



## **Product Review**

### **SimWelder™ Client:**

Edison Welding Institute

### **Review Written By:**

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In recent years, there has been a resurgence of interest in welder training devices. Historically the vast majority of devices have been mechanical in nature with no visual component besides the device itself. In 2003, the Office of Naval Research funded VRSim through the Navy Joining Center (a Navy ManTech Center of Excellence) to develop the first virtual reality welder training device. That unit was the predecessor to SimWelder, which was later commercialized by VRSim. My company (EWI), among others, is actively developing new welder training devices to meet the growing demand of industry and academia. SimWelder, however, remains the only true "virtual reality" welding simulator that is commercially available.

SimWelder looks very much like a typical welder training setup. The trainee wears a real welding helmet and uses a real welding torch on a sample weld joint located on an adjustable height table. The computer system that drives the simulation is housed in a cabinet that is similar in size to a typical welding power source. When the user pulls the torch trigger, the viewing lens changes to what one would see through an actual welding helmet. The simulated weld changes in response to travel speed, torch angles, contact tip-to-work distance and seam tracking. In addition, there is audio feedback that provides welding sounds that change in response to the user's contact tip-to-work distance.

Making welds in virtual reality allows the trainee to practice doing as many welds as needed to develop the muscle memory required to consistently produce good welds, time after time. Since people have different learning curves, some people need more practice than others. Virtual reality welder training allows users to make an infinite number of welds without wasting test plates, shielding gas, welding filler wire, electricity, and torch consumables. One might even say virtual reality is a green approach to welder training, since no consumables are wasted.



SimWelder also provides an option to turn on visual training cues to guide the trainee in real time. There are indicators for travel speed, work angle, travel angle and seam tracking. For multiple pass welds, visual cues show the trainee where to place subsequent passes to maximize weld integrity. These visual cues can be used in any combination or not at all. This allows the student to work on each essential variable independently or together to maximize his/her training experience. In traditional welder training, one instructor typically trains a group of students simultaneously. The instructor must go from booth to booth to correct travel speed, work angle, travel angle and seam tracking. Students left to their own devices can practice these wrong techniques until an instructor intervenes to correct them. With SimWelder, the "instructor" is there 100% of the time, making this option for welder training much more effective compared to traditional welder training approaches.

In addition to real time feedback, after welding is complete, color coded graphs show students what they did and convey performance information in an easily understandable format. Instructors and students alike can use these graphs to watch student performance improve with time. Comparing performance graphs is also a fun way to foster friendly competition among fellow trainees.

SimWelder currently offers gas metal arc welding (GMAW) and shielded metal arc welding (SMAW) simulations for a variety of weld joints and welding positions. SimWelder is an excellent high end tool for any formal welder training program. It fits well in a class room setting, as the system runs on 110 Volts. It can be used as a stand alone system or grouped together to train multiple students at one time.