

# Simulation Report

DWSIM 9.0

## Details

Title: MySimulation\_50

Comments:

Object: PIPE

Type: Pipe Segment

Property	Value	
Time step discretization	10	
Pressure Drop (Total)	-0.0660281	bar
Temperature Change	0.00117719	C.
Heat Exchanged	-0.00330758	kW
Outlet Pressure (Spec)	101.325	kPa
Outlet Temperature (Spec)	25	C
Overall HTC (Spec)	0	W/[m2.K]
External Temperature (Spec)	25	C
Ambient Temperature Gradient	0	C./m
Total Length (Straight Tubes)	500	m
Total Elevation (Straight Tubes)	0	m
PressureDropStatic	0	bar
PressureDropFriction	0.0660281	bar
HydraulicSegment,1,Length	500	m
HydraulicSegment,1,Elevation	0	m
HydraulicSegment,1,InternalDiameter	102.3	mm
HydraulicSegment,1,ExternalDiameter	114.3	mm
HydraulicSegment,1,Sections	5	
HydraulicSegment,1,Results,1,InitialPressure	1000	kPa
HydraulicSegment,1,Results,1,FinalPressure	0	kPa
HydraulicSegment,1,Results,1,AveragePressure	0	kPa
HydraulicSegment,1,Results,1,HeatTransfer	0	kW
HydraulicSegment,1,Results,1,HeatTransfer	0	kW
HydraulicSegment,1,Results,1,HeatCapacityLiquid	4.17931	kJ/[kg.K]
HydraulicSegment,1,Results,1,HeatCapacityVapor	0	kJ/[kg.K]
HydraulicSegment,1,Results,1,PressureDropFriction	0.0132056	bar
HydraulicSegment,1,Results,1,PressureDropHydrostatic	0	bar
HydraulicSegment,1,Results,1,PressureDropTotal	0.0132056	bar
HydraulicSegment,1,Results,1,LiquidHoldup	1	
HydraulicSegment,1,Results,1,HTCoverall	0	W/[m2.K]
HydraulicSegment,1,Results,1,HTCexternal	0	W/[m2.K]
HydraulicSegment,1,Results,1,HTCinternal	0	W/[m2.K]
HydraulicSegment,1,Results,1,HTCinsulation	0	W/[m2.K]

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Comments:

HydraulicSegment,1,Results,1,HTCpipewall	0	W/[m2.K]
HydraulicSegment,1,Results,1,ThermalConductivityLiquid	0.607601	W/[m.K]
HydraulicSegment,1,Results,1,ThermalConductivityVapor	0	W/[m.K]
HydraulicSegment,1,Results,1,ReynoldsNumberLiquid	38851.2	
HydraulicSegment,1,Results,1,ReynoldsNumberVapor	NaN	
HydraulicSegment,1,Results,1,ViscosityLiquid	0.889873	cP
HydraulicSegment,1,Results,1,ViscosityVapor	0	cP
HydraulicSegment,1,Results,1,VolumetricFlowLiquid	10.0255	m3/h
HydraulicSegment,1,Results,1,VolumetricFlowVapor	0	m3/h
HydraulicSegment,1,Results,1,DensityLiquid	997.452	kg/m3
HydraulicSegment,1,Results,1,DensityVapor	0	kg/m3
HydraulicSegment,1,Results,1,SurfaceTension	0.0728167	N/m
HydraulicSegment,1,Results,1,InitialTemperature	25	C
HydraulicSegment,1,Results,1,FlowRegime	G6	
HydraulicSegment,1,Results,1,VelocityLiquid	0.338816	m/s
HydraulicSegment,1,Results,1,VelocityVapor	0	m/s
HydraulicSegment,1,Results,1,ExternalTemperature	25	C
HydraulicSegment,1,Results,1,MachNumber	NaN	0
HydraulicSegment,1,Results,1,DynamicResidenceTime	0	s
HydraulicSegment,1,Results,1,DynamicInternalMassFlowRa	0	kg/h
HydraulicSegment,1,Results,1,DynamicInternalVolumetricFI	0	m3/h
HydraulicSegment,1,Results,2,InitialPressure	998.679	kPa
HydraulicSegment,1,Results,2,FinalPressure	0	kPa
HydraulicSegment,1,Results,2,AveragePressure	0	kPa
HydraulicSegment,1,Results,2,HeatTransfer	0	kW
HydraulicSegment,1,Results,2,HeatTransfer	0	kW
HydraulicSegment,1,Results,2,HeatCapacityLiquid	4.17931	kJ/[kg.K]
HydraulicSegment,1,Results,2,HeatCapacityVapor	0	kJ/[kg.K]
HydraulicSegment,1,Results,2,PressureDropFriction	0.0132056	bar
HydraulicSegment,1,Results,2,PressureDropHydrostatic	0	bar
HydraulicSegment,1,Results,2,PressureDropTotal	0.0132056	bar
HydraulicSegment,1,Results,2,LiquidHoldup	1	
HydraulicSegment,1,Results,2,HTCoverall	0	W/[m2.K]
HydraulicSegment,1,Results,2,HTCexternal	0	W/[m2.K]
HydraulicSegment,1,Results,2,HTCinternal	0	W/[m2.K]
HydraulicSegment,1,Results,2,HTCinsulation	0	W/[m2.K]
HydraulicSegment,1,Results,2,HTCpipewall	0	W/[m2.K]
HydraulicSegment,1,Results,2,ThermalConductivityLiquid	0.607601	W/[m.K]

