

We are delighted to announce the release of **MySep Studio v6.1**, a significant update to our flagship software. This version includes improved analysis capabilities for liquid-liquid separation and updates our proprietary mist carry-over calculations for key demisting devices. Additionally, we have made numerous usability and technical enhancements, many based on customer feedback. This release also enhances the direct interaction with leading process simulators and provides greatly enhanced support for **MySep Engine v6.1** capabilities in rendering rigorous separator modelling, within process simulations and Digital Twins.


MySep Studio v6.1 builds on our ground-breaking release of MySep Studio v6.0 in October 2023. This introduced an intuitive and flexible user interface that has been warmly embraced across our growing community of users. That release milestone was built on a foundation of entirely new code and architecture designed to enhance cyber security, streamline maintenance and provide a platform for future development.

In the following, we will detail some key highlights of the new v6.1 capabilities and list many of the other improvements.

## Liquid-liquid Separation Modelling

Our extensive research has led to one of our most requested improvements in liquid-liquid separation modelling. The new v6.1 release predicts the concentration of oil-in-water and water-in-oil, irrespective of which phase is regarded as the continuous phase. Users can now enjoy the best carry-over estimate for each liquid product in both horizontal 3-phase gas-liquid-liquid vessels, and in horizontal liquid-liquid separation vessels.

From the vessel navigation tree:

 **Results** section now gives access to the extended analysis, including complete oil-in-water and water-in-oil concentrations – shown highlighted here to the right.

### Ex.2 - (R) Production Separator Results

Gas-Liquid		Liquid-Liquid		Liquid-Solids	
Overall vessel liquid-liquid separation performance					
	Case 1	Case 2	Case 3		
Valve pressure drop	0	0	0	bar	
Phase inversion critical water cut	43.77	43.77	43.77	%	
NIL - NLL residence time	3.62	4.14	4.83	min	
BV - NIL residence time	9.33	6.22	3.11	min	
Dispersed phase removal d100	WiO	131	122	113	micron
	OiW	53	65	94	micron
Dispersed phase separation efficiency	WiO	95.35	96.82	99.63	%
	OiW	99.99	99.97	98.33	%
HC liquid outlet					
Water carryover	3.074	3.156	0.743	m³/hr	
Water concentration	1.149	1.344	0.379	% v/v	
Water concentration	11,490.7	13,444.0	3,787.2	ppm v/v	
Water outlet					
Oil carryover	0.038	0.077	3.324	m³/hr	
Oil concentration	0.06	0.08	1.651	% v/v	
Oil concentration	602.4	804.8	16,514.2	ppm v/v	

More comprehensive analysis can also be found in: **Liquid Section > Detailed LL** tab.

Liquid-liquid carry-over numerical results are accompanied by plots of predicted outlet droplet size distribution for both liquid phases and water-in-oil and oil-in-water concentration histograms.

## Enhanced Carry-over Export for Process Simulations

MySep Studio can now update process simulations with predicted liquid-liquid carry-over results, as well as the gas-liquid carry-over and pressure drop results previously supported.

The screenshot shows the 'Simulator communications' window in MySep Studio. The interface includes a sidebar with 'Tools' (3-phase separator (V-1000), Autosize, Datasheet generation, Report generation, Simulator communications, Weight) and a main panel. The main panel has tabs for Project, Analysis, Tools, and Preferences. The 'Tools' tab is active, showing the 'Simulator communications' section. This section includes a 'Connection status' (Connected to Aspen HYSYS), a 'Simulation application' (Aspen HYSYS), and buttons for 'Connect', 'Open case file', 'Disconnect', and 'Refresh lists'. Below this, there are sections for 'Select a simulation case file' (D:\Desktop\mysp files\MySep\_Engine\_Adt\_Asset\_Starter\_Rev3\_HYSYSv12.hsc), 'Select a simulation vessel' (V-0302A @Main, 1st Stage Separator @Main, V-0301A @Main), 'Select an operation' (Get vessel inlet data from simulator, Send vessel carryover / pressure drop data to simulator), 'MySep Studio settings' (Vessel: 3 phase separator, Case: Case 1, Case title: Design), 'Data direction' (Send data), 'Simulator settings' (Vessel: 1st Stage Separator @Main, Case file: D:\Desktop\mysp files\MySep\_Engine\_Adt\_Asset\_Starter\_Rev3\_HYSYSv12.hsc), and 'MySep Studio results' (Send liquid in gas carryover (m³/hr), Send WIO and OIW carryover (m³/hr), Send pressure drop (mbar)). The 'Send WIO and OIW carryover (m³/hr)' section is highlighted with a blue box, showing values for Water in HC liquid carryover (0.01153) and HC liquid in water carryover (0.00008). The 'Send pressure drop (mbar)' section shows values for Inlet dP (77.9), Gas outlet dP (19.4), and Vessel dP (97.3).

This breakthrough for process designers, and customers optimizing the operation of existing facilities, brings simulations which comprehensively represent accurate product-stream compositions for separation vessels, and reflect the impact these will have on downstream unit operations. To fully integrate our comprehensive modelling in simulations and Digital Twins, users will also deploy MySep Engine.

## Enhanced Support for MySep Engine

MySep Studio allows process engineers to build separator models that MySep Engine deploys within process simulations. The **MySep Engine v6.1** release can read the (.mvp) project file directly, during the simulation vessel setup process, eliminating the need for the special (.myg) file. This development means the old: **Tools > Simulator communications > Engine geometry file generation** workflow is only required for backward compatibility where old versions of MySep Engine within simulators. The adoption of a unified project file greatly enhances MySep Engine's capabilities in process simulations.

## Improved Modelling of Vane Pack Demisting and Agglomerating Devices

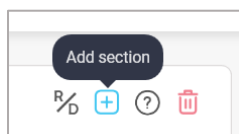
A significant portion of MySep software usage is dedicated to analysing the performance of installed separators, with a particular focus on estimating actual liquid carry-over in gas streams. Exploiting an intensive 18-month in-house research programme, MySep has developed enhanced modelling for vane-pack demisting and agglomerator devices. These improvements ensure a more accurate representation of performance, including behaviour beyond the re-entrainment point.

## Liquid Sealed Agglomerator and Demisting Device Enhancements

Enhanced detection of user-specified partially-submerged agglomerator and demisting devices has been implemented. MySep Studio now automatically classifies a device as liquid-sealed (without a gas box), when a Gas section is placed immediately downstream of the device. Additionally, the flow area and bottom elevation of the device is automatically updated to ensure accurate modelling.

## Further Usability Improvements

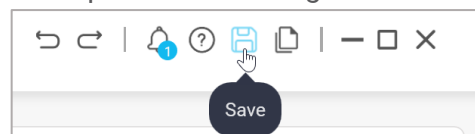
### Adding a section to a vessel



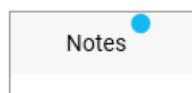
An “**Add section**” button has been added in the top right corner of all movable section screens (Gas, Agglomerator, Demisting). Formerly this control was only visible when the vessel header section was active. The change will provide clearer access to a control especially important when the user is exploring retro-fit options for existing vessels.

### Save button

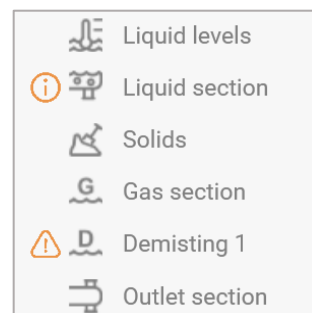
A “**Save**” button has been added to the main top right menu of the application.



### Notes tabs



The notes tabs allow users to internally document MySep Studio models. Entries on any **Notes tabs** are now consolidated and editable on the main Vessel Notes tab. In addition, if any Notes tab contains user-input text, this will be indicated by a blue dot, as shown here.



### Warning icons

**Critical** and **information** warnings are now clearly distinguished with different icons in the vessel navigation tree, as shown to the right.

### Operating envelope

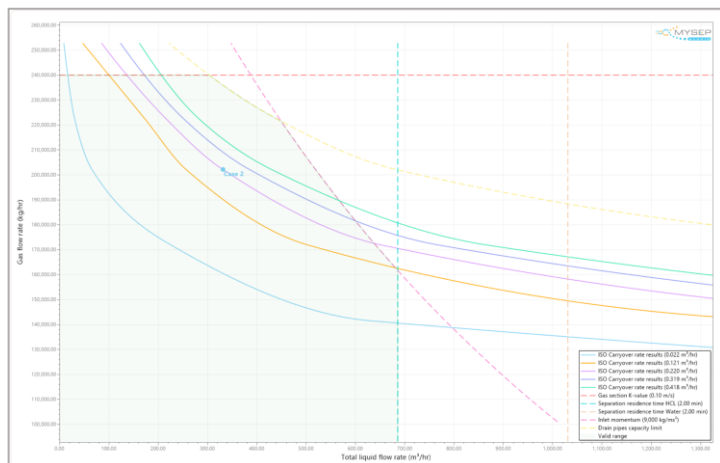
The operating envelope now implements shading of the feasible operating region, based on vessel performance modelling and limits for user-selected gas and liquid side indicators.

### Technical Limits, Criteria and General

#### Plate pack coalescer

By default, a liquid-liquid plate pack coalescer will now have an 85% open area. The user may modify this to any required value.

#### Agglomerator and demisting



- When user changes the drain pipe size or schedule, the pipe inside diameter and number of drain pipes is now automatically updated in accordance.
- In **v6.1** the individual device pressure drops are now included in case results.
- For vertical vane agglomerators in horizontal vessels, a 50mm circumferential support ring is assumed and accounted for in calculations.
- For horizontal split flow vessels with **End** inlets (central gas outlet), equipped with a horizontal agglomerator or demisting device, the device flow area and calculation results were traditionally reported per side of the vessel. Now, they are reported based on the entire device.

### General improvements

- Keyboard shortcuts are now implemented for: **Undo** (Ctrl+Z) and **Redo** (Ctrl+Y).
- A snapshot image of each vessel layout is stored into (.mvp) files. This makes these available for display when setting up vessels with MySep Engine v6.1, in a process simulation.
- Result values associated with critical warnings are now highlighted with **red font**.
- A range of improvements and bug fixes have been made to the following areas of: **Project** > *Inlet section*; > *Liquid levels*; > *Liquid section*; > *Gas section*; > *Demisting section*; > *Vessel layout* ..... and
- **Analysis** > *External data processing*; > *Motion*; > *Sensitivity analysis* .... and
- **Tools** > *Autosize* ... and many more, based on user-support requests both “customer” and “in-house.”