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**Laboratory Test Report**

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Report No.: 08CA48596-00  
Date Issued: 18 September 2008

**SUBJECT:** Pipetite Pneumatic Grommets  
Models: 6mm, 8mm, 10mm and 12mm

**REQUESTED BY:** Lake Products Ltd  
15 Woodson Place  
Glenfield  
Auckland  
New Zealand

**INSTRUCTIONS:** Test for compliance with AS 60529:2004 “Degrees of protection provided by enclosures (IP code)” for an IP66/IP68 Rating.

**CONTENTS:** General  
Test Specification  
Date of test  
Description  
Results: AS 60529:2004

**SUMMARY:** All test results in this report in relation to the Pipetite Pneumatic Grommets, 6mm, 8mm, 10mm and 12mm confirmed that the specimens Complied with the relevant provisions of AS 60529:2004 for an IP66/IP68 Rating.

APPROVED BY:

Christopher Bennetts  
IANZ Signatory

TESTED BY:

Christopher Olds  
Engineer

## GENERAL

- a) As detailed in this report, one specimen each of the Pipetite Pneumatic Grommets, 6mm, 8mm, 10mm and 12mm was received for testing. These grommets were mounted in an IP66 rated enclosure by the customer.
- b) The results detailed in this report relate only to the specimens submitted by the customer.
- c) The specimens were tested for compliance with AS 60529:2004 as requested by the customer for a rating of IP66/IP68.
- d) All testing was carried out under the following environmental conditions, unless otherwise noted:

Ambient temperature: 15°C to 35°C  
Relative humidity: 30% to 60%  
Atmospheric pressure : 86 kPa to 106 kPa.

- e) Note: N/R means Not Relevant to design assessed. , N/T = Not Tested at manufacturer's request. EUT = Equipment Under Test, DNC = Did Not Comply.
- f) The reported expanded uncertainties ( $U$ ) listed below are based on standard uncertainties multiplied by a coverage factor  $k = 2$ , and define an interval  $\pm U$  providing a level of confidence of approximately 95%. The uncertainty calculations have been carried out in accordance with IANZ requirements.

(i) Flow rate (water) 1 - 100 l/min  $\pm 5\%$

## TEST SPECIFICATION

Australian Standard AS 60529:2004 "Degrees of Protection provided by enclosures (IP Code)."

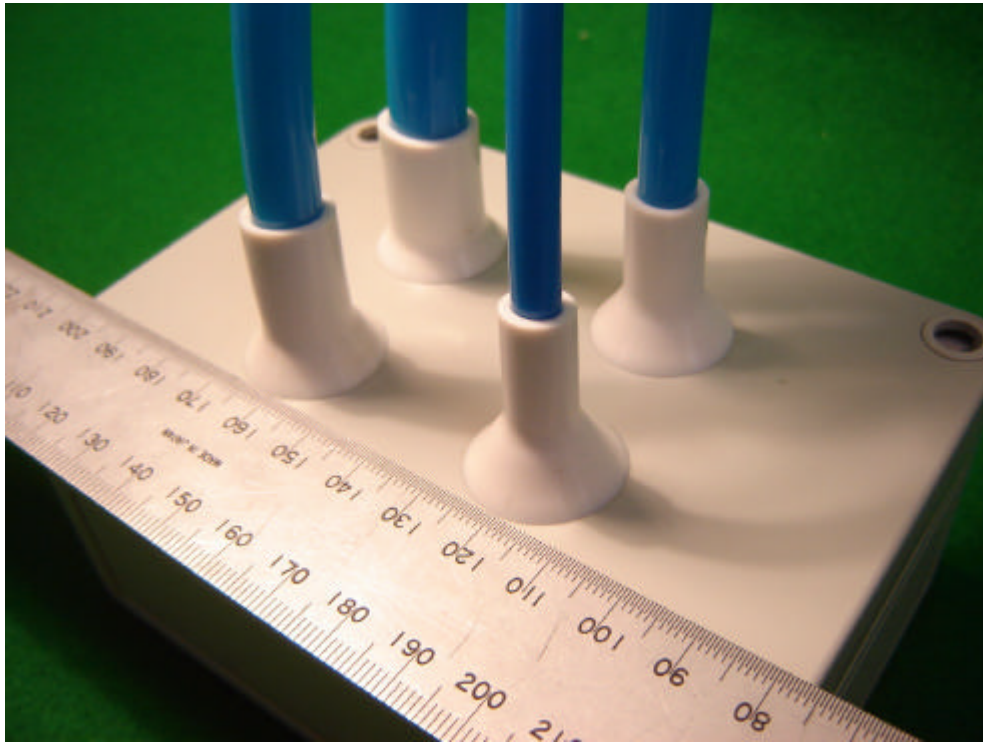
(Including No Amendments)

This specification was applicable at the time of testing.

## DATE OF TEST

Testing was completed on 17 September 2008.





