



A. SHORT CUT METHOD (FENSKE UNDERWOOD GILLILAND)

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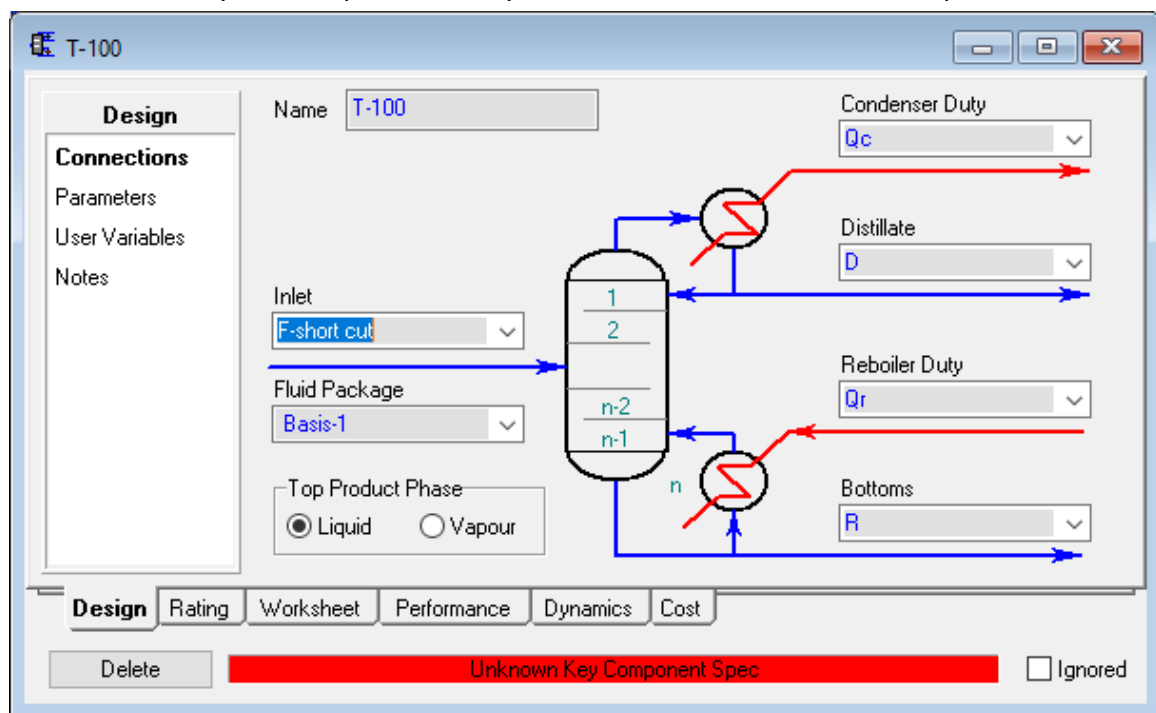
A. SHORT CUT METHODS (FENSKE UNDERWOOD GILLILAND)

1. Add a Short Cut Distillation Column

- Drag and Drop the Short Cut Distillation icon  from the Object Palette.
- Double-click the Short Cut Distillation icon .
- The Short Cut Distillation property view appears

2. Specifying Short Cut Column connections

- Click on the Design tab.
- Click on the Connections page.
- In the Name field, specify a name for the Short Cut Column. (Optional)
- In the Inlet drop-down list either type in the name of the stream or if you have pre-defined your stream select it from the drop-down list.
- In the Condenser Duty drop-down list either type in the name of the stream or if you have pre-defined your stream select it from the drop-down list.
- In the Reboiler Duty drop-down list either type in the name of the stream or if you have pre-defined your stream select it from the drop-down list.
- In the Bottoms drop-down list either type in the name of the stream or if you have pre-defined your stream select it from the drop-down list.
- In the Top Product Phase group, click either the Liquid or Vapour radio button.
- In the Distillate drop-down list (when the Liquid radio button is selected) or the overhead Vapour drop-down list (when the Vapour radio button is selected) either type in the name of the stream or if you have pre-defined your stream select it from the drop-down list.



3. Specifying Short Cut Column parameters

- Click on the Parameters page.
- In the Light Key in Bottoms Component drop-down list, select the component you want to define as the light key.
- Specify the Mole Fraction of the light key in the Light Key in Bottoms Mole Fraction field.

- In the Heavy Key in Distillate Component drop-down list, select the component you want to define as the heavy key.
- Specify the Mole Fraction of the heavy key in the Heavy Key in Distillate Mole Fraction field.
- Specify the condenser and reboiler pressures in the appropriate fields in the Pressures group.
- Specify the external reflux ratio in the External Reflux Ratio field. The External Reflux must be greater than the Minimum Reflux Ratio.

The screenshot shows the 'T-100' design window. On the left is a sidebar with 'Design' selected. The main window is divided into three sections: 'Components', 'Pressures', and 'Reflux Ratios'.
 - **Components:** A table with two rows: 'Light Key in Bottoms' (Methanol, 0.0100) and 'Heavy Key in Distillate' (H2O, 0.0100).
 - **Pressures:** 'Condenser Pressure' and 'Reboiler Pressure' are both set to 1,500 bar.
 - **Reflux Ratios:** 'External Reflux Ratio' is 0.800 and 'Minimum Reflux Ratio' is 0.690.
 At the bottom, there are tabs for 'Design', 'Rating', 'Worksheet', 'Performance', 'Dynamics', and 'Cost'. Below the tabs are buttons for 'Delete', 'OK', and 'Ignored'.

4. Viewing Short Cut Column Results

- Click on the Performance tab.

The **Performance** tab contains the following groups:

- The Trays group displays the following results: [Minimum Number of Trays](#), [Actual Number of Trays](#), and [Optimal Feed Stage](#).
- The Temperatures group displays the following results: [Condenser Temperature](#) and [Reboiler Temperature](#).
- The Flows group displays the following results: [Rectify Vapour](#), [Rectify Liquid](#), [Stripping Vapour](#), [Stripping Liquid](#), Condenser Duty, and Reboiler Duty.

[Minimum Number of Trays](#): This is the Fenske minimum number of trays, which is not affected by the External Reflux Ratio specification

[Actual Number of Trays](#): This is calculated using a using the Gilliland method

[Optimal Feed Stage](#) Top down feed stage for optimal separation

[Rectify Vapour](#), [Rectify Liquid](#): These are the estimated average flow rates above the feed location

[Stripping Vapour](#), [Stripping Liquid](#): These are the estimated average flow rates below the feed location