

GUIDELINES FOR LEAK TESTING STREET SEWER SYSTEMS

Today, when environmental awareness is at an all time high, even piping systems for the conveyance of water or sewage must conform to increasingly strict requirements. The risk of human waste polluting nearby land, groundwater or even sources of drinking water requires that street sewer systems undergo leak tests before they become operational.

The staff carrying out the leak-tightness testing shall be appropriately trained and shall possess adequate experience in this field; references must be made available to the client upon request.

European requirements for leak tightness of piping systems for the conveyance of water or sewage are set forth in greater detail in the PSIST EN 1610 Standard "Construction and Testing Of Drains And Sewers".

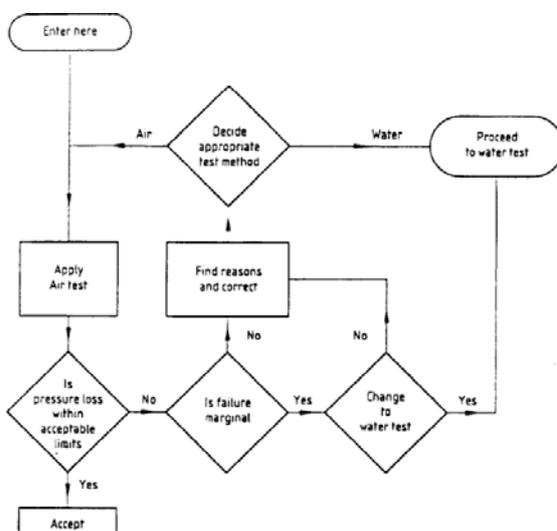
General guidelines for the testing of piping systems

Testing for leak tightness of piping systems shall be carried out by means of air or water. Separate testing of piping sections, e.g. pipes with air and manholes with water, may be undertaken. In the case of the air testing method, the number of corrections and retests is unrestricted. In the event of a single or continued air test failure, recourse to a water test is allowed and the result of the water test alone shall be decisive.

Testing with air (method "L")

The testing process is depicted in the flow diagram.

Flow diagram of leak-tightness testing with air (method L)



Flow diagram of leak-tightness testing with air (method L)

The testing times are given in Table 3 in relation to pipe size and testing methods (LA, LB, LC, LD). The testing method is defined in the project or by the client. An initial slightly higher pressure of the required test pressure, p_0 , shall first be held for approximately 5 min. The pressure shall then be adjusted to the test pressure shown in Table 3. The pressure drop Δp shall be entered and compared to the permissible pressure.

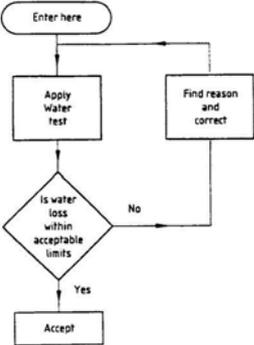
Table 3: Test pressure, permissible pressure drop and testing times

Method	Test pressure P_0 (surcharge)	Pressure drop Δp mbar (kPa)	Testing times (min) Nominal pipe diameters DN				
			DN 100	DN200	DN300	DN400	DN600
LA	10 (1)	2,5 (0,25)	5	5	7	10	14
LB	50 (5)	10 (1)	4	4	6	7	11
LC	100 (10)	15 (1,5)	3	3	4	5	8
LD	200 (20)	15 (1,5)	1,5	1,5	2	2,5	4

Suitable airtight plugs shall be used in order to avoid errors arising from the test equipment. Special care is required for large DN during testing (method LC and LD), for safety reasons.

Testing with water (method "W")

The testing process is depicted in the flow diagram.



Flow diagram of leak-tightness testing with water (method W)

The test pressure is the pressure that comes about by filling the tested piping section up to the ground level of the downstream or upstream manhole, as appropriate, with a maximum pressure of 50 kPa (0.5 bar) and a minimum pressure of 10 kPa (0.1 bar) measured at the top of the pipe. Higher test pressures may be specified for pipelines which are designed to operate under permanent or temporary surcharge.

The required test pressure shall be created by gradually topping up the piping section with water and displacing air. The conditioning usually takes one hour and shall be followed by the 30 min test. During the test, pressure shall be maintained within 1 kPa (0.01 bar) of the test pressure by topping up with water. The total amount of water added during the test to achieve this requirement shall be measured and recorded with the head of water at the required test pressure.

The test requirement is satisfied if the amount of water added is not greater than:

- 0.15 l/m² of wetted internal surface during 30 min for piping sections;
- 0.20 l/m² of wetted internal surface during 30 min for piping including manholes;
- 0.40 l/m² of wetted internal surface during 30 min for manholes and inspection chambers.