(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

ASHRAE Standard 174 provides a method of test for rating the overall performance of desiccant-based dehumidification equipment. Desiccant-based systems are typically designed with moisture removal as their primary function and deliver air at lower dew points than typical air-conditioning systems. Accordingly, this method of test has been developed to assist in the measurement and documentation of variables needed to establish moisture-removal capacity per unit of energy. It is intended for equipment incorporating additional energy transfer devices that fall outside the scope of ANSI/ASHRAE Standard 139, Method of Test for Rating Desiccant Dehumidifiers Utilizing Heat for the Regeneration Process.

Appendices to this standard are included for information purposes only and provide methods for comparing the performance of the desiccant dehumidification equipment to unitary air-conditioning equipment employing electric reheat as a means for reducing the sensible heat ratio of the cooling output. Typical air-conditioning equipment is rated at higher temperature and humidity ratios than are found in desiccant systems, requiring that comparative operational modes for air-conditioning systems vary from their normal rating conditions. A rating standard prepared by an appropriate trade association that specifies standard rating conditions for desiccant-based dehumidifier products would be an ideal companion document to this ASHRAE method-of-test standard.

1. PURPOSE

This standard provides test methods for rating the performance of desiccant-based dehumidification equipment.

2. SCOPE

This method of test applies to dehumidification equipment operating at atmospheric pressure and using desiccants combined with other components to dehumidify air.

3. DEFINITIONS AND NOMENCLATURE

This section defines important terms according to how they are used in this standard and explains the symbols and units used.

3.1 Definitions

apparatus: the facilities and the instrumentation specified in this standard to test the equipment.

dehumidifier system: equipment that uses desiccant-based components, combined with other components within the equipment, to achieve a reduction in the absolute humidity of air. The equipment may include components for precooling or preheating and/or for postcooling or postheating of air.

desiccant: a material that removes moisture by a sorption process.

discharge air: the airstream that is discharged from the equipment to outdoor air.

equipment: the hardware that is subjected to the tests of this standard.

heat energy: the energy input to the equipment in the form of fuels (natural gas, oil, or other combustible fuels), noncombustible heating fluids involving phase change (for example, steam), or single-phase fluids (for example, water).

mode: an option of operation that is determined by the sources of the inlet airstreams to the equipment and the destinations of the exit airstreams from the equipment.

outdoor air: the airstream that is delivered to the equipment from the outdoor ambient.

outdoor air percentage: the proportion of the supply air total, expressed as a decimal, that entered the equipment as outdoor air.

return air: the airstream that is delivered to the equipment from the conditioned space.

sensible heat ratio: an air-conditioning system performance parameter that identifies the fraction of the total cooling capacity that reduces sensible heat.

shall: a term used to indicate provisions that are mandatory if compliance with the standard is claimed.

should: a term used to indicate provisions that are not mandatory but desirable as good practice in this standard.

supply air: conditioned air that is discharged from the equipment. It may be derived from return air only, outdoor air only, or a mixture of both return and outdoor air.

3.2 Nomenclature

C_p	=	specific heat of liquid in Btu/lb·°F (kJ/kg·°C)
E	=	exhaust operating mode
f_s	=	adjustment factor used in the determination of W_s
h_d	=	enthalpy, discharge air to ambient, Btu/lb (kJ/kg) of dry air
h_i	=	enthalpy, outdoor air at the outdoor inlet, Btu/lb (kJ/kg) of dry air
h_o	=	enthalpy, outdoor air at the outdoor inlet, Btu/lb (kJ/kg) of dry air
h_r	=	enthalpy, return air at the return air inlet, Btu/lb (kJ/kg) of dry air
h_s	=	enthalpy, supply air at the supply outlet, Btu/lb (kJ/kg) of dry air
h_{ae}	=	enthalpy, inlet hot air, Btu/lb (kJ/kg) of dry air
h_{al}	=	enthalpy, outlet hot air, Btu/lb (kJ/kg) of dry air
$\dot{m}$	=	mass flow of liquid over test interval, lb/s (kg/s)
p	=	standard barometric pressure, psia (kPa)
$p_{ws(o)}$	=	saturation pressure, outdoor air, psia (kPa)
$p_{ws(r)}$	=	saturation pressure, return air, psia (kPa)
$p_{ws(s)}$	=	saturation pressure, supply air, psia (kPa)
P_e	=	electric power input, dehumidifier system, W
Q_l	=	latent cooling capacity, Btu/h (kJ/s)