DWSIM Command Line Run Mode Documentation

Rev. B (25 sep 12)

Running DWSIM in Command Line Mode

If you want to optimize your simulation using external software, you can run DWSIM in command line mode. The process itself is very simple: DWSIM opens the simulation file without showing the interface, and any changes you want to do to any variable in the simulation are input in a XML file. Also, if you want to read variables after the calculation, you can specify them in the input file. DWSIM then writes another XML file with the values and units of the variables you defined.

To run DWSIM in command line mode, you'll need:

- A completely defined and error-free simulation file,
- A XML file which will be used as input to define parameters and write values to properties before running the simulation.

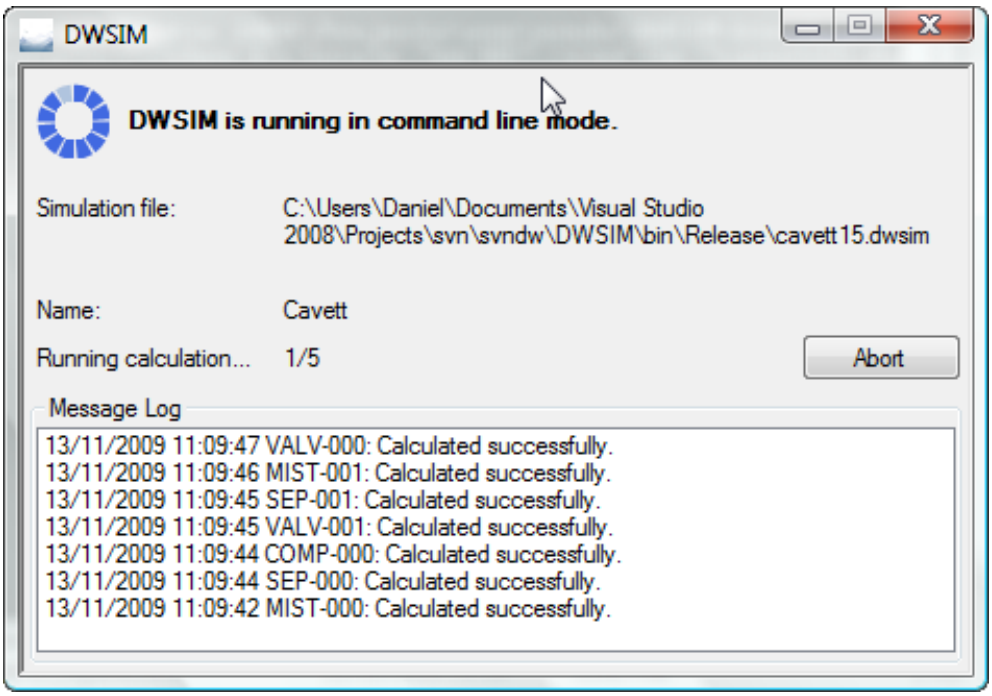
Command line arguments

Argument	Description
-commandline	Runs DWSIM in command line mode.
-nosplash	Prevents the splash screen from showing.
-savechanges	Save changes to the simulation file after running.
-show <VALUE>	Define if a window is shown to display calculation details. <VALUE> is 0 to hide, 1 to show. If omitted DWSIM will run without showing the window.
-locale <VALUE>	Changes the locale settings of the current run. Also affects how DWSIM manages decimal and thousand separators. <VALUE> is the locale string and currently can be "en-US" (English - USA), "pt-BR" (Brazilian Portuguese) or "es" (Spanish). If omitted, DWSIM will use the current locale defined in previous normal (graphical interface) runs.
-simfile <VALUE>	Defines the simulation file to read. <VALUE> is the relative (to the current directory) or absolute path of the .dwsim file, between quotes.
-input <VALUE>	Defines the input XML file. <VALUE> is the relative (to the current directory) or absolute path of the file, between quotes.
-output <VALUE>	Defines the output XML file. <VALUE> is the relative (to the current directory) or absolute path of the file, between quotes.

