

Australian Standard®

**Outdoor weathering of plastics in
the Australian environment**

Part 1: Commercial products

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Bureau of Meteorology

CSIRO, Division of Building, Construction and Engineering

Plastics Institute of Australia

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Part 1: Commercial products

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PREFACE

This Standard was prepared by the Standards Australia Committee on Methods of Testing Plastics as the first part of a general Standard to revise and supersede AS CK24, *Code of practice for outdoor weathering of plastics in the Australian environment, Part 1: Commercial products*.

This Standard introduces a zoning system for four different levels of global radiation throughout Australia. A subgrading of these zones into climatic areas is then given. A technique for siting exposure racks is also provided.

The method of exposure recommended is intended to provide an exposure that is typical of the most severe conditions likely to be encountered in service for given climatic conditions.

The Standard should not be used as the basis of a guarantee of performance; however it may be used to indicate that the assessment of weathering has been carried out by a standard method.

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STANDARDS AUSTRALIA

Australian Standard

Outdoor weathering of plastics in the Australian environment

Part 1: Commercial products

1 SCOPE. This Standard describes the recommended practice for exposure of commercial plastics products to the Australian environment and specifies the climatic conditions in which specimens of those products are to be exposed to obtain compliance with the Standard. Methods of reporting and interpreting results are recommended.

This Standard is applicable to methods and procedures to determine the suitability of plastics products for outdoor service in defined climatic areas. It is not applicable to the exposure of plastics specimens for the purpose of obtaining design data, or for other research or development purposes.

2 REFERENCED DOCUMENTS. The following documents are referred to in this Standard:

AS	
1327	Standard environments for conditioning and testing plastics materials
1745	Code of practice for outdoor weathering of plastics
1745.2	Part 2: Guide for design purposes
ISO	
105	Textiles—Tests for colour fastness
105-A02	Part A02: Grey scale for assessing change in colour
ASTM	
D 659	Method of evaluating degree of chalking of exterior paints
D 1042	Test method for linear dimensional changes of plastics
D 1535	Method for specifying colour by the Munsell system
D 2244	Standard method for calculation of colour differences from instrumentally measured colour coordinates

Bulletin No. 8 of the Department of Transport and Construction—Sunshine and Shade in Australia—1983.

3 DEFINITIONS. For the purpose of this Standard, the definitions below apply.

3.1 General.

3.1.1 Australia—the Australian States, Northern Territory and the Australian Capital Territory.

3.1.2 Trial—the entire procedure of preparation, exposure and testing of a series of specimens.

3.1.3 Test—the procedure of determining some property or characteristic of an exposed or control specimen.

3.2 Specimens.

3.2.1 Control specimens—specimens retained in the dark under nominated room conditions and used

for determining initial property values and for comparison with exposed specimens. Specimens selected as controls are identical with those that are to be exposed.

3.2.2 Reference specimens—specimens of known outdoor performance that are exposed simultaneously with, and under identical conditions to, the specimens under study to provide comparative weathering data.

3.2.3 Specimens—plastics commercial products or exposure specimens cut from commercial products.

3.3 Climatic.

3.3.1 Weathering elements—the main climatic factors that affect changes in plastic materials when exposed outdoors are global radiation, wetness and elevated temperatures. Another factor, only significant in very restricted areas of Australia, is temperature, if consistently below 0°C.

3.3.2 Global radiation.

3.3.2.1 Mean daily global radiation—the mean daily solar irradiation per unit area incident on a horizontal plane at the earth's surface, over a stated number of complete years.

NOTE: The unit usually used is megajoules per square metre.

3.3.2.2 Total global radiation—the product of the mean daily global radiation and the number of days duration of exposure.

NOTE: The unit usually used is megajoules per square metre.

3.3.3 Global radiation zones—geographical areas based on Figure 1 and classified in Table 1.

**TABLE 1
AUSTRALIAN GLOBAL RADIATION ZONES**

Zone	Mean daily global radiation MJ/m ²
A	>21.6
B	>18.0 ≤21.6
C	>14.4 ≤18.0
D	≤14.4

3.3.4 Median annual rainfall—the annual rainfall that is exceeded by exactly half of the annual totals.

NOTES:

1. Rainfall is usually measured in millimetres.
2. The median is used in this Standard instead of the mean because annual rainfall totals frequently show markedly skewed distribution.
3. Mean annual rainfall is sometimes termed average annual or normal annual rainfall. Mean annual rainfall is computed by totalling annual values over a number of years and dividing the total by the number of years.

