

AS 1428.4—1992

Australian Standard®

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## **Design for access and mobility**

### **Part 4: Tactile ground surface indicators for the orientation of people with vision impairment**

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This Australian Standard was prepared by Committee ME/64, Access for People with Disabilities. It was approved on behalf of the Council of Standards Australia on 20 December 1991 and published on 16 April 1992.

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The following interests are represented on Committee ME/64:

Access Australia  
ACROD  
Australian Chamber of Manufactures  
Australian Council on the Ageing  
Australian National Council of and for the Blind  
Australian Uniform Building Regulations Coordinating Council  
Building Owners and Managers Association of Australia  
Department of Administrative Services—Australian Construction Services  
Department of Housing, New South Wales  
Department of Local Government, Queensland  
Master Builders Construction and Housing Association, Australia  
National Committee of Independent Living Centres  
Royal Australian Institute of Architects  
Royal Melbourne Institute of Technology  
South Australian Department of Housing and Construction  
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Additional interests participating in preparation of Standard:

Association for the Blind, Victoria  
Royal Blind Society, New South Wales  
Royal Society for the Blind, South Australia  
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## PREFACE

This Standard was prepared by the Standards Australia Committee on Access for People with Disabilities.

The ground surface indicators proposed in this Standard are designed to give warning of hazards, and directional information to pedestrians who are blind or who have impaired vision, through contact by foot or cane with the ground surface.

The design and installation requirements have been based on research on the ability of people who are blind or who have vision impairments to locate indicators and identify patterns on them, to be published in a report titled *A performance evaluation of selected tactile tiles under consideration for use by the vision impaired in Australia* (see Foreword).

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## FOREWORD\*

Blind pedestrians are subject to a wide range of possible dangers and inconveniences when travelling alone. Fortunately, many of these can be avoided through the use of communication systems which do not depend on vision.

Auditory information allows for communication at a distance, and can readily replace visual clues in some situations (e.g. audible traffic signals can substitute for visual ‘Walk’ and ‘Don’t Walk’ signals). Still, there are many situations in which auditory information is either impractical or inadequate.

Tactile information is another satisfactory alternative for communication in selected cases. Blind people who use long canes can profit from tactile information which is detectable either by their canes or underfoot, and blind people who do not use canes can still profit from underfoot information.

In Japan, several types of tactile tiles have been installed in thousands of locations, and these tiles are used to communicate a variety of messages. As a group, these tiles are usually called ‘braille tiles’ (although they have nothing to do with the symbol system commonly called ‘braille’). Some other Oriental and European countries have also installed braille tiles in selected locations.

However, despite the fact that braille tiles have been installed in many locations over the past 15 years, there are at least three reasons why evaluation of their usefulness is important before recommendations concerning installation of new locations are made:

- (a) Study of the value of the tiles in communicating with blind pedestrians in any locale has been quite limited.
- (b) ‘Braille tile’ is a generic term which represents several different specific styles of tile, some of which may be more valuable than others in some applications.
- (c) The orientation and mobility training and habits of blind pedestrians in different parts of the world may contribute to different levels of performance by blind pedestrians who contact braille tiles.

*A performance evaluation of selected tactile tiles under consideration for use by the vision impaired in Australia* presents the results of several studies of the performance of a group of blind volunteers who attempted to detect selected tactile tiles, and their opinions relative to these tiles. The purpose of the study was to provide objective information on the probable value of specific tiles in particular installations. The three types of tiles evaluated were dome tiles, pathway tiles and braille road rivets.

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\* From the introduction to *A performance evaluation of selected tactile tiles under consideration for use by the vision impaired in Australia*, A.F. Peck, Boston College; M. Tauchi, Japan National Rehabilitation Centre; T. Murakami, Tokyo Metropolitan Rehabilitation Centre; M. Okhura, Seikei University.

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**Design for access and mobility**

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Part 4: Tactile ground surface indicators for the  
orientation of people with vision impairment

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**1 SCOPE** This Standard specifies requirements for the design and installation of tactile indicators for use on ground or floor surfaces to assist the mobility of people with vision impairment.

NOTE: Guidance on the type and installation of raised pavement markers to delineate pedestrian crossing areas are included in Appendix A and on the general installation layout of tactile ground surface indicators in Appendix B.

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

**AS**

- 1428 Design for access and mobility
- 1428.1 Part 1: General requirements—Buildings
- 1428.2 Part 2: Enhanced and additional requirements—Buildings and facilities
- 1683 Methods of test for elastomers
- 1683.4 Method 4: Density of vulcanized rubber
- 1683.11 Method 11: Tension testing of vulcanized rubber
- 1683.12 Method 12: Tear resistance of vulcanized rubber
- 1683.15.2 Method 15.2: Durometer hardness
- 1683.21 Method 21: Rubber – Vulcanized – Determination of abrasion resistance using a rotating cylindrical device
- 1683.23 Method 23: Rubber – Vulcanized – Determination of resistance to liquids
- 1683.24 Method 24: Rubber – Vulcanized – Determination of resistance to ozone cracking – Static strain test
- 1742 Manual of uniform traffic control devices
- 1742.10 Part 10: Pedestrian control and protection

**ASTM**

- D 573 Test method for rubber – Deterioration in an air oven
- D 575 Test methods for rubber properties in compression

**3 DEFINITIONS** For the purpose of this Standard, the definitions given in AS 1428.1 and those below apply.

**3.1 Tactile indicators** – patterned modules which may be individual tiles, or strips of modules.

**3.2 Directional pattern (elongated pattern)** – a pattern that indicates the direction of travel to be taken.

**3.3 Warning pattern (dot pattern)** – a pattern that indicates a potential hazard or a change of direction.

**4 MATERIALS**

**4.1 Tactile indicators for outdoor applications** Tactile indicators for outdoor applications shall have a low rate of degradability, shall not be susceptible to fading by UV light, or to chipping, and shall be slip-resistant when wet or dry.

