AS 2913—1987

Australian Standard®

EVAPORATIVE AIR–CONDITIONING EQUIPMENT

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The following interests are represented on Committee ME/44:

Air Conditioning and Mechanical Contractors of South Australia

Air Conditioning and Refrigeration Equipment Manufacturers Association of Australia

Australian Electrical and Electronic Manufacturers Association Limited

Australian Institute of Refrigeration Air Conditioning and Heating (Inc.)

Capricornia Electricity Board

Department of Housing and Construction, South Australia

Electricity Supply Association of Australia

Institution of Engineers Australia

Refrigeration and Air Conditioning Contractors Association of New South Wales

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PREFACE

This standard was prepared by the Association's Committee on Evaporative Air Coolers at the request of the Air Conditioning and Refrigeration Equipment Manufacturers Association of Australia to fill a need to standardize the methods of determining the data that would be used as product information. That Association also prepared and submitted a proposal, from which this standard was developed.

The fundamental purpose of this standard is to ensure that the data published in relation to any particular equipment are sufficiently accurate to ensure that equipment can be selected correctly for the individual application. The information required for proper selection concerns the unit's airflow, its cooling efficiency, its electrical power consumption, and its sound power output, and appropriate methods for the determination of each are described. Established techniques already exist for airflow and acoustical measurements, so this standard makes reference to them.

The airflow tests are conducted with the evaporation medium dry. This is not the actual condition of use, but there was no real alternative. Because of the length of outlet measurement duct required, downward–discharge units cannot be tested in the normal upright position but must be turned horizontal, in which case the wetting provisions are inoperable. If vertical units must be tested dry, then so must all units, to be consistent. The discrepancy is not great, being of the order of 2 percent or 3 percent, and in any case the results are used mainly for comparison, so there is little real problem as all units are tested on the same basis. An important condition is that the evaporation efficiency tests must be done with the same evaporation pads as were in place for the airflow test; this should offset the effect of variations from pad to pad.

Cooling efficiency is expressed in terms of evaporation efficiency which although well established has some shortcomings which must be understood. Testing must be done within fairly narrow ambient temperature and humidity conditions, because it is not possible to correct from other conditions with adequate repeatability. Further, the result of the test is not repeatable over a period of time, because the best available evaporator media are subject to gradual change of condition, so that a test when new cannot be repeated exactly when the evaporator pad has aged.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
EVAPORATIVE AIR-CONDITIONING EQUIPMENT

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard prescribes a basis for rating specified features of evaporative air-conditioning equipment, and specifies the test procedures and equipment applicable for each form of rating. It also prescribes basic requirements for construction.

1.2 REFERENCED DOCUMENTS. The following documents are referred to in this standard:

AS 1861	Refrigerated Room Air Conditioners
AS 3100	Approval and Test Specification for Definitions and General Requirements for Electrical Materials and Equipment
AS XXXX	Corrosion of Metals — Dissimilar Metals in Contact in Various Environments*
BS 848	Fans for General Purposes Part 1 — Methods of Testing Performance
ASHRAE 41.1-74	Standard Measurement Guide — Section on Temperature Measurements
ASHRAE 41.6-82	Standard Method for Measurement of Moist Air Properties

1.3 DEFINITIONS. For the purpose of this standard, the following definitions apply:

1.3.1 Airflow — the rate of air discharged into the conditioned space, expressed as a volume per unit time, corrected to standard temperature and pressure.

1.3.2 Bleed-off — a device which allows for a controlled continuous run-off to waste of part of the circulated water of an evaporative air-conditioner, the purpose being to maintain an acceptable low concentration of dissolved solids.

1.3.3 Evaporative air-conditioning equipment — a device which cools air by the evaporation of water.

1.3.4 Evaporation medium — a medium, device, or arrangement by which air is brought into intimate contact with water and is cooled by the evaporation of the water.

1.3.5 Free discharge — an operating condition in which the evaporative air-conditioner is installed without any external system resistance, i.e. without any duct work, registers, or air control devices.

1.3.6 Evaporation efficiency — a measure of the cooling performance of the equipment, representing the extent to which the available wet-bulb depression will be achieved as a dry-bulb temperature drop.

1.3.7 Type tests — tests performed on a single representative appliance to establish whether the type of appliance represented is capable of complying with the stated requirements. Results of type tests are assumed to apply to production units of the same type, provided that they are functionally identical with the sample tested.

1.3.8 Wet-bulb depression — the difference between the dry-bulb temperature and the wet-bulb temperature of air.

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* In course of preparation.