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HydraulicSegment,1,Results,2,ThermalConductivityVapor	0	W/[m.K]
HydraulicSegment,1,Results,2,ReynoldsNumberLiquid	38851.1	
HydraulicSegment,1,Results,2,ReynoldsNumberVapor	NaN	
HydraulicSegment,1,Results,2,ViscosityLiquid	0.889873	cP
HydraulicSegment,1,Results,2,ViscosityVapor	0	cP
HydraulicSegment,1,Results,2,VolumetricFlowLiquid	10.0255	m3/h
HydraulicSegment,1,Results,2,VolumetricFlowVapor	0	m3/h
HydraulicSegment,1,Results,2,DensityLiquid	997.452	kg/m3
HydraulicSegment,1,Results,2,DensityVapor	0	kg/m3
HydraulicSegment,1,Results,2,SurfaceTension	0.0728167	N/m
HydraulicSegment,1,Results,2,InitialTemperature	25	C
HydraulicSegment,1,Results,2,FlowRegime	G6	
HydraulicSegment,1,Results,2,VelocityLiquid	0.338816	m/s
HydraulicSegment,1,Results,2,VelocityVapor	0	m/s
HydraulicSegment,1,Results,2,ExternalTemperature	25	C
HydraulicSegment,1,Results,2,MachNumber	NaN	0
HydraulicSegment,1,Results,2,DynamicResidenceTime	0	s
HydraulicSegment,1,Results,2,DynamicInternalMassFlowRa	0	kg/h
HydraulicSegment,1,Results,2,DynamicInternalVolumetricFI	0	m3/h
HydraulicSegment,1,Results,3,InitialPressure	997.359	kPa
HydraulicSegment,1,Results,3,FinalPressure	0	kPa
HydraulicSegment,1,Results,3,AveragePressure	0	kPa
HydraulicSegment,1,Results,3,HeatTransfer	0	kW
HydraulicSegment,1,Results,3,HeatTransfer	0	kW
HydraulicSegment,1,Results,3,HeatCapacityLiquid	4.17932	kJ/[kg.K]
HydraulicSegment,1,Results,3,HeatCapacityVapor	0	kJ/[kg.K]
HydraulicSegment,1,Results,3,PressureDropFriction	0.0132056	bar
HydraulicSegment,1,Results,3,PressureDropHydrostatic	0	bar
HydraulicSegment,1,Results,3,PressureDropTotal	0.0132056	bar
HydraulicSegment,1,Results,3,LiquidHoldup	1	
HydraulicSegment,1,Results,3,HTCoverall	0	W/[m2.K]
HydraulicSegment,1,Results,3,HTCexternal	0	W/[m2.K]
HydraulicSegment,1,Results,3,HTCinternal	0	W/[m2.K]
HydraulicSegment,1,Results,3,HTCinsulation	0	W/[m2.K]
HydraulicSegment,1,Results,3,HTCpipewall	0	W/[m2.K]
HydraulicSegment,1,Results,3,ThermalConductivityLiquid	0.607601	W/[m.K]
HydraulicSegment,1,Results,3,ThermalConductivityVapor	0	W/[m.K]
HydraulicSegment,1,Results,3,ReynoldsNumberLiquid	38851.4	

