STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

METHODS OF TEST FOR UNPLASTICIZED PVC (UPVC) PIPES AND FITTINGS

AS 1462.14
METHOD FOR DETERMINATION OF THE LIGHT TRANSMISSION OF UPVC PIPE

1 SCOPE. This standard sets out a method for determining the diffuse light transmission of UPVC pipe.

2 RELEVANCE OF TEST. This test is used to determine the ability of UPVC pipe to resist the penetration of light which could otherwise lead to the possible growth of algae in a water supply pipe.

3 PRINCIPLE. The light transmitted through a section of pipe and registered by a photocell is calculated as a percentage of the light transmitted without the pipe in position.

4 APPARATUS. The following apparatus (see Figs 1 and 2) is required:

(a) A light source mounted into an apparatus with a matt white interior (mass of movable part approx. 500 g) so that the test specimen is evenly illuminated with light from the visible part of the spectrum (Note 1).

(b) A photocell (Note 2) mounted so that it receives only light that has passed through the test specimen when the test specimen is in position. The photocell should be sensitive to light mainly in the visible part of the spectrum.

(c) A measuring device (Note 3) that applies a suitable load resistance to the photocell, thus ensuring a linear response, and enables measurements from 100 percent down to 0.02 percent transmission.

(d) Neutral density filters Numbers 0.1, 0.5, 1, 2, 3 and 4.

NOTES:

1. Other methods which can be shown to provide an accuracy of the same or a higher degree may be used.
2. A 12 V 18 W tungsten filament globe (connected to a 12 V regulated powersupply) in conjunction with translucent acrylic diffusers (Cadillac LN 166, 75% transmission) and a tungsten to daylight filter (Kodak 80A, 3200 K tungsten source glass filter) have been found suitable. This combination was found to illuminate the test specimen evenly at light levels that did not saturate the photocell when the test specimen was not present.
3. Megatron type M (45 mm diameter) has been found to be suitable.
4. A suitable circuit for this device is shown in Fig. 2. This circuit is designed for the megatron Type M photocell and thus applies a load resistance of less than 100 ohms to ensure a linear response.

   The multimeter connected for measurements should have at least 3½ digits, 20 V, 2 V and 200 mV ranges and have an accuracy of ± (0.1 percent of the reading + 1 digit).

5 PREPARATION OF TEST SPECIMENS. The test specimen shall be a section of pipe approximately 80 mm × 80 mm × thickness of the pipe. It shall be split and heated for approximately 15 min (or until soft enough to flatten) in a hot air oven maintained at 150 ±5 °C. It shall then be pressed flat between two plates but not so that it is thinner than the thinnest part of the pipe wall section. With small sized pipe, where a test specimen of the required size cannot be obtained, as large a test specimen as possible shall be used and the photocell shall be masked by reducing its effective diameter.

Three test specimens shall be tested in each test.

6 REFERENCE SPECIMENS. Each reference specimen shall be opaque and of the same wall thickness as the test specimen with a hole 55 ±1mm in diameter cut in the centre.