



Line Sizing using Aspen Hysys



Example: Size the piping outlet of K.O.D which is located at the inlet of a methanol plant with the following condition:

Parameter	Value	Unit
Flow	133000	Kg/hr
Fluid	Methane	
Fluid Package	PR	
Pressure 1	52.9	bara
Length	1000	m
Temperature	40	C

Steps to be taken:

- 1.Add Methane to component list.
- 2.Select PR as the fluid package.
- 3.Enter simulation environment and drag a pipe and a material stream.



Material Stream: 1

Worksheet Attachments Dynamics

Worksheet

Stream Name	1	Vapour Phase
Vapour / Phase Fraction	1.0000	1.0000
Temperature [C]	40.00	40.00
Pressure [kPa]	5290	5290
Molar Flow [kgmole/h]	8290	8290
Mass Flow [kg/h]	1.330e+005	1.330e+005
Std Ideal Liq Vol Flow [m3/h]	444.2	444.2
Molar Enthalpy [kJ/kgmole]	-7.523e+004	-7.523e+004
Molar Entropy [kJ/kgmole-C]	150.4	150.4
Heat Flow [kJ/h]	-6.237e+008	-6.237e+008
Liq Vol Flow @Std Cond [m3/h]	1.955e+005	1.955e+005
Fluid Package	Basis-1	
Utility Type		

OK

Delete Define from Stream... View Assay

Material Stream: 1

Worksheet Attachments Dynamics

Worksheet

	Mole Fractions	Vapour Phase
Methane	1.0000	1.0000

Total 1.00000

Edit... View Properties... Basis...

OK

Delete Define from Stream... View Assay



4. Click on Equipment Design/Line Sizing and then append list and select stream 1.

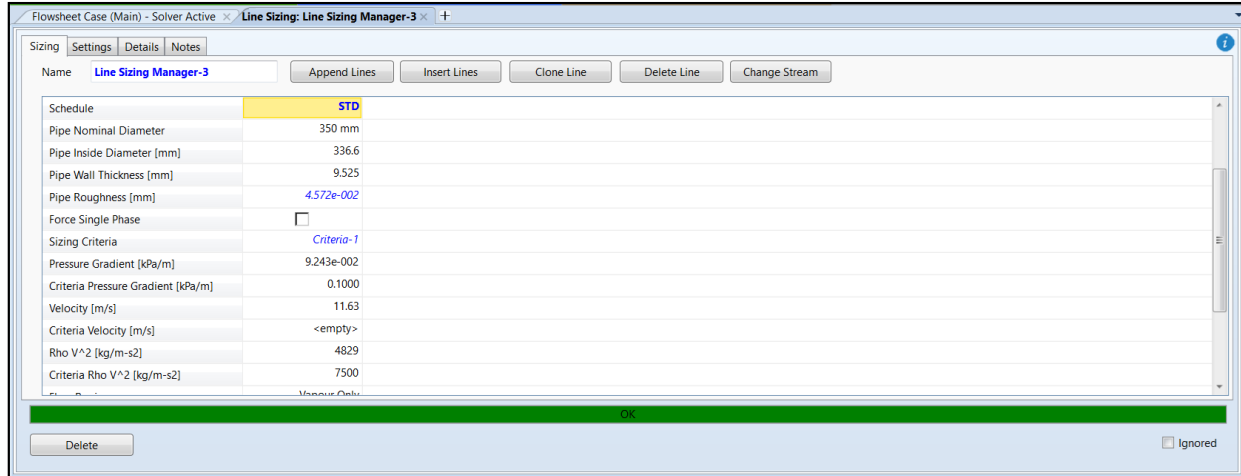
Name	Max Pressure Gradient [kPa/m]	Max Velocity [m/s]	Max Rho V ² [kg/m-s ²]	Description
Criteria-1	0.1000	<empty>	1.000e+004	A new criteria

5. Go to setting and specify the criteria based on the next page table.

Name	Max Pressure Gradient [kPa/m]	Max Velocity [m/s]	Max Rho V ² [kg/m-s ²]	Description
Criteria-1	0.1000	<empty>	7500	A new criteria



6. See the result in Sizing tab or Details Note.



Vapour and steam lines	ρv^2 max. (kg.m ⁻¹ .s ⁻²)	Max. Velocity (m/s)	DP (bar/km)	
			Normal	Maxi
- Continuous operation				
P <= 20 bar g	6000)	
20 < P <= 50 bar g	7500)	
50 < P <= 80 bar g	10000)	Pressure drop must be
80 < P <= 120 bar g	15000)	considered compatible
P > 120 bar g	20000)	with corresponding service
- Compressor suction	Compatible with above		0.2	0.7
- Compressor discharge	Compatible with above		0.45	1.15
- Discontinuous operation				
P <= 50 bar g	10000)	
50 < P <= 80 bar g	15000)	Pressure drop must be
P > 80 bar g	25000)	considered compatible
- Column overhead	15000)	with corresponding service
	(high pressure columns)			
- Stripper vapor return			0.2	0.45
- Kettle vapor return			0.2	0.4

So based on Hysys analysis, the selected size is 14”.