Institute on August 11, 2011.

Each change given below is identified in the standard, by a bar in the margin with the letter (a) next to it. (a)

Summary of Changes

Page	Section	Change
6	Section 5.2.1	Revised
6	Section 5.2.1 NOTE	Revised
7	Section 5.3.2.1	Revised
7	Section 5.3.2.2	Revised
7	Section 5.4.1	Add the word *filtration*
7	Section 5.5.1	Add the word *filtration*
8	Section 5.5.1 NOTE	Add new NOTE

American National Standard

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Foreword

This Foreword is not part of the American National Standard ANSI/APSP/ICC-15 2011. It is included for information only.

Following approval by the APSP-15 Committee and the ANSI Standards Consensus Committee, and after public review, Addenda A was approved by the American National Standards Institute on January 9, 2013. The original edition of this standard was approved by the American National Standards Institute on August 11, 2011.

The objective of this voluntary standard is to provide recommended minimum guidelines for the energy efficiency of permanently installed residential aboveground/onground and inground swimming pools and inground spas. This standard is intended to meet the needs for incorporation into national or regional building codes, and also for adoption by federal, state and/or local governments, and/or as a local code or ordinance. It is understood that for the sake of applicability and enforceability, the style and format of the standard may need adjustment to meet code or ordinance style of the jurisdiction adopting this document.

The APSP does not certify, test, or endorse any product.

The recommendations and testing practices in this standard are based upon sound engineering principles, research, and field experience that, when applied properly, contribute to the delivery and installation of a safe product.

The words “safe” and “safety” are not absolutes. While the goals of this standard are to design and construct a safe, enjoyable product, it is recognized that risk factors cannot, as a practical matter, be reduced to zero in any human activity. This standard does not replace the need for good judgment and personal responsibility. In permitting use of the pool or spa by others, owners must consider the skill, attitude, training, and experience of the expected user.

As with any product, the specific recommendations for installation and use provided by the manufacturer should be carefully observed.

This standard was prepared by the APSP-15 Residential Swimming Pool and Spa Energy Efficiency Standard Writing Committee of the Association of Pool and Spa Professionals (APSP) in accordance with American National Standards Institute (ANSI) Essential Requirements: Due process requirements for American National Standards.

Consensus approval was achieved by a ballot of the balanced APSP ANSI Standards Consensus Committee below and through an ANSI Public Review process. The ANSI Public Review provided an opportunity for additional input from industry, academia, regulatory agencies, safety experts, state code and health officials, and the public at large. Inclusion in this list does not necessarily imply that the organization concurred with the submittal of the proposed standard to ANSI.

Suggestions for improvement of this standard should be sent to the Association of Pool and Spa Professionals, 2111 Eisenhower Avenue, Alexandria, VA 22314.

This standard is published in partnership with the International Code Council (ICC). ICC develops and publishes the ***International Building Code (IBC)*** and ***International Residential Code (IRC)***, which are adopted as the basis for the building codes used in most states and jurisdictions within the United States. Additionally, APSP and ICC have collaborated to develop the first comprehensive model swimming pool and spa code, known as the ***International Swimming Pool and Spa Code***. This landmark document incorporates and references material from ANSI/APSP standards and ICC’s model codes, to create a stand-alone code that is consistent with codes and standards from both organizations.

These codes and standards are the result of a joint effort between ICC and APSP as a service to both the swimming pool and spa community, and building code professionals. It is the hope of both organizations that they will lead to enhanced safety for pool and spa users around the world.

Organizations Represented

Consensus approval in accordance with ANSI procedures was achieved by ballot of the following APSP Standards Consensus Committee. Inclusion in this list does not necessarily imply that the organization concurred with the submittal of the proposed standard to ANSI.

Producers

All American Custom Pools & Spas, Inc . . . John Romano
Custom Pools, Inc . . . . . Scott Heusser
Gary Pools, Inc . . . . . Leif Zars
Hayward Industries . . . . . John O'Hare
HornerXpress South Florida . . . . . Bill Kent
Master Spas Inc . . . . . Nathan Coelho
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Royal Fiberglass Pools Inc . . . . . Tony Hebert
S.R. Smith, LLC . . . . . Bill Svendsen
Van Kirk & Sons, Inc . . . . . Don Cesarone

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American Red Cross . . . . . Connie Harvey
Con-Serv Associates, Inc . . . . . Wally James
Conroe Independent School District, TX. . . . Louis Sam Fruia
Higgins Environmental Solutions
(National Environmental Health Assoc.) . . . Florence Higgins
Walt Disney Parks and Resorts . . . . . Michael Beatty
Gene Wells Consulting . . . . . Gene Wells
Don Witte, Consultant . . . . . Don Witte
World Waterpark Association . . . . . Rick Root
Wyndham Worldwide Corporation
(American Hotel & Lodging Association) . . . Tony Mendez
YMCA of the USA . . . . . Albert Tursi

