

**Pedestrian Slip Resistance
Testing to AS/NZS 3661.1: 1993
for Acuflo Industries Ltd**

S.M. Potter

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S.M. Potter

Opus International Consultants Limited
Central Laboratories
Hutt Park Road
PO Box 30 845, Lower Hutt
New Zealand

Telephone: +64 4 587 0600
Facsimile: +64 4 587 0604

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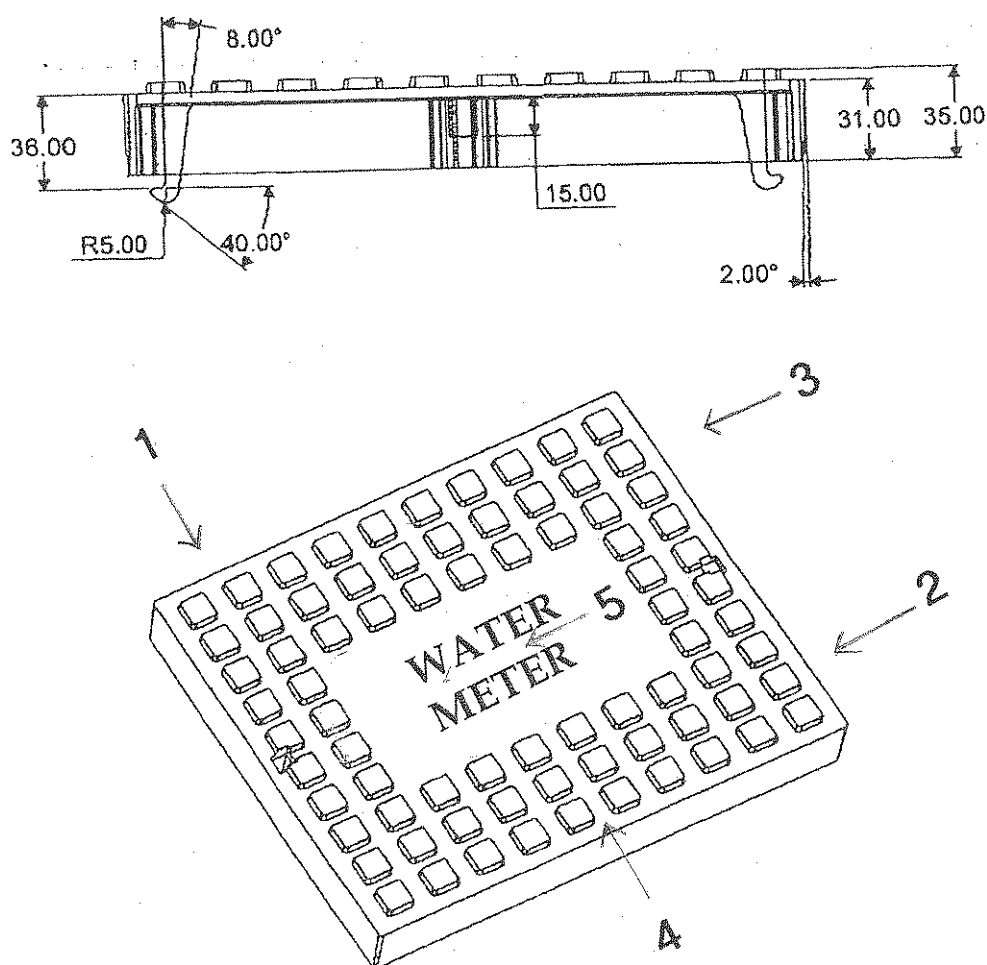
CLIENT: Acuflo Industries Ltd
PO Box 660
Levin

CONTACT: Ewan Patterson
Phone: 06 368 4996
Fax: 06 367 9201

1 MATERIALS TESTED

One sample each comprising 5 specimens was supplied by the client for testing. It was stated to be Acuflo Meter Box Lids and was given Central Laboratories Sample Number 7/00/35.

Specimen numbers 1-3 were blue in colour with the word 'water' embossed in the central area, numbers 4 and 5 were black with the words 'water meter' as shown in the diagram below.