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Comments:

HydraulicSegment,1,Results,3,ReynoldsNumberVapor	NaN	
HydraulicSegment,1,Results,3,ViscosityLiquid	0.889867	cP
HydraulicSegment,1,Results,3,ViscosityVapor	0	cP
HydraulicSegment,1,Results,3,VolumetricFlowLiquid	10.0256	m3/h
HydraulicSegment,1,Results,3,VolumetricFlowVapor	0	m3/h
HydraulicSegment,1,Results,3,DensityLiquid	997.451	kg/m3
HydraulicSegment,1,Results,3,DensityVapor	0	kg/m3
HydraulicSegment,1,Results,3,SurfaceTension	0.0728167	N/m
HydraulicSegment,1,Results,3,InitialTemperature	25.0003	C
HydraulicSegment,1,Results,3,FlowRegime	G6	
HydraulicSegment,1,Results,3,VelocityLiquid	0.338816	m/s
HydraulicSegment,1,Results,3,VelocityVapor	0	m/s
HydraulicSegment,1,Results,3,ExternalTemperature	25	C
HydraulicSegment,1,Results,3,MachNumber	NaN	0
HydraulicSegment,1,Results,3,DynamicResidenceTime	0	s
HydraulicSegment,1,Results,3,DynamicInternalMassFlowRa	0	kg/h
HydraulicSegment,1,Results,3,DynamicInternalVolumetricFI	0	m3/h
HydraulicSegment,1,Results,4,InitialPressure	996.038	kPa
HydraulicSegment,1,Results,4,FinalPressure	0	kPa
HydraulicSegment,1,Results,4,AveragePressure	0	kPa
HydraulicSegment,1,Results,4,HeatTransfer	0	kW
HydraulicSegment,1,Results,4,HeatTransfer	0	kW
HydraulicSegment,1,Results,4,HeatCapacityLiquid	4.17932	kJ/[kg.K]
HydraulicSegment,1,Results,4,HeatCapacityVapor	0	kJ/[kg.K]
HydraulicSegment,1,Results,4,PressureDropFriction	0.0132056	bar
HydraulicSegment,1,Results,4,PressureDropHydrostatic	0	bar
HydraulicSegment,1,Results,4,PressureDropTotal	0.0132056	bar
HydraulicSegment,1,Results,4,LiquidHoldup	1	
HydraulicSegment,1,Results,4,HTCOverall	0	W/[m2.K]
HydraulicSegment,1,Results,4,HTCexternal	0	W/[m2.K]
HydraulicSegment,1,Results,4,HTCinternal	0	W/[m2.K]
HydraulicSegment,1,Results,4,HTCinsulation	0	W/[m2.K]
HydraulicSegment,1,Results,4,HTCpipewall	0	W/[m2.K]
HydraulicSegment,1,Results,4,ThermalConductivityLiquid	0.607601	W/[m.K]
HydraulicSegment,1,Results,4,ThermalConductivityVapor	0	W/[m.K]
HydraulicSegment,1,Results,4,ReynoldsNumberLiquid	38851.6	
HydraulicSegment,1,Results,4,ReynoldsNumberVapor	NaN	
HydraulicSegment,1,Results,4,ViscosityLiquid	0.889862	cP

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Comments:

HydraulicSegment,1,Results,4,ViscosityVapor	0	cP
HydraulicSegment,1,Results,4,VolumetricFlowLiquid	10.0256	m3/h
HydraulicSegment,1,Results,4,VolumetricFlowVapor	0	m3/h
HydraulicSegment,1,Results,4,DensityLiquid	997.45	kg/m3
HydraulicSegment,1,Results,4,DensityVapor	0	kg/m3
HydraulicSegment,1,Results,4,SurfaceTension	0.0728166	N/m
HydraulicSegment,1,Results,4,InitialTemperature	25.0006	C
HydraulicSegment,1,Results,4,FlowRegime	G6	
HydraulicSegment,1,Results,4,VelocityLiquid	0.338817	m/s
HydraulicSegment,1,Results,4,VelocityVapor	0	m/s
HydraulicSegment,1,Results,4,ExternalTemperature	25	C
HydraulicSegment,1,Results,4,MachNumber	NaN	0
HydraulicSegment,1,Results,4,DynamicResidenceTime	0	s
HydraulicSegment,1,Results,4,DynamicInternalMassFlowRa	0	kg/h
HydraulicSegment,1,Results,4,DynamicInternalVolumetricFI	0	m3/h
HydraulicSegment,1,Results,5,InitialPressure	994.718	kPa
HydraulicSegment,1,Results,5,FinalPressure	0	kPa
HydraulicSegment,1,Results,5,AveragePressure	0	kPa
HydraulicSegment,1,Results,5,HeatTransfer	0	kW
HydraulicSegment,1,Results,5,HeatTransfer	0	kW
HydraulicSegment,1,Results,5,HeatCapacityLiquid	4.17932	kJ/[kg.K]
HydraulicSegment,1,Results,5,HeatCapacityVapor	0	kJ/[kg.K]
HydraulicSegment,1,Results,5,PressureDropFriction	0.0132056	bar
HydraulicSegment,1,Results,5,PressureDropHydrostatic	0	bar
HydraulicSegment,1,Results,5,PressureDropTotal	0.0132056	bar
HydraulicSegment,1,Results,5,LiquidHoldup	1	
HydraulicSegment,1,Results,5,HTCOverall	0	W/[m2.K]
HydraulicSegment,1,Results,5,HTCexternal	0	W/[m2.K]
HydraulicSegment,1,Results,5,HTCinternal	0	W/[m2.K]
HydraulicSegment,1,Results,5,HTCinsulation	0	W/[m2.K]
HydraulicSegment,1,Results,5,HTCpipewall	0	W/[m2.K]
HydraulicSegment,1,Results,5,ThermalConductivityLiquid	0.607601	W/[m.K]
HydraulicSegment,1,Results,5,ThermalConductivityVapor	0	W/[m.K]
HydraulicSegment,1,Results,5,ReynoldsNumberLiquid	38851.9	
HydraulicSegment,1,Results,5,ReynoldsNumberVapor	NaN	
HydraulicSegment,1,Results,5,ViscosityLiquid	0.889856	cP
HydraulicSegment,1,Results,5,ViscosityVapor	0	cP
HydraulicSegment,1,Results,5,VolumetricFlowLiquid	10.0256	m3/h

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Comments:

HydraulicSegment,1,Results,5,VolumetricFlowVapor	0	m3/h
HydraulicSegment,1,Results,5,DensityLiquid	997.45	kg/m3
HydraulicSegment,1,Results,5,DensityVapor	0	kg/m3
HydraulicSegment,1,Results,5,SurfaceTension	0.0728166	N/m
HydraulicSegment,1,Results,5,InitialTemperature	25.0009	C
HydraulicSegment,1,Results,5,FlowRegime	G6	
HydraulicSegment,1,Results,5,VelocityLiquid	0.338817	m/s
HydraulicSegment,1,Results,5,VelocityVapor	0	m/s
HydraulicSegment,1,Results,5,ExternalTemperature	25	C
HydraulicSegment,1,Results,5,MachNumber	NaN	0
HydraulicSegment,1,Results,5,DynamicResidenceTime	0	s
HydraulicSegment,1,Results,5,DynamicInternalMassFlowRa	0	kg/h
HydraulicSegment,1,Results,5,DynamicInternalVolumetricFI	0	m3/h
HydraulicSegment,1,Results,6,InitialPressure	993.397	kPa
HydraulicSegment,1,Results,6,FinalPressure	0	kPa
HydraulicSegment,1,Results,6,AveragePressure	0	kPa
HydraulicSegment,1,Results,6,HeatTransfer	0	kW
HydraulicSegment,1,Results,6,HeatTransfer	0	kW
HydraulicSegment,1,Results,6,HeatCapacityLiquid	4.17933	kJ/[kg.K]
HydraulicSegment,1,Results,6,HeatCapacityVapor	0	kJ/[kg.K]
HydraulicSegment,1,Results,6,PressureDropFriction	0.0132056	bar
HydraulicSegment,1,Results,6,PressureDropHydrostatic	0	bar
HydraulicSegment,1,Results,6,PressureDropTotal	0.0132056	bar
HydraulicSegment,1,Results,6,LiquidHoldup	1	
HydraulicSegment,1,Results,6,HTCoverall	0	W/[m2.K]
HydraulicSegment,1,Results,6,HTCexternal	0	W/[m2.K]
HydraulicSegment,1,Results,6,HTCinternal	0	W/[m2.K]
HydraulicSegment,1,Results,6,HTCinsulation	0	W/[m2.K]
HydraulicSegment,1,Results,6,HTCpipewall	0	W/[m2.K]
HydraulicSegment,1,Results,6,ThermalConductivityLiquid	0.6076	W/[m.K]
HydraulicSegment,1,Results,6,ThermalConductivityVapor	0	W/[m.K]
HydraulicSegment,1,Results,6,ReynoldsNumberLiquid	38852.1	
HydraulicSegment,1,Results,6,ReynoldsNumberVapor	NaN	
HydraulicSegment,1,Results,6,ViscosityLiquid	0.88985	cP
HydraulicSegment,1,Results,6,ViscosityVapor	0	cP
HydraulicSegment,1,Results,6,VolumetricFlowLiquid	10.0256	m3/h
HydraulicSegment,1,Results,6,VolumetricFlowVapor	0	m3/h
HydraulicSegment,1,Results,6,DensityLiquid	997.449	kg/m3

