

I. INTRODUCTION

This report discusses the Laser Touch model LT-B512 manufactured by Laser Touch and Technologies, LLC, the performance claim to be verified by the Air Resources Board (ARB), the emissions testing results, and the findings and recommendations of the ARB staff concerning this technology.

This report is organized into several sections. The General Information section provides background information on the ARB's Equipment and Process Precertification (Precertification) Program. The next three sections (Summary of Scope, Statement of Claims, and Description of Technology) discuss the breadth of our evaluation, the performance claim, and a detailed description of the Laser Touch model LT-B512.

The Technical Evaluation and Evaluation of Claims sections present detailed information on our technical review and assessment of the Laser Touch model LT-B512. The Quality Management and Environmental Benefits sections provide supporting information on Laser Touch and Technologies LLC technology and a brief assessment of the potential environmental impacts of the technology.

The Recommendations section discusses the ARB staff's determination of the performance of the Laser Touch model LT-B512 relative to the company's claim. The Precertification Conditions section provides guidance with respect to the specific conditions that must be met for

the certificate to remain valid for three years.

Appendix A contains the listing of the information that we relied upon to conduct our evaluation. The remaining appendices contain the detailed information that supports the evaluation in this report.

II. GENERAL INFORMATION

On June 14, 1996, the ARB adopted section 91400 of the California Code of Regulations, which included the Criteria for Equipment and Process Precertification. The regulation became effective on November 30, 1996.

Under this regulation, equipment or processes eligible for Precertification must: 1) have an air quality benefit; 2) be commonly-used or have the potential to be commonly-used in the near future (market ready); and 3) not pose a significant potential hazard to public health and safety and the environment. Furthermore, applicants must demonstrate that they have sufficient control over the manufacturing of the equipment or process to ensure that they can consistently and reliably produce equipment that performs at least as well as that considered in this evaluation.

A. ARB's Equipment Precertification Program Background

Under the Equipment Precertification Program, manufacturers request that the ARB conduct an independent third-party verification of performance claims which focus on the air quality benefits of its equipment or process. If the

claims are verified, the manufacturer is free to refer to the results of the ARB staff's evaluation in its marketing literature. Upon successful completion of the verification process, the ARB staff notify air pollution control and air quality management districts (Districts) in California of its determination. As a result of the ARB's notification, Districts have an advance opportunity to become familiar with the performance of the equipment or process.

The ARB received a request from Laser Touch and Technologies, LLC that the ARB staff determine if the Laser Touch model LT-B512 was eligible for the Equipment Precertification program. After receiving confirmation from the ARB staff that the Laser Touch model LT-B512 was eligible for the program, Laser Touch and Technologies, LLC submitted a Precertification application package. As part of its review of the application package, the ARB staff evaluated the results of emissions testing programs, and other information concerning the performance of the Laser Touch model LT-B512 to determine whether the claim was verifiable.

B. Relationship to Air Quality

The reduction of volatile organic compound (VOC) emissions from a broad spectrum of activities is part of California's strategy to achieve and maintain healthful air quality. The ARB staff evaluated the ability of the Laser Touch model LT-B512 when attached to a high volume low pressure (HVLP) spray gun to assist painters in reducing paint usage, and thus VOC emissions.

1. VOC Emissions

VOCs are emitted directly as by-products of incomplete combustion or as fugitive emissions from sources such as painting operations. Painting operations may include automotive and woodworking refinishing; architectural coating; and metal parts and products coating.

Through a series of complex reactions, VOCs function as chemical precursors to the formation of tropospheric (ground-level) ozone. Repeated exposure to ozone may cause permanent damage to the lungs. Even at relatively low concentrations, ozone triggers a variety of health problems including chest pains, coughing, nausea, throat irritation, and congestion. It can also worsen bronchitis, heart disease, emphysema, asthma, and reduce lung capacity. Ozone interferes with the ability of plants to produce and store food, making them more susceptible to disease, insects, and other pollutants.

2. Control of VOC Emissions from Painting Operations

District rules and regulations require emission limits, best available control technology, and inspection schedules to reduce fugitive VOC emissions from commercial painting operations. Some Districts have specific daily, monthly, or annual VOC emission limits for permitted coating operations that, if exceeded, may trigger the requirements for emissions offsets. For example, the San Joaquin Valley Unified Air Pollution Control District's Rule 2201, section 4.5.3 Table 4-1, sets the quantity of VOC emissions that would trigger the requirement for

offsets at 20,000 pounds/VOC per year, while the South Coast Air Quality Management District's level is 4 tons per year.

The options for controlling VOC emissions from commercial painting operations include the use of compliant paints; approved cleaning devices, paint spray booth with filters; add-on air pollution control equipment; and approved paint application devices, such as HVLP spray guns.

