

Making Fluid Model

Making fluid model process allows you to generate black oil fluid models. These models are defined by specifying several properties such as viscosity, density and volume formation factors for each of the fluid phases. These properties are normally entered as tables that only depend on pressure. The most reliable way to obtain this information is from a reservoir fluid study using bottom hole or reconstituted fluid samples. If such data is not available, correlations can be used to estimate the oil, water and gas properties as well as the gas/oil relationships. Note that this process does not offer any support for creating ECLIPSE 300 compositional fluid models.

Making fluid model process gives you access to a wide range of correlations. A best correlation is automatically selected based on the input parameters you choose. Alternatively, you may choose correlations manually.

Data for initial reservoir conditions must also be entered in the Make fluid model process. Together with the fluid properties and saturation functions, this allows determination of the initial fluid distribution in the reservoir. Rock compressibility data is now entered using the Make rock physics functions process.

How to make a fluid model from correlations

To create a new fluid model by using correlations:

1. In the Processes pane, open **Simulation** and select **Make fluid model**. This opens the **Make fluid model** dialog. As shown in Fig.23.1.

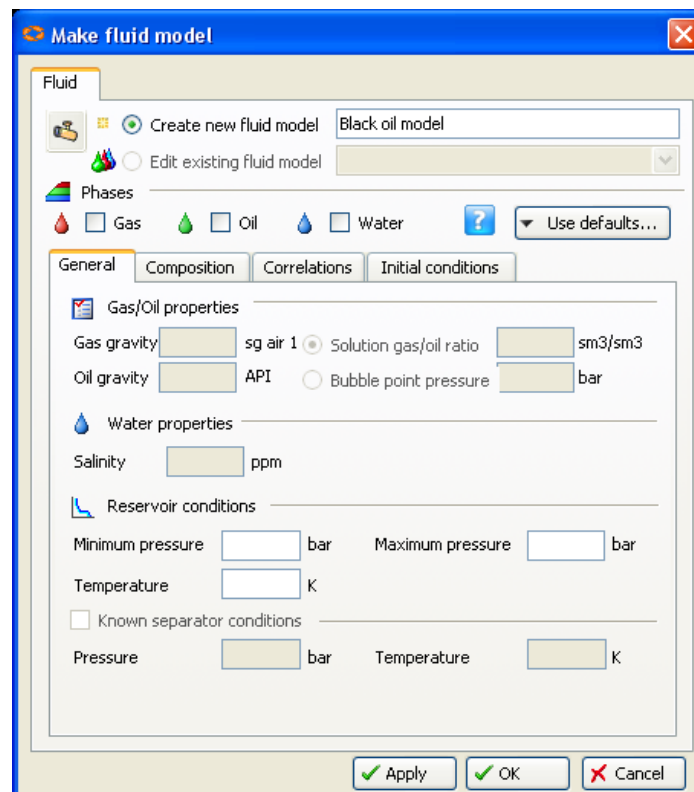


Fig.23.1: Make fluid model dialog

2. Most of the fields on the dialog can be filled in with default values by selecting an option from the **Use defaults** list as shown in Fig.23.2. For example we will choose **Light oil + gas** option.
3. Select **Create new fluid model** and enter the name for the new fluid model into the adjacent field, for example: **Fluid 1**