The example below shows how to run DWSIM in command line mode from a command line window (or a batch file). It assumes that all the necessary files are in the same path, which is also the path of DWSIM executable file.

dwsim.exe -commandline -nosplash -show 1 -locale "en-US" -simfile "cavett15.dwsim" -input "input2.xml" -output "results.xml"

This command tells DWSIM to run in command line mode, not showing the splash screen, using English (USA) as the locale. The simulation file is "cavett15.dwsim" and the input and output XML files are "input2.xml" and "results.xml" respectively. When you execute this command, DWSIM will show the following window prior to writing to the output XML file:



When this window closes, the simulation has been run and you can open the output XML file to view the results.

Input XML file structure

The basic structure of an input XML file is shown below:

```
<DWSIMXMLFile>
  <Configuration>
    <UnitsSystem Mode="Default" Name="" />
    <Simulation NumberOfRuns="1" FormattedOutput="Yes" />
    <PureCompoundProperties>
      <Compound Name="C7+">
        <Property Name="Molar_Weight" Value="210.00" />
        <Property Name="Critical_Temperature" Value="702.800" Unit="K" />
        <Property Name="Critical_Pressure" Value="21.70" Unit="atm" />
        <Property Name="Acentric_Factor" Value="0.6775" />
      </Compound>
    </PureCompoundProperties>
    <PropertyPackages>
      <PropertyPackage Name="PP_1">
        <Parameter Name="PP_FLASHALGORITHM" Value="3" />
        <InteractionParameters>
          <InteractionParameter Comp1="C7+" Comp2="Carbon Dioxide" kij="0.12" />
          <InteractionParameter Comp1="C7+" Comp2="Nitrogen" kij="0.12" />
          <InteractionParameter Comp1="C7+" Comp2="Hydrogen Sulfide" kij="0.05" />
        </InteractionParameters>
      </PropertyPackage>
    </PropertyPackages>
</Configuration>
  <InputParameters>
    <SimulationObjects>
      <Object Name="MAT-000">
          <Property ID="PROP_MS_0" Value="100" />
          <Property ID="PROP_MS_1" Value="6000" />
      </Object>
    </SimulationObjects>
  </InputParameters>
  <OutputParameters>
    <SimulationObjects>
      <Object Name="VALV-000">
        <Property ID="PROP_VA_3" Name="" Value="" Unit=""/>
```

```
      </Object>
      <Object Name="MAT-001">
        <Property ID="PROP_MS_0" Name="" Value="" Unit=""/>
        <Property ID="PROP_MS_7" Name="" Value="" Unit=""/>
      </Object>
      <Object Name="MAT-000">
        <Property ID="PROP_MS_7" Name="" Value="" Unit=""/>
      </Object>
    </SimulationObjects>
  </OutputParameters>
</DWSIMXMLFile>
```

