DEMONSTRATION OBJECTIVE

The Laser Coating Removal System (Model A600) was demonstrated at FIU-HCET in October 1999 by General Lasertronics Corporation. The objective of the demonstration was to remove coatings or rust from carbon steel plates and I-beams.

TECHNOLOGY DESCRIPTION

The Model A600 laser coating removal system is a fully portable laser-based coating removal and decontamination system. The system consists of four primary components: Laser Power Unit (LPU), workhead, interface module, and umbilical hoses. LPU is a trailer-mounted suite of equipment. It is the energy source for the system workhead, and transmits this energy to the workhead via fiber optical cables. The workhead contains the delivery end of the laser optics path. This includes the focusing objective lens and scanners, and also the RGB camera for color sensing and a optically safe view of the work surface. The Interface Module contains most of the electronics used for operator and safety functions. There are two separate umbilical hoses from the LPU to the workhead. One of them is used for waste collection, and the other contains the laser fibers and the electronic control harness between the LPU and the workhead. The operator presses one button to initiate an automatic startup sequence. The workhead is then removed from its storage compartment, and can be extended in any direction out to the 100-foot reach of the umbilical. The operator simply places the workhead against the work surface, and while viewing progress through a built-in video viewfinder, controls laser firing by using triggers incorporated into the workhead's hand grips. The computer system will analyze the surface, and fire the lasers accordingly, either removing a pre-specified thickness of paint, or pre-specified color of paint. The residue of stripping is vacuumed into the Model A600 filter system.

RESULTS

With a low production rate, the technology managed to remove the epoxy paint and the anti-corrosive paint from a steel plate and I-beams respectively. Rate for epoxy coating removal on the plate was 0.29 ft²/hr, nearly twice as fast as what the technology prototype demonstrated in 1997. Rate for removal of a softer anti-corrosive paint from the I-beams was 2.18 ft²/hr, more than 9 times as fast as the prototype.

Demonstration for rust removal was not successful. Instead of removing the rust, the system appeared to deoxidize the top layer of the rust. The final product will have to be treated by other means for repaint.

The technology required simple equipment setup and no personal protection equipment. It also creates a safe work environment: little noise, no airborne dust and almost no secondary waste were generated.

For additional information about this Decontamination Technology Assessment contact:
Cindy Zhang, D&D Project Manager, FIU-HCET, (305) 348-6340.