**4.2 Tactile indicators made from natural or synthetic rubbers** Tactile indicators made from natural or synthetic rubbers shall comply with the test criteria shown in Table 1.

**5 DESIGN REQUIREMENTS**

**5.1 Tactile indicators warning of hazards** Tactile indicators warning of hazards shall be Type A as shown in Figure 1 or Type B as shown in Figure 2.

NOTE: Type B is preferable for use in wet areas.

**5.2 Tactile indicators for directional guidance** Tactile indicators for directional guidance shall be Type C as shown in Figure 3.

**TABLE 1**  
**TEST METHODS AND CRITERIA FOR TACTILE INDICATORS MADE FROM**  
**NATURAL OR SYNTHETIC RUBBER**

| Test                            | Method              | Test criteria                                                                                                |                                                             |
|---------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
|                                 |                     | Before ageing in accordance with ASTM D 573 for 96 h at 70°C                                                 | Change after ageing                                         |
| Tensile strength                | AS 1683.11          | Not less than 6 MPa                                                                                          | Not more than $\pm 30\%$ from the original tensile strength |
| Elongation of material at break | AS 1683.11          | Not less than 180%                                                                                           | Not more than $-30\%$ from the original measurement         |
| Tear strength                   | AS 1683.12          | Not less than 20 kg/cm                                                                                       | Within $\pm 30\%$ of the original measurement               |
| Hardness                        | AS 1683.15.2 Type A | A median hardness of $70 \pm 5^\circ$                                                                        | Not more than $\pm 5^\circ$ from the original hardness      |
| Compressibility                 | ASTM D 575          | The deflection of the specimen expressed as a percentage of the original thickness – no more than 36%        |                                                             |
| Density (specific gravity)      | AS 1683.4           | The mean density of the material – $1.40 \pm 0.10 \text{ t/m}^3$                                             |                                                             |
| Wear resistance                 | AS 1683.21          | The relative volume loss – not more than $150 \text{ mm}^3$                                                  |                                                             |
| Effect of water                 | AS 1683.23          | Following immersion in water for 168 h at $23 \pm 2^\circ\text{C}$ , length change – not more than 5%        |                                                             |
| Ozone resistance                | AS 1683.24          | Following testing for 72 h, 50 p.p.h.m. (by volume) ozone at $40^\circ\text{C}$ , there shall be no cracking |                                                             |

## 6 INSTALLATION REQUIREMENTS

**6.1 General requirements** Tactile indicators shall comply with the following requirements:

- (a) Tactile indicators shall have a colour contrast to that of the adjacent surface. The colour shall provide a luminance contrast to the surrounding surface of not less than 0.3 (30%).

NOTE: A person with limited vision needs this contrast to detect the module visually.

- (b) Where tactile indicators warning of a hazard are required on ground or floor surfaces, the indicators shall be Type A or Type B (see Figures 1 and 2).
- (c) Type A or Type B indicators shall be installed across the path of travel, at right angles to the hazard. The minimum length of the indicator, measured at right angles to the hazard, shall be 600 mm. Except for railway stations, wharves and the like (see Clauses 6.7 and 6.8), the edge of the indicator adjacent to the hazard shall be set back from the hazard a distance of  $300 \pm 10 \text{ mm}$ .
- (d) Where direction of travel indicators are required on ground or floor surfaces, Type C indicators shall be laid in the direction of travel (see Figure 3).
- (e) Type C indicators used to form a path of travel shall be centred on the line of travel and have a minimum length and width of 300 mm.

Where Type C indicators are used in conjunction with Type A or Type B indicators to give direction of travel to negotiate an obstacle or danger, the Type C indicators directly adjacent to the Type A or Type B indicators shall have a minimum width of 600 mm and a minimum length of 300 mm.

- (f) Type C indicators shall be provided with drainage gaps through the raised ribs. These gaps shall have a width of  $10 \pm 2 \text{ mm}$  and be located not more than 600 mm apart.
- (g) Indicators shall be laid so that there is no likelihood of edges lifting.
- (h) The abutment of any surface shall be such that there is no step or ledge of more than 3 mm.

In addition to the general requirements noted above, specific installation requirements for particular applications are provided in Clauses 6.2 to 6.9 as follows:

- (i) Stairways, escalators and ramps (see Clause 6.2).
- (ii) Kerb and step ramps (see Clause 6.3).
- (iii) Car park crossings (see Clause 6.4).
- (iv) Vehicle pick-up areas (see Clause 6.5).
- (v) Railway platforms (see Clause 6.6).
- (vi) Passenger wharves (see Clause 6.7).
- (vii) Overhead hazards (see Clause 6.8).
- (viii) Change of direction (see Clause 6.9).

**6.2 Tactile indicators at stairways, escalators and ramps** Type A or Type B indicators shall be provided at both the top and bottom of stairways, escalators and ramps, as shown in Figure 4. The indicators shall have a minimum length of  $600 \pm 10 \text{ mm}$  except at landings in enclosed stairways and at escalators where the length may be reduced to not less than 300 mm.

NOTE: Tactile indicators for directional guidance may also be provided.