Section/Node	Attribute	Description
Configuration	In the Configuration section you can define the system of units to be used, number of flowsheet runs and change pure compound and Property Package parameters.	
UnitsSystem	*Mode*	"Default" uses the system of units defined in the simulation, otherwise you can enter "Custom" to use another.
UnitsSystem	*Name*	If you decided to use another system, this is where you enter its name. The system's name you enter here must be present in the simulation, of course.
Simulation	*NumberOfRuns*	Defines how many runs DWSIM will execute before outputting any value to the XML file.
Simulation	*FormattedOutput*	Defines if the calculated values will be written to the output XML file using the simulation number format or not.
PureCompoundProperties/ Compound	*Name*	Name (String ID) of the compound whose properties will be changed/updated. The string ID of a compound can be found in the Pure Compound Properties Utility, between brackets in the compound selector combo box.
PureCompoundProperties/ Compound/ Property	*Name*	Name (String ID) of the property that will be changed/updated for the compound indicated in the parent node.
PureCompoundProperties/ Compound/ Property	*Value*	Value of the property to be changed/updated.
PureCompoundProperties Compound Property	*Unit*	Unit of the property to be changed/updated.
PropertyPackages/ PropertyPackage	*Name*	Name (User-defined string ID) of the Property Package whose properties will be changed/updated.
PropertyPackages/ PropertyPackage/ Parameter	*Name*	ID of the Property Package parameter to be changed/updated.
PropertyPackages/ PropertyPackage/ Parameter	*Value*	Value of the Property Package parameter to be changed/updated.
PropertyPackages/ PropertyPackage/ InteractionParameters/ InteractionParameter	*Comp1*	String ID of compound 1. The string ID of a compound can be found in the Pure Compound Properties Utility, between brackets in the compound selector combo box.
PropertyPackages/ PropertyPackage/ InteractionParameters/ InteractionParameter	*Comp2*	String ID of compound 2. The string ID of a compound can be found in the Pure Compound Properties Utility, between brackets in the compound selector combo box.
PropertyPackages/ PropertyPackage/ InteractionParameters/ InteractionParameter	*kij, kji, A12, A21, alpha12*	Value of the parameter to be updated, depends on the Property Package. See below for details.

InputParameters	In this section we define the objects which will be modified before the simulation is run.	
Object	*Name*	Define the name of the object whose properties you will modify before running the simulation.
Property	*ID*	Self-explanatory. The ID of the property which will have its value modified.
Property	*Value*	The value of the property you defined with the ID attribute. Please note that this value works in conjunction with the units system you defined above (which can be either the one selected in the simulation or the one you indicated in this input XML file).
OutputParameters	In this section we define the objects whose properties will be read after the simulation is run.	
Object	*Name*	Define the name of the object whose properties you will read after running the simulation.
Property	*ID*	Self-explanatory. The ID of the property which will have its value read.
Property	*Name*	The name of the property (localized according to the locale setting) will be written by DWSIM to the output file.
Property	*Value*	The value of the property will be written by DWSIM to the output file.
Property	*Unit*	The unit of the property will be written by DWSIM to the output file.

Property Package Configuration Parameters

Property ID	Default value	Allowed values	Description
PP_PHFILT	0.001	Any real number	PH Flash - Internal Loop Tolerance
PP_PSFILT	0.001	Any real number	PS Flash - Internal Loop Tolerance
PP_PHFELT	0.001	Any real number	PH Flash - External Loop Tolerance
PP_PSFELT	0.001	Any real number	PS Flash - External Loop Tolerance
PP_PHFMEI	50	Any integer number	PH Flash - Maximum External Iterations
PP_PSFMEI	50	Any integer number	PS Flash - Maximum External Iterations
PP_PHFMII	100	Any integer number	PH Flash - Maximum Internal Iterations
PP_PSFMII	100	Any integer number	PS Flash - Maximum Internal Iterations
PP_PTFMEI	100	Any integer number	PT/PV Flash - Maximum External Iterations
PP_PTFMII	100	Any integer number	PT/PV Flash - Maximum Internal Iterations
PP_PTFILT	0.001	Any real number	PT/PV Flash - Internal Loop Tolerance
PP_PTFELT	0.001	Any real number	PT/PV Flash - External Loop Tolerance
PP_RIG_BUB_DEW_FLASH_INIT	0	0, 1	Use Rigorous Bubble and Dew Points for TP Flash Vapor Fraction Initialization
PP_IDEAL_MIXRULE_LIQDENS	0	0, 1	Use Ideal Mixing Rule for Liquid Phase Density
PP_FLASHALGORITHM	2	0, 1, 2, 3, 4, 5, 6	Flash Algorithm (0 = Default, 1 =