3.3.5 Rainfall sub-zones — geographical areas based on Figure 2 and classified in Table 2.

3.3.6 Alpine zone — the relatively small geographical areas which are classified on the basis of altitude and region (see Table 3). These areas experience daily minimum temperature below 0°C for much of the year.

TABLE 2
AUSTRALIAN RAINFALL SUB-ZONES

Sub-zone	Median annual rainfall mm
1	> 1200
2	> 400 ≤ 1200
3	≤ 400

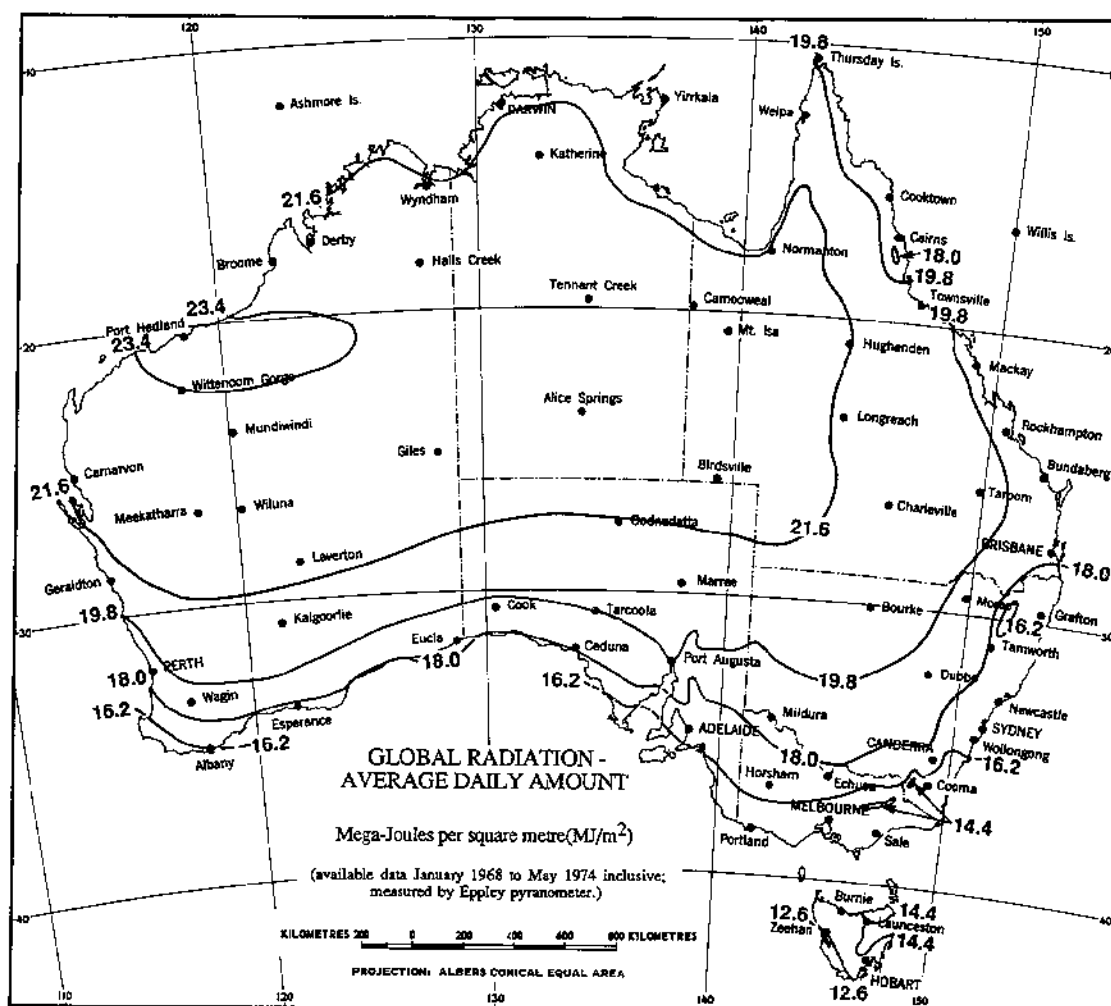


FIGURE 1 MEAN DAILY GLOBAL RADIATION

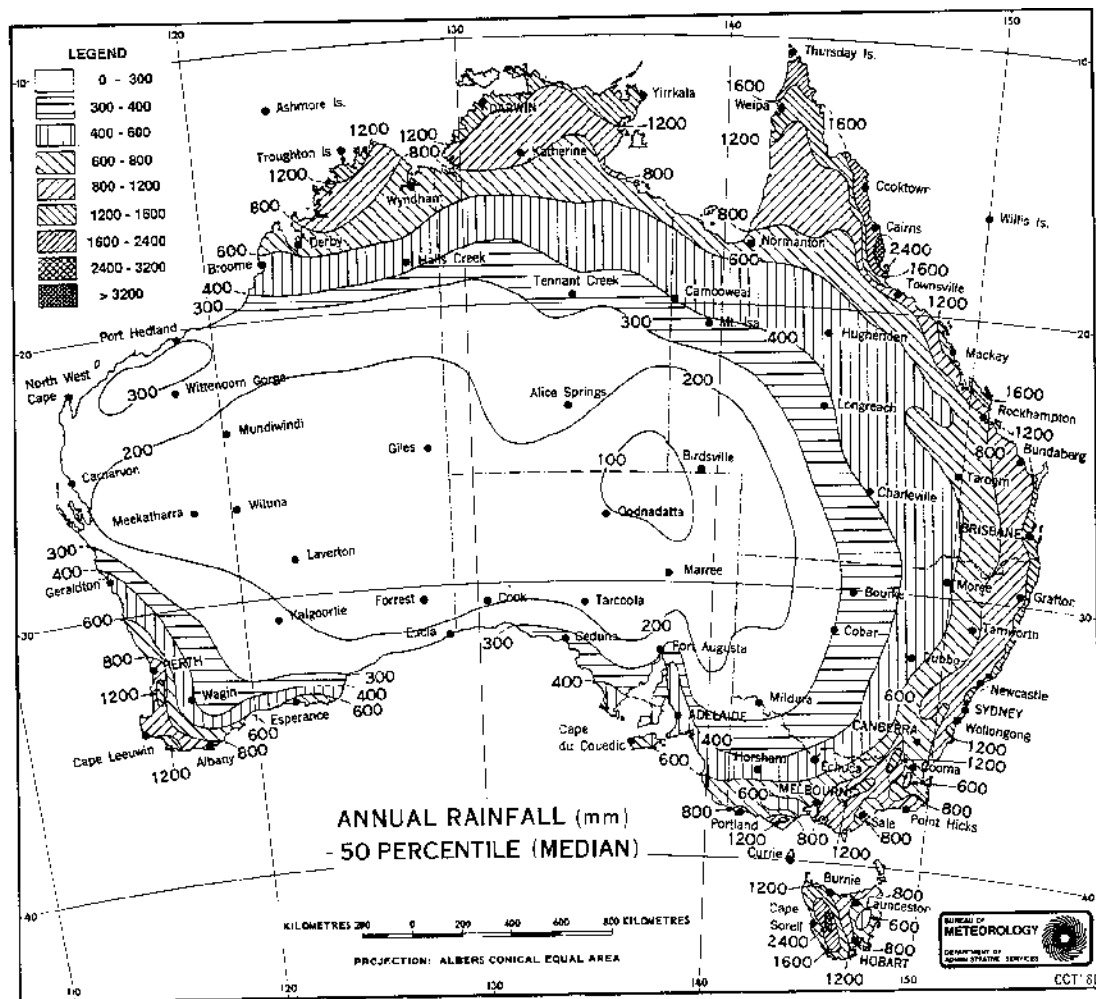


FIGURE 2 MEDIAN ANNUAL RAINFALL