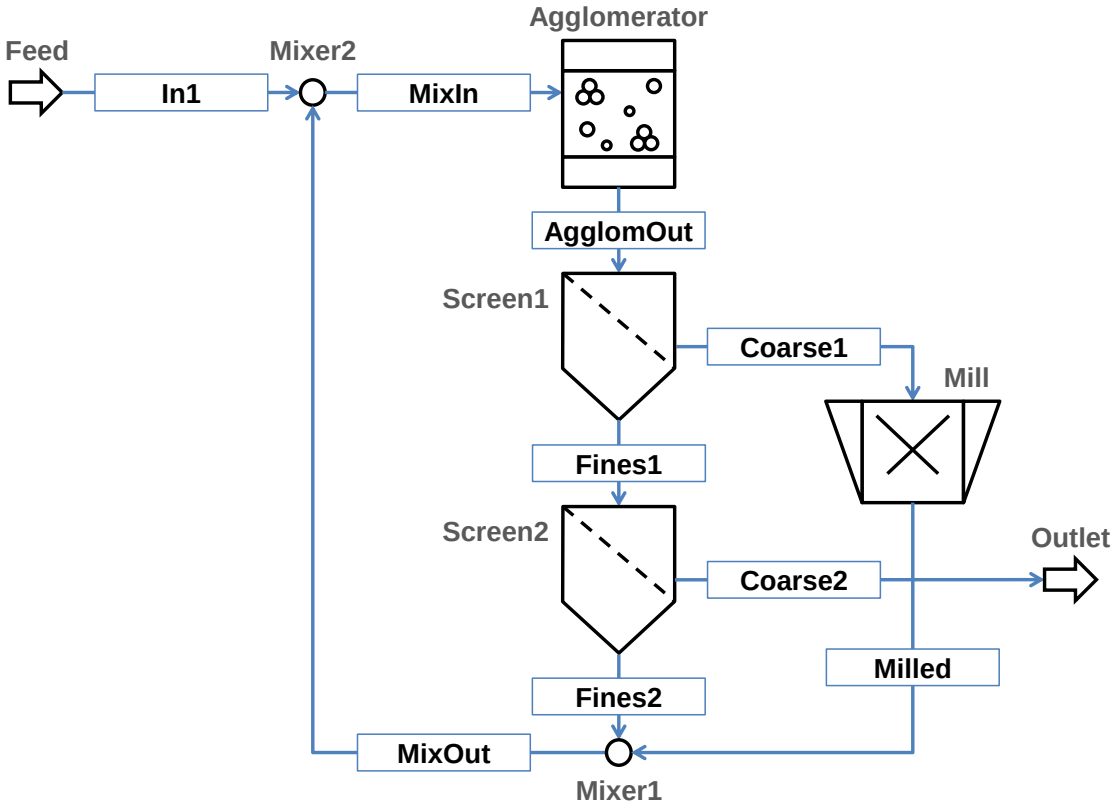
Example processes

All example flowsheets can be found in the installation directory under *<Dyssol/Example Flowsheets/Processes/>*.

- Agglomeration process
- Comminution process
- Granulation process
- Sieve-Mill process

Agglomeration process



Units:

Inlet	
Model	InletFlow
Agglomerator	
Model	Agglomerator
Rate factor	1e-10
Max time step	0 s
Solver	Agglomeration Solver FFT
Kernel	Brownian
Separation rank	3
Screen1	
Model	Screen Plitt
Cut size	4.5 mm
Separation sharpness	9
Screen2	
Model	Screen Plitt
Cut size	4 mm
Separation sharpness	9
Mill	
Model	Crusher Cone
Closed-side setting	3 mm
Alpha 1	0.5
Alpha 2	1.7
n	2

Minimum fragment size	2.5 mm
q	0.55
Mixer1	
Model	Mixer
Mixer2	
Model	Mixer
Outlet	
Model	OutletFlow

Compounds: Urea

Phases: Solid phase

PSD mesh:

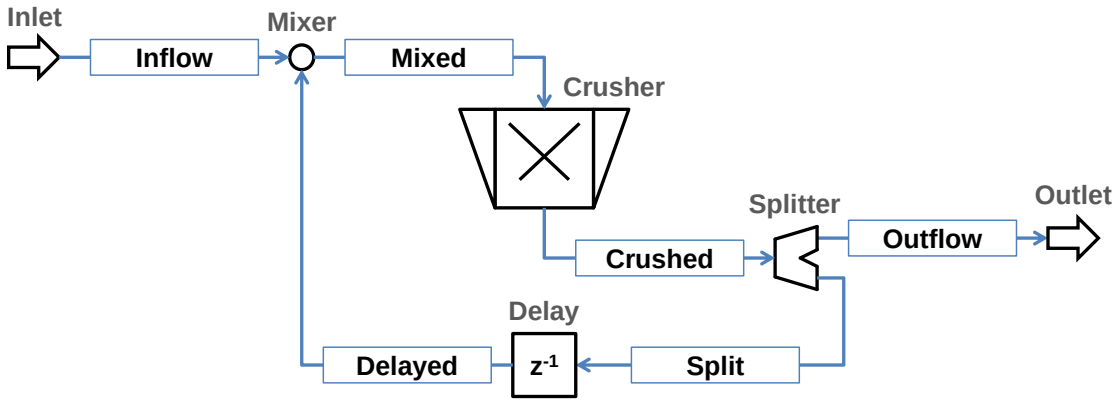
Entry	Numeric
Type	Equidistant
Classes	320
Limits	0 – 8 mm

Parameters of input streams and holdups:

Feed	
Time points	0 s
Mass flow	0.003 kg/s
Temperature	300 K
Pressure	100000 Pa
Phase fractions	100% Solid
Compounds fractions, solid phase	100% Urea
Compound of PSD q3 distribution	Urea
PSD q3 Distribution type	Normal
PSD q3 D50	3 mm
PSD q3 Standard deviation	0.2 mm
Agglomerator	
Time points	0 s
Mass	20 kg/s
Temperature	300 K
Pressure	100000 Pa
Phase fractions	100% Solid
Compounds fractions, solid phase	100% Urea
Compound of PSD q3 distribution	Urea
PSD q3 Distribution type	Normal
PSD q3 D50	3 mm
PSD q3 Standard deviation	0.1 mm

Simulation time: 10 h

Comminution process



Units:

Inlet	
Model	InletFlow
Mixer	
Model	Mixer
Crusher	
Model	Crusher Bond's law
Power input	200 kW
Bond work index	50 kWh/t
Standard deviation	0.15 mm
Splitter	
Model	Splitter
Delay	
Model	Time delay
Time delay	1 s
Outlet	
Model	OutletFlow

Compounds: Sand

Phases: Solid phase

PSD mesh:

Entry	Numeric
Type	Equidistant
Classes	100
Limits	0 – 2 mm

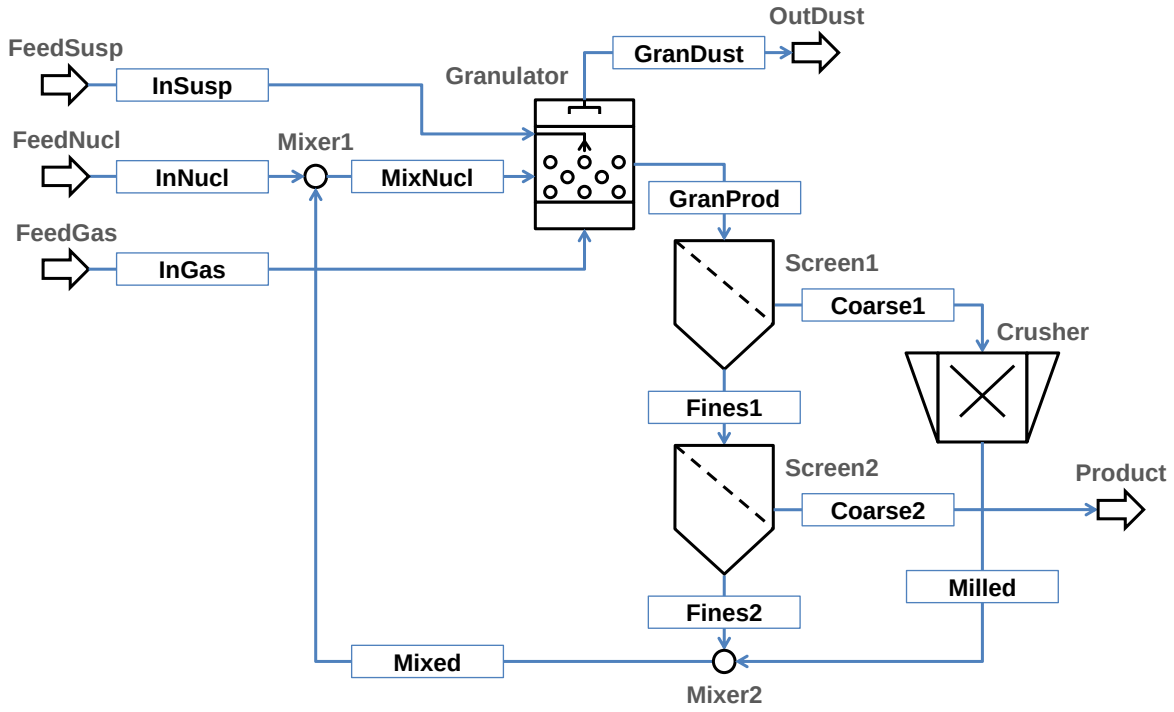
Parameters of input streams and holdups:

