

## Top 10 Questions About Aspen HYSYS® Dynamics

## 1. I already have my equipment modeled in steady state with Aspen HYSYS. Do I need to recreate it from scratch in Aspen HYSYS Dynamics?

No, Aspen HYSYS Dynamics is a dynamic process simulation application that has been integrated into Aspen HYSYS. This makes it easy to convert your steady-state process model into a dynamic process simulation model. Aspen HYSYS and Aspen HYSYS Dynamics utilize the same interface, thermodynamic models and input cases.

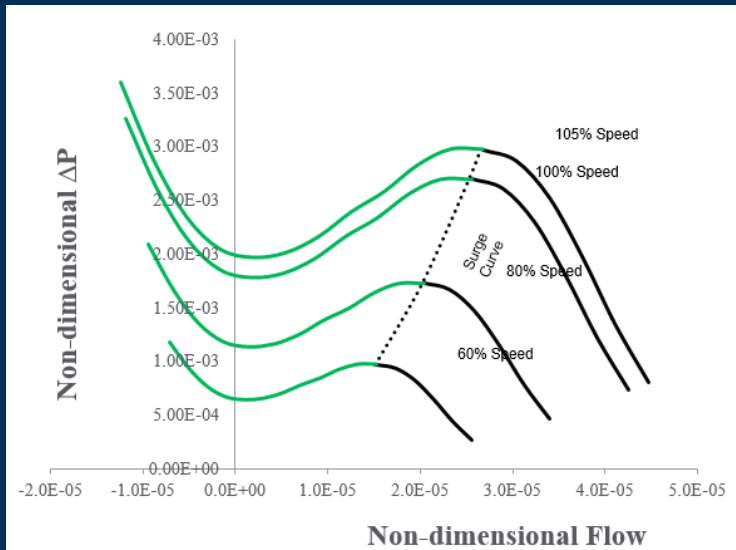
## 2. What curve options are available in Aspen HYSYS Dynamics for modeling compressors? What types of compressors can I model in Aspen HYSYS Dynamics?

Aspen HYSYS Dynamics has several standard curve options, including single molecular weight (MW), multiple MW and multiple inlet guide vane (IGV). In addition to the standard options, Aspen HYSYS Dynamics has the option for both non-dimensional curves and quasi-dimensionless curves. Multiple compressors can be modeled in Aspen HYSYS Dynamics, including centrifugal and reciprocating. AspenTech introduced the ability to model screw compressors in V9.

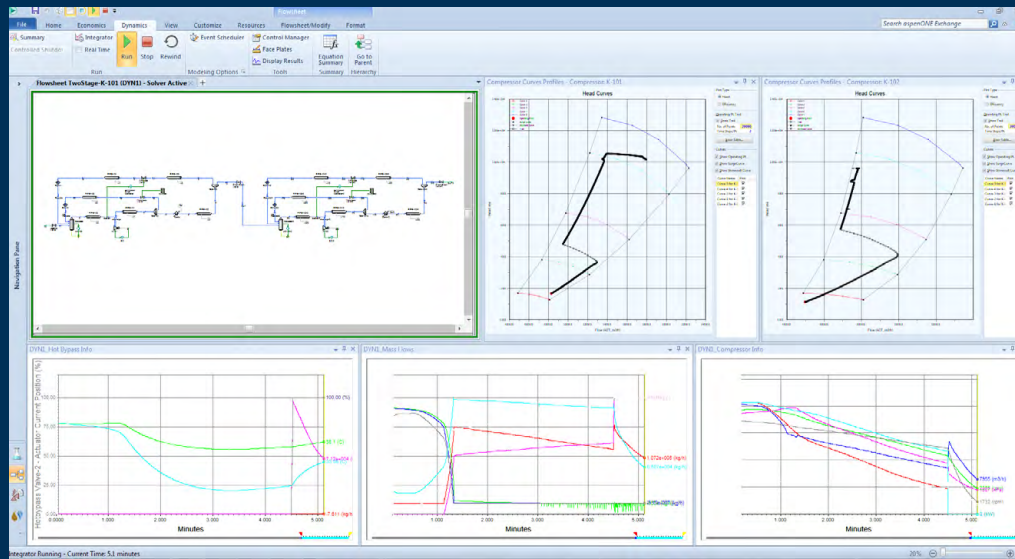
## 3. Can Aspen HYSYS Dynamics accurately represent the behavior of my compressor close to and in the surge region?

Yes, Aspen HYSYS Dynamics has been proven to show an average error of less than 2 percent for compressor surge calculations. The ability to predict surge behavior is dependent on the level of detail provided in the model. The two options, quasi-dimensionless and non-dimensional, are used to extrapolate data into regions not defined by the manufacturer curve data.

Typically, users will extrapolate normal operating data into the surge region to get a rough idea of how the compressor will behave. In the graph show to the left, the green area is typically not supplied by the vendor and these curve types will be used to estimate compressor behavior.



Understand compressor behavior beyond the surge curve with quasi-dimensionless and non-dimensional curve options.



Activated Dynamics in Aspen HYSYS allows you to visualize compressor performance over a time period using pre-made templates and plots.

#### 4. I have very little background in using Aspen HYSYS Dynamics. How can I get started with modeling compressors?

AspenTech introduced Activated Dynamics in V8 to help engineers get started with dynamically modeling compressors. Activated Dynamics automatically creates a dynamic case based on the steady-state model and built-in templates and scenarios for single-stage and multistage compressors. This lets them better understand what situations may result in the compressors approaching surge conditions, and what actions can be taken to help avoid surge. It provides new and experienced users a good starting point to perform a compressor study across a range of scenarios including shutdown, emergency shutdown, total power loss and discharge valve failure. Users can also create custom scenarios in the Event Scheduler. Additionally, users can visualize compressor behavior with pre-configured strip charts and operating curves that open automatically.

#### 5. Can Aspen HYSYS Dynamics accurately represent the dynamic behavior of my column?

Yes, columns can have many variables that rapidly change during plant operation, but they can also be quite slow to respond, depending on the size of the column. A key benefit of dynamic simulation is to be able to model a column, along with the regulatory controls (and advanced multivariable controls where implemented), so that columns can be studied to determine preferred operating conditions and control system approaches.

Utilizing Aspen HYSYS Dynamics, users can set up models to view and control the dynamic response of columns to ensure process safety and operability. Many different control implementations can be tested, such as reflux-bottoms control, distillate-boilup control and reflux-boilup control. Aspen HYSYS Dynamics also provides you with the ability to simulate many different emergency scenarios, including cooling water failure, blocked outlet, steam failure and others.

## 6. Can I use Aspen HYSYS Dynamics to seed an advanced process control (APC) model?

Yes, you can take advantage of existing models to build advanced controllers to minimize or even eliminate the need for step testing the real process unit. The dynamic simulation can step test and collect data in a format readable by Aspen APC software to create APC models and tune the controller. This controller can then be deployed online in the real plant to run in Calibrate to generate step test data from the real process.

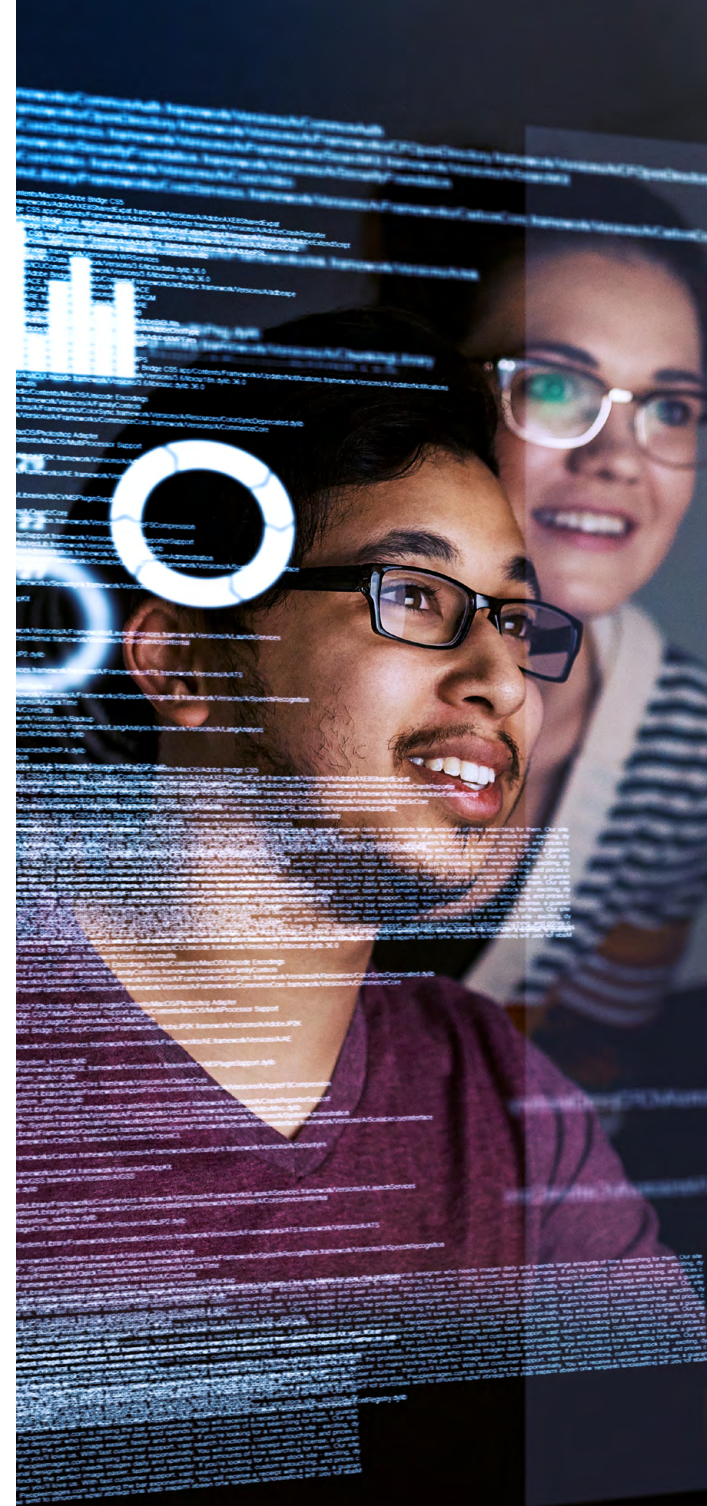
This approach lets users improve the robustness and confidence in the APC model and expose the APC controller to a wider range of operating parameters. In cases where the APC controller is being installed in a remote facility, seeding the APC model can significantly reduce deployment time.

## 7. Can I use my dynamic simulations from Aspen HYSYS Dynamics to create an operator training simulator (OTS)?

Yes, you can expand the Aspen HYSYS Dynamic models developed in design and FEED to support OTS applications. Dynamic models used in OTS applications typically require more fidelity than in earlier stages, but that detail can be added in Aspen HYSYS Dynamics. With the complete Aspen HYSYS Dynamics lifecycle, users can leverage a common dynamic model in early conceptual design down through operations to create process trainers and operator training simulators. To learn more, visit the [Aspen Operator Training](#) page.

## 8. Can Aspen HYSYS Dynamics accurately predict controller logic if I do not have access to a DCS emulator?

If users do not have access to a DCS emulator or other control emulator, Aspen HYSYS Dynamics can be used to emulate control behavior. Aspen HYSYS Dynamics has a wide range of control and logical operations that can be used to simulate control logic and process response.



## 9. Have others had success with Aspen HYSYS Dynamics?

Yes, countless customers have told us about the value they have achieved from using Aspen HYSYS Dynamics:

- **Equinox saved time and ensured safety** by using a consistent simulator through detailed engineering with Aspen HYSYS Dynamics. Ultimately, they reduced operational bottlenecks for a new gas compression system on an existing offshore platform.
- **Genesis reduced the time to first oil by two weeks and generated \$3M USD** by leveraging Aspen HYSYS Dynamics to commission the process control system of an offshore floating production storage and offloading vessel onshore.
- **NPCC saved significant CAPEX in expansion projects** by using dynamic analysis to identify the available margin of 20 percent for peak flow to a subsea flare header and tip.

## 10. How do I get started?

We have many resources to help new users get started with dynamic modeling. Please visit the [Aspen HYSYS Dynamics](#) page for jump start guides, white papers, application examples, e-learning and information on training courses.



AspenTech is a leading software supplier for optimizing asset performance. Our products thrive in complex, industrial environments where it is critical to optimize the asset design, operation and maintenance lifecycle. AspenTech uniquely combines decades of process modeling expertise with big data machine learning. Our purpose-built software platform automates knowledge work and builds sustainable competitive advantage by delivering high returns over the entire asset lifecycle. As a result, companies in capital-intensive industries can maximize uptime and push the limits of performance, running their assets faster, safer, longer and greener.

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