



Dynamic flowsheet simulation system

Dyssol

User Interface

User interface



Path to the current flowsheet

File

Setup

Modules

Tools

Help

New flowsheet...
Ctrl+N

Open flowsheet...
Ctrl+O

Save flowsheet
Ctrl+S

Save flowsheet as...
Ctrl+Shift+S

Save config file...

1 Granulation Process.dflw

2 Granulation Process.dflw

3 Comminution Process.dflw

4 Agglomeration Process.dflw

5 Time Delay.dflw

6 Splitter.dflw

7 Screen Teipel-Hennig.dflw

8 Screen Probability.dflw

9 Screen Plitt.dflw

10 Screen Molerus-Hoffmann.dflw

Exit
Ctrl+Alt+Shift+Q

Units

Screen Parameters

Parts of Screen 1

Port name

Type

Connect screen

Input

Coarse

Output

Coarse1

Fines

Output

Fines1

Parameter

Units

Value

[m]

0.0025

[-]

Use the table below ...

Sharpness of separation

Min = 0

Max = 100

Time [s]

Units

Value

0

[-]

10

20

[-]

9

50

[-]

8

100

[-]

7

+

-

Main menu bar

Standard file operations

Create a configuration file
for command line utility

List of previously opened
flowsheets

Close the program

Main window

Menu entries



Dyssol - C:/Program Files/Dyssol/Example Flowsheets/Processes/Granulation Process.dflw

File Setup Modules Tools Help

Compounds Ctrl+Shift+C
Phases Ctrl+Shift+P
Distributions Grids Ctrl+Shift+G
Holdups Ctrl+Shift+H
Options Ctrl+Shift+O
Calculation Sequence Ctrl+Shift+Q
Recycle Streams Ctrl+Shift+R

Units

Model Screen Plitt

Basic flowsheet setup

Additional flowsheet settings

Ports of Screen1

Port name	Type	Connected stream
1 Input	Input	GranProd
2 Coarse	Output	Coarse1

Unit parameters

Parameter	Units	Value
1 Xcut	[m]	0.0025
2 Alpha	[-]	Use the table below ...

Dyssol - C:/Program Files/Dyssol/Example Flowsheets/Processes/Granulation Process.dflw

File Setup Modules Tools Help

Flowsheet Dust Formation Tendency Ctrl+Shift+D

Ref.: Help\Dust formation tester.pdf

Units: + - ▲ ▼

Model Screen Plitt

Post-process – Dustiness tester

Ports of Screen1

Port name	Type	Connected stream
1 Input	Input	GranProd
2 Coarse	Output	Coarse1

Unit parameters

Parameter	Units	Value
1 Xcut	[m]	0.0025
2 Alpha	[-]	Use the table below ...

Dyssol - C:/Program Files/Dyssol/Example Flowsheets/Processes/Granulation Process.dflw

File Setup Modules Tools Help

Models Manager Ctrl+Shift+U
Materials Database Ctrl+Shift+M
Settings Ctrl+Shift+A

Additional tools

Program-wide settings

Ports of Screen1

Port name	Type	Connected stream
1 Input	Input	GranProd
2 Coarse	Output	Coarse1

Unit parameters

Parameter	Units	Value
1 Xcut	[m]	0.0025
2 Alpha	[-]	Use the table below ...



The screenshot shows the Dyssol main window with the Help menu open. The Help menu has two options: Documentation and About Dyssol. The Documentation submenu is open, showing a list of files: Introduction, Units, Solvers, Development, Command Line Interface, Convergence, and Dust Formation Tester. The About Dyssol dialog box is open, showing the Dyssol logo, version information (Version 0.9.0.0, Build 190503.134422.f2046f4), copyright (2019), and a license agreement. The license agreement states that redistribution and use in source and binary forms are permitted under certain conditions. The main window displays a process flow diagram with units like FeedGas, Mixer1, Granulator, Screen1, Screen2, and Crusher, and streams like InSusp, InNucl, InGas, MixNucl, GranDust, and GranProd.

Information about installed version

Documentation files

About Dyssol

Dyssol: Dynamic Simulation of Solids Processes
Version 0.9.0.0
Build 190503.134422.f2046f4
Copyright 2019
Template solution: Visual Studio 2015 (x64)
Check for updates at <http://www.dynsim-fp.de>

License Developers Libraries Changelog

Copyright (c) 2019, Dyssol Development Team
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- * All advertising materials mentioning features or use of this software must display the following acknowledgement: This product includes software developed by Dyssol Development Team and its contributors.
- * Neither the name of Dyssol Development Team nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDERS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

OK



Dyssol - C:/Program Files/Dyssol/Example Flowsheets/Processes/Granulation Process.dflw

File Setup Modules Tools Help

Flowsheet Simulator Streams Units

Units: + - ▲ ▼ Model Screen Plitt

Ports of Screen1

Port name	Type	Connected stream
1 Input	Input	Input
2 Coarse	Output	Coarse1
3 Fines	Output	Fines1

Flowsheet editor tab

- Create flowsheet structure
- Specify unit parameters

Simulator tab

- Set simulation time
- Run and stop the simulation
- Calculation log and report

Streams tab

- Post-processing of streams

Units tab

- Post-processing of units

Parameter	Units	Value
1 Xcut	[m]	0.0025
2 Alpha	[-]	Use the table below ...

Sharpness of separation
Min = 0
Max = 100

Time [s]	Units	Value
0	[-]	10
20	[-]	9
50	[-]	8
100	[-]	7

+ -



Remove selected unit

Add new unit

Flowsheet

Simulator

Streams

Units

Units:

+

-

▲

▼

Model

Screen Plitt

3 FeedGas

4 Mixer1

5 Granulator

6 Screen1

7 Screen2

8 Crusher

Renaming

F2

DoubleClick

List of units

Streams:

+

-

▲

▼

1 InSusp

2 InNucl

3 InGas

4 MixNucl

5 GranDust

6 GranProd

Ports of Screen1

Port name	Type	Connected stream
1 Input	Input	GranProd
2 Coarse	Output	Coarse1
3 Fines	Output	Fines1

Unit parameters

Parameter	Units	Value
1 Xcut	[m]	0.0025
2 Alpha	[-]	Use the table below ...

Sharpness of separation
Min = 0
Max = 100

Time [s]	Units	Value
0	[-]	10
20	[-]	9
50	[-]	8
100	[-]	7

+

-



Dyssol - C:/Program Files/Dyssol/Example Flowsheets/Processes/Granulation Process.dflw

File Setup Modules Tools Help

Flowsheet Simulator Streams Units

Units: + - ▲ ▼ Model Screen Plitt

3 FeedGas

4 Mixer1

5 Granulator

6 Screen1

7 Screen2

8 Crusher

Streams: + - ▲ ▼

1 InSusp

2 InNucl

3 InGas

4 MixNucl

5 GranDust

6 GranPr

Ports of Screen1

Port name	Type	Connected stream
1 Input	Input	GranProd
2 Coarse	Output	Coarse1
3 Fines	Output	Fines1

Unit parameters

Parameter	Units	Value
1 Xcut	[m]	0.0025
2 Alpha	[-]	Use the table below ...

Sharpness of separation
Min = 0
Max = 100

Time [s]	Units	Value
0	[-]	10
20	[-]	9
50	[-]	8
100	[-]	7

+ -

Add new stream

Remove selected stream

Rearrange streams

Renaming

F2 DoubleClick

List of streams



File

Setup

Modules

Tools

Help

Flowsheet

Simulator

Streams

Units

Units:

+

-

▲

▼

3

FeedGas

▲

4

Mixer1

▲

5

Granulator

▲

6

Screen1

▲

7

Screen2

▲

8

Crusher

▼

Streams:

+

-

▲

▼

1

InSusp

▲

2

InNucl

▲

3

InGas

▲

4

MixNucl

▲

5

GranDust

▲

6

GranProd

▼

Model

Screen Plitt

Agglomerator

Agglomerator (Litster)

Bunker

Calciner

Combustor (SteadyState)

Crusher Bond's law

Crusher CSTR-PBM

Crusher Cone

Crusher Const output

Crystallizer Batch

Crystallizer Batch 2D

Cyclone

Electrostatic precipitator

Granulator

HeatExchanger

InletFlow

InletGenerator

Mixer

OutletFlow

Screen Molerus & Hoffmann

Screen Plitt

Screen Probability model

Screen Teipel & Hennig

SinFlow

Splitter

Time delay

Ports of

1

Inp

▼

2

Co

▼

3

Fin

▼

Unit parameters

	Parameter	Units	Value
1	Xcut	[m]	0.0025
2	Alpha	[-]	Use the table below ...

