

American National Standard

ASSE 1090-2020



Performance Requirements for
**Drinking Water Atmospheric
Water Generators (AWG)**

ASSE Board Approved: July 2020

ANSI Approved: July 2020

ICS Code: 13 060 20



General Information

Neither this standard, nor any portion thereof, may be reproduced without the written consent of ASSE International.

No product may be said to be ASSE listed unless the manufacturer has received approval from ASSE International and the product is listed in ASSE's online directory. Instructions for receiving the authorization to display the ASSE Seal are available from the ASSE International Office. Organizations wishing to adopt or list any ASSE standard should print the ASSE standard number on the cover page first and in equal or larger type to that of the adopting or listing organization.

ASSE International
Mokena, Illinois
Copyright © 2020
All rights reserved.

Foreword

This foreword shall not be considered a part of the standard; however, it is offered to provide background information.

ASSE standards are developed in the interest of consumer safety.

Water conservation continues to be an important role for the plumbing and water treatment industry. As major droughts and deteriorating access to safe drinking water continue to affect countries around the world, new technologies continue to emerge to provide safe drinking water. Products that produce drinking water by using humidity as the source are now being used in the market. Creating a product safety standard to help ensure these products produce potable water is desired by the water treatment industry.

Atmospheric water generation (AWG), water-from-air, becomes a real source of water supply in places where tap-water is not available, or the quality of the tap water does not meet the consumer's requirements. To become a source of drinking water, the water-from-air (atmospheric water generation) should meet two primary criteria:

- 1) The water should be produced for a reasonable cost so that it's affordable to the user. The cost of the water is based on the energy efficiency of the atmospheric water generator system — electrical energy consumption per liter of water produced.
- 2) The water quality produced by the atmospheric water generator shall be safe to consumers.

Recognition is made of the time volunteered by members of the working group and of the support of the manufacturers who also participated in the meetings for this standard.

This standard does not imply ASSE's endorsement of a product which conforms to these requirements. Compliance with this standard does not imply acceptance by any code body.

It is recommended that these systems be installed consistent with local codes by qualified and trained professionals. It is recommended that these systems be installed and maintained per the manufacturer's instructions.

This standard was promulgated in accordance with procedures developed by the American National Standards Institute (ANSI).

2020 Product Standards Committee

Tsan-Liang Su, PhD, Chairperson

*Stevens Institute of Technology
Hoboken, NJ*

Karl Abrahamson

*Saint Paul Department of Safety
and Inspections
Cottage Grove, MN*

Brian Andersen

*C.J. Erickson Plumbing Co.
Manhattan, IL*

William Briggs Jr.

*JB&B
New York, NY*

Terry Burger

*NSF International
Cleveland, OH*

William Chapin

*Professional Code Consulting, LLC
Cullman, AL*

Mark E. Fish

*Zurn Industries, LLC
Cary, NC*

Ron George

*Plumb-Tech Design & Consulting Services LLC
Newport, MI*

Mark Gibeault

*Kohler Company
Kohler, WI*

Daniel Gleiberman

*Sloan
Los Angeles, CA*

Brandon Gunnell

*Precision Plumbing Products
Portland, OR*

Chris Haldiman

*Watts Water Technologies
Springfield, MO*

John F. Higdon, P.E.

*Supply Source Solutions
Matthews, NC*

Jim Kendzel

*American Supply Association
Minneapolis, MN*

Ramiro Mata

*American Society of Plumbing
Engineers (ASPE)
Mentor, OH*

Robert Neff

*Delta Faucet
Pendleton, IN*

Thomas Pitcherello

*State of New Jersey
Bordentown, NJ*

Daniel Rademacher

*Plumbing Code and Design Consulting
Butte, MT*

Shabbir Rawalpindiwala

*Kohler Company
Kohler, WI*

Billy Smith

*American Society of Plumbing
Engineers (ASPE)
Montgomery, AL*

Chris White (non-voting)

