

Chicago Regional Council of Carpenters elevates welding training with Lincoln Electric's VRTEX® 360 Welding Training Simulator.



LOCAL CARPENTERS TRAINING CENTER SETS NEW STANDARDS FOR WELDING TRAINING WITH VIRTUAL REALITY

At the Chicago Regional Council of Carpenters Apprentice and Training Center in Elk Grove, Ill., instructors and apprentices are preparing for transformational growth on a number of fronts. One specific focus, welding education, is undergoing a revival of sorts. In addition to experiencing a significant enrollment jump – from 650 apprentices at its lowest point during the Great Recession to 1,800 today – the training center has adopted virtual training technology, which is rapidly reshaping the traditional welding classroom.

Four years ago, the Carpenter’s Union took its first step into the world of virtual welding with the purchase of the Lincoln Electric VRTEX® 360 welding training simulator. Heralded for its cost savings and training potential, the VRTEX® 360 has since proven to be invaluable in the teaching and application of real welding processes and muscle memory, according to Craig Triplett, the training center’s assistant director.

“We were utilizing it so much in our classrooms that we decided to get another one so more of our students could use it at the same time,” Triplett said. “It is saving us tens of thousands of pounds of material, not to mention electricity for all of the equipment, which is tremendous.”

Designed for welding training facilities, schools and the welding industry, the VRTEX® 360 immerses the user into a safe, simulated welding environment. The equipment is engineered to maximize welding repetition while eliminating the cost of material loss and the time associated with tacking plate and tossing scrap. Welding processes include Shielded Metal Arc Welding, Gas Metal Arc Welding, Flux-Cored Arc Welding and Gas Tungsten Arc Welding. Lincoln Electric’s VRTEX® Transport™, 360 and 360+ dual user machines also feature Gas Tungsten Arc Welding complete with the filler metal, torch and Foot Amptrol™ pedal, in addition to the standard welding gun.

Using a welding procedure specification (WPS), students must enter the correct welding coupon, position, process, gas type, gas flow, amperage/voltage and wire-feed speed/arc length into the system. Once inside the virtual environment, they can use the stinger or welding gun to perform either a push, drag, weave, whip or straight stringer according to the specific (WPS) selected.

This experience not only introduces the learner to the preparation that goes into setting up a weld, but also allows them to quickly practice and fine-tune motor skills critical for a professional welder’s development, according to Triplett.



“It’s not a video game,” Triplett said. “It’s a teaching tool for us. Whether it’s a journeyman who has been in the trade for years or a first-year apprentice who is just starting to weld, this is another tool they can put in their toolbox to learn how to better perform their craft.”

With the VRTEX® 360, the user can control the welding puddle, leaving a stunningly realistic bead in its wake. Sparks and welding fumes are simulated because the potential

length needs to be adjusted,’ so I put that cue on. Once they weld with that on, it’s like their eyes open up.

Welding demos show what a weld should look like and reveal the five parameters of good welding – proper speed, work and travel angles, arc length/contact-tip-to-work distance, and position. There is a demo weld for every weld. The demo also provides the welder with the knowledge of how each pass should be stacked. Replay mode plays back the weld the user

“The VRTEX® makes my job easier because I can show the apprentices how to weld hands-on with equipment that is not intimidating, doesn’t waste material or frighten them off.”

hazards inherent in real-life welding do not exist in the virtual environment. The interactive experience also includes actual welding sounds that are beneficial for teaching welders how to identify mistakes and make adjustments mid-weld. In addition, the system’s exceptionally intricate graphics can reveal welding errors or discontinuities, such as porosity, when a weld has been poorly executed.

The VRTEX® system also includes visual welding cues that can be turned off or on to help the welder further hone essential welding skills.

“At first, I don’t put any of those cues on,” said Joel Boley, one of the school’s training instructors. “Then, once the students see the score at the end of their first run, I go, ‘OK, your arc

created. This permits the instructor to view the weld through the welder’s eyes and display the weld at any angle.

Each weld is scored and graphed providing the welder with a visual of what they did on each parameter while welding. The welder receives the instant feedback and can easily identify how to improve their next weld.

“For me, I think it’s pretty much right on to what I need to know to do a quality weld,” Boley said. “Before we had the VRTEX®, it was just trial and error right from the beginning. Now, students know about arc length, travel angles, speed and speed of travel – all those things they didn’t know before – and they are walking down to the weld shop with that knowledge because of the VRTEX®.”

“When I take students through the VRTEX®, and then take them down to the booth, it’s very comparable to real welding because they have the same things to work with.”





“It’s the same table, the same stand, the same electrode holder and the same hood as in the welding booth,” Boley added.

The Weldometer® tracking system is another helpful tool of the VRTEX® that makes it easy for instructors and program administrators to quantify savings.

“We spend a lot of money on steel and certification plates,” Boley said. “If we can take someone through the process before even wasting any steel, it’s a huge savings.”

In addition to the virtual welding tool, Lincoln Electric offers instructors supporting learning materials and lessons plans for the VRTEX® through its U/LINC® curriculum and online learning management system.



Luke Stenberg, a third-year apprentice with the Millwright Local 1693, credits the VRTEX® for giving him the confidence he needed to strike his first arc and develop good welding technique.

“If I were to go straight into a booth without the VRTEX® simulator, I would have been shocked,” Stenberg said. “I would not have been able to run any sort of bead. I would have been sticking at all times. It would have been embarrassing and possibly demoralizing. It really helped me to feel more comfortable with some of the first beads I ever ran.

“When you put everything the VRTEX® offers you together, you are going to be a much better welder,” Stenberg added.

Having trained for and served in multiple tours of duty with the U.S. Army, Warrant Officer Juan E. Lopez fully understands the importance of proper training.

“Having used the VRTEX®, I don’t see how you can teach welding without it,” Lopez said. “It’s like having the instructor there with you all the time.”

During the Iraq War, Lopez supervised welders who were repairing roads, bridges and overpasses. He witnessed firsthand the protection they were able to provide him and his fellow soldiers. Hours before departing on a route regularly accompanied by small arms fire and IEDs, he watched as a team of welders used heavy-duty steel to modify and upgrade a fleet of 36 armorless vehicles.

“Knowing you are putting yourself in a risky situation where you are depending on these welds holding up, you start to understand how important welding really is to you,” Lopez said. “That kind of sparked the interest I’ve always had in welding – you can go from protecting soldiers to building skyscrapers.”