Sharpness of separation

Min = 0

Max = 1

Time [s]	Units	Value
0	[-]	10
20	[-]	9
50	[-]	8
100	[-]	7

+

-

Select a model
Set model for selected unit

Select a unit

List of available models



Dyssol - C:/Program Files/Dyssol/Example Flowsheets/Processes/Granulation Process.dflw

File Setup Modules Tools Help

Flowsheet Simulator Streams Units

Units: + - ▲ ▼ Model Screen Plitt

3	FeedGas
4	Mixer1
5	Granulator
6	Screen1
7	Screen2
8	Crusher

Streams: + - ▲ ▼

1	InSusp
2	InNucl
3	InGas
4	MixNucl
5	GranDust
6	GranProd

Port types

- Input
- Output

Port connections

Connect ports of selected unit to available streams

List of ports in the selected unit

Port name	Type	Connected stream
1 Input	Input	GranProd
2 Coarse	Output	Coarse1
3 Fines	Output	Fines1

List of available streams to connect

Time [s]	Unit	Value
0	[-]	10
20	[-]	9
50	[-]	8
100	[-]	7



Dyssol - C:/Program Files/Dyssol/Example Flowsheets/Processes/Granulation Process.dflw

File Setup Modules Tools Help

Flowsheet Simulator Streams Units

Units: + - ▲ ▼ Model Screen Plitt

3	FeedGas
4	Mixer1
5	Granulator
6	Screen1
7	Screen2
8	Crusher

Streams: + - ▲ ▼

1	InSusp
2	InNucl
3	InGas
4	MixNucl
5	GranDust
6	GranProd

Parts of Screen1

Port name	Type	Connected stream
1 Input	Input	GranProd
2 Coarse	Output	Coarse1
	Output	Fines1

List of unit parameters

Parameter	Units	Value
1 Xcut	[m]	0.0025
2 Alpha	[-]	Use the table below ...

Sharpness of separation
Min = 0
Max = 100

Time [s]	Units	Value
0	[-]	10
20	[-]	9
50	[-]	8
100	[-]	7

+ -

Constant value of the unit parameter

Description of the selected parameter

Values between time points will be linearly interpolated

Add/remove time point from the selected unit parameter



Streams tab

Table view



Dyssol - C:/Program Files/Dyssol/Example Flowsheets/Processes/Granulation Process.dflw

File Setup Modules Tools Help

Flowsheet Simulator Streams Units

Streams

InSusp

InNucl

InGas

MixNucl

GranDust

GranProd

Coarse1

Fines1

Coarse2

Fines2

Milled

Mixed

Parameter: Mass flow

Table view

			GranProd	Coarse1	Fines1	Coarse2
			Mass flow [kg/s]	Mass flow [kg/s]	Mass flow [kg/s]	Mass flow [kg/s]
1	0		0.199548	0.0494943	0.150054	0.15
2	1.937		0.199547	0.0494937	0.150054	0.15
3	3.87436e-7	0.1	0.199547	0.049493	0.150054	0.15
4	7.74872e-7	0.1	0.199546	0.0494924	0.150054	0.15
5	1.53112e-6	0.1	0.199546	0.0494917	0.150054	0.15
6	3.09942e-6	0.1	0.199545	0.0494911	0.150054	0.15
7	6.19898e-6	0.1	0.199545	0.0494904	0.150054	0.15
8	1.2398e-5	0.1	0.199544	0.0494898	0.150054	0.15
9	2.47959e-5	0.1	0.199543	0.0494892	0.150054	0.15
10	4.95918e-5	0.1	0.199543	0.0494886	0.150054	0.15
11	9.91836e-5	0.1	0.199542	0.0494879	0.150054	0.15

Timepoints: 514

Number of unique time points in the selected streams

List of parameters to show

List of material streams

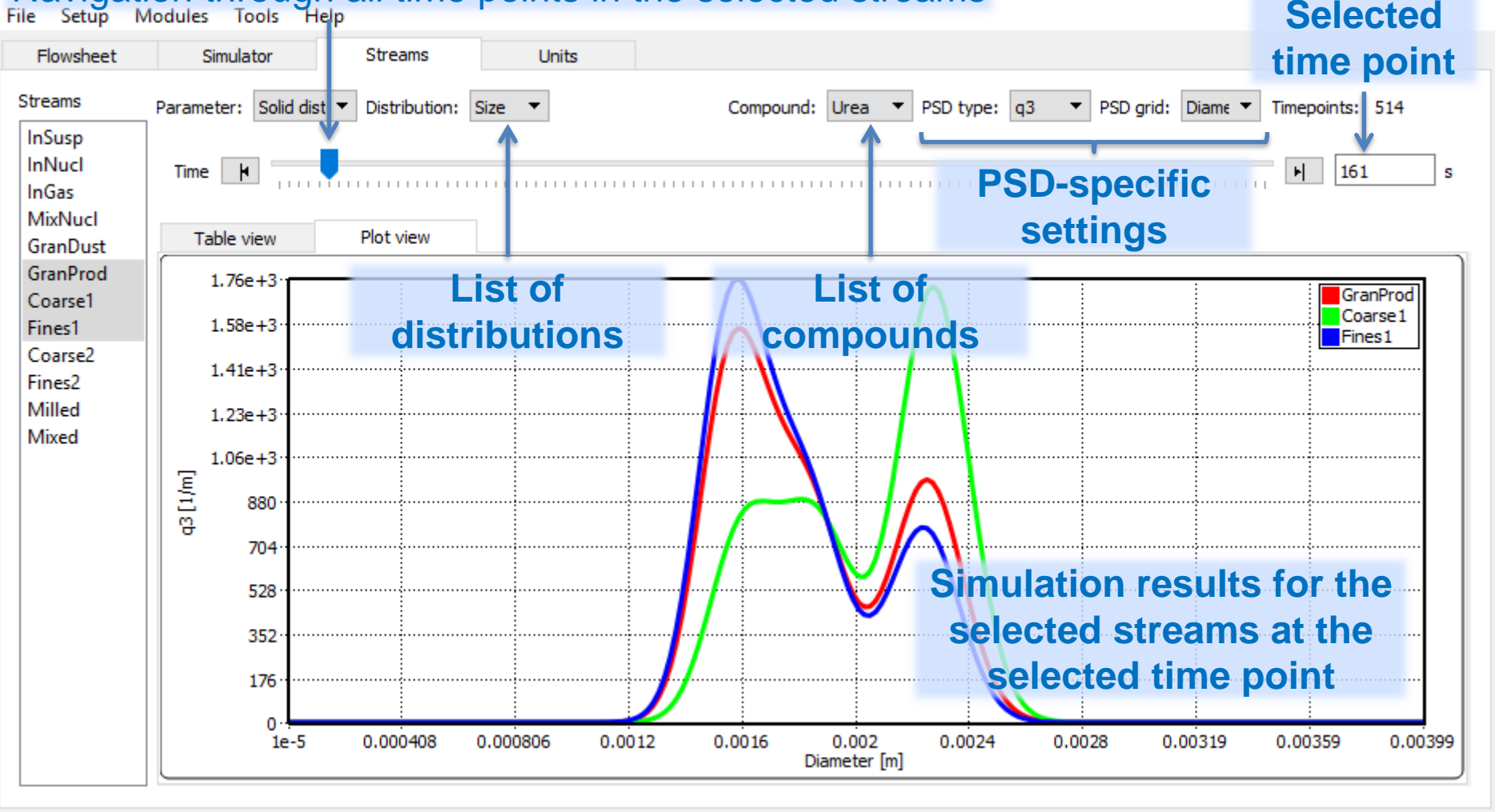
Simulation results for the selected streams



Time points slider

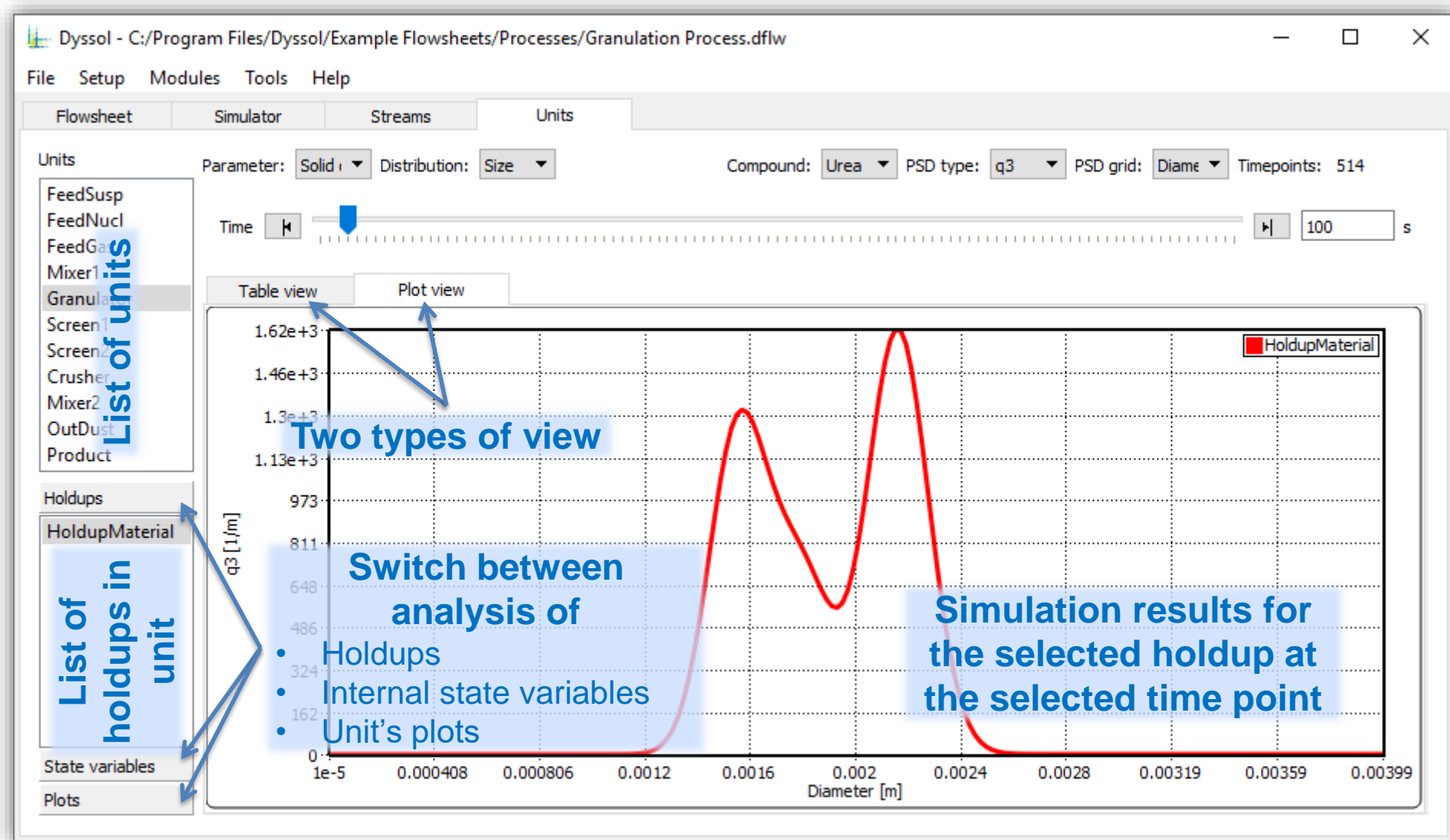
Navigation through all time points in the selected streams