An HVLP spray gun operates at a constant high volume of air at low pressure (under 10 pounds per square inch) to atomize the applied coating. Atomizing the coating decreases the bounce-back and blow-by of the coating during the application process. The increased efficiency at which the coating is applied to the target surface reduces the use of paint and thus its associated emissions.

C. Health and Environmental Impacts

As part of its evaluation, the ARB staff conducted a cursory review of the potential health and environmental impacts associated with the Laser Touch model LT-B512. Based on the review of the information in the Laser Touch model LT-B512 Precertification Program application, the ARB staff concluded that the Laser Touch model LT-B512 would not likely present health impacts significantly different from those associated with air pollution control equipment which are currently in wide use for painting operations throughout California.

Please note that Laser Touch and Technologies, LLC, its distributors, and/or operators of the Laser Touch model LT-B512 are required to meet all applicable federal, state, and local laws, rules and regulations with respect to the manufacture, operation, maintenance, sale, and disposal of the Laser Touch model LT-B512.

D. Manufacture/Ownership Rights

The recommendations in this report are contingent upon Laser Touch and Technologies, LLC having the legal rights to produce and/or market the Laser Touch model LT-B512. Laser Touch and Technologies, LLC documented its ownership of these rights in its application package to the ARB, dated August 16, 2001.

III. SUMMARY OF SCOPE

Laser Touch and Technologies, LLC claims that a Laser Touch model LT-B512 attached to a HVLP spray gun can assist painters in reducing the volume of paint used, therefore VOC emission reductions can be assumed.

IV. STATEMENT OF CLAIMS

The following is the claim verified by the ARB staff concerning the Laser Touch and Technologies, LLC's Laser Touch model LT-B512. The verification of this claim is predicated on the presumption that the Laser Touch model LT-B512 is manufactured, operated, maintained, sold, and disposed of in accordance with manufacturer's instructions.

When using Laser Touch Model LT-B512 with an Accuspray Model 19 high volume low pressure paint

spray gun, in accordance with the Laser Touch manufacturer's instructions, the volume of a single-stage polyurethane enamel application was decreased by an average of 15 percent and therefore a corresponding volatile organic compound emissions reduction of an average 15 percent can be assumed.

V. DESCRIPTION OF TECHNOLOGY

A. Laser Touch Model LT-B512

Laser Touch model LT-B512 is an add-on component for paint spray guns. The Laser Touch model LT-B512 is an optical device that assists painters in identifying the ideal gun-to-target paint application distance. Appendix B contains a schematic for the Laser Touch model LT-B512.

The Laser Touch model LT-B512 contains a diode laser, beam splitter, and a reflecting mirror to generate a reference beam and a gauge beam. The reference beam transmits in a fixed forward direction, but the gauge beam is redirected by adjusting the attitude of the reflecting mirror. The reference beam and the gauge beam intersect at a convergence point, which can be repositioned to a selected distance from the nozzle of the spray painting system by adjusting the path of the gauge beam. The painter can identify the ideal gun-to-target paint application distance by locating the convergence point on the surface being painted.

The Laser Touch model LT-B512 weighs 4.1 ounces and can be attached to paint spray guns. The

device is 2 inches (in.) high, 0.75 in. wide, and 4.5 in. long and operates on a single AA lithium 3.6 volts battery. The manufacturer claims that the laser component of the Laser Touch model LT-B512 has an operating life of approximately 12 years of continuous use.

VI. TECHNICAL EVALUATION

A. Description of Emissions Testing

In October 1999, a testing program was conducted to evaluate the transfer efficiency of the Laser Touch model LT-B512. The test was conducted at the Iowa Waste Reduction Center's (IWRC) Painting and Coating Compliance Enhancement facility. Testing, processing, and laboratory analyses were performed by IWRC staff under the direction and observation of staff of the United States Environmental Protection Agency (U.S. EPA) Environmental Technology Verification (ETV) Program. The testing, processing, analyses, and calculations were performed in accordance with ASTM Method D 5286-95 Standard Test Methods for Determination of Transfer Efficiency Under General Production Conditions for Spray Application of Paints. (Appendix C contains detailed information about the coating used in the test program. Appendix D contains detailed information about the test results.)

The testing program included locally-recruited painters who had varying levels of experience and training on the use of HVLP spray guns but no training or experience on use of the Laser Touch model LT-B512. All painters used an Accuspray model 19

HVLP spray gun equipped with a 0.036 in. fluid tip, a 0.036 in. fluid needle, and a number 7 air cap.