			Inside-Out, 2 = Global Setting, 3 = Three-Phase Inside-Out, 4 = Two-Phase Gibbs Min., 5 = Three-Phase Gibbs Min., 6 = Three-Phase Hybrid NL/IO)
PP_USEEXPLIQDENS	0	0, 1	Use Experimental Liquid Density Data
PP_USEEXPLIQTHERMALCOND	1	0, 1	Use Experimental Liquid Thermal Conductivity Data
PP_USE_EOS_LIQDENS	0	0, 1	Use EOS for Liquid Density
PP_USE_EOS_VOLUME_SHIFT	0	0, 1	Use Peneloux Volume Translation correction

Pure Compound Parameter IDs

Parameter ID	Description
Molar_Weight	Molecular Weight
Critical_Temperature	Critical Temperature
Critical_Pressure	Critical Pressure
Critical_Volume	Critical Volume
Critical_Compressibility	Critical Compressibility
Acentric_Factor	Acentric Factor
Z_Rackett	Rackett Parameter
PR_Volume_Translation_Coefficient	Peng-Robinson Volume Translation Coefficient (si = ci/bi)
SRK_Volume_Translation_Coefficient	SRK Volume Translation Coefficient (si = ci/bi)
CS_Acentric_Factor	Chao-Seader Acentric Factor
CS_Solubility_Parameter	Chao-Seader Solubility Parameter
CS_Liquid_Molar_Volume	Chao-Seader Liquid Molar Volume
IG_Entropy_of_Formation_25C	Ideal Gas Entropy of Formation at 25 C
IG_Enthalpy_of_Formation_25C	Ideal Gas Enthalpy of Formation at 25 C
IG_Gibbs_Energy_of_Formation_25C	Ideal Gas Gibbs Energy of Formation at 25 C
Dipole_Moment	Dipole Moment
Vapor_Pressure_Constant_EqNo	Vapor Pressure Equation Number (ChemSep-like)
Vapor_Pressure_Constant_A	Vapor Pressure Equation A Constant
Vapor_Pressure_Constant_B	Vapor Pressure Equation B Constant
Vapor_Pressure_Constant_C	Vapor Pressure Equation C Constant
Vapor_Pressure_Constant_D	Vapor Pressure Equation D Constant
Vapor_Pressure_Constant_E	Vapor Pressure Equation E Constant
Ideal_Gas_Heat_Capacity_EqNo	Ideal Gas Heat Capacity Equation Number (ChemSep-like)
Ideal_Gas_Heat_Capacity_Const_A	Ideal Gas Heat Capacity Equation A Constant
Ideal_Gas_Heat_Capacity_Const_B	Ideal Gas Heat Capacity Equation B Constant
Ideal_Gas_Heat_Capacity_Const_C	Ideal Gas Heat Capacity Equation C Constant
Ideal_Gas_Heat_Capacity_Const_D	Ideal Gas Heat Capacity Equation D Constant
Ideal_Gas_Heat_Capacity_Const_E	Ideal Gas Heat Capacity Equation E Constant

Liquid_Viscosity_Const_EqNo	Liquid Viscosity Equation Number (ChemSep-like)
Liquid_Viscosity_Const_A	Liquid Viscosity Equation A Constant
Liquid_Viscosity_Const_B	Liquid Viscosity Equation B Constant
Liquid_Viscosity_Const_C	Liquid Viscosity Equation C Constant
Liquid_Viscosity_Const_D	Liquid Viscosity Equation D Constant
Liquid_Viscosity_Const_E	Liquid Viscosity Equation E Constant
Liquid_Density_Const_EqNo	Liquid Density Equation Number (ChemSep-like)
Liquid_Density_Const_A	Liquid Density Equation A Constant
Liquid_Density_Const_B	Liquid Density Equation B Constant
Liquid_Density_Const_C	Liquid Density Equation C Constant
Liquid_Density_Const_D	Liquid Density Equation D Constant
Liquid_Density_Const_E	Liquid Density Equation E Constant
Normal_Boiling_Point	Normal Boiling Point
HVapA	Heat of Vaporization Equation A Constant
HVapB	Heat of Vaporization Equation B Constant
HVapC	Heat of Vaporization Equation C Constant
HVapD	Heat of Vaporization Equation D Constant
UNIQUAC_R	UNIQUAC Model R Parameter
UNIQUAC_Q	UNIQUAC Model Q Parameter