Selected time point



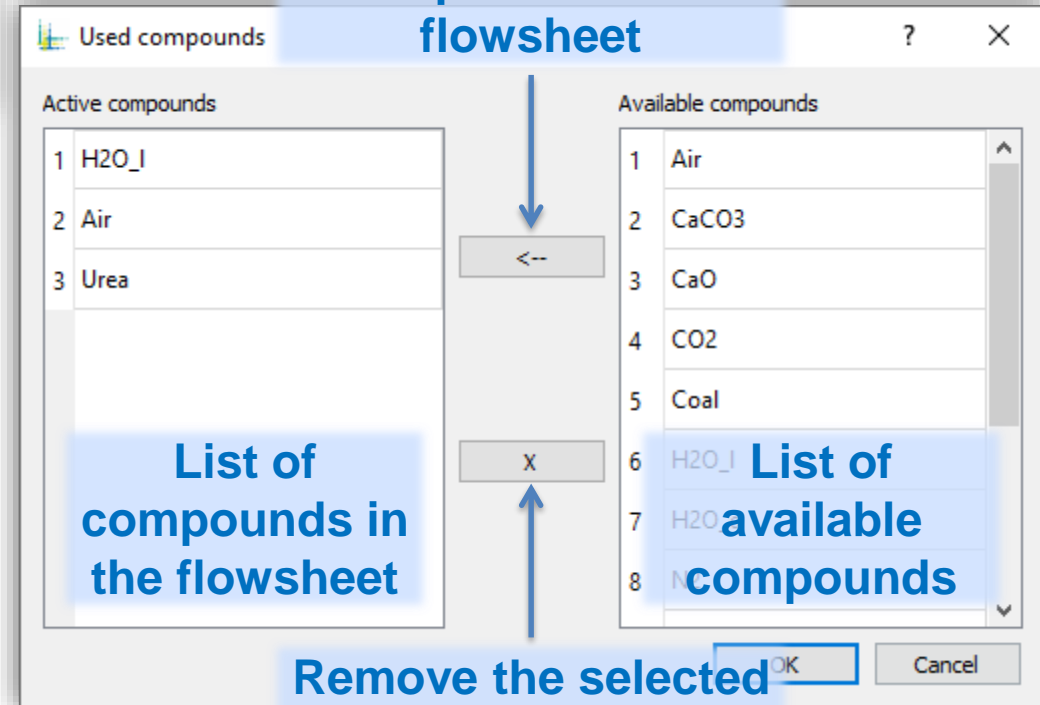
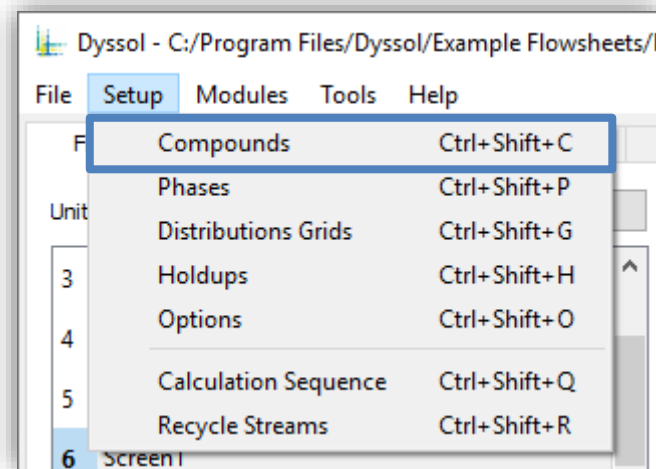
Units tab

