THE ENVIRONMENTAL TECHNOLOGY VERIFICATION PROGRAM

U.S. Environmental Protection Agency

Concurrent Technologies Corporation

ETV JOINT VERIFICATION STATEMENT

TECHNOLOGY TYPE:	**LASER TARGETING DEVICE**
APPLICATION:	**MANUAL SPRAY APPLICATIONS**
TECHNOLOGY NAME:	**Laser Touch™ model LT-B512**

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The United States Environmental Protection Agency (EPA) has created the Environmental Technology Verification Program (ETV) to facilitate the deployment of innovative or improved environmental technologies through performance verification and dissemination of information. The goal of the ETV Program is to further environmental protection by substantially accelerating the acceptance and use of improved, cost-effective technologies. ETV seeks to achieve this goal by providing high-quality, peer-reviewed data on technology performance to those involved in the design, distribution, financing, permitting, purchase, and use of environmental technologies.

ETV works in partnership with recognized standards and testing organizations, stakeholder groups consisting of buyers, vendor organizations, and states, and with the full participation of individual technology developers. The program evaluates the performance of innovative technologies by developing test plans that are responsive to the needs of stakeholders, conducting field or laboratory tests (as appropriate), collecting and analyzing data, and preparing peer-reviewed reports. All evaluations are conducted in accordance with rigorous quality assurance protocols to ensure that data of known and adequate quality are generated and that the results are defensible.

The ETV Coatings and Coating Equipment Program (CCEP), 1 of 12 technology areas under ETV, is operated by Concurrent Technologies Corporation (*CTC*), in cooperation with EPA's National Risk Management Research Laboratory. The ETV CCEP has recently evaluated the performance of a manual spray application targeting device. This verification statement provides a summary of the test results for the Laser Touch™ model LT-B512, manufactured by Laser Touch and Technologies, LLC.

VERIFICATION TEST DESCRIPTION

The ETV CCEP evaluated the pollution prevention capabilities of the Laser Touch™ model LT-B512 targeting device for manual spray painting operations. The test was conducted under representative factory conditions at the Iowa Waste Reduction Center's (IWRC) Painting and Coating Compliance Enhancement (PAC^2E) facility. This test was designed to verify that the Laser Touch™ model LT-B512 can provide an environmental benefit over unassisted manual spray application systems while maintaining or improving the finish quality of the applied coating. To quantify these benefits, several painters with varying degrees of experience were asked to coat test parts as they normally would to establish their unassisted baseline, then they were trained on the use of the Laser Touch™ model LT-B512 and asked to coat the same type of parts using the targeting device. The Laser Touch™ model LT-B512 was verified to provide an improvement of the painter's transfer efficiency (TE) and/or improve the finish quality of their finished parts. The improvement in TE leads to a reduction in paint usage and a subsequent reduction of volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions and solid waste disposal.

In this test, the Laser Touch™ model LT-B512 was tested under conditions recommended by Laser Touch and Technologies, LLC, the equipment's manufacturer. The test parts are 121.9 cm (48 in.) long, 101.6 cm (40 in.) wide and 1.5 to 1.7 mm (0.060 to 0.066 in.) thick. One type of part is completely solid, which is called the 'Full' part. The second type of part consists of an outside frame with a horizontal and a vertical members that meet in the center of the part, which is called the 'Window' part. Laser Touch and Technologies, LLC selected Sherwin-Williams® Polane® HS Plus white single-stage polyurethane enamel as the test coating. The coating was mixed 3:1:0.48 with Sherwin-Williams® Catalyst V66V55 and Sherwin-Williams® Reducer MAK R6K30. The manual spray gun used by all painters was an Accuspray® Model 19 high-volume, low-pressure (HVLP), pressure feed gun equipped with a 0.9 mm (0.036 in.) fluid tip, a 0.9 mm (0.036 in.) fluid needle and a #7 air cap. Each painter coated seven 'Full' and seven 'Window' parts during both the unassisted baseline and the Laser Touch™ model LT-B512 test. The parts were sprayed one at a time. Coated test parts were used for painter transfer efficiency (TE) and finish quality analyses. The TE improvement of the Laser Touch™ model LT-B512 versus that of an unassisted baseline was verified using American Society for Testing and Materials (ASTM) method D 5286.

The details of the test, including a summary of the data and a discussion of results, may be found in Chapters 4 and 5 of the “Environmental Technology Verification Report: Laser Touch and Technologies, LLC - Laser Touch™ model LT-B512,” which was published by *CTC*. A more detailed discussion of the test conditions, test results, and data analyses can be found in the "Environmental Technology Verification Data Notebook: Laser Touch and Technologies, LLC - Laser Touch™ model LT-B512," which is also published by *CTC*. Contact Robert J. Fisher of *CTC* at (814) 269-2702 to obtain copies of this statement, the Verification Report, or the Data Notebook.

