



New Technologies Reflect Success

The most recent program advancement for the STAR4D program is the use of a computer-integrated virtual reality painting system. Virtual reality training utilizes the computer software and hardware to simulate real-life situations.

STAR4D's primary objective for integrating virtual reality technology into the training program is to allow spray technicians a means of practicing proper spray techniques repeatedly before spraying actual coatings, without generating any hazardous wastes or emissions. The use of this technology decreases the cost of training, quantity of material consumed and the amount of VOCs released into the atmosphere. One significant limitation of traditional hands-on painter training is the amount of time it takes to train larger classes. Virtual reality can increase training capacity by reducing the unavoidable time constraints involved in the traditional training process.

The virtual reality hardware includes a real hand-held spray gun, motion-tracking device, a rear-projected display and a head-mounted display. The hardware and software interact through a central computer system to simulate actual spray painting. When the spray gun is triggered, the tracking system detects the positioning of the spray gun and projects virtual paint onto a virtual object appearing on the display.

The two different displays within this system allow the painter to focus on particular skills. The rear-projected display shows a flat object projected on to a screen, which enables the technician to practice painting the virtual part using proper spray techniques with the Laser Touch unit. With the head-mounted display, the painter can see and interact with objects in a virtual spray booth, allowing for more freedom of gun movement and control of paint application onto the virtual object.

The IWRC is continually improving and developing new components and features in the training process. The new virtual reality equipment can provide greater flexibility in training, reduce material consumption, eliminate waste and emissions and provide instant feedback to measure the user's performance. The capabilities of virtual reality significantly improve the quality and efficiency the STAR4D training program.

The virtual reality spray system was recently demonstrated at the 2005 Air Force Corrosion Program Conference in Macon, GA. Numerous Air Force personnel were able to participate in the virtual reality demonstration.

STAR4D is a program of the Iowa Waste Reduction Center at the University of Northern Iowa.