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Illinois Department of Public Health . . . . . Justin DeWitt
International Code Council. . . . . Lee Clifton
Madison County Inspection Dept., WI . . . . . Matthew Danner
N.J. Dept. of Community Affairs
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Oregon Public Health Division . . . . . Stephen Keifer
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Washington State Dept. of Health. . . . . Gary Fraser

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In accordance with American National Standards Institute (ANSI) procedures, this document will be reviewed periodically. The Association of Pool & Spa Professionals welcomes your comments and suggestions, and continues to review all APSP standards, which include:

ANSI/APSP-1 2003 Standard for Public Swimming Pools
ANSI/APSP-2 1999 Standard for Public Spas
ANSI/APSP-3 1999 Standard for Permanently Installed Residential Spas
ANSI/APSP-4 2007 Standard for Aboveground/Onground Residential Swimming Pools
ANSI/APSP/ICC-5 2011 Standard for Residential Inground Swimming Pools
ANSI/APSP-6 1999 Standard for Residential Portable Spas
ANSI/APSP-7 2006 Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Catch Basins
ANSI/APSP-8 2005 Model Barrier Code for Residential Swimming Pools, Spas and Hot Tubs
ANSI/APSP-9 2005 Standard for Aquatic Recreation Facilities
ANSI/APSP-11 2009 Standard for Water Quality in Public Pools and Spas
ANSI/APSP/ICC-14 2011 Standard for Portable Electric Spa Energy Efficiency
ANSI/APSP/ICC-15 2011 Standard for Pool and Spa Energy Efficiency
ANSI/APSP-16 2011 Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs
APSP-17 Manufactured Safety Vacuum Release Systems (SVRS) for Residential and Commercial Swimming Pool, Spa, Hot Tub, and Wading Pool Suction Systems (Draft)
APSP 2005 Workmanship Standards for Swimming Pools and Spas

APSP-15 Writing Committee

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Waterway Plastics . . . . . Ray Mirzaei
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Zodiac Pool Systems, Inc . . . . . Steve Gutai (Alt.)

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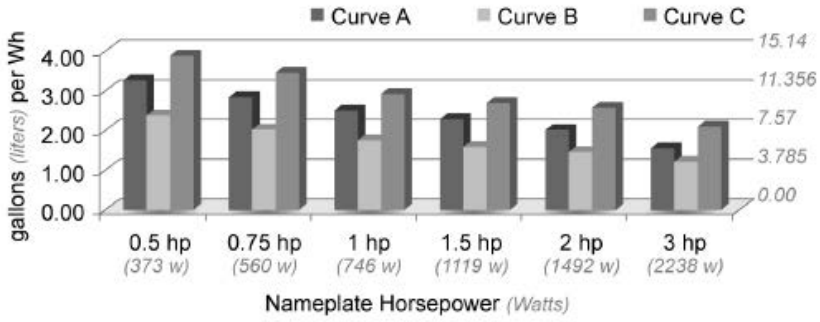
Introduction

The objective of this standard is to provide energy efficiency performance specifications for swimming pool filtration systems. It also includes minimum efficiency levels for pool and spa heaters, which are federally regulated and included in this standard for accessibility and consistency. All specifications originate from the California Energy Commission's Appliance Efficiency Regulations and Building Energy Efficiency Standard, the foundation of which are studies produced by the Davis Energy Group and Pacific Gas & Electric.

Figure i-1 Energy Factor by HP and System Curves



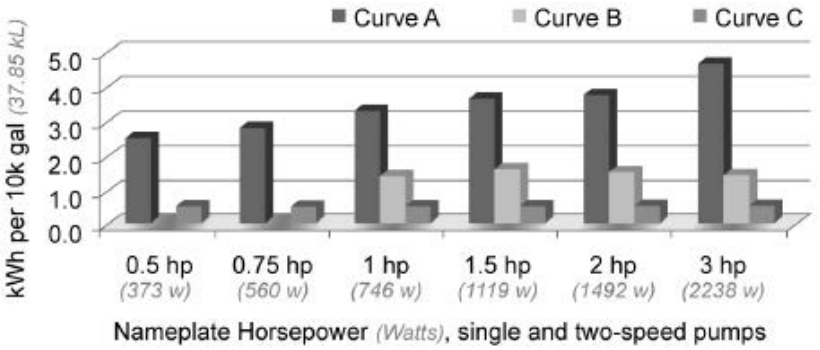
Pool filtration systems are the primary focus because they run each day, providing significant energy savings opportunities. Daily operation is an important factor in providing energy savings sufficient to recover the incremental cost associated with higher efficiency systems. Conversely, auxiliary systems, such as water features and spa therapy systems, are not covered by this standard because these systems typically operate on user demand and not a regular schedule, making energy savings and cost recovery impossible to quantify.

Pumps and pump motors have the greatest impact on overall filtration efficiency, and for this reason the manufacturer will test and report pump performance data. This data includes **energy factor,** a measure analogous to miles per gallon, where filter pump efficiency is provided in gallons per watt-hour. When filtering water is the reason for running a pump, the goal is to do so using as little energy as possible, with **energy factor** providing a good head-to-head pump efficiency comparison.

