



**Transport**  
Roads & Maritime  
Services

# Test method T1506

## Stiffness properties of plastic drainage pipe

NOVEMBER 2012



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## Revision Summary

Ed/Rev Number	Clause Number	Description of Revision	Authorisation	Date
		Reformatted and Revision Summary Added	D.Dash	June 2001
Ed 2/ Rev 0	All	Reformatted RMS template	J Friedrich	November 2012

Note that Roads and Maritime Services is hereafter referred to as 'RMS'.

The most recent revision to Test method T1506 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

# Test method T1506

## Stiffness properties of plastic drainage pipe

### 1. Scope

This method sets out the procedure for determining the stiffness properties of plastic drainage pipe and has been adopted from Australian Standard AS 2439 (Appendix H).

### 2. Materials

Smooth or corrugated plastic drainage pipe covered by Australian Standard AS 2439.

### 3. Apparatus

- (a) Mechanical testing machine calibrated in accordance with AS 2193 Grade A and capable of test to 5 kN. e.g. Instron 1185 or equivalent
- (b) Steel plates (2), 320 mm in length, 5 mm thick (minimum)

### 4. Preparation

- (a) 2 specimens, each  $300 \pm 1$  mm, are cut from the sample of pipe submitted
- (b) Measure the outside diameter at 3 points evenly spaced around the specimens with an accuracy of  $\pm 0.1$  mm
- (c) Measure the inside diameter at 3 points evenly spaced around the specimens with an accuracy of  $\pm 0.1$  mm

### 5. Procedure

#### 5.1 Method A - Test machine with computer control

- (a) Check that the test method variables and parameters are correct in the software programme
- (b) Calibrate the load cell via the software programme
- (c) Set the force and speed controls at the appropriate settings. i.e. 0-5 kN range and 10mm/minute respectively
- (d) Place a specimen centrally between the steel plates and place the assembly on the bottom compression platen and apply a small load (45 N) to hold the specimen in place. Zero the load reading using the console controls
- (e) Set the test programme in motion through the computer keyboard and stop the test when the 10% deflection point has been passed
- (f) After all specimens have been tested print out the force-deflection graphs in order to calculate the stiffness values

#### 5.2 Method B - Test machine with console and recorder.

- (a) Check calibration of load and extension accessories
- (b) Set the force and speed controls at the appropriate setting i.e. 0-5 kN range and  $11 \pm 2$ mm/minute respectively
- (c) Place the specimen centrally between the steel with the pipe's longitudinal axis parallel to the longitudinal axis of the plates. Place the assembly on the bottom compression platen and apply a small load (45 N)
- (d) Zero the deflection and load indicators or recorder
- (e) Compress the specimen at  $11 \pm 2$  mm minute until the deflection is 5% of the internal diameter of the pipe. Record the force
- (f) Continue compressing the specimen until deflection is 10% I/D. Record the force. Stop the test

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**NOTE: 5% and 10% deflection is 5% and 10% of the internal diameter of the pipes.**

## 6. Calculations

Calculate the stiffness of each test specimen at 5% and 10% deflection as follows:

$$PipeStiffness = \frac{F(kN)}{y(m) \times L(m)}$$

Where  $F$  = Force at 5% or 10% deflection (in kN)  
 $y$  = Deflection (in metres) ie 5% or 10% of I/D  
 $L$  = Specimen length (in metres)

## 7. Reporting

Report the lowest values obtained for the stiffness at 5% and 10% deflection.