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Comments:		

HydraulicSegment,1,Results,6,DensityVapor	0	kg/m3
HydraulicSegment,1,Results,6,SurfaceTension	0.0728165	N/m
HydraulicSegment,1,Results,6,InitialTemperature	25.0012	C
HydraulicSegment,1,Results,6,FlowRegime	G6	
HydraulicSegment,1,Results,6,VelocityLiquid	0.338817	m/s
HydraulicSegment,1,Results,6,VelocityVapor	0	m/s
HydraulicSegment,1,Results,6,ExternalTemperature	25	C
HydraulicSegment,1,Results,6,MachNumber	NaN	0
HydraulicSegment,1,Results,6,DynamicResidenceTime	0	s
HydraulicSegment,1,Results,6,DynamicInternalMassFlowRa	0	kg/h
HydraulicSegment,1,Results,6,DynamicInternalVolumetricFI	0	m3/h
ThermalProfile,CalculationType	Definir_CGTC	
ThermalProfile,OverallHTC	0	W/[m2.K]
ThermalProfile,ExternalTemperatureDefinedHTC	25	C
ThermalProfile,ExternalTemperatureGradientDefinedHTC	0	C./m
ThermalProfile,ExternalTemperatureEstimatedHTC	25	C
ThermalProfile,ExternalTemperatureGradientEstimatedHTC	0	C./m
ThermalProfile,HeatExchanged	0	kW
ThermalProfile,IncludeWallHTC	G6	
ThermalProfile,IncludeInternalHTC	G6	
ThermalProfile,IncludeInsulationHTC	G6	
ThermalProfile,InsulationThickness	0	mm
ThermalProfile,InsulationThermalConductivity	0	W/[m.K]
ThermalProfile,IncludeExternalHTC	G6	
ThermalProfile,ExternalEnvironmentType	0	
ThermalProfile,ExternalEnvironmentVelocityOrDeepness	0	m/s

Object: water input

Type: Material Stream

Property	Value	
Temperature	25	C
Pressure	1000	kPa
Mass Flow	10000	kg/h
Molar Flow	555.084	kmol/h
Volumetric Flow	10.0255	m3/h
Density (Mixture)	997.452	kg/m3
Molecular Weight (Mixture)	18.0153	kg/kmol

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Comments:

Specific Enthalpy (Mixture)	105.761	kJ/kg
Specific Entropy (Mixture)	0.366999	kJ/[kg.K]
Molar Enthalpy (Mixture)	1905.32	kJ/kmol
Molar Entropy (Mixture)	6.61159	kJ/[kmol.K]
Thermal Conductivity (Mixture)	0.607601	W/[m.K]

Object: water Out

Type: Material Stream

Property	Value	
Temperature	25.0012	C
Pressure	993.397	kPa
Mass Flow	10000	kg/h
Molar Flow	555.084	kmol/h
Volumetric Flow	10.0256	m3/h
Density (Mixture)	997.449	kg/m3
Molecular Weight (Mixture)	18.0153	kg/kmol
Specific Enthalpy (Mixture)	105.76	kJ/kg
Specific Entropy (Mixture)	0.367017	kJ/[kg.K]
Molar Enthalpy (Mixture)	1905.3	kJ/kmol
Molar Entropy (Mixture)	6.61192	kJ/[kmol.K]
Thermal Conductivity (Mixture)	0.6076	W/[m.K]