

Australian/New Zealand Standard®

Methods of test for PVC pipes and fittings

Method 11: Method for high temperature stress-relief testing of fittings

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee PL/21 on Unplasticized PVC Pipe.

METHOD

1 SCOPE This Method sets out the procedure for detecting inclusions, voids, lack of fusion along weld lines, and residual stresses resulting from the moulding process.

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

AS

1984 Vernier callipers (metric series)

2101 Internal micrometers (including stick micrometers) (metric series)

2102 Micrometer callipers for external measurement

3 PRINCIPLE A complete fitting is heated in a hot air oven at 150°C. After removal and cooling, the fitting is examined for defects.

4 APPARATUS The following apparatus is required:

- (a) *Hot air oven*—capable of maintaining and controlling an air temperature of $150 \pm 4^\circ\text{C}$.
- (b) *Mercury-in-glass thermometer*—of appropriate temperature range graduated at intervals of 2°C or smaller, and capable of indicating the test temperature to an accuracy of $\pm 2^\circ\text{C}$.
- (c) *Micrometer*—complying with AS 2101 or AS 2102, as applicable, or vernier callipers complying with AS 1984.

Other suitable temperature indicating instruments, which can be shown to provide an accuracy of the same or higher degree, may be used.

5 TEST SPECIMEN The test specimen shall be a complete moulding.

6 PROCEDURE The test procedure shall be as follows:

- (a) Preheat the oven to the required test temperature of $150 \pm 4^\circ\text{C}$. Allow it to stabilize for a further 15 min before inserting the test specimen.

- (b) Place the test specimen in the oven and stand it vertically on one socket mouth, where possible.
- (c) Allow the test specimen to remain in the oven at a temperature of $150 \pm 4^\circ\text{C}$ for a period as specified in the relevant Standard.
- (d) Remove the test specimen from the oven. Whilst still hot, section the specimen with a sharp knife through the injection point and, if necessary, through weld lines or any other discernible internal delamination.

Open up the fitting to an extent that will allow proper inspection upon cooling.

- (e) The cooled specimen shall be examined, and the existence of any of the following changes shall be noted and recorded:
 - (i) The presence of any blisters, inclusions or voids.
 - (ii) Any delamination or damage at the injection point which results in a reduction of wall thickness. If this has occurred, the reduced wall thickness shall be measured.
 - (iii) Any opening of the weld line. If this has occurred, the location of the opening and its depth shall be measured.
 - (iv) The presence of any surface delamination. If this has occurred, the depth of delamination shall be measured and its area expressed as a percentage of the total surface of the test specimen.
 - (v) The presence of any internal delamination. If this has occurred the maximum width or diameter shall be measured. The total length of the delamination expressed as a percentage of the length of the section and the length of the longest delamination shall also be determined.

7 REPORT The following information shall be reported:

- (a) The complete identification of the fitting tested.
- (b) The duration of test.
- (c) The presence of any blisters, inclusions or voids.
- (d) Any delamination or damage at the injection point and, if so, the reduced wall thickness.
- (e) Any opening of the weld line and, if so, its location and depth.
- (f) Any surface delamination and, if so, its depth and percentage area.
- (g) The maximum width or diameter and length of any delamination within the fitting wall, and the total length of the delaminations expressed as a percentage of the length of the section.
- (h) Reference to this test method i.e. AS/NZS 1462.11.

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