2 TESTS USED AND BASIS FOR INTERPRETATION

The testing that was applied was in accordance with the joint Australian and New Zealand standard AS/NZS 3661.1 : 1993 "Slip Resistance of Pedestrian Surfaces, Part 1 Requirements". The scope of the standard states that these test methods are appropriate to determine the characteristics of surface materials either in the laboratory, under conditions in which the surface materials are intended to be installed, or in situ following installation. The test method is selected on the basis of whether the material is to be used in either a wet or dry area. The client requested that the material be tested for the wet condition. The test method is set out in Appendix A of the standard, namely the pendulum friction tester for the wet condition. A brief description of the instrument is as follows.

The TRRL Pendulum (pendulum friction tester) has a rigid swinging arm approximately 450 mm long which contacts the surface with a spring loaded slider about 75 x 20 mm in size, at a speed of about 2 m/sec. This slider is of a specially designed rubber material (Simulated Standard Shoe Sole, the 4S rubber) so that the instrument delivers, as far as possible, a response which is representative of a "typical" pedestrian wearing suitable footwear. This instrument is regarded as equating the action of pedestrians running, hurrying or turning abruptly as, when wet, it replicates the aquaplaning effect which is particularly pronounced on smooth or highly glazed surfaces.

AS/NZS 3661.2:1994 gives guidance on the selection of surface materials. It gives examples of factors, which should be considered, for example:

- a) Anticipated amount and type of pedestrian traffic and the effect of wear on its required life.
NOTE: Consider type of traffic, strollers, people in a hurry, children running, the elderly and people with disabilities.
- b) Mechanical strength of surface and subsurface to withstand anticipated wheel pressure loading of vehicles and conveyance devices, or static loading if anticipated.
- c) Adequate gripping of floor covering to subsurface to minimise slipping. For example, runners and throw rugs can be hazardous if not properly secured.
- d) Grading and adequate drainage of surfaces on which spillage may be anticipated and for disposal of liquid cleaners. Preferably, spillages should be prevented by trapping and drainage at source.
- e) Resistance of materials to chemicals and other contaminants.
- f) Compatibility with cleaning materials and, where required, capability of meeting hygiene requirements.
- g) Provision of slip-resistant nosings and treads on stairs and fitting on handrails.
- h) Ramps, where provided, shall be designed in accordance with the relevant building regulations.
- i) Areas which are normally wet (e.g. bath tubs, showers, pools and surrounds) require special provisions for slip resistance.

The results described within this test report are only for the samples tested. The client should determine the extent to which the samples tested is representative of their materials.

3. FRICTION REQUIREMENTS OF SURFACES

Friction requirements of surfaces as defined in AS/NZS3661.1 are:

Coefficient of Friction – Wet: When tested in accordance with the method set out in Appendix A, the pedestrian surface shall have a mean coefficient of friction of not less than 0.4 and no specimen in that sample shall be less than 0.35.

Coefficient of Friction – Dry: When tested in accordance with the method set out in Appendix B, the pedestrian surface shall have a mean coefficient of friction of not less than 0.4 and no specimen in that sample shall be less than 0.35.

Note: It would generally be expected that surfaces which have been shown to comply with the wet requirement would also comply with the dry requirement.

Ramps and Other Sloped Areas

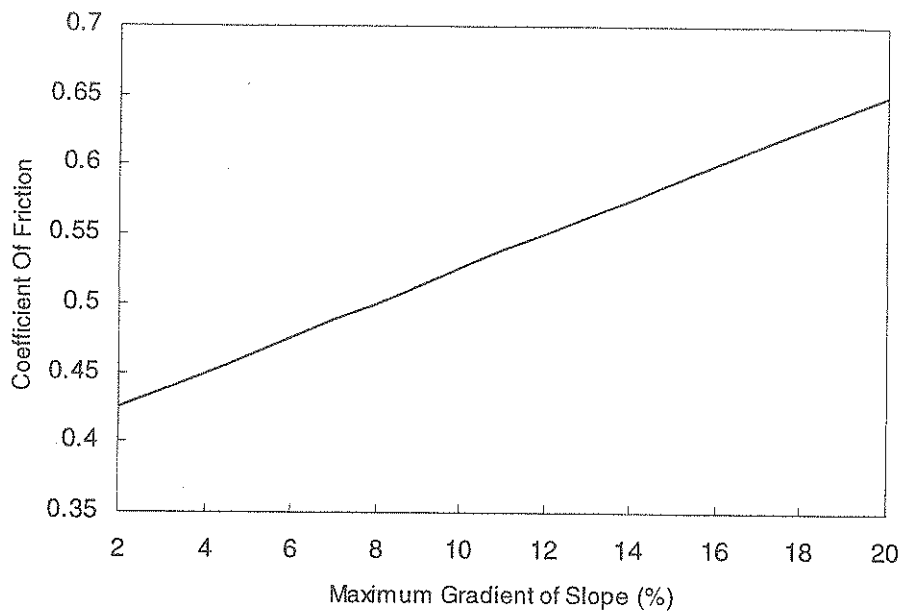
For all sloped or graded surfaces with a gradient not less than 2%, the minimum required value for the coefficient of friction of either wet or dry surfaces as specified above shall be increased in accordance with the following equation, expressed to an accuracy of 0.01:

