

ISO/TR 12767:2023-09 (E)

Measurement of fluid flow by means of pressure differential devices - Guidelines on the effect of departure from the specifications and operating conditions given in ISO 5167

Contents		Page
Foreword.....		v
Introduction.....		vi
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Symbols	2
5	Effect of errors on flowrate calculations	3
5.1	General.....	3
5.2	Quantifiable effects.....	3
6	Effects of deviations in construction	3
6.1	Orifice-plate edge sharpness.....	3
6.2	Thickness of orifice edge.....	4
6.3	Condition of upstream and downstream faces of orifice plate.....	5
6.4	Position of pressure tappings for an orifice.....	6
6.4.1	General.....	6
6.4.2	Calculation of discharge coefficient.....	6
6.4.3	Estimation of additional uncertainty.....	6
6.4.4	Example.....	6
6.5	Condition of pressure tappings.....	7
7	Effects of pipeline near the meter	7
7.1	Pipe diameter.....	7
7.2	Steps and taper sections.....	7
7.3	Diameter of carrier ring.....	8
7.4	Undersize joint rings.....	11
7.5	Protruding welds.....	11
7.6	Eccentricity.....	11
8	Effects of pipe layout	13
8.1	General.....	13
8.2	Discharge coefficient compensation.....	14
8.2.1	Corrections.....	14
8.2.2	Additional uncertainty.....	15
8.3	Pressure tappings.....	16
8.4	Devices for improving flow conditions.....	16
9	Operational deviations	16
9.1	General.....	16
9.2	Deformation of an orifice plate.....	17
9.2.1	General.....	17
9.2.2	Elastic deformation.....	17
9.2.3	Plastic deformation.....	17
9.3	Deposition on the upstream face of an orifice plate.....	18
9.4	Deposition in the meter tube.....	22
9.5	Orifice-plate edge sharpness.....	23
9.5.1	Deterioration.....	23
9.5.2	Plate reversal.....	23
9.6	Deposition and increase of surface roughness in Venturi tubes.....	24

9.6.1	General	24
9.6.2	Deposition	24
9.6.3	Surface roughness	24
10	Pipe roughness	25
10.1	General	25
10.2	Upstream pipe	26
10.3	Downstream pipe	30
10.4	Reduction of roughness effects	30
10.5	Maintenance	30
	Bibliography	32