

Third Party Connections (IGT & UIP)

Pressure Test Certificates Briefing Note

1. Introduction

Cadent have undertaken a review of the quality and accuracy of submitted pressure test certificates. During this review it has become apparent that key information is not present on the certificate to allow assessment of the validity of the test and ensure that the pipework as vested in Cadent is fit for purpose.

The following information is a reminder of the requirements of pressure testing and to provide guidance on what is deemed an acceptable submission.

2. Common Issues Identified

Gauges

Gauges are an important factor when undertaking pressure tests and are required to be to a specified accuracy. The absolute accuracy of gauges shall be 3mbar for 0-10.5bar or 0.0285% of full scale for over 10.5bar maximum range, for short duration testing. They are required to have a resolution of 0.1mbar.

When recording these on the pressure test certificate it will be required to state the Make, Model and Range, e.g. Druck 705E IS (700mbar), allowing Cadent to confirm it has the required accuracy for the test undertaken.

For Low Pressure testing Cadent allows the use of 10mbar accuracy gauges, however these will need adjusted test durations as per table 37.4 of CAD/PM/MSL/1 (below). These Long Duration Tests take into account the reduced accuracy of the gauge in use.

Table 1: Table 37.4 - Test Period table (Long Duration) for Low Pressure PE80 and PE100 mains per metre length (calculated in hours). Maximum allowable pressure loss - 3mbar

Diameter (mm)	Low Pressure PE80 or PE100 Pipes				
	SDR11	SDR13.6	SDR17.6	SDR21	SDR26
40	0.0008	-	0.0010	-	-
55	0.0016	-	0.0018	-	-
63	0.0021	0.0023	0.0024	-	-
75	0.0030	0.0032	0.0034	-	-
90	0.0043	-	0.0050	0.0052	-
110	-	-	-	0.0078	-
125	0.0082	-	0.0096	-	-
140	-	-	0.0120	-	0.0131
160	-	-	0.0157	-	0.0171
180	0.0170	-	0.0198	-	-
200	-	-	0.0245	-	0.0268
213	-	-	-	-	0.0304
250	0.0329	-	0.0382	0.0402	-
268	-	-	-	-	0.0481
280	-	-	-	-	0.0525
315	0.0522	-	0.0607	0.0638	0.0664
355	0.0663	-	0.0771	0.0810	-
400	0.0841	-	0.0978	0.1029	-
450	0.1065	-	0.1238	0.1302	-
469	-	-	-	0.1414	-
500	0.1314	-	0.1529	0.1607	-
630	0.2087	-	0.2427	0.2552	-

Temperature

Temperature variation can affect the pressure within a pipe under test and mask an underlying leak. It should be noted that a change of 1°C, on a pneumatic test, will result in a change of:

- 4.5mbar on a 350mbar test
- 13.3mbar on a 3bar test
- 26.7mbar on a 7bar test

To minimise the effect of temperature variation, the main under test shall be backfilled as completely as possible (including covering of test ends and insulation of test instrument and hoses).

Where temperature change within a main is a concern, usually on longer duration tests, the temperature of the main should be monitored by using two or more ground temperature probes, positioned at suitable locations adjacent to the main. This allows assessment of whether marginal changes in test pressures are as a result of leakage or variation in ground temperature.

For LP testing and metallic only mains of all pressure tiers (as there is no creep conditioning), test air temperature should be allowed to stabilise before the commencement of the test, this will normally occur within 2 hours and will be indicated by stable pressure readings.

Where a stabilisation period is used for LP testing, that does not require conditioning for creep allowance, this shall be recorded on the test certificate. The certificate shall indicate the time

pressurisation was reached and the two stable readings, no less than 30 minutes apart, that were recorded prior to test commencement.

Test location and parameters (including materials)

Test certificates require an accurate record of the characteristics of the pipe under test. This shall include; the material; diameter, grade, SDR (where applicable) and the start and termination locations (as eastings and northings and description of location, e.g. ECV). These details are of particular importance where creep is a factor in determining the pass/fail criteria of the test (MP & IP).

This section shall also include the design pressure, test pressure, maximum operating pressure, test specification and the test period. A numbered drawing that shows the pipeline as it has been tested should be included in the pack.

During IP testing, alongside the strength test certificate (hydrostatic), an elevation plan shall be supplied to ensure that the test pressure does not exceed the limits of the pipeline's construction. It is recommended that the elevation change is no greater than 60m to ensure that static head pressure does not exceed 16.5 barg.

The elevation plan shall also note the test equipment locations, in particular where this does not sit at the high point of the pipeline under test. This is to ensure that the test pressure is adequate at the high point.

Initial Pressurisation and Test Commencement

Pressure test certificates shall record the time:

- of initial pressurisation;
- of the pipeline reaching test pressure;
- of test commencement.

These three time factors make up the conditioning period, required for ensuring that the creep allowance is calculated for the test as carried out.

Where a test fails and is not fully de-pressurised, the time from the initial pressurisation to the final reading shall become the new conditioning time. The new creep allowance will need to be calculated from this revised conditioning time.

3. References

<i>IGEM/TD/3</i>	<i>Steel and PE pipelines for gas distribution</i>
<i>CAD/PM/MSL/1</i>	<i>Main Laying and Service Laying on systems operating at pressures up to and including 7bar.</i>
<i>GIS/TE/P6.3:2021</i>	<i>Specification for Equipment used in testing gas mains and gas service with operating pressure not greater than 7bar</i>