The painters were first asked to coat uniform, solid test parts without the assistance of the Laser Touch model LT-B512 (Unassisted Run.) The painters were then given the opportunity to practice with the spray gun and coating in order to become accustomed to the characteristics of the Laser Touch model LT-B512 targeting device. The practice session did not attempt to correct the painters' form or their application method, but rather to provide them with the information necessary to interpret the visual feedback provided by the device. The painters were then asked to coat the same type of parts assisted by the Laser Touch model LT-B512 (Assisted Run.) The parts coated during the Unassisted Run were checked for the same performance criteria as the parts coated during the Assisted Run.

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 MAKR6K30. The coating was analyzed for viscosity, temperature, density, and solids.

Upon completion of pretreatment, parts were stored until they were needed for testing. The parts were then engraved with an identification number, weighed, and suspended from the conveyor pending transfer into the wet spray

booth. Each part was stationary in the wet spray booth while the painter applied the coating. The paint was generally applied in one coat, but a few painters used a second coat applied in a pattern that was 90 degrees from the first (cross hatch).

The processed parts were moved to the cure oven and force-cured at approximately 80 degrees Celsius for a total of 94 minutes in two stages.

Several process conditions and operational parameters were monitored by the IWRC during the test program. The process conditions were factory and spray booth relative humidity, factory and spray booth temperature, spray booth average air velocity, and average part temperature. The operational parameters were average dynamic input air pressure, average output air pressure at the cap, and average distance to the target.

B. Description of Test Results

The staff of the ARB's Monitoring and Laboratory and Stationary Source Divisions evaluated the results of the testing program submitted by the IWRC.

As shown in Table D-3 of Appendix D, paint usage and VOC reductions were calculated for the Unassisted and Assisted runs. As shown in Table D-4 of Appendix D, the average paint reduction was 15 percent or 0.03 gallons per run. The paint usage reduction corresponds to an average of 15 percent or 0.09 pounds reduction of VOC emissions.

C. Site Visit

As part of our evaluation, we contacted current users of the Laser Touch model LT-B512. One customer was LuminOre, Incorporated of Vista, California where the Laser Touch model LT-B512 was used in the application of various metallic coatings on a wide variety of substrates. These users indicated that they have been pleased with the performance of the Laser Touch model LT-B512 as an assistive device for applying coatings.

VII. EVALUATION OF CLAIMS

This section presents additional information relating to the claim verified by the ARB staff as part of this evaluation report. Our verification of this claim is based on our evaluation of the information listed in Appendix A. As stated earlier, the ARB staff's evaluation and recommendations presented in this report are predicated on the expectation that the Laser Touch model LT-B512 is manufactured, sold, used, and maintained in accordance with manufacturer's instructions.

The claim language is precise because it directly correlates with the supporting documentation included with the application package. Below the claim are supporting comments, which may be used to interpret the significance of the claim verified in this report. To assist the reader, the claim is displayed in bold text.

When using Laser Touch Model LT-B512 with an Accuspray Model 19 High Volume Low Pressure paint spray gun, in accordance with the Laser Touch manufacturer's

instructions, the volume of a single-stage polyurethane enamel application was decreased by an average of 15 percent therefore a corresponding volatile organic compound emissions reduction of an average 15 percent can be assumed.

It should be noted that this device is effective at reducing VOC emissions only to the extent to which a painter provides corrective action in response to the assistive feedback of the Laser Touch model LT-B512.

VIII. QUALITY MANAGEMENT

A. Practices and Standards

The Laser Touch model LT-B512 is manufactured exclusively by Laser Touch and Technologies, LLC at their manufacturing facility in Waterloo, Iowa. Laser Touch and Technologies, LLC's quality management practices and standards for the Laser Touch model LT-B512 are described in detail in the Laser Touch and Technology, Total Quality Management Manual.

Except for the laser module, every component used in the manufacturing of the Laser Touch model LT-B512 is custom made or machined. The laser module is custom ordered from a source-specific vendor (see Diagram E-1, Appendix E). Each component is analyzed at the manufacturing facility for a variety of parameters, including laser output and mechanical and electrical integrity. If a component does not meet Laser Touch and Technologies, LLC's specifications, it is either shipped back to the vendor or remanufactured. Once a component

has been qualified, it is placed in inventory and stored until needed.

The manufacturing process of the Laser Touch model LT-B512 involves a specific sequence of assembly instructions and standards.

Mechanical and electrical procedures are incorporated into each sequence. The final inspection contains a series of enforced standards. The inspection adheres to the U.S. Department of Health and Human Services Food and Drug Administration's (FDA) specifications for lasers.

Data sheets throughout each sequence are retained in a workbook at the facility and entered into a computer database for future reference. The data sheet records the inventory, component performance, and other quality assurance measurements. The data sheets and quality assurance measurements are reviewed, and once it is determined that the Laser Touch model LT-B512 meets Laser Touch and Technologies, LLC specifications, it is released for sale.

