



**Automation
Solutions**

T H E L I N C O L N E L E C T R I C C O M P A N Y

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To whom it may concern:

The Lincoln Electric Company is the sole source for development, manufacturing and delivery of the Lincoln Electric VRTEX® 360, virtual reality arc welding system, which is described in detail herein. The VRTEX® 360 includes the following unique features:

- Joint configurations: Flat plate, Tee joint, Groove joint, 6 inch diameter schedule 40 pipe and 2 inch diameter XXS pipe
- Multiple welding processes including SMAW (E6010, E 6013, E7018), GMAW (Short arc, Axial Spray, Pulse and STT®) and FCAW (Gas-shielded and Self-shielded)
- Support for multi-positions (2F, 3F, 4F, 1G, 2G, 3G, 4G, 5G, 6G)
- Multi-position, full function welding stand
- Retractable SMAW device
- Realistic and differentiated welding puddle per welding process
- Equipment interaction and set-up

The Lincoln Electric virtual reality arc welding system, the VRTEX® 360 is a stand-alone system that uses virtual reality technology to simulate the welding processes for training purposes. VRTEX® 360 simulator is a proprietary product that combines physical props with virtual reality to create a one of a kind experience that includes tactile, visual, and auditory cues in an easy to use format. The VRTEX® 360 simulator is the only product that is a multi-process focused piece of equipment with a variety of joint configurations including pipe and flat plate. The simulator is also unique in that it covers multiple welding positions, while providing an augmented reality experience including tactile, visual, and audio feedback.

VRTEX® 360 simulators combine proprietary hardware with proprietary physics modeling to create a welding experience that looks, sounds, and feels real. Further, the VRTEX® 360 simulator provides a variety of instructor tools that allow the instructor to customize the system to match welding curriculum. This includes an 'instructor cam' feature which provides real time visual inspection of the weld and the student's technique while the student is welding and afterwards for inspection. These instructor tools allow the instructor to use the simulator to teach techniques and processes that are mission critical. The VRTEX® 360 welding simulator is designed to easily fit into an existing training curriculum.

Status	Patent Number	Application Date	Application Number	Title
Application		8/21/2008	61/090,794	WELDING SIMULATOR
Patent	D615573	7/10/2009	29/339,980	MOCK WELDING ELECTRODE HOLDER
Patent	D614217	7/10/2009	29/339,979	SIMULATOR WELDING COUPON STAND
Application		7/10/2009	29/339,978	WELDING SIMULATOR CONSOLE
Application		7/10/2009	12/501,263	VIRTUAL REALITY PIPE WELDING SIMULATOR
Application		7/10/2009	12/501,257	SYSTEM AND METHOD PROVIDING ARC WELDING TRAINING IN A REAL-TIME SIMULATED VIRTUAL REALITY ENVIRONMENT USING REAL-TIME WELD PUDDLE FEEDBACK
Application		7/17/2009	12/504,870	WELDING SIMULATOR
Application		5/27/2010	61/349,029	VIRTUAL REALITY SIMULATOR

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Best regards,

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