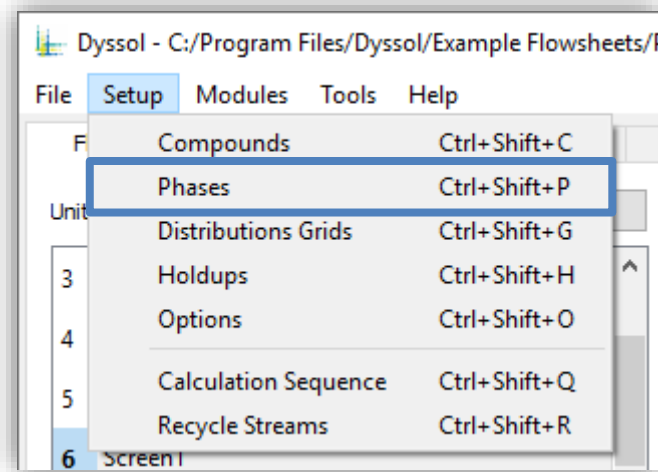
Main controls



Flowsheet setup

Compounds

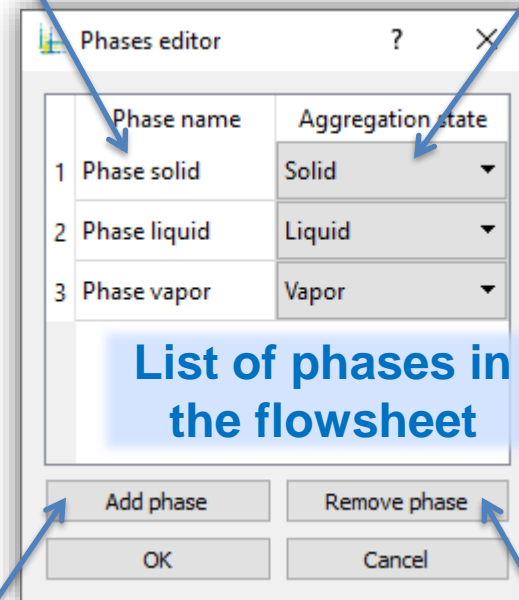




Phase name

Aggregation state

- Solid
- Liquid
- Gas



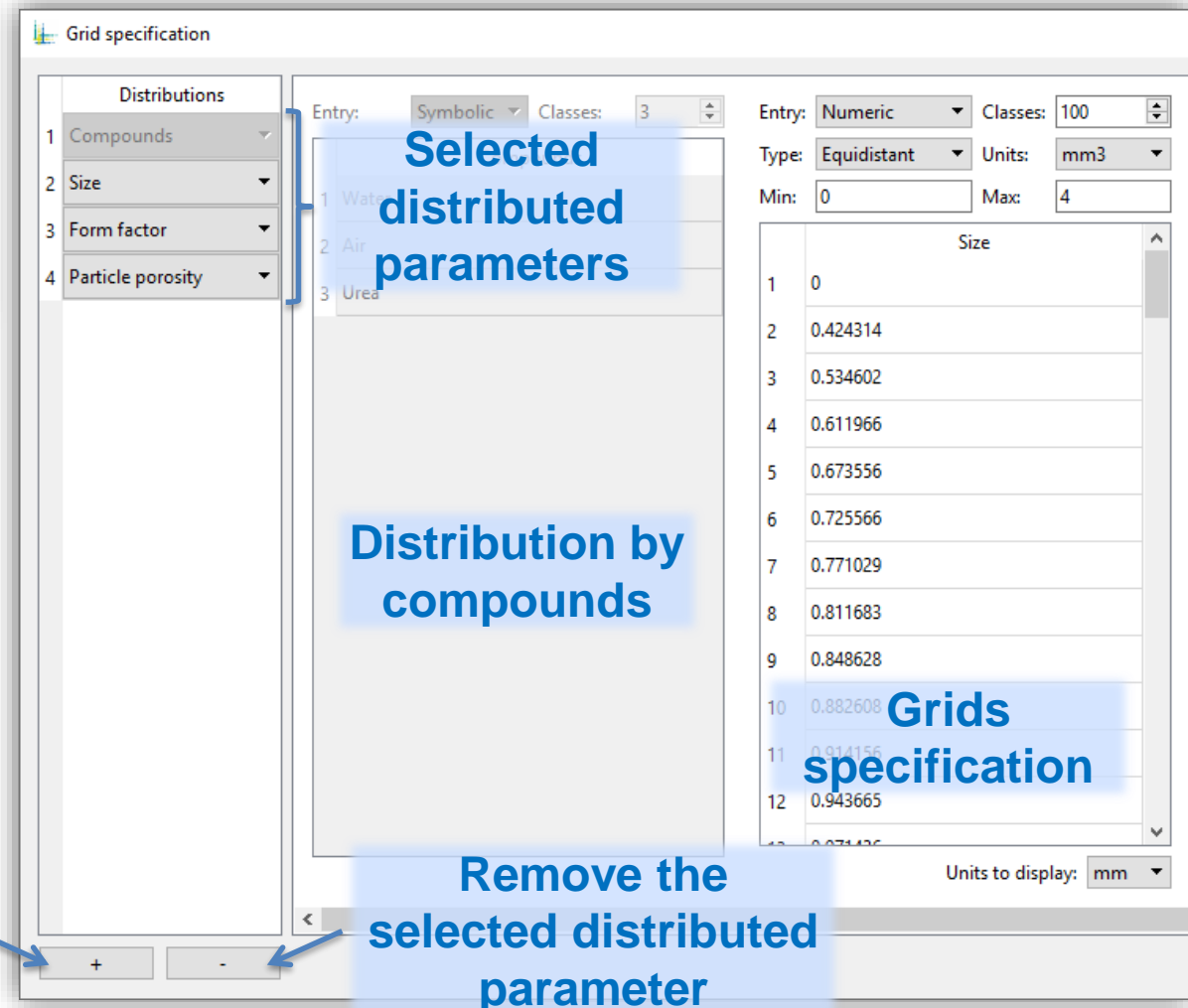
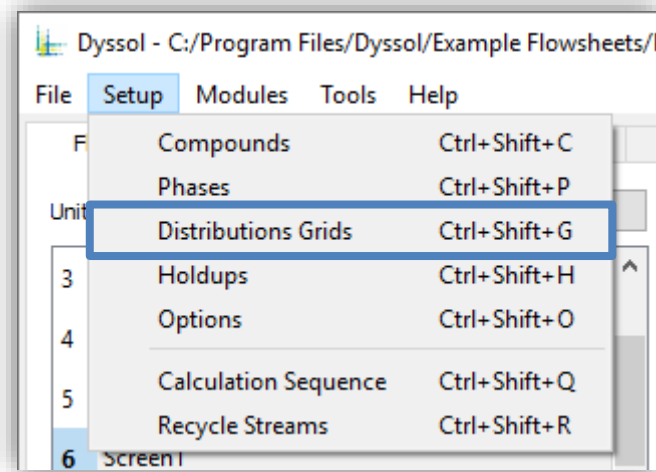
List of phases in the flowsheet

Add new phase to the flowsheet

Remove the selected phase from the flowsheet

Flowsheet setup

Grids specification





Grid specification

• Numeric

• Symbolic

1 Compounds

2 Size

3 Form factor

4 Particle porosity

Entry: Numeric

Classes: 100

Type: Equidistant

Units: mm3

Min: 0

Max: 4

	Size
1	0
2	0.424314
3	0.534602
4	0.611966
5	0.673556
6	0.725566
7	0.771029
8	0.811683
9	0.848628
10	0.882608
11	0.914156
12	0.943665
13	0.971136

Units to display: mm

Entry: Numeric

Classes: 50

Type: Logarithmic in

Min: 0.1

Max: 0.9

	Form factor
1	0.1
2	0.106311
3	0.112758
4	0.119287
5	0.125962
6	0.132767
7	0.139708
8	0.146791
9	0.154021
10	0.161492
11	0.168949
12	0.176661
13	0.184544

Entry: Numeric

Classes: 200

Type: Geometric inc

Min: 0.1

Max: 0.5

	Particle porosity
1	0.1
2	0.100808
3	0.101622
4	0.102444
5	0.103271
6	0.104106
7	0.104947
8	0.105795
9	0.106649
10	0.107511
11	0.10838
12	0.109256
13	0.110138

• Manual

• Equidistant

• Geometric

• Logarithmic

OK

Cancel

Apply

Entries type

Number of classes

Grid boundaries

Units for grid boundaries

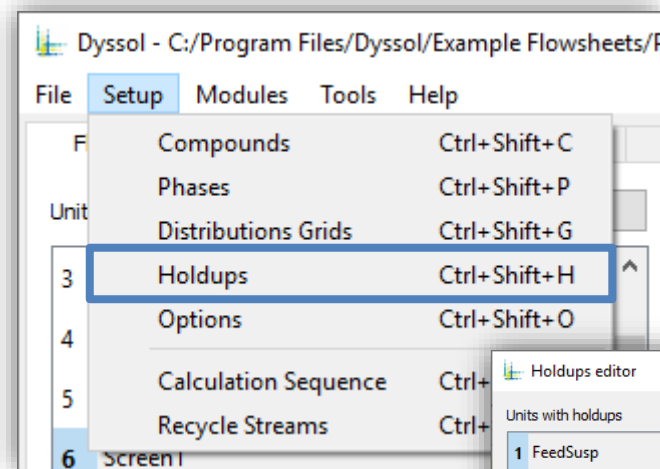
Grid type

Cells boundaries

Units to display cells boundaries

Flowsheet setup

Holdups editor



Holdups editor

Units with holdups

- 1 FeedSusp
- 2 FeedNucl
- 3 FeedGas

Holdups

- 1 InputMaterial

Time points [s]

- 0
- 1

Buttons: +, -, Remove all

Table with 4 columns: Time [s], Mass flow [kg/s], Temperature [K], Pressure [Pa]

	Time [s]	Mass flow [kg/s]	Temperature [K]	Pressure [Pa]
1	0	0.1	300	100000
2	1	0.15	300	100000



Holdups editor

Units with holdups

1	FeedSusp
2	FeedNucl
3	FeedGas

List of available units with holdups

Holdups

1	InputMaterial
---	---------------

List of holdups in the selected unit

Time points [s]

0						
1	0		0.1		300	100000
2	1		0.15		300	100000

List of time points in the selected holdup

Distributed parameters of the solid phase

Mass fractions of compounds in the gas phase

Mass fractions of compounds in the liquid phase

Mass fractions of phases

Overall parameters

- Mass
- Temperature
- Pressure

Add/remove time point

Buttons: +, -, Remove all

Flowsheet setup

Holdups editor – Concentrated parameters



Time points [s]	MTP	Phase fractions	Phase liquid	Phase vapor	Phase solid
0					
1					

Time [s]	Mass flow [kg/s]	Temperature [K]	Pressure [Pa]
1 0	0.1	300	100000
2 1	0.15	300	100000

Mass/Temperature/Pressure

Values between time points will be linearly interpolated

Time points [s]	MTP	Phase fractions	Phase liquid	Phase vapor	Phase solid
0					
1					

Time [s]	Phase solid	Phase liquid	Phase vapor
1 0	0.5	0.5	0
2 1	0.5	0.5	0

Mass fraction of each phase relative to the overall mass

Time points [s]	MTP	Phase fractions	Phase liquid	Phase vapor	Phase solid
0					
1					

Time [s]	H2O_l	Air	Urea
1 0	1	0	0
2 1	0.8	0.2	0

Mass fraction of each compound in the liquid phase relative to the phase's mass

Sum of fractions for each time point must be equal to one

Time points [s]	MTP	Phase fractions	Phase liquid	Phase vapor	Phase solid
0					
1					

Time [s]	H2O_l	Air	Urea
1 0	0	0	0
2 1	0	0	0

Mass fraction of each compound in the gas phase relative to the phase's mass

Flowsheet setup

Holdups editor – Distributed parameters



Holdups editor

Units with holdups

1 FeedSusp

2 FeedNucl

3 FeedGas

Holdups

1 InputMaterial

Time points [s]

0

1

MTP

Phase fractions

Phase liquid

Phase vapor

Phase solid

Selected time point [s]:

1

Mass fraction of each compound in the solid phase relative to the phase's mass

H2O

Mass fraction

0

Compound: Urea

Rows: Total mixture

Columns: Size

PSD type: q3

PSD grid: Diameter

	00132 : 0.00134 [n]	00134 : 0.00136 [n]	00136 : 0.00138 [n]	.00138 : 0.0014 [m]	.0014 : 0.00142 [m]	00142 : 0.00144 [n]	00144 : 0.00146 [n]	00146 : 0.00148 [n]	.00148 : 0.0015 [m]
q3 [1/m]	0.000145873	0.000202505	0.000279426	0.000380976	0.000514264	0.000687217	0.000909356	0.00119122	0.00154493