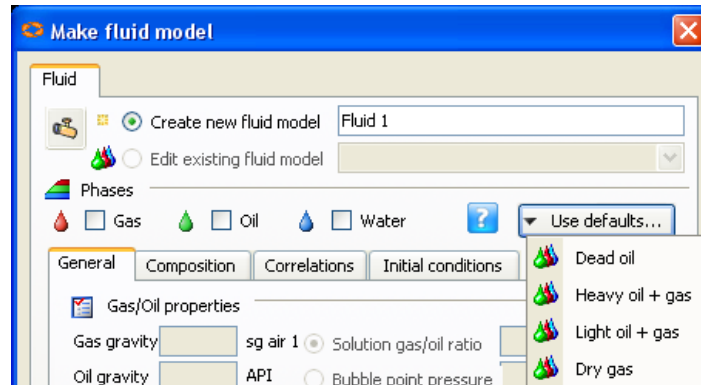


Fig.23.2: Fluid 1 inserted with use defaults popup list

4. Select the phases required by clicking on the appropriate checkboxes.

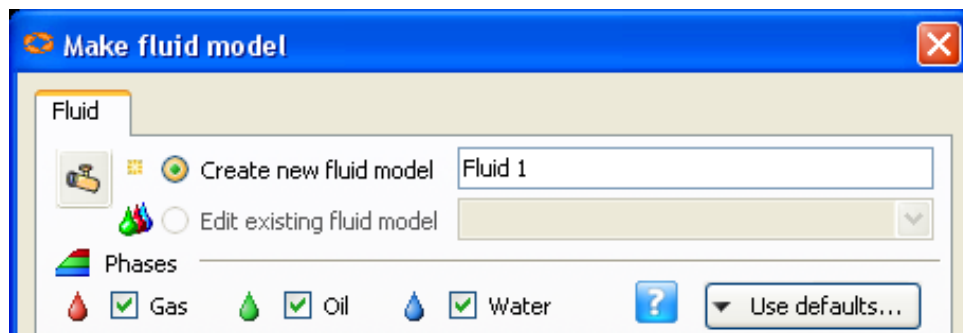


Fig.23.3: Gas, Oil and Water selected as a required for the model

5. If you know the values for the model parameters, enter them into the appropriate fields.

The screenshot shows the 'Make fluid model' dialog box with the following fields and values:

- Fluid** tab selected.
- Create new fluid model** (checked) with name **Fluid 1**.
- Edit existing fluid model** (unchecked).
- Phases** section: **Gas**, **Oil**, and **Water** are checked. A **Use defaults...** button is present.
- General** tab selected.
- Gas/Oil properties** section:
 - Gas gravity**: 1.6636
 - sg air 1**: radio button selected
 - Solution gas/oil ratio**: empty field, unit **sm3/sm3**
 - Oil gravity**: 45
 - API**: radio button selected
 - Bubble point pressure**: 300, unit **bar**
- Water properties** section:
 - Salinity**: 30000, unit **ppm**
- Reservoir conditions** section:
 - Minimum pressure**: 80, unit **bar**
 - Maximum pressure**: 350, unit **bar**
 - Temperature**: 350, unit **K**
- Known separator conditions** section (checkbox unchecked):
 - Pressure**: empty field, unit **bar**
 - Temperature**: empty field, unit **K**
- Buttons** at the bottom: **Apply**, **OK**, and **Cancel**.

Fig.23.4: the parameters for phases inserted

6. If you wish to use particular correlations rather than the defaults, select the correlations in the **Correlations** tab.

