Rigorous RadFrac

- Model Gas Absorption - RadFrac

- Column Internals and Design

- %Flooding. Tray SPacing, Col Diagram

Problem Statement

- Acetone is to be absorbed into water from air mixture
  - Specs: 15 Stages, P = 1 atm, Isobaric

- Feed Gas:
  - %Acetone = 2%; Air = 98%
  - F = 80 kmol/h, T = 25°C, P = 1 atm (101.3 kPa)

- Solvent
  - %Water = 100%
  - F = 80 kmol/h, T = 25°C, P = 1 atm (101.3 kPa)

Design Methodology

- (A) Perform the Simulation of Absorption, verify Results
- (B) Compare Sieve Trays vs. Bubble-Cap Trays
- (C) Change Tray Spacing to verify results
- (D) Change from Tray Columns to Packed Column, verify Results

Bubble Tray Result
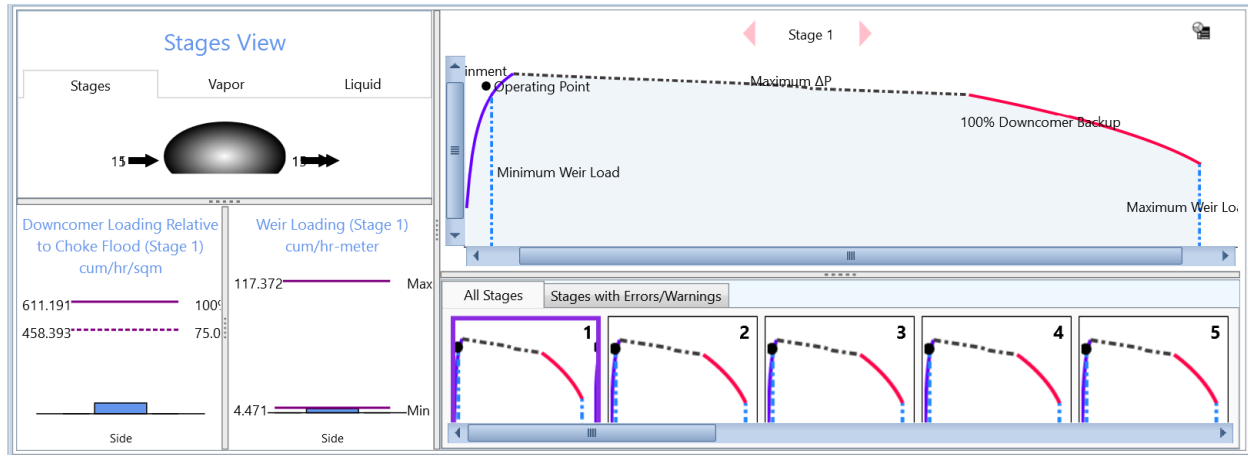
	Value	Units
▶ Number of Trayed/Packed stages	15	
▶ Total height	9.144	meter
▶ Total head loss (Hot liquid height)	1.58822	meter
▶ Total pressure drop	0.154365	bar
▶ Number of sections	1	
▶ Number of diameters	1	
▶ Pressure drop across sump		bar
▶ Total residence time	0.0369729	hr

Sieve Tray Result
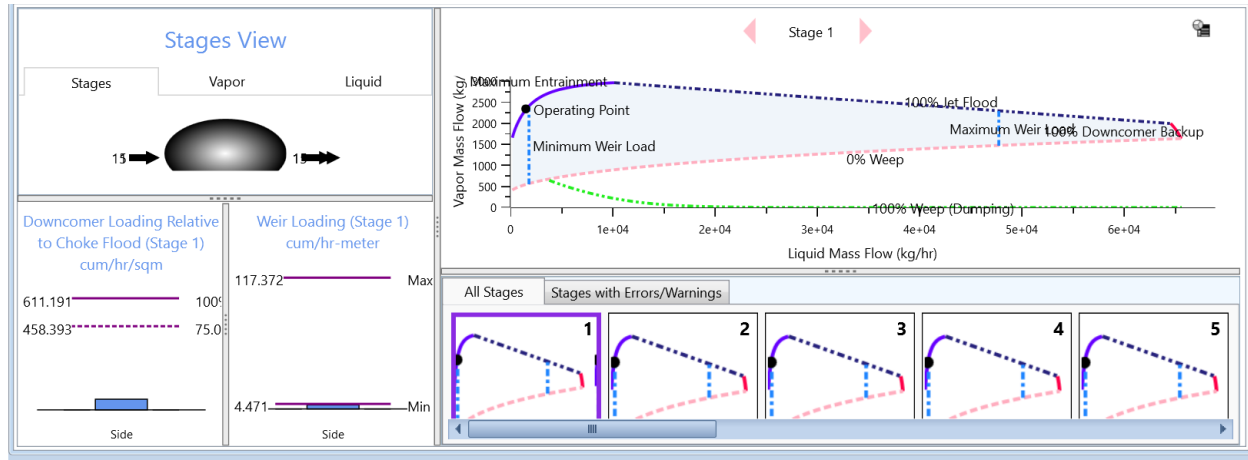
	Value	Units
Number of Trayed/Packed stages	15	
Total height	9.144	meter
Total head loss (Hot liquid height)	1.68739	meter
► Total pressure drop	0.164003	bar
Number of sections	1	
Number of diameters	1	
Pressure drop across sump		bar
Total residence time	0.0331813	hr

Tray Spacing
For spacing of 70cm

	Value	Units
▶ Number of Trayed/Packed stages	15	
Total height	10.5	meter
Total head loss (Hot liquid height)	1.94503	meter
Total pressure drop	0.189044	bar
Number of sections	1	
Number of diameters	1	
Pressure drop across sump		bar
Total residence time	0.0343061	hr

Packed Type

Input Specification:

Column description [   ]   Input Complete

Add New | Auto Section ▼ | Duplicate | Import Template | Export Template | View Internals Summary

Name	Start Stage	End Stage	Mode	Internal Type	Tray/Packing Type	Tray Details		Packing Details			Tray Spacing/Section Packed Height	D
						Number of Passes	Number of Downcomers	Vendor	Material	Dimension		
▶ CS-1	1	15	Interactive sizing	Packed	RASCHIG			RASCHI ▼	METAL	25-MM ▼	6.75 meter	0.7078

⊚ Don't update pressure drop

Results

Column Internals Summary

	Number of Trayed/Packed stages	15	
	Total height	6.75	meter
	Total head loss (Hot liquid height)	0.528218	meter
▶	Total pressure drop	0.0513567	bar
	Number of sections	1	
	Number of diameters	1	
	Pressure drop across sump		bar
	Total residence time	0	hr

Sections

	Start Stage	End Stage	Diameter		Section Height		Internals Type	Tray Type or Packing Type	Section Pressure Drop		% Approach to Flood	Limiting Stage	
CS-1	1	15	0.707815	meter	6.75	meter	PACKING	RASCHIG	0.0513567	bar	80	15	View