Chosen distributions

PSD-specific settings

Fractions

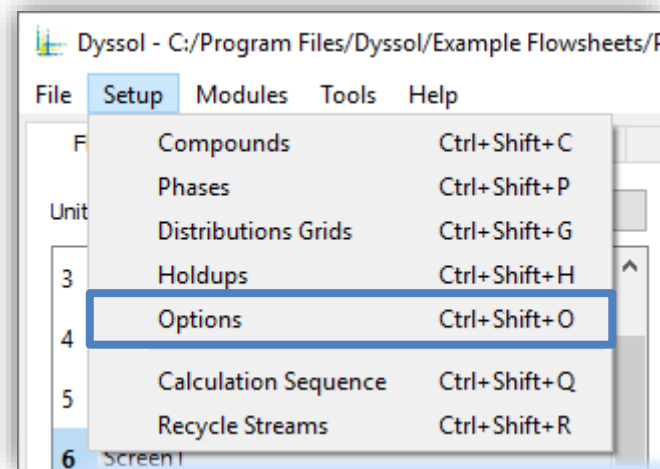
Set distribution

- Normal
- RRSB
- GGs
- Log normal

Distributed properties editor

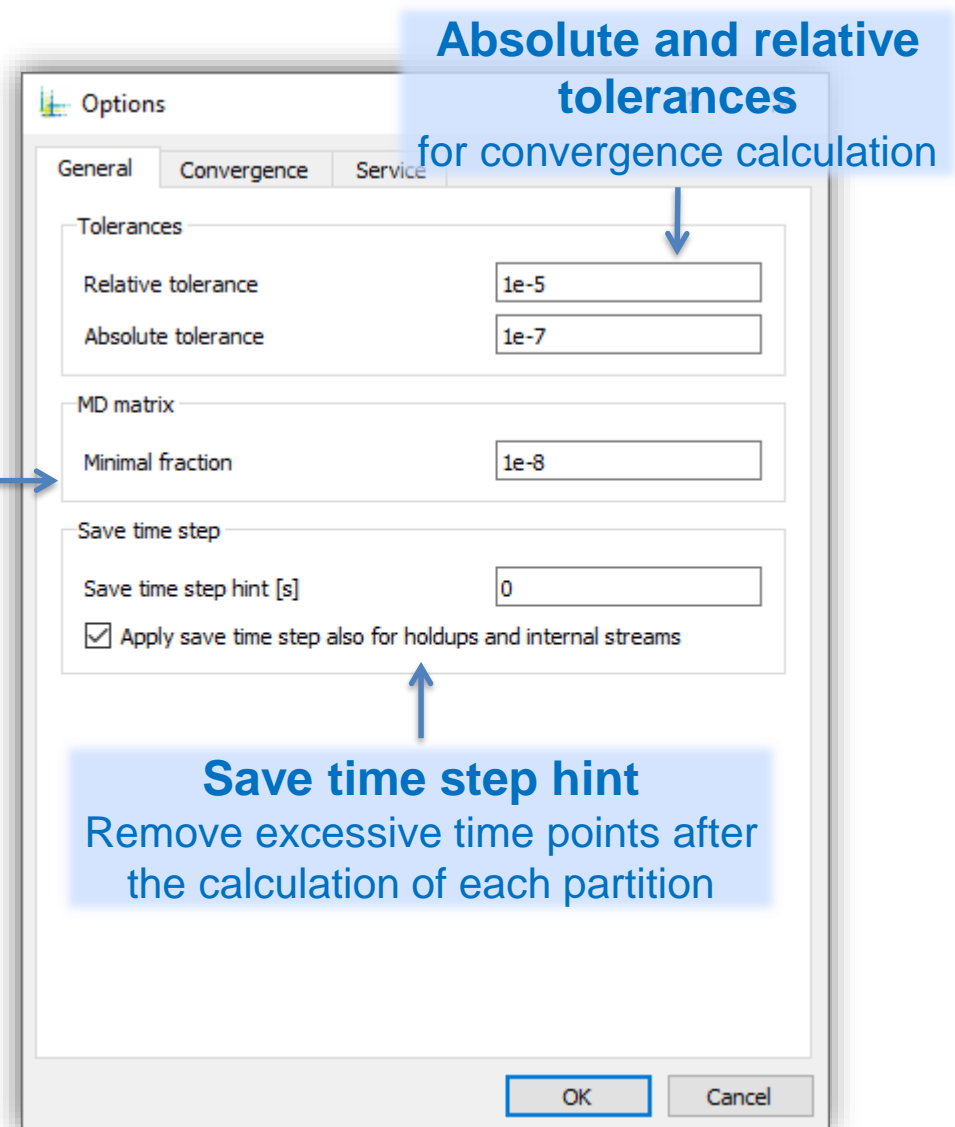
Apply changes

Apply



Minimum fraction

that is considered in the multidimensional distributed set of parameters



Absolute and relative tolerances
for convergence calculation

Save time step hint

Remove excessive time points after the calculation of each partition



**Settings for waveform
relaxation method**

Select convergence method

Select extrapolation method

Options

General Convergence Service

Time windows

Initial time window [s] 1

Min time window [s] 1e-9

Max time window [s] 1000

Max iterations number 500

Time window change rate 1.2

Iterations upper limit 7

Iterations lower limit 3

Iterations upper limit (1st window) 20

Convergence methods

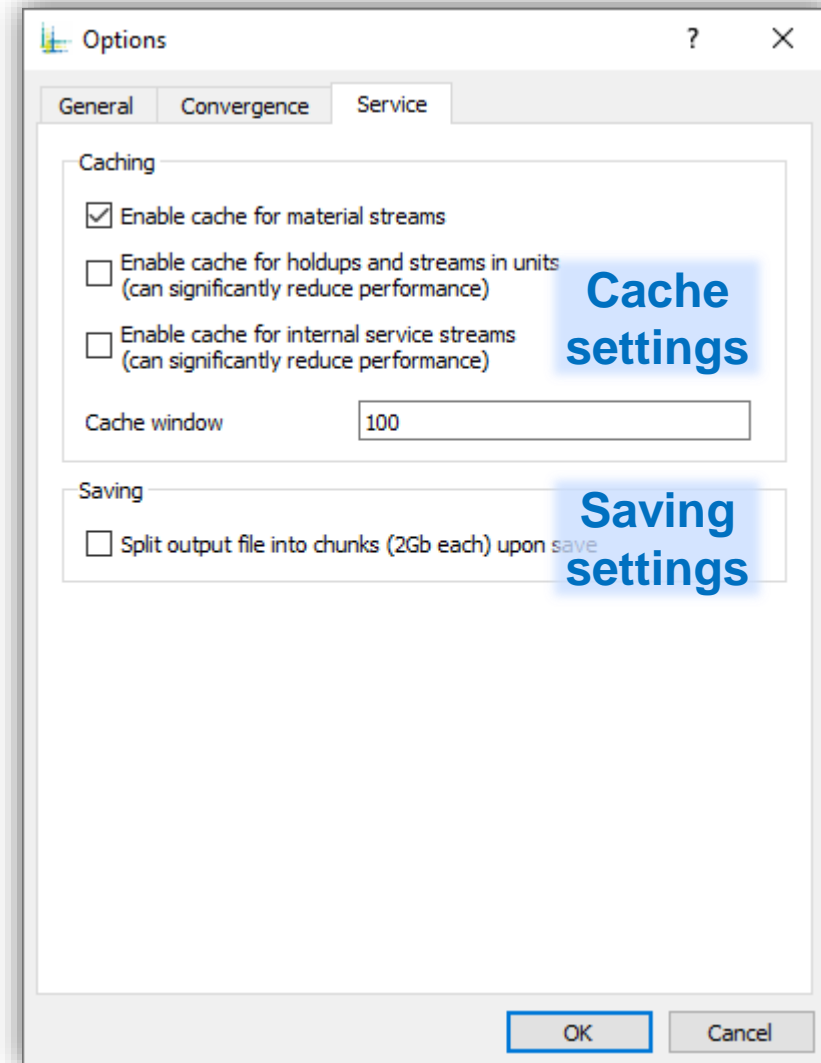
Method Wegstein's method

Acceleration parameter limit (-5;1) -0.5

Data extrapolation

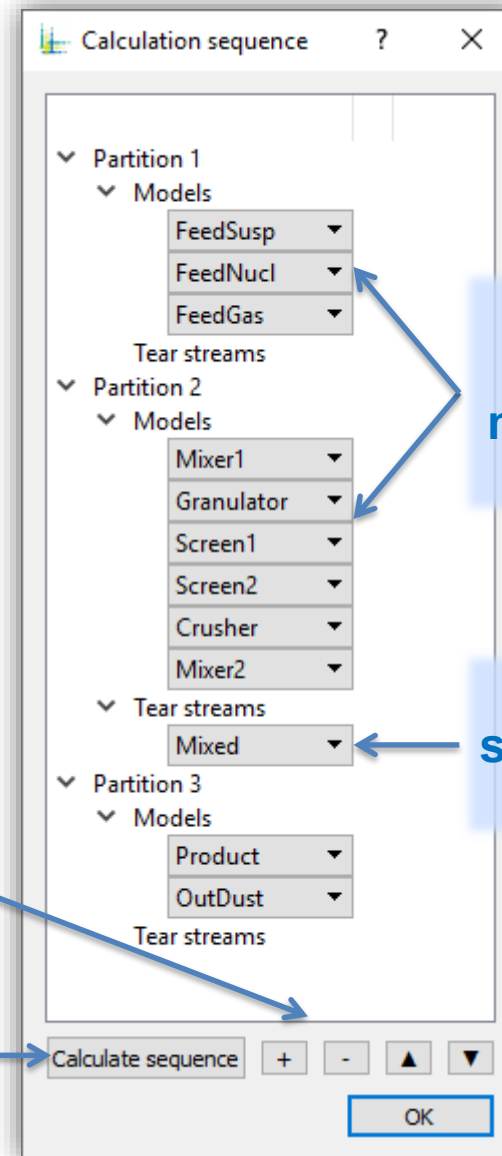
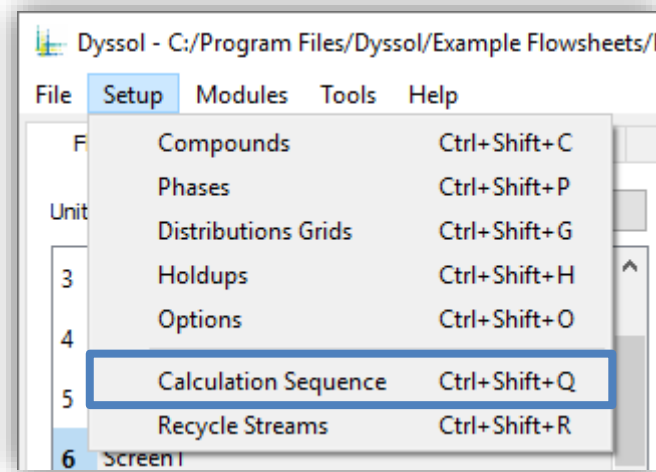
Extrapolation method Cubic spline extrapolation