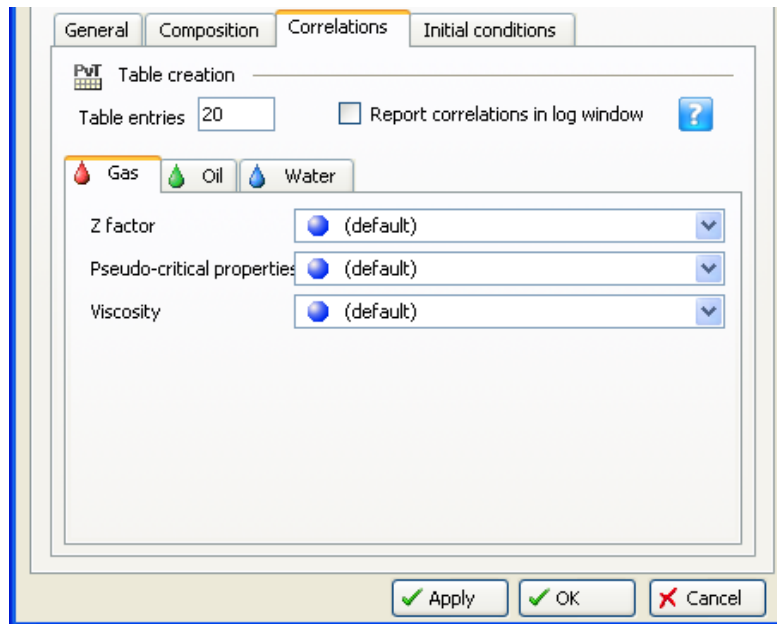


Fig.23.5: Correlations tab for the phases

7. To specify the initial reservoir conditions for the model, you can either drop in a contact set, For example we will insert the **Contact Set** from **Models** Pane and enter a table of **contact depths** and **pressures**.

General Composition Correlations Initial conditions

☒ Define from contact set Target number of initial condns 5 ?

☐ Define in table Surface elevation 0 m

Fill table from contact set ?

Region	
Name	Initial condition 1
Pressure (bar)	170
Datum depth (m)	-1700
Gas-oil contact (m)	-1700
Water contact (m)	-2024