Binary Interaction Parameter Table

Property Package	**Binary Parameter ID**				
	kij	**kij**	**A12**	**A21**	**A12**
PC-SAFT	PC-SAFT kij	Not used	Not used	Not used	Not used
Peng-Robinson (PR)	PR kij	Not used	Not used	Not used	Not used
Soave-Redlich-Kwong (SRK)	SRK kij	Not used	Not used	Not used	Not used
Peng-Robinson-Stryjek-Vera 2 (PRSV2)	PRSV2-M kij	PRSV2-M kji	Not used	Not used	Not used
Peng-Robinson / Lee-Kesler (PR/LK)	PR kij	Not used	Not used	Not used	Not used
UNIFAC	PR kij	Not used	Not used	Not used	Not used
UNIFAC-LL	PR kij	Not used	Not used	Not used	Not used
Modified UNIFAC (Dortmund)	PR kij	Not used	Not used	Not used	Not used
NRTL	PR kij	Not used	NRTL A12 (cal/mol)	NRTL A21 (cal/mol)	NRTL Alpha
UNIQUAC	PR kij	Not used	UNIQUAC A12 (K)	UNIQUAC A21 (K)	Not used
Chao-Seader	Not used	Not used	Not used	Not used	Not used
Grayson-Streed	Not used	Not used	Not used	Not used	Not used
Lee-Kesler-Plöcker	LKP kij	Not used	Not used	Not used	Not used
Raoult's Law	Not used	Not used	Not used	Not used	Not used
COSMO-SAC (JCOSMO)	PR kij	Not used	Not used	Not used	Not used
IAPWS-IF97 Steam Tables	Not used	Not used	Not used	Not used	Not used

Output XML file structure

The output XML file is the same as the input one, with the exception that the names, values and units of the variables which were defined to be read now appear in the OutputParameters section.

```
<DWSIMXMLFile>
 <Configuration>
  <UnitsSystem Mode="Default" Name="" />
  <Simulation NumberOfRuns="2" FormattedOutput="Yes" />
  ...
  </Configuration>
  <InputParameters>
    <SimulationObjects>
      <Object Name="MAT-000">
        <Property ID="PROP_MS_0" Value="100" />
        <Property ID="PROP_MS_1" Value="6000" />
      </Object>
    </SimulationObjects>
  </InputParameters>
  <OutputParameters>
    <SimulationObjects>
      <Object Name="VALV-000">
        <Property ID="PROP_VA_3" Name="Temperature Drop" Value="-10.99552" Unit="°C." />
      </Object>
      <Object Name="MAT-001">
        <Property ID="PROP_MS_0" Name="Temperature" Value="89.00448" Unit="°C" />
        <Property ID="PROP_MS_7" Name="Mixture Specific Enthalpy" Value="71.76271" Unit="kJ/kg"
/>
      </Object>
      <Object Name="MAT-000">
        <Property ID="PROP_MS_7" Name="Mixture Specific Enthalpy" Value="71.76284" Unit="kJ/kg"
/>
      </Object>
    </SimulationObjects>
  </OutputParameters>
</DWSIMXMLFile>
```

Property IDs

In order to read and write object property values, you need to know their **IDs**. A Property ID is a code which uniquely defines a property of an object of any type. For example, **"PROP_MS_0"** is the ID for the **Temperature** property of the **Material Stream** object. If you have the object name and the property ID, then you can read and/or write to that property. This is the very principle of operation of the command line run mode.