OK Cancel



Flowsheet setup

Calculation sequence

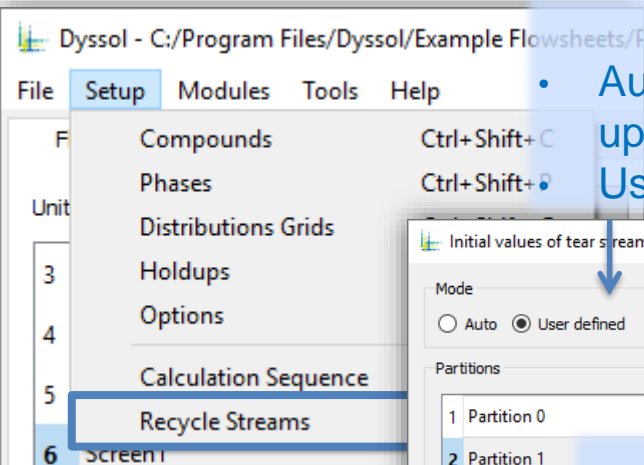


Calculation
sequence of
models within
the partition

List of tear
streams within
the partition

Add, remove, rearrange models,
tear streams or partitions

Update calculation sequence



Mode selection

- Auto: use obtained simulation result in subsequent simulations, update them on change
- User defined: manually set all stream parameters

Initial values of tear streams

Mode
☐ Auto ☒ User defined

Partitions

1	Partition 0
2	Partition 1
3	Partition 2

Tear streams

1	Mixed
---	-------

Time points [s]

Time points [s]	MTP	Phase fractions	Phase liquid	Phase vapor	Phase solid
0					
0.1					

Time [s] Mass flow [kg/s] Temperature [K] Pressure [Pa]

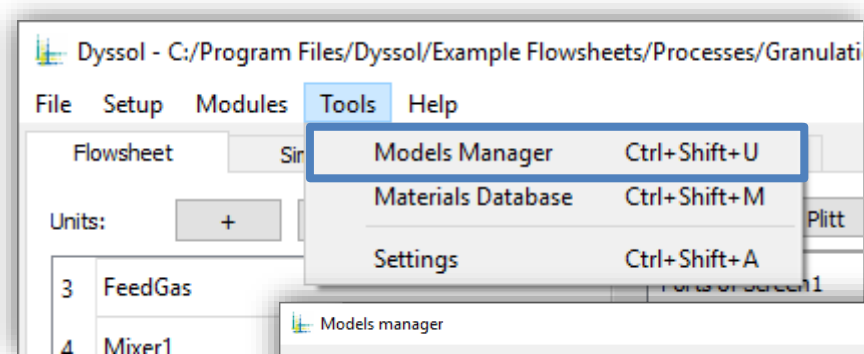
Time [s]	Mass flow [kg/s]	Temperature [K]	Pressure [Pa]
1 0	0.0491	300	100000
2 0.1	0.0492	300	100000

Control over time points

Customizable parameters

Tools

Models manager



Whether to look for models in this directory

List of directories with models

Path	Activity
8 ..\x64\Release	<input type="checkbox"/>
9 D:/Temp/Zentrifuge	<input checked="" type="checkbox"/>
10 C:/Program Files/Dyssol/Units	<input checked="" type="checkbox"/>
11 C:/Program Files/Dyssol/Solvers	<input checked="" type="checkbox"/>

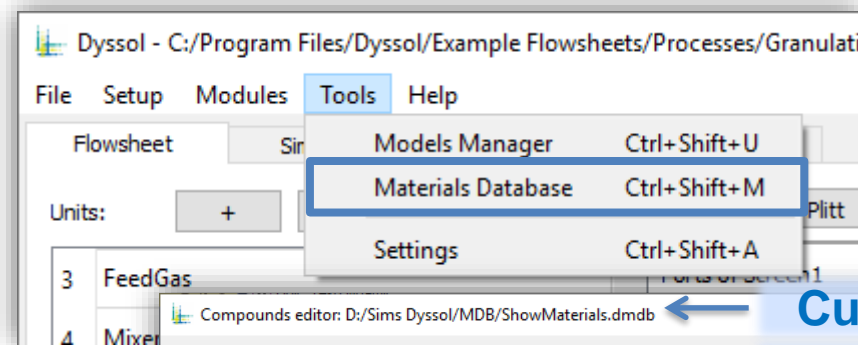
Add/remove/rearrange directory

List of available models

Name	Location	Type	Version	Author	Created
16 InletFlow	C:/Program Files/Dyssol/Units/Unit_Inlet.dll	Dynamic Unit	1	SPE TUHH	Thu Apr 18 16:23:30 2019
17 InletGenerator	C:/Program Files/Dyssol/Units/Unit_InletGenerator.dll	Dynamic Unit	1	SPE TUHH	Thu Apr 18 16:21:48 2019
18 Mixer	C:/Program Files/Dyssol/Units/Unit_Mixer.dll	Steady-state Unit	1	SPE TUHH	Thu Apr 18 16:20:41 2019
19 OutletFlow	C:/Program Files/Dyssol/Units/Unit_Outlet.dll	Dynamic Unit	1	SPE TUHH	Thu Apr 18 16:20:42 2019
20 Screen Molerus & Hoffmann	C:/Program Files/Dyssol/Units/Unit_ScreenMolerusHoffmann.dll	Steady-state Unit	1	SPE TUHH	Thu May 2 19:15:48 2019
21 Screen Plitt	C:/Program Files/Dyssol/Units/Unit_ScreenPlitt.dll	Steady-state Unit	1	SPE TUHH	Thu May 2 19:16:02 2019
22 Screen Probability model	C:/Program Files/Dyssol/Units/Unit_ScreenProbability.dll	Steady-state Unit	1	SPE TUHH	Thu May 2 19:16:02 2019
23 Screen Teipel & Hennig	C:/Program Files/Dyssol/Units/Unit_ScreenTeipel.dll	Steady-state Unit	1	SPE TUHH	Thu May 2 19:16:02 2019
24 SinFlow	C:/Program Files/Dyssol/Units/Unit_InletSin.dll	Dynamic Unit	1	SPE TUHH	Thu Apr 18 16:20:44 2019
25 Splitter	C:/Program Files/Dyssol/Units/Unit_Splitter.dll	Steady-state Unit	1	SPE TUHH	Thu Apr 18 16:20:44 2019
26 Time delay	C:/Program Files/Dyssol/Units/Unit_TimeDelay.dll	Dynamic Unit	1	SPE TUHH	Thu May 2 19:16:36 2019
27 Agglomeration Solver Cell Average	C:/Program Files/Dyssol/Solvers/Solver_AgglomerationCellAverage.dll	Agglomeration #1 Solver	3	Robin Ahrens	Thu Apr 18 16:21:58 2019
28 Agglomeration Solver FFT	C:/Program Files/Dyssol/Solvers/Solver_AgglomerationFFT.dll	Agglomeration #1 Solver	4	Lusine Shahmuradyan / Robin Ahrens	Thu Apr 18 16:21:58 2019
29 Agglomeration Solver Fixed Pivot	C:/Program Files/Dyssol/Solvers/Solver_AgglomerationFixedPivot.dll	Agglomeration #1 Solver	3	Lusine Shahmuradyan / Robin Ahrens	Thu Apr 18 16:21:56 2019

Tools

Materials database



Current file with materials database

Standard file operations

Compounds editor: D:/Sims Dyssol/MDB/ShowMaterials.dmdb

New Load Save Save as

Compounds Interactions

Compounds list

	Name	Key
1	Air	
2	Coal	compCoal
3	Sand	compSand
4	OxygenCarrier	compOC
5	Urea	compUrea
7	H2O	compH2O
8	H2	compH2
9	O2	compO2
10	N2	compN2
11	CH4	compCH4
12	CO	compCO
13	CO2	compCO2