Apply OK Cancel

Fig.23.6: initial conditions tab for the contact

8. Click on **OK** or **Apply** to create the new fluid model.

9. Now, for displaying the fluid model, open a **new function window** then from **Input** Pane display the phases.

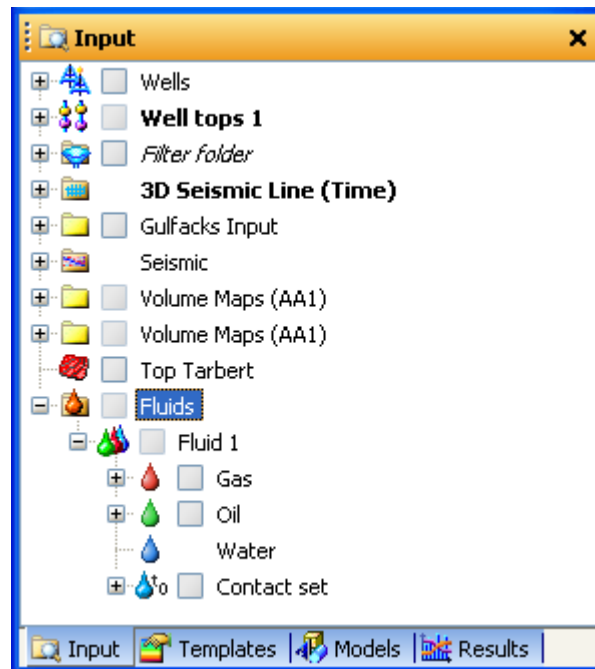


Fig.23.7: Fluids folder in the Input Pane

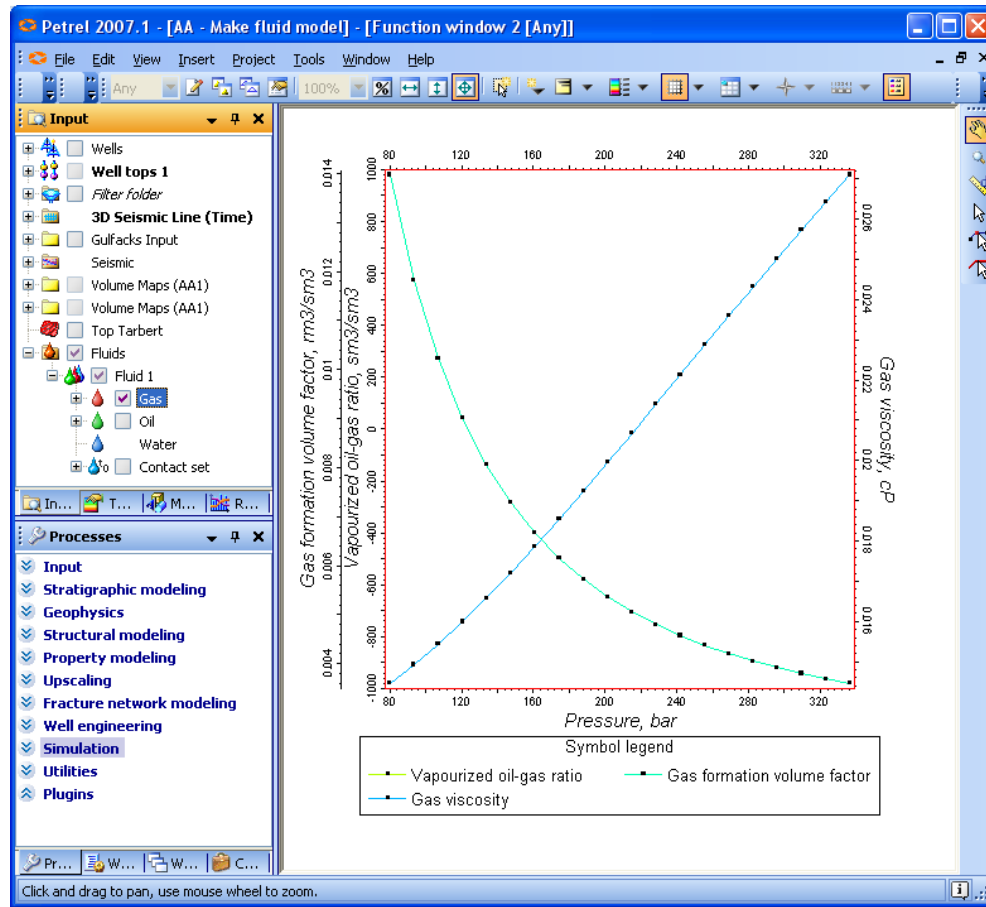


