

Automotive Simulation Case Study

Sim Specialists Helps a Major Detroit Automotive OEM Increase Manufacturing Efficiency

A major Detroit Automotive OEM planned to add a new process to their facility. The process would require pieces of equipment that are sensitive to their surrounding environment. Fluctuations in the surrounding temperature would correspond with unacceptable deviations in the product; especially considering the location for the process was positioned between conditioned and non-conditioned HVAC zones.

While fully enclosing the equipment area would control the equipment's surroundings, it would also be disruptive to facility operations. Conditioning more of the facility would also provide an adequate environment for the equipment, but it would be an expensive solution.

The Sim Specialists Division of Hagerman & Company became an extension of the company's engineering team to develop a cost-effective solution that would minimize the facilities manufacturing process. Combining the operations knowledge of the automotive company with the simulation expertise of Sim Specialists, multiple design scenarios were evaluated to support the engineering and business decisions needed to successfully add a new process to their facility.

The team established a baseline of air movement and temperatures for the scenario of installing equipment with no changes to the facility; confirming the temperature variation of the critical region.

Sim Specialists

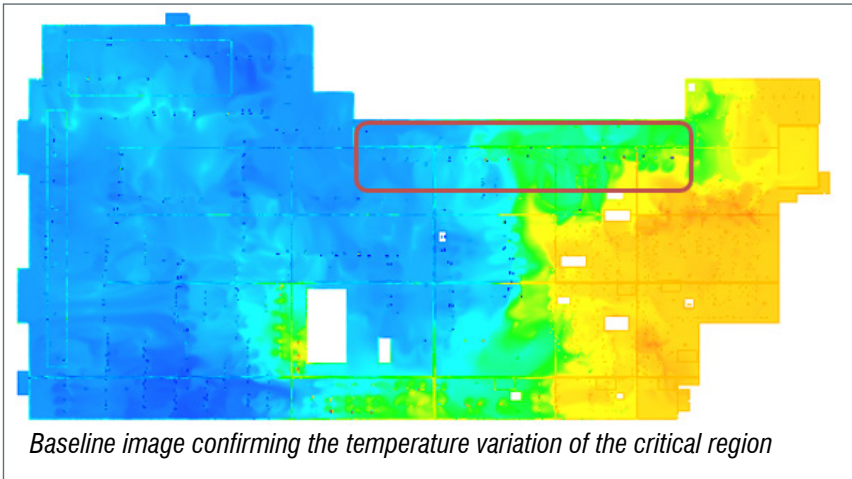
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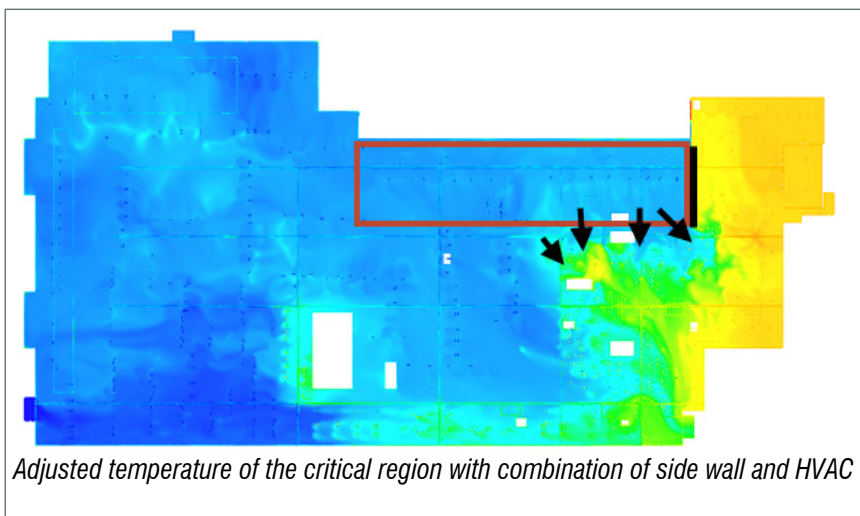
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Baseline image confirming the temperature variation of the critical region

The expert interpretation and visualization of simulation results identified deficiencies and improvement opportunities. Multiple “what-if” scenarios were evaluated to compare their performance. What if the critical region was only $\frac{3}{4}$ enclosed, or $\frac{1}{2}$, or $\frac{1}{4}$? What if only a portion of the adjacent unconditioned space was upgraded with conditioned HVAC? How many additional

cooling units are needed? Can supply diffusers be strategically located to create an “air-curtain”? With insights from some of those design scenarios it was decided that a half wall, along with the addition of an air curtain above the machinery and extension of air ducts in the area would yield the best climate for the machines to operate.



Adjusted temperature of the critical region with combination of side wall and HVAC

After collaborating throughout the iterative process of evaluating the performance of multiple designs, the team was able to present an engineering justification of various solutions to support the customer’s decision-making process. With the help of the Sim Specialists Division of Hagerman & Company, the automotive company was able to have confidence in a cost-effective solution with minimal disruption to facility operations.

With family at the heart of our company, you can trust us to make your projects more efficient, productive and, most of all, profitable.

IMAGINE IT. DESIGN IT. BUILD IT. WE’LL HELP.