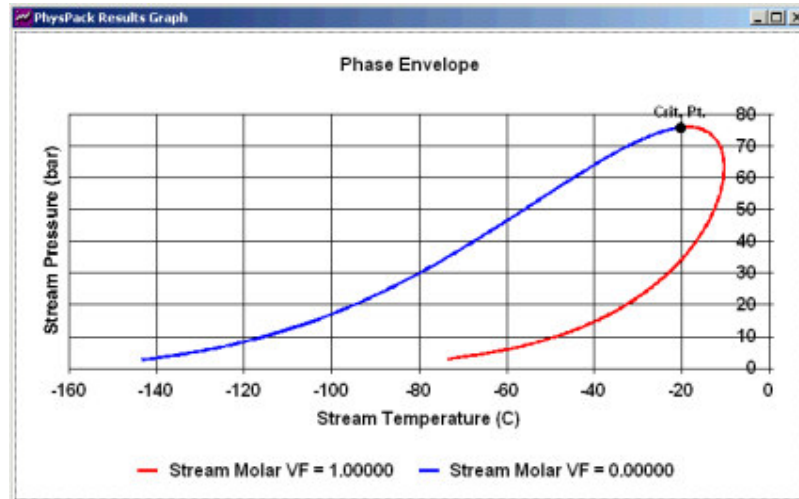


This short guide will show you how easy it is to use the new PhysPack and how quickly you can calculate accurate physical properties.



Within 60 seconds from now you will have learned how to use PhysPack and produced a graph of the phase envelope for a mixture of methane, ethane and propane.

Okay, the clock starts now...

Starting PhysPack

1. Click on **Start | Programs | PEL | PhysPack**.

The main PhysPack window appears. There are 4 tabs across the top of the window; the Components tab is selected by default. On this tab there are 3 options – Pure Component, Aqueous Solution, and Mixture; Pure Component is the default.

The first thing we need to do is add the components.

2. Select the **Mixture** option.

A new panel is displayed with several tabs – the default one being Feeds. This tab is where we select the components we are interested in and specify their compositions.

3. Click **Add Component** to display the *Select Components from Databank* window.
4. In the *Search for Name* box, type **ME** for methane. All the components on the databank beginning with ME are then listed below. Scroll down the list, click on **METHANE** and then click **Add to Stream** at the bottom of the window to add methane to our stream. (Tip: you can also double-click on the name to add it to the list) Next, delete **ME** from the Search box and type **ET** for ethane; double-click on ethane in the list to add ethane to the stream. Repeat this for propane. Finally, click **Close** to return to the *Mixture* panel.

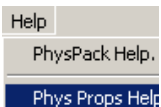
Next we need to set the feed for each component – 50% methane, 40% ethane, 10% propane by mass fraction

5. Click the **mass fraction** column in the spreadsheet. Type **0.5** for methane, **0.4** for ethane, and **0.1** for propane.

Notice that PhysPack automatically calculates the Mole, Mole Fraction, and Mass.

Next, we need to check which method PhysPack has chosen to model the Vapour Liquid Equilibrium.

6. Click the **VLE** tab.



You can see that the Peng Robinson (PR/PR) method has been automatically selected for both the vapour and the liquid phases. This method is an Equation-of-State and is very suitable for modelling hydrocarbons at high temperatures and pressures. To find out more about VLE methods click on PhysProps Help on the Help menu at the top of the screen. Then select Thermodynamic Models from the Reference Guide.

Now on to specify the calculation type - we want a phase envelope calculation

7. Click the **Specification** tab at the top of the screen. Click on the **down-arrow** on the box for selecting the calculation type and select **VL Phase Envelope**.

That's all we need to specify. We're now ready to do the calculation and see the results so ...

8. Click the **Stream tab** at the top of the screen. After a few seconds PhysPack presents the results in a spreadsheet. Move up and down using the scroll bar to see the results and notice the *Comments* column which identifies the Maximum Temperature, Maximum Pressure, and the Critical Point.

Fine, but we wanted a graph not a table so ...

9. Click the **column header** for *Stream Pressure*; the column goes black to show it has been selected. Now click the **right-mouse** button. A menu appears in the middle of the screen. Select the item **Graph Selected Results** and - Hey Presto! - there's your graph just like the one on the previous page. If you click the right-mouse button you can modify the appearance of the graph to your heart's content as well as print it or copy it to another program. Finally, click the **X** at the top right hand corner of the Graph window to return to the spreadsheet.

Now let's go back and see what happens if we use a different VLE method?

10. Click the **Components** tab at the top of the screen. **Uncheck** *Allow automatic selection of VLE Method* then select the Redlich Kwong Soave method called **RKS(API)/RKS(API)** from the pull-down list.
11. Switch back the **Stream** tab. Highlight the *Stream Pressure* column, **right-mouse** click, and select **Add Selected Results to the Current Graph** from the pop-up menu. Both sets of results are displayed on the same graph so you can easily compare the differences between the two methods.

*And that's it. How's the time doing? Did you beat the clock? If you have, try clicking on the Units tab and converting the Temperature from **K** to **C** and see how easily different units can be used.*

*Now you've learned the basics it's time to read the **PhysPack User Manual**. This will tell you more about all of the really useful features and options in the program.*

This program is developed, maintained and supported by PEL Support Services, ABB. We run a Hotline telephone and email service to answer any queries about the PEL products. You can contact us:

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