**Pipetite Pneumatic Grommets, 6mm, 8mm, 10mm and 12mm: Overall View**



**Pipetite Pneumatic Grommets, 6mm, 8mm, 10mm and 12mm: Internal View**

**RESULTS: AS 60529:2004 “Degrees of protection provided by enclosures (IP code)”.**

CLAUSE 1 SCOPE AND OBJECT Applied

CLAUSE 2 NORMATIVE REFERENCES Noted

CLAUSE 3 DEFINITIONS Noted

CLAUSE 4 DESIGNATIONS Noted

CLAUSE 5 DEGREES OF PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS AND AGAINST SOLID FOREIGN OBJECTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL Noted

The first characteristic numeral indicates that the enclosure provides protection of persons against access to hazardous parts and simultaneously the enclosure provides protection of equipment against the ingress of solid foreign objects.

Enclosures designated IP 6X are protected against access to hazardous parts with a wire and are ‘dust-tight’.

CLAUSE 6 DEGREES OF PROTECTION AGAINST INGRESS OF WATER INDICATED BY THE SECOND CHARACTERISTIC NUMERAL Noted

The second characteristic numeral indicates the degree of protection provided by enclosures with respect to harmful effects on the equipment due to the ingress of water.

Enclosures designated IP X6 are protected against powerful water jets.

Enclosures designated IP X8 are protected against the effects of continuous immersion in water.

CLAUSE 7 DEGREES OF PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS INDICATED BY THE ADDITIONAL LETTER N/R

CLAUSE 8 SUPPLEMENTARY LETTERS N/R

CLAUSE 9 EXAMPLES OF DESIGNATIONS WITH THE IP CODE Noted

CLAUSE 10 MARKING Noted

CLAUSE 11 GENERAL REQUIREMENTS FOR TESTS Applied

Recommended atmospheric conditions during the tests are as follows:

Temperature range: 15°C to 35°C  
Relative humidity: 25% to 75%  
Air pressure: 86 kPa to 106 kPa

CLAUSE 12 TESTS FOR PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL Complied

Clause 12.1 Access probes Applied

Clause 12.2 Test conditions Applied

The 1 mm probe was applied to the samples.

Clause 12.3 Acceptance conditions Complied

The full diameter of the probe did not pass through any opening.

CLAUSE 13 TESTS FOR PROTECTION AGAINST SOLID FOREIGN OBJECTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL Complied

Clause 13.1 Test means Applied

Testing was conducted in the dust chamber.

Clause 13.2 Test conditions for first characteristic numerals 1, 2, 3, 4 Applied

The 1 mm probe was pushed against the samples with a force of 1 N  $\pm$  10%.

Clause 13.3 Acceptance conditions for first characteristic numerals 1, 2, 3, 4 Complied

The full diameter of the probe did not pass through any opening.

Clause 13.4 Dust test for first characteristic numerals 5 & 6 Applied

A pump was used to continuously circulate the talcum powder in the chamber. The samples were designated Category 1. A vacuum pressure of 20 mbar was applied to the enclosure, resulting in no air flow through the grommets.

The vacuum and dust circulation were applied for a duration of 8 hrs.

Clause 13.5 Special conditions for first characteristic numeral 5 N/R

Clause 13.6 Special conditions for first characteristic numeral 6 Complied

Following testing the enclosure was disassembled for inspection. No dust was found inside the enclosure.

CLAUSE 14 TESTS FOR PROTECTION AGAINST WATER INDICATED BY THE SECOND CHARACTERISTIC NUMERAL Complied

Clause 14.1 Test means Applied

Testing was conducted using a water jet nozzle and pump and an immersion tank.

Clause 14.2 Test conditions Applied

The water temperature did not differ by more than 5 K from the temperature of the specimens.

Clause 14.2.1 Test for second characteristic numeral 1 with the drip box N/R

Clause 14.2.2 Test for second characteristic numeral 2 with the drip box N/R

Clause 14.2.3 Test for second characteristic numeral 3 with oscillating tube or spray nozzle  $\pm 60$  degrees from vertical N/R

Clause 14.2.4 Test for second characteristic numeral 4 with oscillating tube or spray nozzle  $\pm 180$  degrees N/R

Clause 14.2.5 Test for second characteristic numeral 5 with the 6.3 mm nozzle N/R

Clause 14.2.6 Test for second characteristic numeral 6 with the 12.5 mm nozzle Applied

The water pump and 12.5 mm diameter nozzle were used for this test. Flow rate was 100 l/min  $\pm 5\%$ . The water jet was applied from all practicable directions at a distance of between 2.5 m and 3.0 m.

Test duration was 3 minutes per sample.

Clause 14.2.7 Test for second characteristic numeral 7 temporary immersion between 0.15 m and 1 m N/R

Clause 14.2.8 Test for second characteristic numeral 8: continuous immersion subject to agreement Applied

An immersion tank was used for this test. The enclosure was completely immersed in its normal operation orientation so that the grommets were 1800 mm below the surface of the water.

Test duration was 30 min.



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Clause 14.3 Acceptance conditions

Complied

Following testing the enclosure was disassembled for inspection. No water was found to have entered through the grommets.

CLAUSE 15 TEST FOR PROTECTION AGAINST ACCESS TO  
HAZARDOUS PARTS AS INDICATED BY THE ADDITIONAL LETTER

N/R

**END OF REPORT**