Properties

Const	Name	Units	Value
<input type="checkbox"/>	Critical pressure	Pa	220.55
<input checked="" type="checkbox"/>	Critical temperature	K	647.13
<input checked="" type="checkbox"/>	Heat of fusion	J/mol	6002
<input checked="" type="checkbox"/>	Heat of vaporization	J/mol	40660.5
<input checked="" type="checkbox"/>	Molar mass	kg/mol	0.05844
<input checked="" type="checkbox"/>	Normal boiling point	K	373.15
<input checked="" type="checkbox"/>	Normal freezing point	K	273.15
<input checked="" type="checkbox"/>	Reactivity type	-	2
<input checked="" type="checkbox"/>	Formation enthalpy	J/mol	-241826
<input checked="" type="checkbox"/>	State of aggregation	-	0
<input checked="" type="checkbox"/>	User property 1	-	0
<input type="checkbox"/>	Enthalpy	J/kg	
<input type="checkbox"/>	Thermal conductivity	W/(m·K)	
<input type="checkbox"/>	Vapor pressure	Pa	
<input type="checkbox"/>	Dynamic Viscosity	Pa·s	
<input checked="" type="checkbox"/>	Density	kg/m³	2170

Correlations

Temperature [K] Pressure [Pa] Correlation type

Min 50 Min 1000 Power function

Max 150 Max 1e+9 $y = aT^b$

1 Values

	a	b
Value	0.02	1

Temperature [K] Pressure [Pa] Correlation type

Min 110 Min 1000 Polynomial

Correlation plot

Temperature Pressure P [Pa]: 101325

6.7 6.13 5.56 4.99 4.42 3.85

7 6 5 4 3 2 1 0

0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

Legend: #1: P=101325, [1000..1e+9] Pa; #2: P=101325, [1000..1e+9] Pa; #3: P=101325, [1000..1e+9] Pa

Calculate T [K]: 180 P [Pa]: 1e+6 Enthalpy [J/kg]: 4.795



Compounds editor: D:/Sims Dyssol/MDB/ShowMaterials.dmdb

New Load Save Save as

Compounds Interactions

Compounds list

	Name	Key
1	Air	compAir
2	Coal	compCoal
3	Sand	compSand
4	OxygenCarrier	compOC
5	Urea	compUrea
6	NaCl	SodiumChloride1
7	H2O	compH2O
8	H2	compH2
9	O2	compO2
10	N2	compN2
11	CH4	compCH4
12	CO	compCO
13	CO2	compCO2

Properties

Const	Name	Units	Value	
<input checked="" type="checkbox"/>	Critical pressure	Pa	220.55	i
<input checked="" type="checkbox"/>	Critical temperature	K	647.13	i
<input checked="" type="checkbox"/>	Heat of fusion	J/mol	6002	i
<input checked="" type="checkbox"/>	Heat of vaporization	J/mol	40660.5	i
<input checked="" type="checkbox"/>	Molar mass	kg/mol	0.05844	i
<input checked="" type="checkbox"/>	Normal boiling point	K	373.15	i
<input checked="" type="checkbox"/>	Normal freezing point	K	273.15	i
<input checked="" type="checkbox"/>	Reactivity type	-	2	i
<input checked="" type="checkbox"/>	Formation enthalpy	J/mol	-241826	i
<input checked="" type="checkbox"/>	State of aggregation	-	0	i
<input checked="" type="checkbox"/>	User property 1	-	0	i
<input type="checkbox"/>	Enthalpy	J/kg		i
<input type="checkbox"/>	Thermal conductivity	W/(m·K)		i
<input type="checkbox"/>	Vapor pressure	Pa		i
<input type="checkbox"/>	Dynamic Viscosity	Pa·s		i
<input checked="" type="checkbox"/>	Density	kg/m³	2170	i
<input checked="" type="checkbox"/>	Permittivity	F/m	710	i
<input checked="" type="checkbox"/>	User property 2	-	0	i

Correlations

Temperature [K] Pressure [Pa] Correlation type

Min 50 Min 1000 Power function

Max 150 Max 1e+9 $y = aT^b$

1 Values

	a	b
Value	0.02	1

Temperature [K] Pressure [Pa] Correlation type

Min 110 Min 1000 Polynomial

+ - ▲ ▼

Correlation plot

● Temperature ○ Pressure P [Pa]: 101325

Enthalpy [J/kg]

Temperature [K]

Calculator

T [K]: 180

P [Pa]: 1e+6

Enthalpy [J/kg]: 4.7952

List of compounds

Can be edited

Duplicate also deals with corresponding interactions

Control over compounds



Compounds editor: D:/Sims Dyssol/MDB/ShowMaterials.dmdb

New Load Save Save as

Compounds Interactions

Compounds list

	Name	Key
1	Air	compAir
2	Coal	compCoal
3	Sand	compSand
4	OxygenCarrier	compOC
5	Urea	compUrea
6	NaCl	SodiumChloride1
7	H2O	compH2O
8	H2	compH2
9	O2	compO2
10	N2	compN2
11	CH4	compCH4
12	CO	compCO
13	CO2	compCO2

Constant properties

Temperature-pressure-dependent properties

Properties

Const	Name	Units	Value	
<input checked="" type="checkbox"/>	Critical pressure	Pa	220.55	i
<input checked="" type="checkbox"/>	Critical temperature	K	311.0	i
<input checked="" type="checkbox"/>	Heat of fusion	J/mol	6002	i
<input checked="" type="checkbox"/>	Heat of vaporization	J/mol	40660.5	i
<input checked="" type="checkbox"/>	Molar mass	kg/mol	0.05844	i
<input checked="" type="checkbox"/>	Normal boiling point	K	373.15	i
<input checked="" type="checkbox"/>	Normal freezing point	K	273.15	i
<input checked="" type="checkbox"/>	Reactivity type	-	2	i
<input checked="" type="checkbox"/>	Formation enthalpy	J/mol	-241826	i
<input checked="" type="checkbox"/>	State of aggregation	-	0	i
<input checked="" type="checkbox"/>	User property 1	-	0	i
<input type="checkbox"/>	Enthalpy	J/kg		i
<input type="checkbox"/>	Thermal conductivity	W/(m·K)		i
<input type="checkbox"/>	Vapor pressure	Pa		i
<input type="checkbox"/>	Dynamic Viscosity	Pa·s		i
<input checked="" type="checkbox"/>	Density	kg/m³	2170	i
<input checked="" type="checkbox"/>	Permittivity	F/m	710	i
<input checked="" type="checkbox"/>	User property 2	-	0	i

List of properties

User defined properties

Property description

Correlations

Temperature [K] Pressure [Pa] Correlation type

Min 50 Min 1000 Power function

Max 150 Max 1e+9 $y = aT^b$

1 Values

	a	b
Value	0.02	1

Temperature [K] Pressure [Pa] Correlation type

Min 50 Min 1000 Polynomial

+ - ▲ ▼

Correlation plot

● Temperature ○ Pressure

P [Pa]: 101325

Enthalpy [J/kg]

Described by a set of correlations

Considered as a constant over the entire T & P range

Control over user defined properties

Calculator

T [K]: 180

P [Pa]: 1e+6

Enthalpy [J/kg]: 4.7952



Compounds editor: D:/Sims Dyssol/MDB/ShowMaterials.dmdb

New Load Save Save as

Compounds Interactions

Compounds list

	Name	Key
1	Air	compAir
2	Coal	compCoal
3	Sand	compSand
4	OxygenCarrier	compO
5	Urea	compUrea
6	NaCl	SodiumChloride1
7	H2O	compH2O
8	H2	compH2
9	O2	compO2
10	N2	compN2
11	CH4	compCH4
12	CO	compCO
13	CO2	compCO2

Properties

Const	Name	Units	Value	
<input checked="" type="checkbox"/>	Critical pressure	Pa	220.55	i
<input checked="" type="checkbox"/>	Critical temperature	K	647.13	i
<input checked="" type="checkbox"/>	Heat of fusion	J/mol	6002	i
<input checked="" type="checkbox"/>	Heat of vaporization	J/mol	40660.5	i
<input checked="" type="checkbox"/>	Molar mass	kg/mol	0.05844	i
<input checked="" type="checkbox"/>	Normal boiling point	K	373.15	i
<input checked="" type="checkbox"/>	Normal freezing point	K	273.15	i
<input checked="" type="checkbox"/>	Formation enthalpy	J/mol	-241826	i
<input checked="" type="checkbox"/>	State of aggregation		0	i
<input checked="" type="checkbox"/>	User property 1	-	0	i
<input checked="" type="checkbox"/>	Enthalpy	J/kg		i

Correlations

Temperature [K] Pressure [Pa] Correlation type

Min 50 Min 1000 Power function

Max 150 Max 1e+9 $y = aT^b$

1 Values

	a	b
Value	0.02	1

Temperature [K] Pressure [Pa] Correlation type

Min 110 Min 1000 Polynomial

Correlation plot

☒ Temperature ☐ Pressure P [Pa]: 101325

Custom property definition

Temperature [K] P [Pa]: 1e+6

Enthalpy [J/kg]: 4.7952

Add property

Type	Key	Key value	Name	Initial value	Units	Description
Constant	CONST_PROP_USER_DEFINED_01	150	User property 1	0.25	-	User defined constant property #1. Can be accessed from units by key 'CONST_PROP_USER_DEFINED_01' or '150'

Add new property

Edit property

Temperature [K]

Enthalpy [J/kg]



