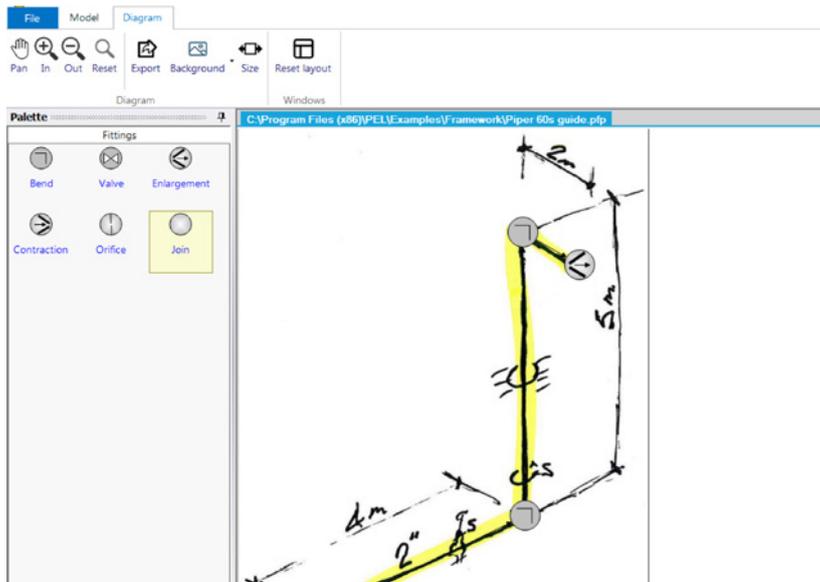


GENERAL FACTSHEET

PEL PIPER

Two phase flow



PEL PIPER calculates the pressure, flowrate and phase of a liquid, two phase mixture, or gas along an unbranched closed conduit system using rigorous physical properties.

PEL PIPER calculates two phase flowrates and pressure drop through a pipe as well as handling single phase liquid and gas flows.

It is based on the assumption of homogeneous equilibrium flow and determines the equilibrium phase split at multiple points along the pipe to produce accurate results.

When supplied with the pressure at the inlets, PEL PIPER calculates the flow, internal pressure, temperature and vapour fraction along the pipe.

Alternatively, given the flow and the inlet pressure, it will calculate the internal pressure, temperature and vapour fraction along the pipe.

What we offer

PEL PIPER has all of the flexibility you need to draw and construct your model using an intuitive graphical interface. Behind the scenes PEL PIPER has a tried and tested calculation engine which works with the rigorous PEL Physpack physical property system to generate the results, predict flow chokes and provide the analysis the engineer needs simply and easily.

Key features

Creating models is simple:

- Simple drag and drop tool for drawing the model
- Automatic connection of vessels and fittings
- Automatic pipe size correction when diameters are changed
- Table view of the system to allow quick modifications to multiple items
- Simple tools for internal pipe diameters and pipe roughness
- K Value calculator for fitting losses
- Insert isometric or sketch into the drawing tool so the model can be built over the isometric

Benefits

- Users can have complete confidence in the results
- Reduces risk of human errors in calculations - essential when working with safety critical equipment
- Allows engineers to be more efficient and productive
- Provides a documented record of calculations for audit
- Improves QA and standardises procedures by everyone using the same set of data and calculations
- PEL PIPER can be licensed as an add-on to PEL or as a completely separate programme

The presentation of results makes it easy to understand how your model is working:

- Workspace is fully customisable with dockable windows to display the information you want the way you want it
- Calculated results and input data can be highlighted on the drawing
- Result tables can be copied and pasted into other applications such as MS Excel
- Calculated results can be presented in a customisable table of results and exported to MS Office

The results also display the vapour and liquid phase physical properties as they change down the pipe including molecular weight, density, viscosity and enthalpy.

Pipe Section	Section Type	Straight Pipe Void Fraction	Liquid Mol Wt	Vapour Mol Wt	Liquid Density	Vapour Density	Liquid Viscosity	Vapour Viscosity	Liquid Enthalpy	Vapour Enthalpy	Fail Flag
			kg/m3	kg/m3	kg/m3	kg/m3	kg/m2	kg/m2	J/kg	J/kg	
0	Feed	0.00000	25.9014	1.00000	797.397	0.00000	0.000239890	0.00000	-1283750	0.00000	-
1	Contraction	0.00000	25.9014	1.00000	797.398	0.00000	0.000239890	0.00000	-1283760	0.00000	-
2	Straight	0.00000	25.9014	1.00000	797.398	0.00000	0.000239892	0.00000	-1283760	0.00000	-
3	Bend	0.00000	25.9014	1.00000	797.398	0.00000	0.000239891	0.00000	-1283760	0.00000	-
4	Straight	0.00000	25.9014	1.00000	797.397	0.00000	0.000239889	0.00000	-1283760	0.00000	-
5	Bend	0.00000	25.9014	1.00000	797.397	0.00000	0.000239889	0.00000	-1283760	0.00000	-
6	Straight	0.00000	25.9014	1.00000	797.398	0.00000	0.000239890	0.00000	-1283770	0.00000	-
7	Bend	0.00000	25.9014	1.00000	797.397	0.00000	0.000239890	0.00000	-1283770	0.00000	-
8	Straight	0.00000	25.9014	1.00000	797.397	0.00000	0.000239889	0.00000	-1283770	0.00000	-
9	Bend	0.00000	25.9014	1.00000	797.397	0.00000	0.000239889	0.00000	-1283770	0.00000	-
10	Straight	0.00000	25.9014	33.6334	797.396	0.00000	0.000239886	0.00000	-1283770	0.00000	-
10	Straight	0.677347	25.9014	33.6423	803.722	3.86238	0.000231968	0.0000122196	-1314400	148678	-

The results table provides simple and useful results displaying pressure, pressure drop, temperature, vapour mass fraction and homogeneous velocity. The table also highlights where chokes / pressure discontinuities are present in the pipe. These can also be displayed graphically.

Pipe Section	Section Type	Kvalue or Length	Static Pressure	Pressure Drop	Temperature	Vapour Mass Fraction	Homogeneous Velocity	Pressure Discontinuity
		m	N/m2	N/m2 diff	K		m/s	
0	Feed	401.325	0.00000		393.150	0.00000	0.00658657	-
1	Contraction	0.58599	397788	3537.18	393.150	0.00000	2.38968	-
2	Straight	0.50000	393440	4347.97	393.149	0.00000	2.38968	-
3	Bend	0.35320	392636	804.160	393.149	0.00000	2.38968	-
4	Straight	8.00000	385648	6987.76	393.150	0.00000	2.38969	-
5	Bend	0.27453	385023	625.046	393.150	0.00000	2.38969	-
6	Straight	0.50000	380675	4347.96	393.150	0.00000	2.38968	-
7	Bend	0.35320	379871	804.161	393.150	0.00000	2.38968	-
8	Straight	4.00000	376377	3493.88	393.150	0.00000	2.38969	-
9	Bend	0.35320	375573	804.161	393.150	0.00000	2.38969	-
10	Straight	0.190122	373910	1662.55	393.152	0.0000100000	2.95462	-
10	Straight	4.80988	322777	51133.7	388.427	0.0188583	13.0135	-

