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Unison Comfort Technologies® was established in 2010 as the parent organization of Innovent®, Valent® and Precision Coils. Tracing its market legacy to 1981, today Unison designs, manufactures, and provides air handling products that ventilate, dehumidify, filter, and heat or cool air. The company’s mission is to deliver products that reduce energy consumption and building operational costs.

Unison is headquartered in Minneapolis, MN, with additional manufacturing plants near Sacramento, CA and Memphis, TN. More specifically, its three businesses include:

- **Innovent Air Handling Equipment** is a custom manufacturer of commercial/industrial air handling systems, energy recovery units, desiccant dehumidification products, and pool dehumidification units. Innovent products are installed in a wide range of facilities including educational, health care, industrial, government, hospitality, recreational, research, and retail buildings.

- **Valent Air Management Systems** manufactures high-percentage outdoor air packaged rooftop units that address the needs of building owners, specifying engineers, and installing contractors. Valent units serve in dedicated outdoor air comfort and process applications in facilities ranging from educational buildings and lodging facilities to laboratories, industrial operations, and commercial properties.

- **Precision Coils** specializes in manufacturing competitively-priced, precision-engineered HVAC heating and cooling coils. Precision Coils offers a full range of HVAC replacement coils.

In 2013, Unison began its search for more productive and efficient fabrication equipment. At that time, both Innovent and Valent had separate and older fabricating and forming lines at different areas in the 180,000-square-foot Minneapolis facility. However, both companies also manufactured a wide range of similar rectangular panels for their products. The decision was made to combine production and bring it together in one location for more efficient planning and cost efficiencies. According to Jacob VandeHei, manufacturing engineer, Unison’s challenge was

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to also improve their processes in order to keep up with increased demand. “We began to look at other options,” he explains. “We had a FastBend panel bender from Prima Power that was performing well and producing high-quality parts. While visiting the Prima Power facility outside Chicago, I inspected the Shear Genius punch/shear. And as we fine tuned the project and explored the options available to us, we discovered that we could really benefit from a complete automated fabrication line.”

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PSBB Line

“We explored many options,” VandeHei continues. “We looked at high-speed punch presses, different types of lasers, and combination machines. Ultimately, we decided on the Prima Power PSBB Line. We discovered that we could most easily maintain single part flow with the PSBB line, eliminate all the in-between processing handling time, and also reduce our ‘WIP.’”

The Prima Power PSBB is a compact, flexible manufacturing line that processes blank sheets into high-quality components that exit fully bent. The PSBB concept includes the following functions:

- System design
- Software
- Machine tools and cells
- Material handling automation
- Customer support and service
- Automatic storages and flexible buffering

The combo storage allows processing of components from a variety of materials, which can be changed, as programmed, automatically. The sheets are transferred into a Shear Genius punch/shear cell. After shearing, the components are sent to buffering and subsequent bending in an automatic bending cell.

“Our older turret punch press, we were running about 7-8 minutes per sheet compared to the 3 1/2 - 4 minutes with the Prima Power SGe. That’s a 2-to-1 increase in productivity.”

Material flow can be arranged in flexible ways to transfer parts directly to automatic bending, to balance the different time requirements of bending and punching/shearing, to exit material from the system, and to bring new material into it. The combo storage allows processing of components from a variety of materials, which can be changed, as programmed, automatically. The sheets are transferred into a Shear Genius punch/shear cell. After shearing, the components are sent to buffering and subsequent bending in an automatic bending cell.

“We really like the loading system with the wagons that allow a sheet to process as it preps the next one,” explains VandeHei. “In just a matter of seconds, it transitions into the next sheet. We wanted the loading and unloading to be as ergonomic as possible. There is no more shaking out parts, no more loading the sheets by hand. Our SGe also runs 24/7, although we have staff available on each shift. We’ve also eliminated skeletons by taking advantage of common-line cutting. With a traditional punch press, typically there would be about ¾” - 1” of space between the parts. We have very rectangular parts, so the right-angle shear was a perfect solution for us. We were able to nest more parts and to achieve better sheet utilization. With our older
that part in just 45-50 seconds.”

To form that part on a traditional brake, we would end up flipping it 8 times...and now we can form that part in just 45-50 seconds.

Buffering
Material flow can be arranged in flexible ways to transfer parts directly to automatic bending, to balance the different time requirements of bending and punching/shearing, to exit material from the system, and to bring new material into it. The flexible and versatile buffering function ensures that optimum operation in terms of manufacturing cost and throughput time can always be chosen, whatever the manufacturing task at hand. Flexible buffering ensures optimal operation of integrated machines.

“The buffer helps to level the work load between the Shear Genius and the Express Bender,” explains VandeHei. “The buffer holds the parts and releases them in a measured manner down to the bender. It also allows the SGe to remain running as fast as possible.”

“To form that part on a traditional brake, we would end up flipping it 8 times, and now we can form that part in just 45-50 seconds.”

Express Bender
EBe6
The EBe servo electric Express Bender is a bending solution that is designed specifically for each fabricator’s production requirements to achieve maximum productivity, quality, and repeatability. The bending operation is fully automated, from the loading of flat punched parts to unloading of the finished product.

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The EBe bender has a maximum bending length of 131” (3,350 mm) and a maximum opening height of 8” (200 mm). The proven construction features actuations of the bending blade movements (vertical and horizontal) by NC servo axes instead of hydraulic cylinders. The upper tool movements are also made by another NC servo axis. Prima Power EBe provides the high bending quality required in demanding applications. The quality is achieved through precise control of bending axes, fast and smooth bending motion, programmability, and rigid construction that is immune to variation in thermal conditions.

“One of the greatest benefits of the EBe is its ability to do negative flanges and positive flanges at the same time without flipping the part over,” says VandeHei. “That’s an important feature because we have door panels that have nine forms and four negative bends on it. To form that part on a traditional brake, we would end up flipping it 8 times...and now we can form that part in just 45-50 seconds. Another big benefit we have experienced with the EBe is the ability to parametrically create bend programming. It can do this on the fly, with no human intervention. This saves us a ton of programming time.”

“By automating, we were not cutting jobs. The number of employees is growing, but in different areas. We are taking out the grunt work and creating better, higher-tech jobs.”

Quality Products
According to VandeHei, quality parts are the real benefit that Unison has received from the PSBB line. “Many times the visual impact of the unit is how people measure the internal quality of a product,” reflects VandeHei. “We design the interior of our components to the highest level of quality, so it is really important for us to have the exterior of our products match that same level of quality... and the PSBB line, and especially the bender, helps us achieve this. It has helped us produce high-quality, scratch-free parts. It helps produce these parts a lot easier than before. It is very precise and consistent.”

New Opportunities
“When we designed the new plant layout, we brought new equipment on line and many of our employees were shifted into different roles,” says VandeHei. “By automating, we were not cutting jobs. The number of employees is growing, but in different areas. We are taking out the grunt work and creating better, higher-tech jobs. For example, we no longer have to shake out parts or load heavy sheets by hand. We can’t hire fast enough for our new production jobs.”

“Our new Prima Power PSBB line has been a life saver when you consider the amount of growth we have recently experienced,” concludes VandeHei. “The efficiency of the PSBB has been fantastic. It has eliminated a great amount of non-value added time between stations. As a result, from sheet metal to a finished panel, we went from days to hours. It has been a real game changer, and we shudder to think what would have happened if the line had been installed a few months later. The PSBB line has helped us reach production levels that we could not have reached without it.”