The table below shows the Property IDs for all object types available in DWSIM:

Object Type	Property ID	Property Name (en-US)
Material Stream	PROP_MS_0	Temperature
	PROP_MS_1	Pressure
	PROP_MS_2	Mass Flow
	PROP_MS_3	Molar Flow
	PROP_MS_4	Volumetric Flow
	PROP_MS_5	Mixture Density
	PROP_MS_6	Mixture Molar Weight
	PROP_MS_7	Mixture Specific Enthalpy
	PROP_MS_8	Mixture Specific Entropy
	PROP_MS_9	Mixture Molar Enthalpy
	PROP_MS_10	Mixture Molar Entropy
	PROP_MS_11	Mixture Thermal Conductivity
	PROP_MS_12	Vapor Phase Density

	PROP_MS_13	Vapor Phase Molar Weight
	PROP_MS_14	Vapor Phase Specific Enthalpy
	PROP_MS_15	Vapor Phase Specific Entropy
	PROP_MS_16	Vapor Phase Molar Enthalpy
	PROP_MS_17	Vapor Phase Molar Entropy
	PROP_MS_18	Vapor Phase Thermal Conductivity
	PROP_MS_19	Vapor Phase Kinematic Viscosity
	PROP_MS_20	Vapor Phase Dynamic Viscosity
	PROP_MS_21	Vapor Phase Heat Capacity (Cp)
	PROP_MS_22	Vapor Phase Heat Capacity Ratio (Cp/Cv)
	PROP_MS_23	Vapor Phase Mass Flow
	PROP_MS_24	Vapor Phase Molar Flow
	PROP_MS_25	Vapor Phase Volumetric Flow
	PROP_MS_26	Vapor Phase Compressibility Factor
	PROP_MS_27	Vapor Phase Molar Fraction
	PROP_MS_28	Vapor Phase Mass Fraction
	PROP_MS_29	Vapor Phase Volumetric Fraction
	PROP_MS_30	Liquid Phase (Mixture) Density
	PROP_MS_31	Liquid Phase (Mixture) Molar Weight
	PROP_MS_32	Liquid Phase (Mixture) Specific Enthalpy
	PROP_MS_33	Liquid Phase (Mixture) Specific Entropy
	PROP_MS_34	Liquid Phase (Mixture) Molar Enthalpy
	PROP_MS_35	Liquid Phase (Mixture) Molar Entropy
	PROP_MS_36	Liquid Phase (Mixture) Thermal Conductivity
	PROP_MS_37	Liquid Phase (Mixture) Kinematic Viscosity
	PROP_MS_38	Liquid Phase (Mixture) Dynamic Viscosity
	PROP_MS_39	Liquid Phase (Mixture) Heat Capacity (Cp)
	PROP_MS_40	Liquid Phase (Mixture) Heat Capacity Ratio (Cp/Cv)
	PROP_MS_41	Liquid Phase (Mixture) Mass Flow
	PROP_MS_42	Liquid Phase (Mixture) Molar Flow
	PROP_MS_43	Liquid Phase (Mixture) Volumetric Flow
	PROP_MS_44	Liquid Phase (Mixture) Compressibility Factor
	PROP_MS_45	Liquid Phase (Mixture) Molar Fraction
	PROP_MS_46	Liquid Phase (Mixture) Mass Fraction
	PROP_MS_47	Liquid Phase (Mixture) Volumetric Fraction
	PROP_MS_48	Liquid Phase (1) Density
	PROP_MS_49	Liquid Phase (1) Molar Weight
	PROP_MS_50	Liquid Phase (1) Specific Enthalpy
	PROP_MS_51	Liquid Phase (1) Specific Entropy
	PROP_MS_52	Liquid Phase (1) Molar Enthalpy
	PROP_MS_53	Liquid Phase (1) Molar Entropy
	PROP_MS_54	Liquid Phase (1) Thermal Conductivity
	PROP_MS_55	Liquid Phase (1) Kinematic Viscosity
	PROP_MS_56	Liquid Phase (1) Dynamic Viscosity
	PROP_MS_57	Liquid Phase (1) Heat Capacity (Cp)
	PROP_MS_58	Liquid Phase (1) Heat Capacity Ratio (Cp/Cv)
	PROP_MS_59	Liquid Phase (1) Mass Flow

	PROP_MS_60	Liquid Phase (1) Molar Flow
	PROP_MS_61	Liquid Phase (1) Volumetric Flow
	PROP_MS_62	Liquid Phase (1) Compressibility Factor
	PROP_MS_63	Liquid Phase (1) Molar Fraction
	PROP_MS_64	Liquid Phase (1) Mass Fraction
	PROP_MS_65	Liquid Phase (1) Volumetric Fraction
	PROP_MS_66	Liquid Phase (2) Density
	PROP_MS_67	Liquid Phase (2) Molar Weight
	PROP_MS_68	Liquid Phase (2) Specific Enthalpy
	PROP_MS_69	Liquid Phase (2) Specific Entropy
	PROP_MS_70	Liquid Phase (2) Molar Enthalpy
	PROP_MS_71	Liquid Phase (2) Molar Entropy
	PROP_MS_72	Liquid Phase (2) Thermal Conductivity
	PROP_MS_73	Liquid Phase (2) Kinematic Viscosity
	PROP_MS_74	Liquid Phase (2) Dynamic Viscosity
	PROP_MS_75	Liquid Phase (2) Heat Capacity (Cp)
	PROP_MS_76	Liquid Phase (2) Heat Capacity Ratio (Cp/Cv)
	PROP_MS_77	Liquid Phase (2) Mass Flow
	PROP_MS_78	Liquid Phase (2) Molar Flow
	PROP_MS_79	Liquid Phase (2) Volumetric Flow
	PROP_MS_80	Liquid Phase (2) Compressibility Factor
	PROP_MS_81	Liquid Phase (2) Molar Fraction
	PROP_MS_82	Liquid Phase (2) Mass Fraction
	PROP_MS_83	Liquid Phase (2) Volumetric Fraction
	PROP_MS_84	Aqueous Phase Density
	PROP_MS_85	Aqueous Phase Molar Weight
	PROP_MS_86	Aqueous Phase Specific Enthalpy
	PROP_MS_87	Aqueous Phase Specific Entropy
	PROP_MS_88	Aqueous Phase Molar Enthalpy
	PROP_MS_89	Aqueous Phase Molar Entropy
	PROP_MS_90	Aqueous Phase Thermal Conductivity
	PROP_MS_91	Aqueous Phase Kinematic Viscosity
	PROP_MS_92	Aqueous Phase Dynamic Viscosity
	PROP_MS_93	Aqueous Phase Heat Capacity (Cp)
	PROP_MS_94	Aqueous Phase Heat Capacity Ratio (Cp/Cv)
	PROP_MS_95	Aqueous Phase Mass Flow
	PROP_MS_96	Aqueous Phase Molar Flow
	PROP_MS_97	Aqueous Phase Volumetric Flow
	PROP_MS_98	Aqueous Phase Compressibility Factor
	PROP_MS_99	Aqueous Phase Molar Fraction
	PROP_MS_100	Aqueous Phase Mass Fraction
	PROP_MS_101	Aqueous Phase Volumetric Fraction
Energy Stream	PROP_ES_0	Power
Valve	PROP_VA_0	Calculation Mode
	PROP_VA_1	Pressure Drop
	PROP_VA_2	Outlet Pressure
	PROP_VA_3	Temperature Drop

