

TECHNICAL REPORT

ISO
TR 10501

First edition
1993-12-15

Thermoplastics pipes for the transport of liquids under pressure — Calculation of head losses

*Tubes en matières thermoplastiques pour le transport de liquides sous
pression — Calcul des pertes de charge*



Reference number
ISO/TR 10501:1993(E)



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Foreword

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ISO/TR 10501, which is a Technical Report of type 3, was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Sub-Committee SC 2, *Plastics pipes and fittings for water supplies*.

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Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Thermoplastics pipes for the transport of liquids under pressure — Calculation of head losses

1 Scope

This Technical Report gives a method of calculating head loss in the transport of liquids under pressure in hydraulically smooth thermoplastics pipes.

The formulae given in the Technical Report apply to the transport of water under pressure, or to all other liquids of the same dynamic viscosity, at temperatures of up to 45°C.

2 Definitions

For the purposes of this Technical Report, the following definitions apply.

2.1 flowrate, q_v : Volume of water flowing through the pipe per unit time.

2.2 steady flow : Flow in which the flowrate through a measuring section does not vary with time.

2.3 average velocity, v : Flowrate through the pipe divided by the reference cross-section of the pipe. It is calculated by dividing the actual flowrate through the pipe by the cross-section of the pipe.

2.4 reference cross-section of the pipe, A : Area of the circle with a diameter equal to the average internal diameter of the pipe. The free cross-sectional area of the pipe is calculated from the inside diameter of the pipe.

2.5 head loss, Δh : Change in pressure head between two sections of a horizontal pipe due to liquid flow through the pipe.

2.6 head drop, J : Head loss per unit length of pipe.

3 Symbols and units

The symbols and units used in this Technical Report are given in Table 1.

Table 1

Sub-clause	Quantity	Symbol	Unit
2.1	Flowrate	q_v	m ³ /h
2.3	Average velocity	v	m/s
2.4	Average internal diameter	d	m
2.5	Head loss	Δh	m
2.6	Head drop	J	m/m
4.1	Reynolds number	Re	dimension-less
4.1	Kinematic viscosity	ν	m ² /s
4.2	Pipe length	l	m
4.3	Temperature of liquid	t	°C
4.3	Temperature correction factor	k_t	dimension-less