*ASSE International
Mokena, IL*

ASSE 1090 Working Group

Stanislav Ratner, Chairperson

*Watergen
Rishon LeZion, Israel*

David Kuo

*Water Harvesting, Inc.
Santa Ana, CA*

Sal Aridi

*IAPMO R&T
Ontario, CA*

Tsan-Liang Su, PhD

*Stevens Institute of Technology
Hoboken, NJ*

Mike Blumenstein

*NSF International
Ann Arbor, MI*

Tom Palkon (non-voting)

*IAPMO R&T
Mokena, IL*

Frank Brigano

*Marmon Water
St. Paul, MN*

Tim Reising (non-voting)

*ASSE International
Chicago, IL*

Terry Burger

*NSF International
Cleveland, OH*

Frank Slovenec

*Water Harvesting, Inc
Santa Ana, CA*

Mary Conley Eggert

*Global Water Works
Libertyville, IL*

Scott Tudor

*Water Technologies International
Stuart, FL*

Ron Dorfman

*Skywell, LLC
Santa Monica, CA*

Roland Wahlgren

*Atmoswater Research
Ottawa, Canada*

Eugene Kapustin

*Water Harvesting, Inc.
Santa Ana, CA*

Chris White (non-voting)

*ASSE International
Mokena, IL*

Table of Contents

Section I	1
1.0 General	1
1.1 Application	1
1.2 Scope	1
1.3 Reference Documents	1
Section II	3
2.0 Test Specimens and Test Laboratory	3
2.1 Samples Submitted	3
2.2 Samples Tested	3
2.3 Drawings	3
2.4 Rejection	3
Section III	4
3.0 Performance Requirements and Compliance Testing	4
3.1 Drinking Water Production Rate	4
3.2 Fill Volume and Automatic Shut Off for Tank-Style Systems	4
3.3 Energy Efficiency – Drinking Water Produced per Energy Consumed	5
3.4 Backflow Protection	5
3.5 Microbiological Safe Drinking Water Requirement	5
Table 1	6
3.6 Chemical Reduction Performance Testing of Filters Included in the System’s Design	6
3.7 Life Cycling for Systems with Upstream Connections to Potable Water	6
Section IV	7
4.0 Detailed Requirements	7
4.1 Materials Extraction Testing and Formulation Review	7
4.2 Documentation	8
4.3 Markings of Systems	8
Section V	9
5.0 Definitions.....	9

Performance Requirements for Drinking Water Atmospheric Water Generators (AWG)

Section I

1.0 General

1.1 Application

Atmospheric water generators are intended to be used to produce drinking water. Typical applications include areas where water is scarce or where water supplies are of unknown water quality.

1.2 Scope

1.2.1 Description

This standard has been created to test point of use and commercial drinking water generating systems that are designed to create potable water from humidity. Critical components of these systems include a condenser, storage tank and disinfection control techniques to address microbiological water contamination.

This standard is not intended to verify chemical, particulate or other water purity claims made by the manufacturer.

Systems may include filtration to reduce chemical and particulate water contamination.

Proper design shall include consideration for the energy efficiency of the atmospheric water generator.

1.2.2 Connections

Pipe threads and other connections shall conform to the applicable standards and local codes.

1.2.3 Potable Connection

A potable water connection inlet is optional for when the water demand exceeds the production rate of air-to-water generation.

1.2.4 Temperature Range

Product water may be produced or dispensed at any temperature.

1.3 Reference Documents

Referenced industry standards shall be to the revision stated below.

- AHAM/ANSI DH-1-2008, *Dehumidifiers*
- ASSE 1087-2018, *Performance Requirements for Commercial and Food Service Water Treatment Equipment Utilizing Drinking Water*
- EPA 418.1, *Petroleum Hydrocarbons (Spectrophotometric, Infrared) 1978*
- IAPMO PS 65-2019, *Airgap Units for Water Conditioning Installation*