The ARB staff reviewed the Laser Touch and Technologies, LLC quality management practices and standards as a part of the evaluation of the Laser Touch Model LT-B512. As a result of the review, the ARB staff has determined that the quality management program is sufficiently comprehensive to support precertifying the Laser Touch Model LT-B512.

B. Other Certifications/Approvals

The Laser Touch model LT-B512 meets all FDA requirements for a

Class III A Laser. The U.S. EPA's ETV Program has verified the results of the

test program evaluated by the ARB staff in this precertification.

C. User Manuals/Assembly Instructions

The recommended practices for use and assembly of the Laser Touch model LT-B512 are contained in Operator's Manual: Laser Touch Model no. LT-B512. This document, available at www.lt-t.com, is provided to distributors and users of the Laser Touch model LT-B512. The document provides a description of assembly, recommended usage/handling, maintenance, safety, and trouble shooting. In addition, the website includes updates and tips regarding the operation and advancement of the Laser Touch model LT-B512.

D. Operator Requirements

The Laser Touch model LT-B512 is sold in the United States by distributors or by Laser Touch and Technologies, LLC sales representatives. Laser Touch and Technologies, LLC trains its distributors and sales representatives about the product and its application. The distributors or sales representatives assist customers in determining whether the Laser Touch model LT-B512 will be effective for specific applications. Distributors in some cases may also provide equipment and operators to demonstrate the Laser Touch model LT-B512.

In order to achieve optimal performance, customers must abide by the manufacturers' recommendations

for assembly and operation of the Laser Touch model LT-B512.

E. Warranties

Laser Touch and Technologies, LLC will replace any Laser Touch model LT-B512 product that does not meet manufactured assembly and operating parameters within 90 days of delivery from a Laser Touch and Technologies, LLC facility.

IX. ENVIRONMENTAL BENEFITS

As part of our review, we evaluated the potential air quality impacts of the Laser Touch model LT-B512. The use of the Laser Touch model LT-B512 as an assistive device for an HVLP paint spray gun, in accordance with manufacturer's instructions, has the potential to reduce VOC emissions.

It should be noted that under certain conditions, emissions reductions resulting from the use of the Laser Touch LT-B512 (eg., automotive refinishing operations) may be eligible for emission reduction credits. Eligibility requirements for emission reduction credits include quantifiable, enforceable, and real reductions of VOC's. Individual air districts in California should be consulted to determine potential eligibility for any emission reduction credits.

X. ARB'S RECOMMENDATIONS

After evaluating the information discussed in this report, the ARB staff recommends that the Laser Touch model LT-B512 be Precertified under its Precertification Program. Specifically, we have independently verified the claim of Laser Touch and

Technologies, LLC concerning its Laser Touch model LT-B512 as presented in the claims section of the report.

By accepting Precertification under the ARB's program, Laser Touch and Technologies, LLC assumes, for the duration of the three-year Precertification period, responsibility for maintaining the quality of the manufactured equipment and materials at a level equal to or better than was provided to obtain this Precertification. Precertification under the ARB's program is also contingent on the recipient agreeing to be subject to quality monitoring by the ARB, as provided by law.

The ARB makes no express or implied warranties as to the performance of the manufacturer's product or equipment. Nor does the ARB warrant that the manufacturer's product or equipment is free from any defects in workmanship or material caused by negligence, misuse, accident, or other causes. The ARB staff believes, however that Laser Touch and Technologies, LLC's Laser Touch model LT-B512 will achieve the performance levels presented in the claims section of this report. Our determination is based on our evaluation of the data submitted by Laser Touch and Technologies, LLC, as well as the other information identified in this report. Our recommendations are predicated on the expectation that assembly and application are performed in accordance with the manufacturer's instructions contained in the document

entitled Operator's Manual: Laser Touch Model no. LT-B512.

XI. PRECERTIFICATION CONDITIONS

The recommendations in this report are conditional upon the Laser Touch model LT-B512 being manufactured, operated, maintained, sold, and disposed of in accordance with manufacturer's instructions contained in the document entitled Operator's Manual: Laser Touch Model no. LT-B512. A copy of this document must be provided to each distributor and user of the Laser Touch model LT-B512, prior to its use for any paint spraying operation. In order for the Precertification to remain valid, Laser Touch and Technologies, LLC must retain the manufacturing rights for the Laser Touch model LT-B512.

Precertification does not relieve the person constructing, installing or operating the equipment at each specific site from the requirement to obtain an authority to construct and permit to operate. Precertification does not relieve the person from compliance with any local air district rules or regulations.

Any manufacturer's modification that affects the claimed performance or emissions of the Laser Touch Model LT-5B12 shall void this Precertification. This Precertification is only valid for the Laser Touch Model LT-B512 that was designed and tested for this evaluation.