$$\mu_m = \frac{100\mu + M}{100 - M\mu}$$

where

- μ_m = coefficient of friction required for a sloped surface
- μ = coefficient of friction obtained on a horizontal surface
- M = maximum gradient of slope, in percent

This equation is represented in graphical form following:



Coefficient of Friction Required for a Sloped Surface,
Calculated for $\mu = 0.4$

For example, a surface with a slope of 8% would require a coefficient of friction of 0.5.

Compliance with the slip resistant performance of NZBC D1.3.3(d) may be verified by confirming that the walking surface, under the expected conditions of use, has a coefficient of friction (μ) of no less than

$$\mu = 0.4 + 0.0125S$$

where S is the slope of the walking surface expressed as a percentage.

4. RESULTS

The results are reported on the following test report 00-527916.37.

The Standard states that the test used may not apply to heavily profiled surfaces such as the water meter cover. However subjective tests carried out by two experienced Central Laboratories' staff concurred with the British Pendulum results.

Prepared By



S.M. POTTER
Technical Officer

April 2000

Reviewed By



V.K. DRAVITZKI
Research Manager
(Materials and Environmental Science)



CENTRAL LABORATORIES
Hutt Park Road, Gracefield
P O Box 30-845, Lower Hutt, New Zealand
Phone (04) 568-3119, Fax (04) 568-3169

PEDESTRIAN SLIP RESISTANCE TEST REPORT NO 00-527916.37

Client: Acuflo Industries Ltd
Client's Reference: Order 716817
Sample No: 7/00/35
Specimen Size: 260mm x 210mm
No. of Locations Tested: 5

Tested By: *[Signature]*
Date: *5/4/00*
Checked By: *[Signature]*
Date: *17/4/00*

DESCRIPTION OF SAMPLE SUPPLIED BY CLIENT

Manufacturer: E S Plastic Ltd, Hamilton
Surface Type: Studded
Colour: 3 x Blue, 2 x Black
Surface Coating : Nil

Material Type: Polypropylene P340J
Common Name: Acuflo Meter Box Lid

METHOD

Tests were carried out according to AS/NZS 3661.1 : 1993 Slip Resistance of Pedestrian Surfaces, Part 1 – Requirements, Appendix A "Method for the Measurement of the Coefficient of Friction of Wet Surfaces".

Type of Test: Unfixed

Location of Test: Central Laboratories

- ☒ A4 preparation for laboratory testing
☐ A5 preparation for in situ testing

Air Temperature: 20°C

Relative Humidity: 65%

RESULTS

Appendix A: Wet Surfaces

| Specimen No. | Test Direction | Mean Coefficient of Friction |
|--------------------------------------|--------------------|------------------------------|
| 7/00/35 -1 | See diagram page 2 | 0.54 |
| 7/00/35 -2 | See diagram page 2 | 0.74 |
| 7/00/35 -3 | See diagram page 2 | 0.59 |
| 7/00/35 -4 | See diagram page 2 | 0.64 |
| 7/00/35 -5 | See diagram page 2 | 0.57 |
| Sample Mean Coefficient of Friction: | | 0.62 |

REQUIREMENTS

See Page 3 of test report, 00-527916.37

Comments: