Pipe Sizing and Pressure Drop — Report

DOCUMENT

Plant / project	**Example Plant**
Equipment tag / system	**L-1001**
Calculation / document no.	**CALC-PP-001**
Revision	**0**
Prepared by	**Your name**
Checked by	**—**
Date	**28-Oct-2026**
Calculation basis	Pressure drop for a given flow · Fluid: Water / steam (liquid) at 30.0 °C · Pipe: NPS 6 Sch 40, 100.0 m, ΣK 5.34 · Darcy–Colebrook; K method (Perry Table 6-4) · Service: Liquid, pump discharge or process line
Status	✓ **Inputs OK** · ℹ️ **3 default value(s) in use: minimum velocity, maximum velocity, maximum pressure drop per 100 m**

KEY INPUTS

Input	Unit	Value used
Temperature	°C	30.0
Inlet pressure	bar g	5.000
Mass flow	kg/h	100,000.0
Straight pipe length	m	100.0
Outlet above inlet (elevation rise)	m	0.00
Other losses ΣK (equipment, strainers …)	—	0.00
Maximum velocity	m/s	1.98
Maximum pressure drop per 100 m	bar/100 m	1.131

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RESULTS

Result	Unit	Value
Inside diameter	mm	154.08
Mass flow	kg/h	100,000.0
Actual volume flow at the inlet	m³/h	100.49
Density at the inlet	kg/m³	995.140
Viscosity	mPa·s	0.8072
Velocity at the inlet	m/s	1.50
Reynolds number	—	284,370
Darcy friction factor	—	0.01704
Friction pressure drop per 100 m of pipe	bar/100 m	0.1233
Straight pipe	kPa	12.332
Fittings, valves and other losses	kPa	5.955
Elevation	kPa	0.000
Total pressure drop	kPa	18.286
Outlet pressure	bar a	5.8304
Velocity at the outlet	m/s	1.50

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SIZE TABLE (same flow, chosen schedule)

NPS / DN	ID, mm	v, m/s	Re	bar/100 m	ΔP, kPa	Meets	Remark
½ (DN 15)	15.8	143.09	2,780,183	16786.7656	1,733,078.9	×	
¾ (DN 20)	21.0	80.90	2,090,443	3736.7369	391,062.8	×	
1 (DN 25)	26.6	50.08	1,644,733	1059.5925	112,622.8	×	
1¼ (DN 32)	35.1	28.88	1,249,022	250.4245	27,258.6	×	
1½ (DN 40)	40.9	21.20	1,070,241	111.6868	12,363.4	×	
2 (DN 50)	52.5	12.90	834,903	30.6226	3,504.7	×	
2½ (DN 65)	62.7	9.05	699,038	12.1824	1,435.7	×	
3 (DN 80)	77.9	5.85	562,316	3.9584	486.9	×	
3½ (DN 90)	90.1	4.38	486,193	1.8747	238.4	×	
4 (DN 100)	102.3	3.40	428,473	0.9822	128.9	×	
5 (DN 125)	128.2	2.16	341,776	0.3114	43.6	×	
6 (DN 150)	154.1	1.50	284,370	0.1233	18.3	✓	◀ recommended · selec
8 (DN 200)	202.7	0.86	216,118	0.0314	5.1	low v	
10 (DN 250)	254.5	0.55	172,191	0.0102	1.8	low v	
12 (DN 300)	303.2	0.39	144,520	0.0043	0.8	low v	
14 (DN 350)	333.3	0.32	131,444	0.0027	0.5	low v	
16 (DN 400)	381.0	0.24	115,002	0.0014	0.3	low v	
18 (DN 450)	428.5	0.19	102,263	0.0008	0.2	low v	
20 (DN 500)	477.8	0.16	91,699	0.0005	0.1	low v	
24 (DN 600)	575.0	0.11	76,196	0.0002	0.1	low v	
30 (not in this schedule)							
36 (DN 900)	875.9	0.05	50,024	0.0000	0.0	low v	

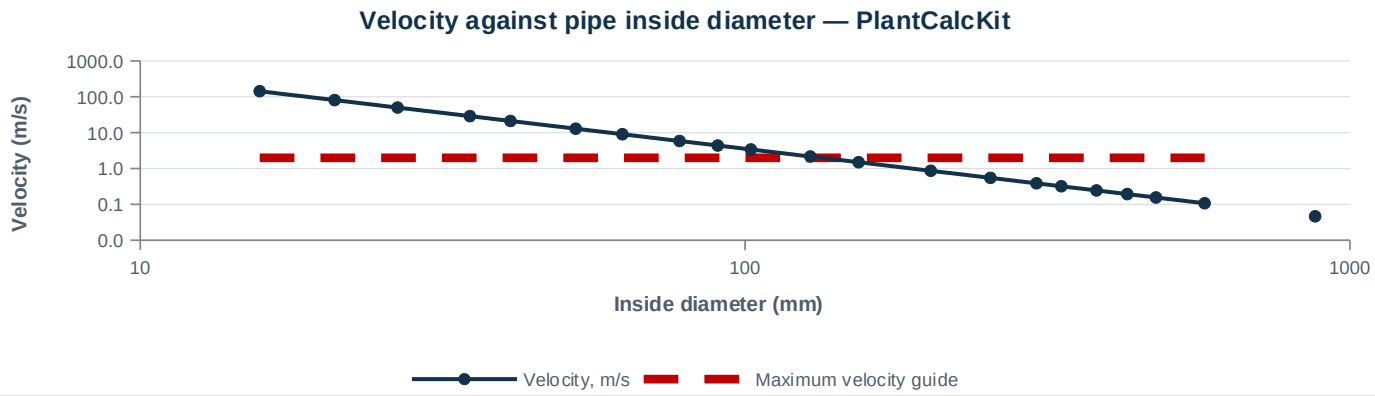
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FINDINGS AND RECOMMENDATIONS

ℹ️ **Note**

Fitting K values are Perry Table 6-4 averages for turbulent flow; K falls with size and rises at low Reynolds numbers — use the valve maker's data where it matters.

CHART



Observations — line size

[Write your observations here]

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