Fig.23.8: gas phase in fluid model display in a new function window

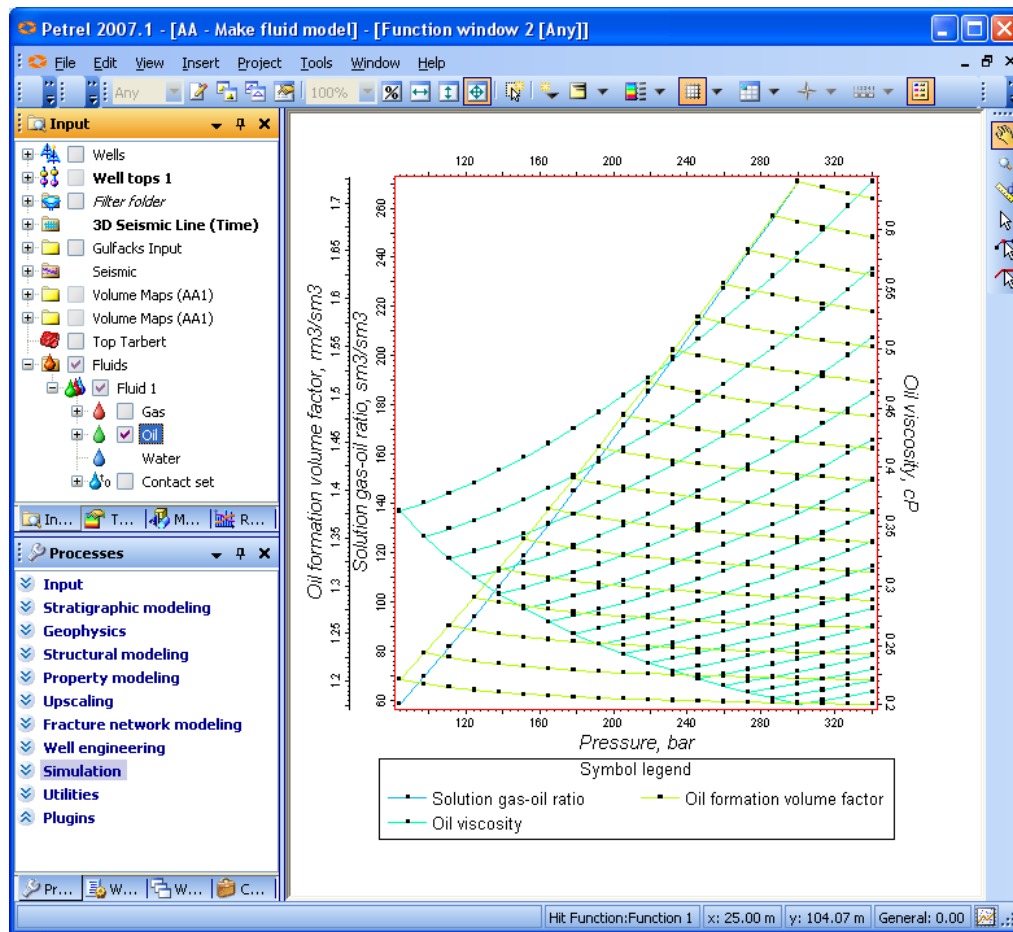


Fig.23.9: oil phase in fluid model display in a new function window

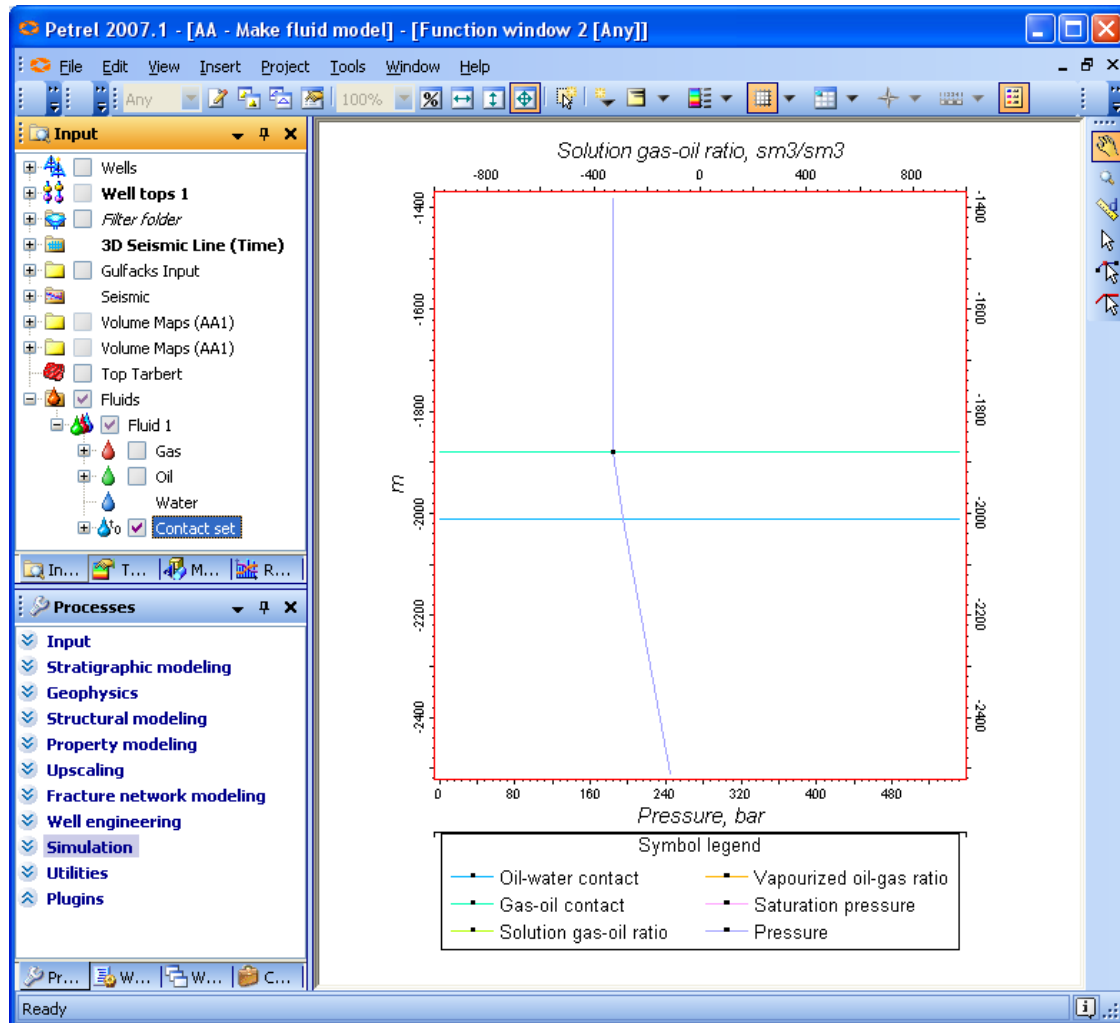


Fig.23.10: contact set in fluid model display in a new function window

How to Edit an Existing Fluid Model

If you have a fluid model that was created by correlations in the Make fluid model process:

1. In the Processes pane, open **Simulation** and select **Make fluid model**. This opens the **Make fluid model** dialog.
2. Select **Edit existing fluid model** and choose the model from the drop-down list.
3. Change the model parameters as required.
4. Click on **OK** or **Apply** to update the fluid model.

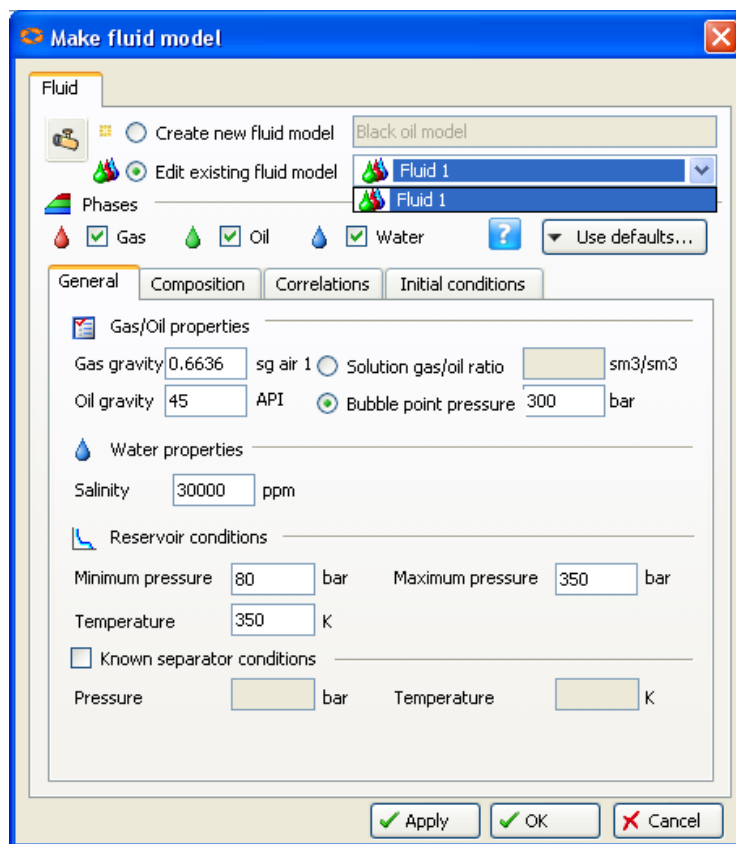


Fig.23.11: edit an existing fluid model for Fluid 1