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Polyethylene (PE) pipes — Pressure drop in mechanical pipe-jointing systems — Method of test and requirements

Canalisations en polyéthylène (PE) — Pertes de charge des raccords mécaniques — Méthode d'essai et spécifications

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FOREWORD

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4059 was developed by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, and was circulated to the member bodies in July 1976.

It has been approved by the member bodies of the following countries :

Austria	Israel	Romania
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Switzerland

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Polyethylene (PE) pipes — Pressure drop in mechanical pipe-jointing systems — Method of test and requirements

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method of test for determining the pressure drop caused by mechanical jointing systems in polyethylene (PE) pipes for water supply, together with the allowed maximum pressure drop of the pipe-jointing system when tested in accordance with this method.

2 REQUIREMENT

The pressure drop caused by the jointing system of such a fitting, determined in accordance with the method described in clause 3, shall not be greater than the pressure drop produced under similar conditions by a PE pipe of length equal to 20 times the inside diameter of the PE pipe for which the fitting is designed.

3 METHOD OF TEST

3.1 Principle

3.1.1 Measurement of the pressure drop in a pipe of length at least 15 times the inside diameter (d_i) and, in any case, not less than 1 m, the flow rate of the water being about 2 m/s and the temperature of the water 20 °C.

3.1.2 Cutting of the pipe into two pieces in such a way that the length of one piece is at least 5 d_i and that of the other piece is at least 10 d_i.

3.1.3 Connection of both pieces by means of the fitting to be tested, and installation of the assembly in the testing apparatus in such a way that the shorter piece is at the water inlet side.

3.1.4 Measurement again of the pressure drop in the jointed pipe and fitting.

3.1.5 Calculation from the measured pressure drop of the length of PE pipe which, under similar conditions, would have caused the same pressure drop as the pipe and fitting together, and subtraction from this value of the length of the two pieces of PE pipe used in the test assembly.

3.2 Apparatus

The testing installation is as shown in the figure. It consists essentially of the following parts :

3.2.1 Pipe supplying water under pressure, equipped with a stop-valve, and to which one end of the PE pipe to be used for the test is connected.

3.2.2 Discharge pipe, equipped with a control-valve, and to which the other end of the PE pipe is connected.

3.2.3 Metering tank, into which water from the discharge pipe flows.

3.2.4 Two pressure take-off devices, both connected to a differential pressure gauge, one of the devices providing the connection to the supply pipe and the other the connection to the discharge pipe.

3.3 Procedure

3.3.1 Connect the PE pipe to be used for determining the pressure drop caused by the fitting, to the two pressure take-off devices. Measure the distance l (in metres) between the two devices.

3.3.2 When stable and continuous water flow at a rate of approximately 2 m/s is reached by adjusting the control-valve and with the stop-valve fully open, measure the rate of water discharge q_v (in cubic metres per second) and the pressure drop z_1 (in metres) across the length of PE pipe.

3.3.3 Cut the pipe into two pieces as indicated in 3.1.2 and assemble the fitting between these two pieces. Install the assembly between the two pressure take-off devices, as shown in the figure.

3.3.4 Adjust the flow to the same rate of discharge (q_v) as obtained before, by using the control-valve. Measure the pressure drop z_2 at this discharge (q_v) in the combination of pipe and fitting.

3.3.5 Calculate the pressure drop Δz of the jointing system using the formula :

$$\Delta z = z_2 - z_1$$

3.3.6 As the pressure drop of a PE pipe of a length of 1 m, measured under the same conditions, is equal to z_1/l, the pressure drop Δz of the jointing system, expressed in terms of pipe length (in metres), will be equal to

$$\frac{z_2 - z_1}{z_1/l}$$

$$= \frac{z_2 - z_1}{z_1} \times l$$

3.3.7 The calculated pressure drop in the jointing system, expressed in metres of PE pipe, shall be rounded off to the next lower 0,01 m.

4 TEST REPORT

The test report shall include the following :

a) a reference to this International Standard;

b) full description of the fitting tested;

c) full description of the PE pipe used to prepare the test assembly;

d) the applied test procedure;

e) the pressure drop due to the inclusion of the fitting in the assembly, expressed as the equivalent length, in metres, of the PE pipe.

