What's New in PhazeComp
January 31, 2026

This is a partial list, by version number, of new features, bug fixes, and other improvements to PhazeComp and its associated files since version 1.8.1.

Version 2.0.2

Compared with the previous release (version 2.0.1), PhazeComp includes the following change:

- **MIX FEED Bug Fix**. When the FEED stream was MIXed to contain 100 mass units, it was renormalized to 1 mole incorrectly. This bug was first introduced with version 2.0.0.

Version 2.0.1

Compared with the previous release (version 2.0.0), PhazeComp includes a few minor improvements, including:

- **New Digital Signatures**. The digital signatures for PhazeComp and its Licensing application should now be better recognized by Windows and macOS, resulting in fewer, and less dire, warnings upon first launch.

- **Updated Documentation**. This file is new and the "Installing PhazeComp 2 on a PC" document was updated.

- **Universal Mac Application**. PhazeComp and its Licensing application are now built as universal binaries and will run natively on both Intel and Apple Silicon Macs.

- **Updated License Manager**. The Reprise License Manager (RLM) and its license server application were updated from version 16.1 to version 17.1.

Version 2.0.0

Compared with the previous release (version 1.8.1), PhazeComp includes a multitude of new features and improvements, including:

- **Plotting**. In conjunction with the open-source software, ***gnuplot***, PhazeComp will plot (in PDF format) any experimental quantity against any other, comparing calculated results with experimental data. PhazeComp will also plot phase envelopes (more details below), characterization properties, gamma distributions, and black oil properties. Most of the examples now include plotting. Search the "Command Summary" tab of the "PhazeComp Keywords" spreadsheet for PLOT keywords, and the "Tabular Input" tab for Axis options.

- **Reporting**. In conjunction with the open-source software, *__LaTeX__*, PhazeComp will automate the building of a report in PDF format. PhazeComp will generate any number of user-directed tables and figures and lay them out automatically with numbering, captioning, cross-referencing, and hyperlinking. Users will only need to add their own text and rerun LaTeX to produce, within seconds, a professional quality, finished report. Most of the examples now include LaTeX commands. Output will include a "Report" folder. Execute the enclosed "make_report.bat" (Windows) or "make_report.command" (Mac) file to generate and display a Report.pdf file. Search the "Command Summary" tab of the "PhazeComp Keywords" spreadsheet for keywords starting with LATEX or CLEAR, and the "Tabular Input" tab for LTX keywords.

- **Phase Envelopes**. PhazeComp can now generate P-T (pressure versus temperature), P-X (pressure versus molar composition), and P-W (pressure versus mass composition) diagrams. PhazeComp will identify bubble points, dew points, critical points, phase inversions, and incipient phase transitions, along with physical properties at each saturation point. It will cover the entire range from ultra-high vacuum to ultra-high pressure. If plotting is enabled, it will generate any number of user-directed plots, with axes on normal scales, log scales, or inverse temperature scales. Many of the examples now include phase envelopes. Search the "Command Summary" tab of the "PhazeComp Keywords" spreadsheet for P-T, P-X, and P-W keywords.

- **Black Oil Tables**. The generation of black oil tables has been enhanced. PhazeComp's standard black oil table (.bot) output file can now include the standard black oil properties, R_s (solution gas-oil ratio), B_o (oil formation volume factor), $1/B_o$, R_v (oil-gas volatility ratio, also known as r_s), B_g (gas formation volume factor), and $1/B_g$. PhazeComp will also calculate the surface oil and gas densities that will optimize the prediction of reservoir oil and gas densities. PhazeComp can also be directed to output the black oil tables to separate files in Eclipse 100 format or in Sensor format. Finally, plots can be generated for all the saturated black oil properties, along with reservoir densities and viscosities. See the "Command Summary" tab of the "PhazeComp Keywords" spreadsheet for the BLACK keyword.

- **Viscosity Estimates**. The drawback to the industry standard Lohrenz-Bray-Clark (LBC) viscosity correlation is that it is not very predictive for components with a molecular weight greater than about 90. The workaround is to adjust the components' ZcVis parameters (critical z-factors for viscosities) to match viscosity data, but that has never been easy to do in a systematic way. However, PhazeComp now includes a proprietary method for estimating the temperature-dependent, atmospheric liquid viscosities for each component that would be a liquid at a specified temperature and atmospheric pressure. It will then automatically calculate the value of ZcVis necessary to reproduce that viscosity. This results in LBC viscosity predictions for reservoir fluids at reservoir conditions that are usually much more accurate (often within 10% of measured values), even before any subsequent tuning. Many of the examples now include this feature. See the "Command Summary" tab of the "PhazeComp Keywords" spreadsheet for the TVIS keyword, and the "Component Properties" tab for the LVIS keyword.

