MANCHESTER 1824
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# COLSEQ enhancements

For non-program-specific enhancements, see the general enhancements document. The enhancements listed here relate to the current software release with the same version number, because individual enhancements do not always require a separate version-number change.

## Version 2.9-160 (08/06/2026)

- The zoom slide control in the flowsheet environment has been changed from a linear scale to an exponential scale. This gives a more intuitive response.
- The input data table reports have been enhanced to display all data and can now be copied to Excel with correct alignment

## Version 2.9-157 (21/04/2026)

- The user defined sequence had some stability issues that have been resolved
- The sloppy separation model has been enhanced so that each column in the 3- or 4-column model can have its own pressure and feed conditions. The degree of separation of the key components between the primary column and the downstream top and bottom columns can now also be specified.
- The feed stream editor can now determine the appropriate feed temperature depending upon the feed specification
- There was an issue with the solution to the Underwood equation (used to determine the minimum column reflux). There was an issue in the determination of the required roots. This has been resolved.
- The simple column models use and Fenske/Underwood/Gillian (FUG) models. The alpha used in the Underwood equation are dependent upon composition. You can now select either the Alpha values at the feed composition or the geometric mean of the alpha values of the top and bottom composition
- When determining the reboiler heatload either energy balance around the bottom of the column using the calculated vapour/liquid/bottom product flowrate and compositions or an energy balance around the entire column using the feed/top product/bottom product and condenser duty. The overall energy balance is the default as the Underwood method assume constant molar overflow.

## Version 2.9-156 (10/06/2025)

## Version 2.9-155 (17/02/2025)

## Version 2.9-154 (21/11/2024)

## Version 2.9-153 (07/10/2024)

- The maximum rejection temperature for a heatpump can now be specified
- Heatpumping to above ambient heat sinks can now be permitted

## Version 2.9-152 (12/09/2024)

- The “task based” sequencing functions has been depreciated due to its limited functionality when it is applied to practical problems
- The design option editor had issue with some option not being un-greyed
- The “User defined” sequence flowsheet has some initialisation issue which have been resolved

## Version 2.9-148 (19/09/2023)

- An issue relating to the initialisation of the NLP optimisation for sequence with merged column has been resolved
- The GA solver formulation was allowing the feed quality (q) to be optimised over a specified range. This has been resolved
- The internal cost correlation for the column capital cost have been updated to 2021 values

## Version 2.9-146

- An issue relating to data corruption for sloppy prefractionators and prefractionator models in the ‘task’ based model has been resolved
- The dephlegmator model was returning incorrect values. This has been resolved
- The sequence heat recovery can now be based on targets rather than a detailed MILP transportation formulation
- In some circumstances (i.e. low pressure, volatile components) the reboiler duty would be less than zero. This situation is now handled correctly
- The stream data in when design in targeting mode could fail to initialise correctly when the targets failed. This has been corrected
- The user constraints can now be used to specify condenser type based on product composition rather than column type
- The EMAT for sub-ambient stream was not being applied in when the sequence HEN design was in targeting mode. This has been corrected
- The side stripper and side rectifier models were using an incorrect condenser type in some situation. This has been resolved
- The light and heavy key recoveries were not correctly determined for system with non-sharp splits. This was causing significant differences between the column product composition and the feed to any downstream column. This has been resolved.

## Version 2.9-145

- The feed quality (q) can now be optimised over a specified range rather than 0 or 1. There is an option to only use 0 or 1 for the feed condition.
- The default condition of side stream for complex columns (pre-fractionators, dividing wall) can now be specified (saturated liquid or saturated vapour). The condition can also be optimised.
- When a vapour needs to be compressed in the stream conditioning, there is an option to permit vapour stream to be first cooled to a liquid, then compressed using a liquid pump and then re-heated to the desired temperature. This can be beneficial where power is expensive, but heating and cooling are relatively cheap. This can also be achieved by changing the upstream condenser to a total condenser There is an new option to only permit this feature where there is no upstream condenser (.i.e. side streams of pre-fractionators , dividing wall etc.)

- A column sensitivity function has been included to permit you to explore how the column operating condition (i.e. condenser/reboiler load and temperatures) change relative to a change in one of the input specifications
- The default column pressure has been added to the column design detailed editor
- The letdown valve was not drawn on the flowsheet under some circumstances
- The multi-stage compressor model was not returning the correct outlet temperature in some circumstances. It was also incorrectly applying inter-cooling to single stage machines
- The user can no longer specify the relative volatilities, and a physical properties source must be specified.
- The reboiler heat load are now determined by an energy balance around the column
- The relative volatiles are now determined at the top and bottom of the column ad the geometric mean is used in the Underwood equation. An option is available to calculate the relative volatilities at either the condenser and reboiler inlet composition or the product compositions
- The specified product recoveries were not being achieve in some column models
- A facility has been added so the user can define and simulate a given sequence
- An option has been added to control if the sequence optimisation results are reset after a data modification. This can be used to investigate how changes to specifications can change the optimised sequences

## Version 2.9-144

- A function has been added to limit the column pressure either the condenser or reboiler produce a product. It some situations the column will be above the critical pressure for the product composition resulting in the failure to correctly estimate the reboiler or condenser heatload
- The flowsheet was reporting the product conditioning specification when the “what is” tool is used. It now reports the actual product stream properties
- BY default, the maximum column pressure is now set as a fraction of the critical pressure or the maximum permitted pressure, whichever is the lower. The critical pressure is calculated using the bottom product composition of the column. The critical pressures for the product are now shown in the sequence data editor\products
- The defaults for the reflux scale-up and column critical section have been changed
- The “move” routines and probabilities for the SA sequence flowsheet have been revised.
- The design constraints for utilities now are applied in the SA design section
- The information in the sequence simulation report is now configurable
- A function has been included to analyse the optimisation trials. Key parameters are stored and can be plot as a guide to the solution space. Pareto front profiles can be generated
- Additional default column design parameters can now be specified
- The HTML version of the flowsheet simulation report had been enhanced with link to enable easier navigation.

## Version 2.9-142

- New Development environment libraries
- Restructure on-line help
- The sequence selection option and ranking did not differentiate identical structure under some circumstances
- The SA sequence selection can now initialise using the best existing sequence

- The default condenser/reboiler HTC have been revised
- Some cost elements were not being included correctly in the SA optimisation objective function
- Additional sequence flowsheet layout options have been included.
- Some of the menu windows menu names have been shortened due to a limitation in windows

## Version 2.9-141

- The heat recovery method used in the SA/GA sequencing has been replaced with an MILP transportation formulation
- The internal cost correlation for a dephlematator was returning that value in correct units giving artificially low values.
- The heat recovery network complexity can now be controlled by setting limits on the number of connect a given heat source/sink may have
- The sloppy prefractionator cost terms in the task-based sequencing were incorrect.

## Version 2.9-140

- The flowsheet annotation layout is now user configurable
- Feed and product properties has been added to the flowsheet
- The column details table function has been enhanced
- In task base sequencing the secondary condenser and reboiler utility cost were being ignored. This has been corrected
- The sloppy prefractionator connection to multi-feed column layout has been improved in the flowsheet
- Issues relating to the sloppy prefractionator task-based optimisation have been resolved

## Version 2.9-130

- Extracted from COLOM software. First independent version