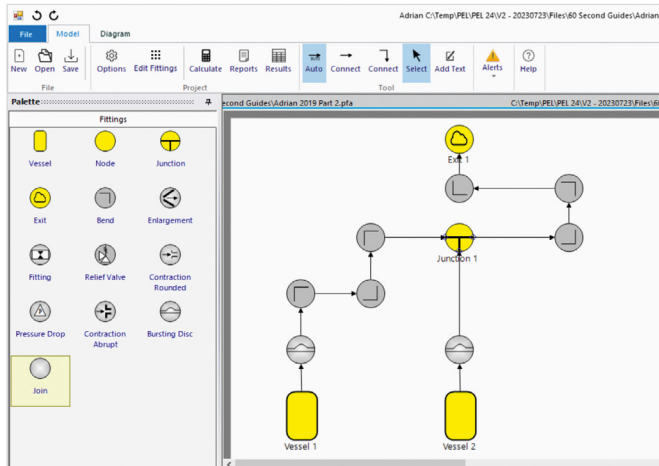


# PEL Adrian

## Compressible network flow



PEL Adrian calculates flows and pressures for high velocity, compressible gases in a network and is relevant for the modelling of relief streams



PEL Adrian calculates single phase high velocity gas or vapour flowrates and pressure drops in piping systems. These may consist of a single pipe or a network. When supplied with the pressure at the inlets and outlet, PEL Adrian calculates the flows and internal pressures throughout the network. Alternatively, given the input flows and the exit pressure, it will calculate the flows and pressures at all other points.

### WHAT WE OFFER

PEL Adrian has all of the flexibility you need to draw and construct your models using an intuitive graphical interface. Calculating compressible flow by hand is an iterative and time consuming process. PEL Adrian has a tried and tested calculation engine to generate the results, predict flow chokes and provide the analysis the engineer needs simply and easily.

### KEY FEATURES

A number of specific types of equipment are modelled:

- Contractions
- Expansions
- Relief valves
- Bursting discs
- Bends
- Fittings

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
- Physical property calculator through a simple interface
- 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 Adrian 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 table provides simple and useful results displaying both stagnation and static pressure as well as temperatures, Mach Number and gas velocities. The table also highlights where chokes/pressure discontinuities are present in the network. These can also be displayed graphically.

### ADRIAN AND RELIEF STUDIES

Relief systems with relief valves and/or bursting discs require modelling of the relief system to determine either pressure drops or the system capacity.

PEL Adrian provides the tools to complete this simply and easily.

For relief valves the upstream irrecoverable pressure loss due to friction and the back pressure is determined and reported as a pressure loss and a percentage of set pressure.

Fitting #	Fitting	Static Pressure	Stagnation Pressure	Temperature	Mach Number	Velocity	Diameter
		bar	bar	C		m/s	mm
1	inlet contraction (1)	6.5132	6.5132	20	-	0	-
1	inlet contraction (2)	6.4608	6.5132	19.3297	0.1075	36.8484	-
2	straight (1)	6.4608	6.5132	19.3297	0.1075	36.8484	26.6
3	bursting disc (1)	6.4137	6.4666	19.3199	0.1083	37.1179	26.6
3	bursting disc (2)	6.3504	6.4038	19.3063	0.1094	37.4859	-
3	bursting disc (3)	6.3504	6.4038	19.3063	0.1094	37.4859	-
4	straight (1)	6.3504	6.4038	19.3063	0.1094	37.4859	26.6
5	relief valve (1)	6.1564	6.2115	19.2622	0.1128	38.6611	26.6
5	relief valve (2)	4.0012	6.2115	-14.3328	0.8178	263.7221	-
6	straight (1)	4.603	4.6767	18.6853	0.1507	51.6058	26.6
6	straight (2)	4.3274	4.4058	18.5143	0.1603	54.8606	26.6

**Relief Valve**

**Relief Valve Pressure Drop Calculation**

Set Pressure:  bar

Over Pressure:  %

Relief Pressure:  bar

Calculated Relief Pressure:  bar

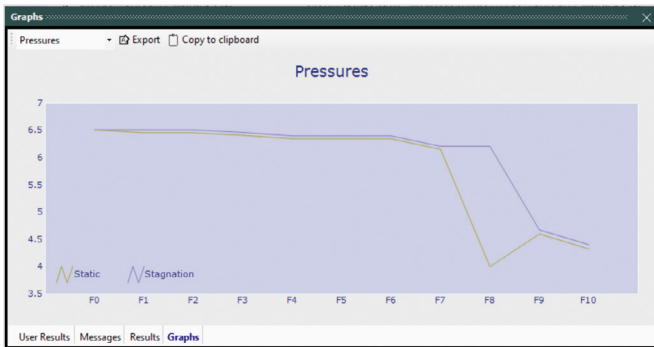
Upstream Stagnation Pressure Drop:  bar diff

Downstream Static Pressure:  bar

**Expressed as % of Relief Valve Gauge Set Pressure**

Upstream:  %

Downstream:  %



For bursting disc systems the relief pressure and the exit pressure, along with the frictional losses in the pipe and across the disc can be modelled to determine the system capacity.

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