

### Flowsheet-III: Production of Ethylene Glycol (PFR)

Models Implemented: Plug Flow Reactor, Mixer, Cooler

Thermodynamic Package: Raoult's Law

#### Reaction Data:

Reaction : *Ethylene Oxide + Water → Ethylene Glycol*

Base Component : Ethylene Oxide

Phase : Vapour Phase

Mode : Outlet temperature defined (400.10 K)

Order : First order

#### Standalone-Unit Operation-Comparison – Plug Flow Reactor

Parameter	DWSIM	OpenModelica	Unit
Volume	50	50.2083	m <sup>3</sup>
Reaction Heat	-145.56	-145.656	kW
Energy Load	-105.99	-100.2	kW
Conversion / Ethylene Oxide	7.45	7.45	%
Conversion / Water	1.86	1.8625	%

#### Simulation-Results-DWSIM

Simulation-Results				
Object	Feed (to reactor)	Reactor Product	Final Stream	Unit
Temperature	390.01	400.10	300	K
Pressure	100000	99729.62	99729.62	Pa
Mass Flow	2.32	2.32	2.32	kg/s
Molar Flow	100	98.51	98.51	mol/s
Mole Flow (Mixture) / Ethylene Oxide	20	18.51	18.51	mol/s
Mole Flow (Mixture) / Water	80	78.51	78.51	mol/s
Mole Flow (Mixture) / Ethylene Glycol	0	1.49	1.49	mol/s

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## OpenModelica - Flowsheet