Energy factor is heavily influenced by the hydraulic characteristics of the system, with a high resistance (high pressure) system resulting in a lower energy factor as compared to a low resistance system. The lower the system resistance, or total dynamic head (TDH), the higher the energy factor. To better quantify pump performance under various operating conditions, the standard utilizes three systems, with curves A, B, and C providing a medium, high, and low TDH system on which pump performance can be compared.

Filter pump size and operating motor speed also influence energy factor, with smaller pumps and lower speeds increasing efficiency. To leverage this reality, the standard uses smaller single-speed pumps or multi-speed pumps to allow filtering the pool at lower speeds. When installed and operated based on these principles, pools can readily achieve the kind of energy savings illustrated in the Horsepower and Speed chart below. The data is based on 10,000 gallons divided by the average reported CEC Energy Factor for Curve C systems. 3450 RPM represent single-speed pumps, 1725 RPM are two-speed pumps, and 1100 RPM is a variable-speed pump with reported data at 1100 RPM.

Figure i-2 Horsepower and Speed



This standard provides uniform testing and reporting specifications for equipment manufacturers as well as design and installation specifications suitable for use by pool professionals, in building codes, and regulations. It is not a substitute for sound hydraulic design and installation, which remains the responsibility of the pool and spa professional.

Standard for Residential Swimming Pool and Spa Energy Efficiency

1 Scope

1.1 General. This standard covers energy efficiency requirements for permanently installed residential aboveground/onground and inground swimming pools and inground spas operated by the property owner and used for bathing. This standard is intended to cover certain aspects of the swimming pool filtration -system design; equipment, including pool and spa heaters; installation; and operational capabilities, for the purpose of minimizing energy consumption while maintaining water quality and temperature.

1.2 Appliances.

1.2.1 Pool filtration pump and filtration pump motors. Permanently installed aboveground/onground/inground pool filtration pump, filtration pump/motor combination, and filtration pump motors shall meet the requirements of this standard.

1.2.2 Pool filtration pump controllers. Permanently installed aboveground/onground/inground pool filtration pump controllers shall meet the requirements of this standard.

1.2.3 Pool and spa heaters. Permanently installed aboveground, onground, inground pool heaters and permanently installed inground spa heaters shall meet the requirements of this standard.

1.2.4 This standard does not cover portable electric spas, which are covered by APSP-14, Standard for Portable Electric Spa Energy Efficiency.

1.2.5 This standard does not cover pumps and pump motors installed in addition to the pool filtration pump, provided the additional pump is used exclusively for other purposes, i.e. pool cleaner booster pumps, water feature pumps, etc. This applies to auxiliary pumps that include a filter, provided the auxiliary pump filtered flow is not used and not needed to meet the pool's turnover requirements.

1.3 Inground pool systems.

1.3.1 Residential inground swimming pool circulation systems that filter and distribute the filtered water to the pool shall meet the requirements of this standard.

1.4 New and existing pools and spas.

1.4.1 All sections of this standard shall apply to new pools and spas.

1.4.2 Section 5.4 and 5.5 of this standard shall only apply to existing pools when the applicable equipment is replaced.

EXCEPTION: An appliance replaced under the manufacturer's original equipment warranty when the replacement is of the same make, model, and design efficiency.

1.5 Water quality. This standard provides specifications for energy efficient filtration systems, but does not specify sanitizer, daily turnover flow rates, or pool-cleaning technologies needed to establish and maintain water quality.

1.5.1 Water clarity. The clarity of the water shall be maintained such that the suction outlet cover (main drain) is visible from the pool deck at all times. For pools and spas without drains clarity can be checked using another visual aid, such as a brush or net positioned in the deepest water.

1.5.2 Water sanitation. Disinfection shall be provided in accordance with manufacturers' instructions by a chemical or other process that provides a residual effect in the water that can be measured by portable field test equipment. For additional guidance see Appendices A, B, and D.

1.5.3 Turnover flow rate. Water clarity shall be maintained in accordance with Section 1.5.1 by providing a turnover flow rate sufficient to keep pace with the rate at which debris enters the water. Storms and frequent use increase debris loading and may require additional turnovers per day. For additional guidance see Appendix C: Filtration, Circulation, and Water Clarity.

NOTE: Pool and spa clarity is maintained by removing suspended solids through the process of serial dilution, where an equivalent volume of pool or spa water is passed through the filter multiple times. Four turns will capture approximately 98% of the suspended solids, and it takes another 6 turns, 10 turns in total, to capture 99.99%.

1.6 This standard does not cover swimming pool safety requirements related to issues including, but not limited to, suction entrapment, structural, thermal, or electrical hazards.

1.6.1 Suction entrapment avoidance. When used, submerged suction outlet safety systems shall be installed and maintained in accordance with the latest published version of ANSI/APSP-7, Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Catch Basins. For additional guidance see Appendix I: Entrapment Avoidance.

1.7 Other standards are referenced in this standard for items not covered above.