TECHNOLOGY DESCRIPTION

The Laser Touch™ model LT-B512 was tested, as received from Laser Touch and Technologies, LLC, to assess its capabilities. The Laser Touch™ model LT-B512, which weighs 184.3 g (6.5 oz), attaches to any manual spray gun using an adapter bracket designed for each particular gun. The device is enclosed in a sealed housing to prevent the chance of electrical ignition of any solvent vapors. The device is battery operated and emits two laser beams that converge at the desired distance-to-target. The distance is set by positioning the spray gun in front of a flat vertical surface. When the gun is the desired distance from the surface, a rubber plug is removed from the side of the device allowing access to the set screw. The set screw is adjusted so that the two laser beams converge into a single point of light on the vertical surface. The plug is replaced and the Laser Touch™ model LT-B512 is ready for use.

The Laser Touch™ model LT-B512 is one of Laser Touch and Technologies, LLC's Laser Touch™ targeting devices. At the time of this verification test, the retail price of the Laser Touch™ model LT-B512 was $799.

VERIFICATION OF PERFORMANCE

The performance characteristics of the Laser Touch™ model LT-B512 include the following:

Environmental Factors

- Relative Transfer Efficiency (TE) Improvement: The Laser Touch™ model LT-B512 provided an increase in TE up to 15.8 percentage points, at an average of 5.7 percentage points, which equates to a relative improvement up to 38.8% over the unassisted baseline, at an average of 11.1%. The average standard deviation for each painter's TE data was 1.5 percentage points.

- Emissions Reduction: The TE improvement of the Laser Touch™ model LT-B512 equates to a reduction of volatile emissions of 0.1 kg per kg of solids applied when compared to the unassisted baseline. The specific quantitative reduction in paint usage, volatile organic compound (VOC) or hazardous air pollutant (HAP) emissions, solid waste, and cost due to increased TE depends on numerous factors such as paint formulation, process line and paint booth design, and the products being coated.

- Cost Savings: The TE improvement of the Laser Touch™ model LT-B512 provides an economic advantage in terms of reduced paint usage and solid waste generation. In this verification test, the TE improvement equates to a reduction of 0.2 L of paint used and 0.2 kg of solid waste generated per kg of solids applied when compared to the unassisted baseline. Cost savings result from the reduced paint usage and solid waste disposal.

Marketability Factors

- Dry Film Thickness (DFT): Based on the Sherwin-Williams® literature, Laser Touch and Technologies, LLC recommended the target DFT to be 0.8–1.5 mils. The DFTs for all tests were determined from twelve points measured on 5 random parts selected for each part type (i.e., 5 parts from each type in the unassisted baseline and 5 parts from each type in the Laser Touch™ model LT-B512 test). The DFT of the Laser Touch™ model LT-B512 parts for all ten painters averaged 1.6 mils with a standard deviation of 0.3 mil. The average DFT for the unassisted baseline parts for all ten painters was 1.6 mils with a standard deviation of 0.3 mil.

- Gloss: The gloss was measured per ASTM D 523 Test Method at three points on five parts per part type. The test method has a range of 0–100 gloss units. The target value of 80 gloss units at a 20° angle was based on the Sherwin-Williams® literature and recommendations from Laser Touch and Technologies, LLC. The Laser Touch™ model LT-B512 parts for all ten painters had an average of 83.3 gloss units with a standard deviation of 3.3 gloss units. The unassisted baseline parts for all ten painters had an average of 80.5 gloss units with a standard deviation of 7.9 gloss units.

- Visual Appearance: IWRC personnel assessed the visual appearance of all 28 parts sprayed for each painter. The intent of this analysis was to identify any obvious coating abnormalities. The visual appearance of the Laser Touch™ parts was determined to be better than that of the unassisted baseline parts, with more even coating coverage and reduced appearance of striping.

SUMMARY

The test results show that the Laser Touch™ model LT-B512 provides an environmental benefit over unassisted manual spray applications by increasing a painter's TE, thereby reducing VOC/HAP emissions, paint usage rates, and solid waste generated, and by maintaining or improving the applied coating's finish quality. As with any technology selection, the end user must select appropriate paint spray equipment for a process that can meet their associated environmental restrictions, productivity, and coating quality requirements.

Original Signed on
May 18, 2000

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Original Signed on
June 7, 2000

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