Pipe Segment	PROP_PS_0	Pressure Drop
	PROP_PS_1	Temperature Drop
	PROP_PS_2	Heat Exchanged
Pump	PROP_PU_0	Pressure Increase (Head)
	PROP_PU_1	Efficiency
	PROP_PU_2	Delta-T
	PROP_PU_3	Power Required
Tank	PROP_TK_0	Pressure Drop
Separator Vessel	PROP_SV_0	Separation Temperature
	PROP_SV_1	Separation Pressure
Compressor	PROP_CO_0	Pressure Increase (Head)
	PROP_CO_1	Efficiency
	PROP_CO_2	Delta-T
	PROP_CO_3	Power Required
Turbine	PROP_TU_0	Pressure Drop
	PROP_TU_1	Efficiency
	PROP_TU_2	Delta-T
	PROP_TU_3	Power Generated
Heater	PROP_HT_0	Pressure Drop
	PROP_HT_1	Efficiency
	PROP_HT_2	Outlet Temperature
	PROP_HT_3	Heat Added
	PROP_HT_4	Delta-T
Cooler	PROP_CL_0	Pressure Drop
	PROP_CL_1	Efficiency
	PROP_CL_2	Outlet Temperature
	PROP_CL_3	Heat Removed
	PROP_CL_4	Delta-T
Recycle	PROP_RY_0	Maximum Iterations
	PROP_RY_1	Mass Flow Tolerance
	PROP_RY_2	Temperature Tolerance
	PROP_RY_3	Pressure Tolerance
	PROP_RY_4	Mass Flow Error
	PROP_RY_5	Temperature Error
	PROP_RY_6	Pressure Error
Energy Recycle	PROP_ER_0	Maximum Iterations
	PROP_ER_1	Power Tolerance
	PROP_ER_2	Power Error
Conversion Reactor	PROP_CR_0	Pressure Drop
Equilibrium Reactor	PROP_EQ_0	Pressure Drop
Gibbs Reactor	PROP_GR_0	Pressure Drop
CSTR	PROP_CS_0	Pressure Drop
PFR	PROP_PR_0	Pressure Drop
Heat Exchanger	PROP_HX_0	Global Heat Transfer Coefficient (U)
	PROP_HX_1	Heat Exchange Area (A)
	PROP_HX_2	Heat Load
Shortcut Column	PROP_SC_0	Reflux Ratio

	PROP_SC_1	Heavy Key Molar Fraction
	PROP_SC_2	Light Key Molar Fraction
	PROP_SC_3	Condenser Pressure
	PROP_SC_4	Reboiler Pressure
	PROP_SC_5	Minimun Reflux Ratio
	PROP_SC_6	Minimum Stages
	PROP_SC_7	Optimal Feed Stage
	PROP_SC_8	Stripping Liquid Molar Flow
	PROP_SC_9	Rectify Liquid Molar Flow
	PROP_SC_10	Stripping Vapor Molar Flow
	PROP_SC_11	Rectify Vapor Molar Flow
	PROP_SC_12	Condenser Duty
	PROP_SC_13	Reboiler Duty
Distillation Column	PROP_DC_0	Condenser Pressure
	PROP_DC_1	Reboiler Pressure
	PROP_DC_2	Condenser Pressure Drop
	PROP_DC_3	Reflux Ratio
	PROP_DC_4	Distillate Molar Flow
	PROP_DC_5	Condenser Duty
	PROP_DC_6	Reboiler Duty
	PROP_DC_7	Number of Stages
Absorption Column	PROP_AC_0	Top Stage Pressure
	PROP_AC_1	Bottom Stage Pressure
	PROP_AC_2	Number of Stages
Reboiled Absorber	PROP_RA_0	Top Stage Pressure
	PROP_RA_1	Reboiler Pressure
	PROP_RA_2	Boil-Up Ratio
	PROP_RA_3	Reboiler Duty
	PROP_RA_4	Number of Stages
Refluxed Absorber	PROP_RF_0	Condenser Pressure
	PROP_RF_1	Bottom Stage Pressure
	PROP_RF_2	Condenser Pressure Drop
	PROP_RF_3	Reflux Ratio
	PROP_RF_4	Distillate Molar Flow
	PROP_RF_5	Condenser Duty
	PROP_RF_6	Number of Stages