- **MW/SG vs MW Correlation**. Experience has shown that distillation cuts from multiple samples of related fluids from a reservoir or field will display a linear relationship between MW/SG and MW. That's not surprising, because the molecular weight divided by the specific gravity is essentially the molar volume of a cut, and if the reservoir fluids are made up of similar building blocks, the molar volume should be linear in MW. Therefore, PhazeComp has introduced a new correlation between SG and MW (to augment the previous Søreide and Jacoby correlations). If activated, it will calculate SG versus MW from a linear relationship between MW/SG and MW. By default, the linear model will closely reproduce the Katz-Firoozabadi SG vs MW correlation, but the two parameters of the linear model can be adjusted to match available data. Many of the examples now include this feature. Search the "Command Summary" tab of the "PhazeComp Keywords" spreadsheet for the MW/SG keyword.

- **Gamma Fitting**. In addition to fitting (or modeling) MWs, component mole fractions, or component mass fractions, a Gamma distribution can now be fit to the logarithms of the component mole or mass fractions. This can improve the fitting of the tail end of a distribution, where the mole or mass fractions become very small (if they are still deemed significant and reliable). Gamma distributions can now also be plotted, comparing the input molar or mass distribution with the model distribution. Several of the examples now include these new Gamma features. See the "Command Summary" tab of the "PhazeComp Keywords" spreadsheet for the GAMMA keyword.

- **Extended Twu MW Damping**. The damping of the Twu MW correlation can now range from -1 to 1 (previously 0 to 1). A damping factor of 1 gives the original Twu MW correlation, which is fairly aromatic for any given carbon number. A damping factor of 0 results in paraffinic MWs, similar to those of the Katz-Firoozabadi correlation. A negative damping factor results in MWs that can be higher than those of normal paraffins, which is possible (as shown by mass spectrometry) because the boiling points of highly branched paraffins can be lower than that of a normal paraffin with a lesser carbon number. Search the "Command Summary" tab of the "PhazeComp Keywords" spreadsheet for the TWUM keyword.

- **Universal Gas Constant Updated**. The universal gas constant was updated from 8314.472 Pa-m3/kmol-K (1998 CODATA) to the currently accepted value of 8314.46261815324 Pa-m3/kmol-K (2022 CODATA). This may affect some of PhazeComp's predictions (anything affected by molar volumes) at the 6th digit.

- **Corrected the Spelling of Naphthalene**. This library component was previously misspelled as "Napthalene."

- **Improved EOS Solution Algorithms**. PhazeComp's internal EOS solution algorithms were overhauled to be even more precise and robust than ever. Due to the improved precision, PhazeComp 2.0.0's calculations might differ very slightly from those of PhazeComp 1.8.1.

- **BOUND Command Improved**. Sometimes, the BOUND command used to return solutions that weren't truly phase boundaries, but were merely mathematical transition points that weren't really useful. The BOUND command will now return only phase boundaries

(between 1 and 2 phases or between 2 and 3 phases). See the "Command Summary" tab of the "PhazeComp Keywords" spreadsheet for the BOUND keyword.

- **Mac Version Released**. For the first time, a version of PhazeComp for macOS is available.

- **64-Bit Executable**. PhazeComp is now a 64-bit application on Windows as well as macOS. With the transition to 64 bits, and to a new compiler, the new Windows version will see a very significant increase in speed.

- **New License Manager**. The outdated and unreliable Sheriff license manager has been replaced by the state-of-the-art Reprise License Manager (RLM), which will be much more transparent, flexible, and reliable for the end user. Unlike many new license managers, RLM will not require a constant connection to the Internet, but when connected, it will still allow for automatic 30-day trial licenses and the ability to transfer licenses from one computer to another (unassisted). It will now also allow Zick Technologies to issue floating network licenses without having to charge for an unlimited corporate license. Floating licenses allow multiple users to share each license (with some imposed limits), and they can be temporarily "roamed" to computers that will be taken off the network.

- **Updated Examples**. The distributed example files were all updated with the new PhazeComp features (plotting, reporting, phase envelopes, etc.). A new, 7-step "Characterization Case Study" example was included, in which each step builds upon the results of the previous step. In most of the examples, the output includes a Report folder that contains either a Report.pdf file or a Plots.pdf file, plus a Figures folder containing all of the individual plots in pdf format.

- **Updated Documentation**. The documentation includes several new files covering installation, licensing, and getting started. The "PhazeComp Flyer" document was updated with summaries of the new features, and the "PhazeComp Keywords" document was updated with the syntax and a brief description of each new command or option.