AHRI Guideline F (I-P)

2015 Guideline for

Selection, Installation and Servicing of Residential Humidifiers

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Note:

This guideline supersedes AHRI Guideline F-2008.

For SI ratings, see AHRI Guideline F (SI) – 2015.

Price $10.00 (M) $20.00 (NM)
Printed in U.S.A.

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TABLE OF CONTENTS

SECTION		PAGE
Section 1.	Purpose	1
Section 2.	Scope	1
Section 3.	Definitions	1
Section 4.	Factors Affecting Humidification Load	2
Section 5.	Humidification Load Determination	3
Section 6.	Residential Humidifier Selection	6
Section 7.	Installation Best Practices	8
Section 8.	Servicing Best Practices	10

TABLES

Table 1.	Humidification Load Required, gal/day	4
Table 2.	Correction Factor for Other Indoor Temperatures and RH Conditions	4
Table 3.	Selection Based on Water Types and Hardness	6

APPENDICES

Appendix A.	References – Normative	11
Appendix B.	References – Informative	11
Appendix C.	Periodic Maintenance Checklist – Informative	12

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SELECTION, INSTALLATION AND SERVICING OF RESIDENTIAL HUMIDIFIERS

Section 1. Purpose

1.1 *Purpose.* The purpose of this guideline is to establish, for residential Humidifiers: definitions; factors affecting Humidification Loads; determination of Humidification Load; equipment selection; installation practices; and servicing practices.

1.1.1 *Intent.* This guideline is intended for the guidance of the industry, including manufacturers, engineers, installers, contractors and users.

1.1.2 *Review and Amendment.* This guideline is subject to review and amendment as technology advances.

Section 2. Scope

2.1 *Scope.* This guideline applies to Central System and Self-contained Humidifiers, as defined in AHRI Standards 610 (I-P) and 620 (I-P), installed in residential and small commercial applications.

Section 3. Definitions

All terms in this document will follow the standard industry definitions in the ASHRAE Terminology Site (https://www.ashrae.org/resources--publications/free-resources/ashrae-terminology) unless otherwise defined in this section.

3.1 *Humidifier.* A device used to add moisture to the air.

3.1.1 *Central System Humidifier.* A type of Humidifier that adds moisture to the air stream of a central air system. It may be mounted in or on the following:

3.1.1.1 Return air duct
3.1.1.2 Return air plenum
3.1.1.3 Supply air duct
3.1.1.4 Supply air plenum
3.1.1.5 By-pass (supply to return)
3.1.1.6 Heating or cooling central air system

3.1.2 *Self-contained Humidifier.* A type of Humidifier intended for installation independent of a central air system. Self-contained humidifiers may or may not be installed directly within the humidified space. Note this may also be referred to as Self-contained Humidifier for Residential Application.

3.2 *Humidification Capacity.* The maximum amount of humidity that a humidifier can add to the air, expressed in gal/day or lbs/hr.

3.3 *Humidification Load.* The amount of water that needs to be added to the air by the humidifier in order to satisfy the conditions desired in the space expressed in gal/day, or lb/hr.

3.4 *Humidifier Types.* Different kinds of Self-contained Humidifiers for Residential Application.

3.4.1 *Atomizing Humidifier.* Humidifiers which disperse or spray a fine mist of liquid water directly into the air. Some examples of Atomizing Humidifiers are centrifugal, nozzle, and ultrasonic.

3.4.2 *Heated Tank Humidifier.* Humidifiers which use electricity, gas, or another energy source to boil water into steam. The steam is then dispersed directly into the conditioned space or into a ducted airstream. Some examples of Heat Tank Humidifiers include electric and electrode.

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3.4.3 *Wetted Media Humidifier.* A type of Humidifier intended for duct applications in which water passes over media placed in the air stream. As the air passes through the wetted media, water evaporates increasing the moisture content of the air stream. The water not evaporated is drained, retained in the reservoir, or returned to a tank for recirculation. Some examples of Wetted Media Humidifiers are wetted pad and rotating drum.

3.5 *Rating Conditions.* A fixed set of environmental conditions which lead to a given level of performance. Varying these conditions will result in varying humidifier performance

3.5.1 *Standard Rating Conditions.* A set of Rating Conditions that are standardized and used as the basis of comparison for performance characteristics.

3.6 *Should.* "Should" is used to indicate provisions which are not mandatory but which are desirable as good practice.

3.7 *Water Characteristics*.

3.7.1 Water *Types.*

3.7.1.1 *Potable Water*. Domestic water from a municipal or well source that meets standards for consumption. May also be referred to as tap water or municipal water.

3.7.1.2 *Softened Water*. Water that has been conditioned by the ion exchange process (commonly referred to as a water softener) to exchange calcium and magnesium ions with sodium or potassium ions.

3.7.1.3 *Demineralized Water*. Water which is largely free from particles and dissolved substances having a conductivity below 0.2 micro-Siemens per centimeter (μS/cm). This includes deionized (DI) and reverse osmosis (RO) water, and distilled water.

3.7.1.4 *Untreated Water*. Water from a rainfall, river, or lake source that has not been treated. Untreated water is not suitable for use in most humidifiers.

3.7.2 *Water Hardness.* The amount of dissolved minerals (e.g., calcium, iron, magnesium, and sodium) that are naturally present in the water and are expressed in grains/gal or ppm. Hardness in water contributes to the formation of mineral scaling inside of humidifiers and may affect the performance of the humidifier.

3.7.2.1 *Naturally Soft Water.* Water with a dissolved solid content usually below 3.5 grains/gal or 60 ppm.

3.7.2.2 *Moderate Hard Water.* Water with a dissolved solid content of 3.5 to less than 7.0 grains/gal or 60 to less than 120 ppm.

3.7.2.3 *Hard Water.* Water with a dissolved solid content of 7.0 to 10.5 grains/gal or 120 to 180 ppm.

3.7.2.4 *Very Hard Water.* Water with a solid content of more than 10.5 grains/gal or 180 ppm.

Section 4. Factors Affecting Humidification Load

4.1 *General.* The following should be used as a basis for estimating the Humidification Load required:

4.1.1 Outdoor design conditions

4.1.2 Indoor design conditions

4.1.3 Size and physical characteristics of residence

4.1.3.1 Conditioned space volume

4.1.3.2 Tightness of structure, insulation, storm windows and doors or equivalent, etc.

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