

ORIFICE PLATE FLOW CALCULATOR (ISO 5167-2)

Project: Feed flow FE 3101

Calc no: CALC FE 001 Rev: 0

Yellow cells: enter data. Grey cells: calculated automatically. Free template from instrumentationblog.in

Inputs			
Pipe inside diameter D (mm)	102.26	Orifice bore d (mm)	63
Differential pressure (mbar)	250	Density ρ (kg/m ³)	998.2
Viscosity μ (cP = mPa·s)	1.002	Pressure tapplings	Flange

Geometry (calculated)			
Beta ratio $\beta = d \div D$	0.6161	Velocity of approach factor E	1.0809
L1 (upstream tap $\div D$)	0.2484	L2' (downstream tap $\div D$)	0.2484
M2' = $2 L2' \div (1 - \beta)$	1.2939		

Iteration of discharge coefficient C and Reynolds number				
Iteration	Re (assumed)	Discharge coefficient C	Mass flow (kg/s)	Re (calculated)
1	1,000,000	0.60626	14.4311	179,323
2	179,323	0.60959	14.5105	180,309
3	180,309	0.60958	14.5101	180,305
4	180,305	0.60958	14.5101	180,305
5	180,305	0.60958	14.5101	180,305
6	180,305	0.60958	14.5101	180,305
7	180,305	0.60958	14.5101	180,305
8	180,305	0.60958	14.5101	180,305
Discharge coefficient C				0.60958
Mass flow (kg/h)				52,236.4
Volume flow (m ³ /h)				52.331
Pipe Reynolds number				180,305
Pipe velocity (m/s)				1.770
Permanent pressure loss (mbar)				152.4
ISO 5167-2 limits (β 0.1 to 0.75, D 50 to 1000 mm, $d \geq 12.5$ mm, Re)				OK

For gas or steam add the expansibility factor ϵ ; this sheet assumes an incompressible liquid. Iteration converges within a few steps for normal conditions.

Prepared by	Checked by
Name:	Name:
Signature:	Signature:
Date:	Date: