



# TOP 10 QUESTIONS

About BLOWDOWN™ Technology in Aspen HYSYS®

**BLOWDOWN Technology is available in Aspen HYSYS V9 and above.** The tool's rigorous calculations and intuitive workflows can help you save CAPEX in greenfield and revalidation projects — with fewer engineering hours. Check out this Q&A to give you a better understanding of this helpful depressurization tool.

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## 1. Why can't you just use the **Depressuring Utility** in Aspen HYSYS for blowdown analyses?

The Depressuring Utility (DPU) is the legacy tool available in Aspen HYSYS, and it has been the industry-standard technology to design blowdown valves for a pool fire. This is a great tool for screening a depressuring system, and when used properly gets validated results. However, correctly capturing the effect of various DPU parameters, like the PV work term and/or the recycle efficiency, can be time-intensive and error-prone.

BLOWDOWN Technology has been proven through experiments and across over 400 projects. Improvements have been made to include better modeling rigor, better vessel and pipe models, more rigorous orifice models, excellent handling of dense-phase fluids, more accurate heat transfer models across liquid and vapor phases (which don't need to be in equilibrium), and to the general ease of use (no PV work term, recycle efficiency, or dense phase tuning factor).

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## 2. Can BLOWDOWN Technology handle a system that involves **dense phase fluids**?

Yes, BLOWDOWN Technology has been proven to handle dense (supercritical) phase fluids and provide accurate results. The dense phase is seen at high pressures, where the fluid has a viscosity similar to a gas, but a density closer to that of a liquid.

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## 3. I want to **run sensitivity studies** to capture the effect that various parameters have on my results. Is there a way to do that?

Yes, the case study tool in Aspen HYSYS allows you to run multiple analyses and is compatible with BLOWDOWN Technology. This will allow you to save significant time in design and revalidation work.

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## 4. Can I model systems that depressurize *after* equilibrating with the atmosphere, such as **compressor systems**?

You can capture systems which equilibrate with the environment using the cool down option. In Aspen HYSYS V10, BLOWDOWN Analysis now includes a “cool down system prior to BDV opening” check box in the Run Controls tab. This can be used if you want to open the BDV only after the equipment conditions that are upstream of the orifice have reached a certain temperature (e.g. atmospheric temperature).

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## 5. Can I complete **staggered blowdown analysis** to reduce the flare header load?

Yes, in Aspen HYSYS V10, Staggered Analysis is available to analyze the performance of the disposal system when blowdown valves are opened at different times. A simple analysis superimposes the free expansion volumetric flow for each of the valve’s independent BLOWDOWN Analyses. A rigorous mode uses the full rigor of BLOWDOWN Technology to dynamically simulate all the independent valves into the disposal system, including line packing effects if needed.

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## 6. How should I account for **water in the system I am analyzing?**

Water can either be modeled in BLOWDOWN Technology as miscible in the hydrocarbon phase or as a separate free-water phase. The component mapping messages provide details on how to select the water handling options. To model water as a free phase, go to the System tab and check the “Global Free Water Phase” box. To model it as miscible in the hydrocarbon liquid zone, you must manually add water to BLOWDOWN Technology’s component list and provide the component mapping. Aspen HYSYS V10 requires you to manually provide a selection for the water handling option to ensure that special consideration is given to this input.

If you are uncertain of the solubility of water in your particular system, the recommended practice is to model water as a free-water phase. If you include water in the hydrocarbon liquid or vapor phase, this may cause flash problems. If you do not provide a selection, water will be excluded from the system entirely, which provides the most conservative approach (with respect to cold temperature predictions).

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## 7. Is it possible to **predict solid CO<sub>2</sub> formation?**

Yes, this is a functionality that was added in Aspen HYSYS V10. Solid carbon dioxide formation prediction results are reported for each individual unit operation. You can use this information to predict and prevent plugging in a line. In addition, the “Results Summary tab | Major Findings” page lists the “Initial Solid CO<sub>2</sub> Formation Time” if CO<sub>2</sub> is present in the BLOWDOWN Technology component list.

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## 8. Can I transfer my results to complete my **flare hydraulic analyses?**

Yes, the mass flow, pressure and composition values can be transferred from BLOWDOWN Technology to Aspen Flare System Analyzer™. After you run and save your BLOWDOWN Technology simulation in Aspen HYSYS, you can then open Aspen Flare System Analyzer to import the results. You can import the results in the tool by selecting “Import Sources | Aspen HYSYS BLOWDOWN and Depressuring Utility Sources” and then selecting the desired case.

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## 9. Can the tool predict **wall temperatures during pipeline pressurization?**

Yes, included in Aspen HYSYS V10, the pipeline pressurization template allows you to analyze the dynamic pressurization of a pipeline. You can determine the minimum temperature achieved in the piping directly downstream of the orifice and how far down the pipeline the temperature propagates. You can also determine the time required to pressurize the system.

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## 10. I am completely new to BLOWDOWN Technology in Aspen HYSYS. **Is it difficult to learn?**

With the release of BLOWDOWN Technology in Aspen HYSYS V9, the focus was on intuitive, user-centric workflows to reduce engineering time and ease new users into learning the tool. The underlying code was kept unchanged in order to maintain the accuracy of the original depressurization technology developed by Doctor Graham Saville and Professor Stephen Richardson. Over 30 individuals trialed BLOWDOWN Technology before its release to test the workflow, as well as the results.

To make the learning process less cumbersome, we've prepared some [videos](#) and [guides](#) to get you started with the tool! Additionally, we have incorporated built-in templates for single-vessel or multi-vessel blowdown, as well as for pipeline pressurization.