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(Bore) Thickness e ; 2.2.5.4 Requirements; 2.2.6 Circularity; 2.3 The Pipe; 2.3.1 General; 2.3.2 Pressure Tappings; 2.3.2.1 General; 2.3.2.2 Flange and D and D/2 Tappings; General; Tapping Diameter; Tapping Location; 2.3.2.3 Corner Tappings; 2.3.2.4 Number of Tappings; 2.3.3 Pipe Roughness; 2.3.3.1 Uniform Roughness; 2.3.3.2 Rough Pipes with a Smooth Portion Immediately Upstream of the Orifice; 2.3.3.3 Non-uniform Roughness; 2.3.4 Steps and Misalignment; 2.3.5 Eccentricity; 2.4 Dimensional Measurements; 2.5 Orifice Fittings; 2.6 Pressure Loss; 2.7 Reversed Orifice Plates; 2.8 Conclusions; Appendix 2.A: Orifice Plates of Small Orifice Diameter; 2. A.1 Introduction and Test Work; 2.A.2 Conclusions; References; 3 Venturi Tube Design; Abstract; 3.1 Introduction; 3.2 Type; 3.2.1 General; 3.2.2 Machined Convergent (5.2.9, 5.5.3 and 5.7.2 of ISO 5167-4: 2003); 3.2.3 Rough-Welded Sheet-Iron Convergent (5.2.10, 5.5.4 and 5.7.3 of ISO 5167-4:2003); 3.2.4 'As Cast' Convergent (5.2.8, 5.5.2 and 5.7.1 of ISO 5167-4:2003); 3.2.5 Wider Range of Reynolds Number; 3.3 Angles, Pressure Loss and Truncation; 3.4 Dimensional Measurements; 3.5 Steps and Straightness; 3.6 Pressure Tappings; 3.7 Effects of Roughness and Reynolds Number; 3.8 High or Low Reynolds Number; 3.9 Conclusions; Appendix 3.A: Effect of Roughness: Computational Fluid Dynamics; 3.A.1 General; 3.A.2 Venturi Tube Roughness; 3.A.2.1 Effect of Venturi Tube Roughness Height; 3.A.2.2 Effect of Reynolds Number; 3.A.2.3 Effect of Venturi Tube Roughness Type; 3.A. 3 Pipe Roughness; 3.A.4 Effect of Rounding the Corner Between the Convergent Section and the Throat; References; 4 General Design; Abstract; 4.1 Introduction; 4.2 Impulse Lines; 4.2.1 General; 4.2.2 Tapping Locations and Slopes of Impulse Lines; 4.2.3 Density of the Fluids in Two Impulse Lines to Measure the Differential Pressure; 4.2.4 Length of Impulse Lines; 4.2.5 Blockage; 4.2.6 Damping of the Pressure Signal or Resonance; 4.3 Differential Pressure; 4.3.1 Differential-Pressure Transmitters

Sommario/riassunto

This book gives the background to differential-pressure flow measurement and goes through the requirements explaining the reason for them. For those who want to use an orifice plate or a Venturi tube the standard ISO 5167 and its associated Technical Reports give the instructions required. However, they rarely tell the users why they should follow certain instructions. This book helps users of the ISO standards for orifice plates and Venturi tubes to understand the reasons why the standards are as they are, to apply them effectively, and to understand the consequences of deviations from the standards.