Compounds editor: D:/Sims Dyssol/MDB/ShowMaterials.dmdb

New Load Save Save as

Compounds Interactions

Compounds list

	Name	Key
1	Air	compAir
2	Coal	compCoal
3	Sand	compSand
4	OxygenCarrier	compOC
5	Urea	compUrea
6	NaCl	SodiumChloride1
7	H2O	compH2O
8	H2	compH2
9	O2	compO2
10	N2	compN2
11	CH4	compCH4
12	CO	compCO
13	CO2	compCO2

Properties

Const	Name	Units	Value
<input checked="" type="checkbox"/>	Critical pressure	Pa	647.13
<input checked="" type="checkbox"/>	Critical temperature	K	647.13
<input checked="" type="checkbox"/>	Heat of fusion	J/mol	333.5
<input checked="" type="checkbox"/>	Heat of vaporization	J/mol	40660.5
<input checked="" type="checkbox"/>	Molar mass	kg/mol	0.05844
<input checked="" type="checkbox"/>	Normal boiling point	K	373.15
<input checked="" type="checkbox"/>	Normal freezing point	K	273.15
<input checked="" type="checkbox"/>	Reactivity type	-	2
<input checked="" type="checkbox"/>	Formation enthalpy	J/mol	-241826
<input checked="" type="checkbox"/>	State of aggregation	-	0
<input checked="" type="checkbox"/>	User property 1	-	0
<input type="checkbox"/>	Enthalpy	J/kg	
<input type="checkbox"/>	Thermal conductivity	W/(m·K)	
<input type="checkbox"/>	Vapor pressure	Pa	
<input type="checkbox"/>	Dynamic Viscosity	Pa·s	
<input checked="" type="checkbox"/>	Density	kg/m³	2170
<input checked="" type="checkbox"/>	Permittivity	F/m	710
<input checked="" type="checkbox"/>	User property 2	-	0

Correlations

Pressure range

Correlation function

Correlation parameters

Control over correlations

Correlation plot

Temperature [K] Pressure [Pa] Correlation type

Min 50 Min 1000 Max 150 Max 1e+9

Correlation type: Power function $y = aT^b$

Values

	a	b
Value	0.02	1

Temperature [K] Pressure [Pa] Correlation type

Min 110 Min 1000

Correlation type: Polynomial

Calculator

P [Pa]: 101325

Enthalpy [J/kg]: 4.7952



Compounds editor: D:/Sims Dyssol/MDB/ShowMaterials.dmdb

New Load Save Save as

Compounds Interactions

Compounds list

	Name	Key
1	Air	compAir
2	Coal	compCoal
3	Sand	compSand
4	OxygenCarrier	compOC
5	Urea	compUrea
6	NaCl	SodiumChloride1
7	H2O	compH2O
8	H2	compH2
9	O2	compO2
10	N2	compN2
11	CH4	compCH4
12	CO	compCO
13	CO2	compCO2

Properties

Const	Name	Units	Value
<input checked="" type="checkbox"/>	Critical pressure	Pa	220.55
<input checked="" type="checkbox"/>	Critical temperature	K	647.13
<input checked="" type="checkbox"/>	Heat of fusion	J/mol	6002
<input checked="" type="checkbox"/>	Heat of vaporization	J/mol	40660.5
<input checked="" type="checkbox"/>	Molar mass	kg/mol	0.05844
<input checked="" type="checkbox"/>	Normal boiling point	K	373.15
<input checked="" type="checkbox"/>	Normal freezing point	K	273.15
<input checked="" type="checkbox"/>	Reactivity type	-	2
<input checked="" type="checkbox"/>	Formation enthalpy	J/mol	-241826
<input checked="" type="checkbox"/>	State of aggregation	-	0
<input checked="" type="checkbox"/>	User property 1	-	0
<input type="checkbox"/>	Thermal conductivity	W/(m·K)	
<input type="checkbox"/>	Vapor pressure	Pa	
<input type="checkbox"/>	Dynamic Viscosity	Pa·s	
<input checked="" type="checkbox"/>	Density	kg/m³	2170
<input checked="" type="checkbox"/>	Permittivity	F/m	710
<input checked="" type="checkbox"/>	User property 2	-	0

Correlations

Temperature [K] Pressure [Pa] Correlation type

Min 50 Min 1000 Power function

Max 150 Max 1e+9 $y = aT^b$

Values

	a	b
Value	0.02	1

Property calculator

Value of the second parameter

Correlation plot

Temperature Pressure

P [Pa]: 101325

Enthalpy [J/kg]

Temperature [K]

Calculator

T [K]: 180

P [Pa]: 1e+6

Enthalpy [J/kg]: 4.7952

Plotting parameter

Correlation plot in 2D



Compounds editor: D:/Sims Dyssol/MDB/ShowMaterials.dmdb

New Load Save Save as

Compounds Interactions

Compounds

Air	Air
Coal	Coal
Sand	Sand
OxygenCarrier	OxygenCarrier
Urea	Urea
NaCl	NaCl
H2O	H2O
H2	H2
O2	O2
N2	N2
CH4	CH4
CO	CO
CO2	CO2

Pairs of compounds

Correlations

Temperature [K] Pressure [Pa] Correlation type

Min 100 Min 1000 Linear

Max 230 Max 1e+9 $y = aT + bP + c$

1 Values

	a	b	c
Value	0.2	0	1

Correlations

Temperature [K] Pressure [Pa] Correlation type

Min 220 Min 1000 Linear

+ - ▲ ▼

Interaction properties

OxygenCarrier - NaCl

Const	Name	Units	Value	
<input checked="" type="checkbox"/>	Interface tension	N/m	25.6601	i
<input type="checkbox"/>	User property 3	-		i

List of interaction properties

Correlation plot

● Temperature ○ Pressure P [Pa]: 101325

Calculator

T [K]: 200

P [Pa]: 1e+8

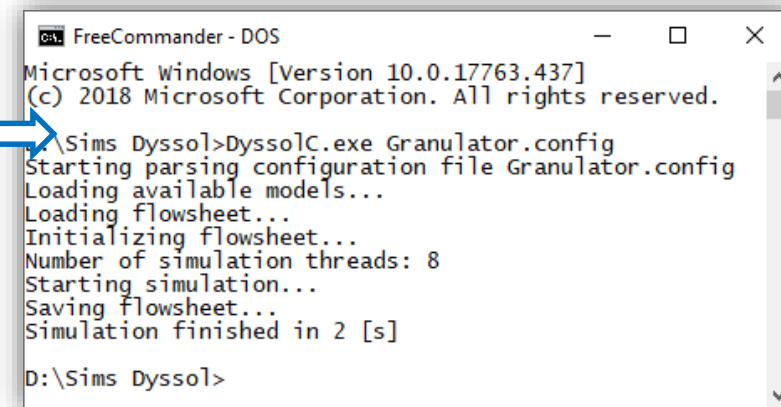
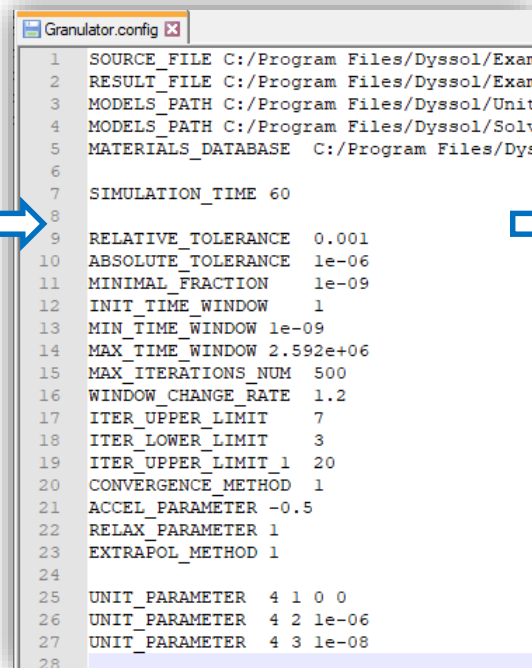
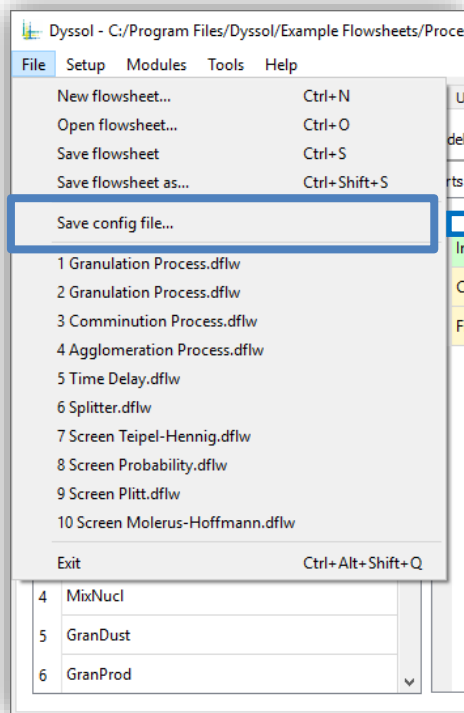
User property 3 [-]: 41

+ - □ ↻ ← **Control over user defined properties**

Command line interface



- Run simulations in command line mode
- Batch runs of multiple simulations
- Change simulation parameters: simulation time, unit parameters, grid parameters, holdups, distributed parameters of solids, simulation options
- Cannot change the flowsheet structure
- Possibility to save flowsheet as the configuration file for the command line mode:



Ref.: Dyssol\Help\Command Line.pdf