Inlet	
Time points	0, 10, 20, 40, 50, 60 s
Mass flow	1, 2, 2, 3, 3, 1 kg/s
Temperature	300 K
Pressure	100000 Pa

Phase fractions	100% Solid
Compounds fractions, solid phase	100% Sand
Compound of PSD q3 distribution	Sand
PSD q3 Distribution type	Normal
PSD q3 D50	1.5 mm
PSD q3 Standard deviation	0.1 mm

Simulation time: 60 s

Granulation process



Units:

FeedSusp	
Model	InletFlow
FeedNucl	
Model	InletFlow
FeedGas	
Model	InletFlow
Granulator	
Model	Granulator
Overspray part	0
Relative tolerance	1e-4
Absolute tolerance	1e-6
Screen1	
Model	Screen Plitt
Cut size	2.5 mm
Separation sharpness	4
Screen2	
Model	Screen Plitt
Cut size	1 mm
Separation sharpness	1
Crusher	
Model	Crusher Bond's law
Power input	0.1 kW
Bond work index	1 kwh/t
Standard deviation	0.1 mm
Mixer1	

Model	Mixer
Mixer2	
Model	Mixer
OutDust	
Model	OutletFlow
Product	
Model	OutletFlow

Compounds: H_2O, Air, Urea

Phases: Solid phase, liquid phase, gas phase

PSD mesh:

Entry	Numeric
Type	Equidistant
Classes	200
Limits	0 – 4 mm

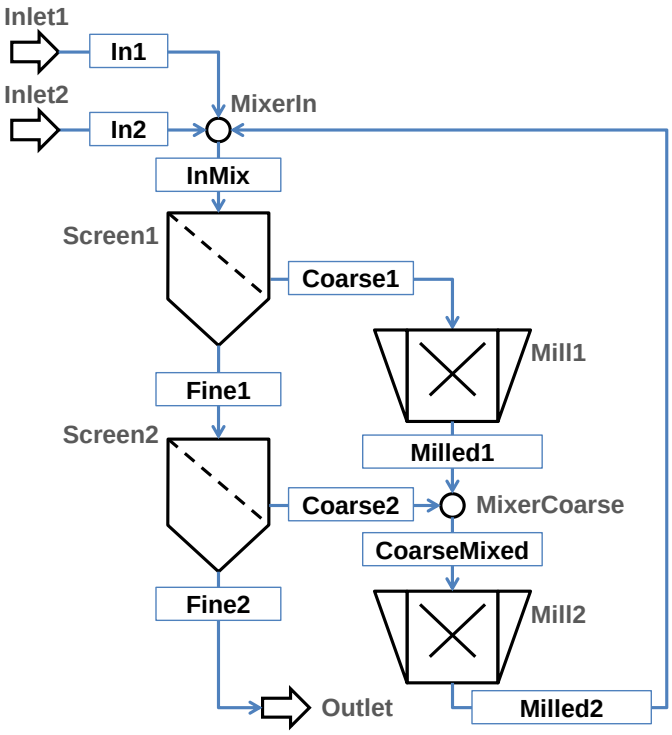
Parameters of input streams and holdups:

FeedSusp	
Time points	0 s
Mass flow	0.1 kg/s
Temperature	300 K
Pressure	100000 Pa
Phase fractions	50% Solid, 50% Liquid
Compounds fractions, liquid phase	100% H_2O
Compounds fractions, gas phase	100% Air
Compounds fractions, solid phase	100% Urea
FeedNucl	
Time points	0 s
Mass flow	0.1 kg/s
Temperature	300 K
Pressure	100000 Pa
Phase fractions	100% Solid
Compounds fractions, liquid phase	100% H_2O
Compounds fractions, gas phase	100% Air
Compounds fractions, solid phase	100% Urea
Compound of PSD q3 distribution	Urea
PSD q3 Distribution type	Normal
PSD q3 D50	1.5 mm
PSD q3 Standard deviation	0.1 mm
FeedGas	
Time points	0 s
Mass flow	0.01 kg/s
Temperature	300 K
Pressure	100000 Pa

Phase fractions	100% Gas
Compounds fractions, liquid phase	100% H_2O
Compounds fractions, gas phase	100% Air
Compounds fractions, solid phase	100% Urea
Granulator	
Time points	0 s
Mass	20 kg/s
Temperature	300 K
Pressure	100000 Pa
Phase fractions	100% Solid
Compounds fractions, liquid phase	100% H_2O
Compounds fractions, gas phase	100% Air
Compounds fractions, solid phase	100% Urea
Compound of PSD q3 distribution	Urea
PSD q3 Distribution type	Normal
PSD q3 D50	2 mm
PSD q3 Standard deviation	0.1 mm

Simulation time: 3000 s

Sieve-Mill process



Units:

Inlet1	
Model	InletFlow
Inlet2	
Model	InletFlow
MixerIn	
Model	Mixer3
Screen1	
Model	Molerus & Hoffman
Cut size	8 mm
Separation sharpness	until 2h: 10 after 2h: 3.5
Screen2	
Model	Molerus & Hoffman
Cut size	6.5 mm
Separation sharpness	until 2h: 10 after 2h: 3.5
Mill1	
Model	Crusher PBM TM
Selection function	Austin
Breakage function	Austin
Scale factor	1
S1	5.2e-7
S2	9.5
B1	0.5
B2	4.1

B3	2.5
Min time step	1
Max time step	1e+9
Method	Runge-Kutta
Mill2	
Model	Crusher PBM TM
Selection function	Austin
Breakage function	Austin
Scale factor	1
S1	6.1e-7
S2	5.5
B1	0.9
B2	4.5
B3	3.2
Min time step	1
Max time step	1e+9
Method	Runge-Kutta
MixerCoarse	
Model	Mixer
Outlet	
Model	OutletFlow

Compounds: Sand

Phases: Solid phase

Distributions grids:

Size	
Entry	Numeric
Type	Equidistant
Classes	200
Limits	0 – 500 mm^3
Distribution 1	
Entry	Numeric
Type	Equidistant
Classes	50
Limits	0 – 0.5

Parameters of input streams and holdups:

Inlet1	
Mass flow	0.1 kg/s
Temperature	300 K
Pressure	100000 Pa
Phase fractions	100% Solid
Compounds fractions, solid phase	100% Sand
PSD Distribution type	Normal

PSD D50	200 mm^3
PSD Standard deviation	20 mm^3
Distribution1 Distribution type	Normal
Distribution1 D50	0.2
Distribution1 Standard deviation	0.04
Inlet2	
Mass flow	until 4h: 0 kg/s after 4h: 0.3 kg/s
Temperature	300 K
Pressure	100000 Pa
Phase fractions	100% Solid
Compounds fractions, solid phase	100% Sand
PSD Distribution type	Normal
PSD D50	350 mm^3
PSD Standard deviation	30 mm^3
Distribution1 Distribution type	Normal
Distribution1 D50	0.4
Distribution1 Standard deviation	0.02
Mill1	
Mass	200 kg
Temperature	300 K
Pressure	100000 Pa
Phase fractions	100% Solid
Compounds fractions, solid phase	100% Sand
Compound of PSD q3 distribution	Sand
PSD Distribution type	Normal
PSD D50	200 mm^3
PSD Standard deviation	20 mm^3
Distribution1 Distribution type	Normal
Distribution1 D50	0.2
Distribution1 Standard deviation	0.04
Mill2	
Mass	100 kg
Temperature	300 K
Pressure	100000 Pa
Phase fractions	100% Solid
Compounds fractions, solid phase	100% Sand
Compound of PSD q3 distribution	Sand
PSD Distribution type	Normal
PSD D50	200 mm^3
PSD Standard deviation	20 mm^3
Distribution1 Distribution type	Normal
Distribution1 D50	0.2
Distribution1 Standard deviation	0.04

Simulation time: 21600 s