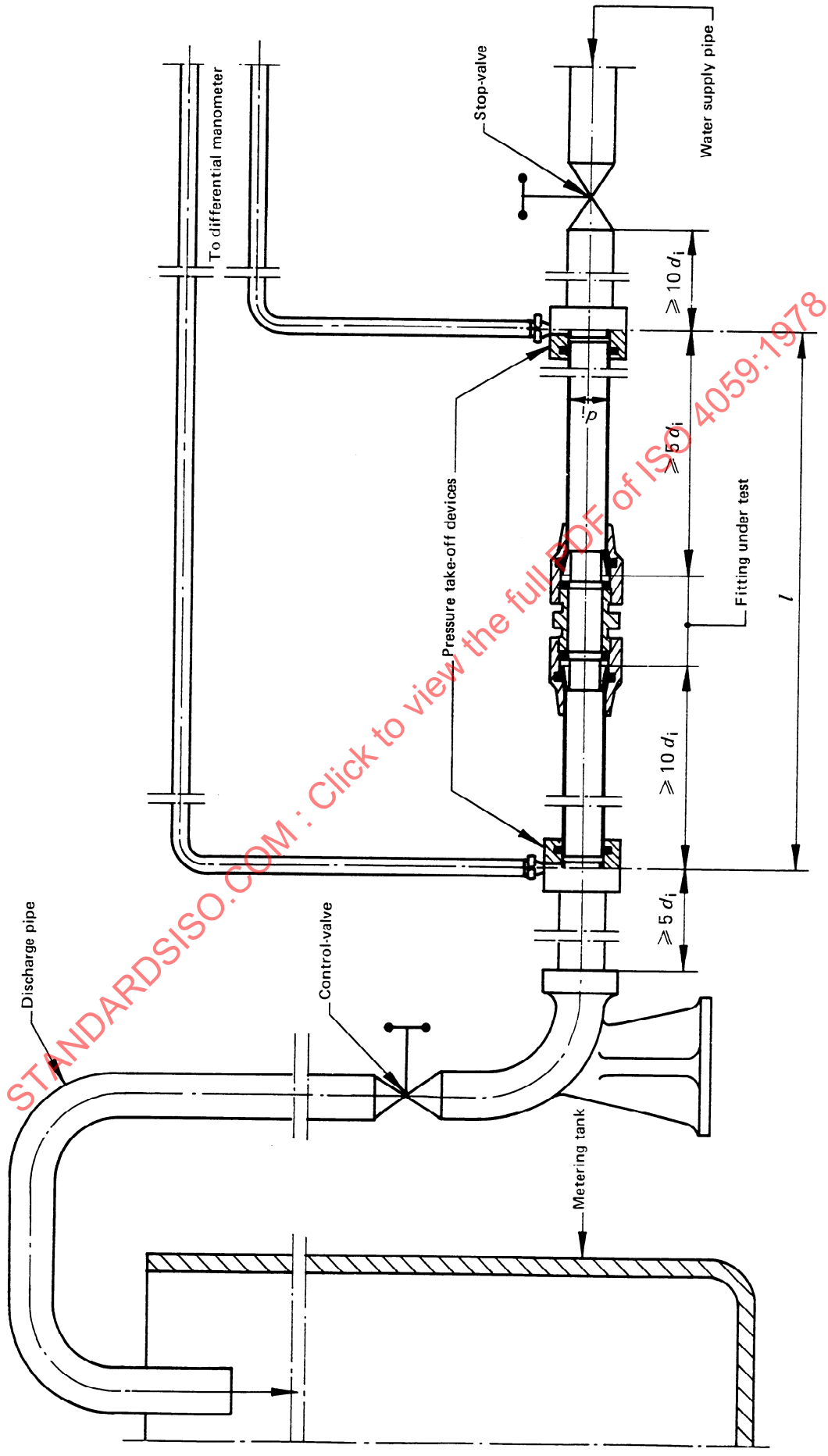

FIGURE — **Testing installation**

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