

Deflection Testing For Polyethylene And Bosspipe Pipelines

Deflection testing for polyethylene and Bosspipe pipelines may be performed where structural verification is required. It may be used for assessing the adequacy of embedment material placement and compaction. The test procedure is based on recommendations of AS/NZS 2566.2:2002.

Maximum allowable short-term vertical polyethylene and polypropylene pipe deflection at 30 days ($\Delta_{y\text{ sall}}$) is 5.0% (AS/NZS 2566.2:2002, Table 5.6). Where measurements are made over another time interval, the allowable deflection is determined by multiplying the above value by the appropriate time factor given in the table to the right (factor values may be interpolated for intervening time intervals, e.g., for 10 days $\Delta_{y\text{ sall}} = 0.85 + ((0.95 - 0.85) \times 3/7) = 0.89$).

Time factors for deflection

Time interval	Factor
24 hours	0.70
3 days	0.75
7 days	0.85
14 days	0.95
30 days	1.0
3 months	1.1
1 year	1.2
2 years	1.3

The test procedure for pipelines of outside diameter less than 750 mm is initiated by cleaning the pipeline, determining the allowable deflection (see above) and measuring the minimum vertical inside diameter (d_{v1}) of pipes and fittings or the minimum mean internal diameter adjusted to ovality of pipes and fittings.

The external diameter (O_d) for rigid prover is calculated as follows:

$$O_d = d_{v1} \left(1 - \frac{\Delta_{y\text{ sall}}}{100}\right) - 2.5, \text{ mm.}$$

The length of a vaned (minimum 8 vanes) or cylindrical portion of the prover shall be 1.0 to 1.3 times the internal pipe diameter.

The test is performed by pulling the rigid prover through the pipeline by hand or by using a hand winch.

The test section shall be acceptable if the prover passes through the test section.

Test report usually includes full details of the pipeline tested, test location, dated test data and results.