


<b><i>HEALTH AND SAFETY MANUAL</i></b>		
Title: Spray Finishing		
Approved by: Greg Savoy		Rev. 1/108

1 Purpose/Scope:

The Company is firmly committed to providing each of its employees a safe and healthy work environment. It is recognized that Spray Finishing operations may present potentially hazardous environments. Hazards include exposure to toxic materials and flammable or explosive mists, particulates, and vapors. This program is designed to inform employees of the engineering controls, personal protective equipment and procedures to work safely in Spray Finishing operations.

This program is applicable to all Company employees, temporary employees, and contractors who may be exposed to hazardous chemicals. When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers Reagan Equipment Co., Inc. employees and contractors and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

2 Definitions/Responsibilities:

2.1 Definitions:

- 2.1.1 Spraying Area - Any area in which dangerous quantities of flammable vapors or mists, or combustible residues, dusts or deposits are present due to the operation of a spraying processes.
- 2.1.2 Spray Booth - A power-ventilated structure provided to enclose or accommodate a spraying operation to confine and limit the escape of spray, vapor, and residue, and to safely conduct or direct them to an exhaust system.
- 2.1.3 Spray Finish - For the Company's purpose, spray finish primarily refers to spray-painting.

2.2 Responsibilities:

2.2.1 Managers:

- Shall ensure that employees and contractors are trained and qualified on proper spray finishing operations including:
  - ✓ Spray finishing procedures.

- ✓ Hazard Communication including MSDS training for all chemical exposures.
- ✓ Respirator training, medical evaluations and fit testing.
- ✓ Shall ensure proper equipment is purchased, operated and maintained.
- ☐ Provide all employees with a work environment protected from all recognizable hazards through:
  - ✓ Administrative controls,
  - ✓ Engineering controls,
  - ✓ And personal protective equipment.

#### 2.2.2 Supervisors:

- ☐ Shall assist management in the selection of equipment and materials (paints, solvents, respirators, etc.) to be used during spray-painting operations.
- ☐ Shall review Material Safety Data Sheets in order to select the appropriate Personal Protective Equipment and to determine if the product will present any health concerns into the job-site.
- ☐ Shall verify that employees involved in the spray-painting operations have received proper training in all aspects of the operations.
- ☐ Shall ensure employees have been properly trained, before performing duties in spray finishing operations on the following:
  - ✓ How to gain knowledge from a MSDS.
  - ✓ The selection and use of proper PPE.
  - ✓ How to properly operate all equipment involved with spray-painting (spray gun, booth, ventilation systems, fire suppression systems, alarms, cleaning of equipment, disposal of waste, PPE, etc.).
  - ✓ The facility emergency and fire prevention plan.

#### 2.2.3 Employees:

- ☐ Shall wear the proper PPE during spray-painting operations.
- ☐ Shall properly maintain and safely operate all equipment in the spray-painting operations.
- ☐ Shall keep spray booth and spray area clean, free of clutter and build up of over-spray / waste.
- ☐ Shall maintain and properly store respirators per Reagan Equipment Co., Inc. Respirator Protection Plan.

### 3 Requirements:

#### 3.1 Spray Booth:

- 3.1.1 Spray booths shall be constructed per all applicable regulations.
- 3.1.2 Cleaning: Spray booths shall be constructed so that all portions are readily accessible for cleaning.
  - A clear space of not less than 3 feet on all sides shall be kept free from storage or combustible construction.
- 3.1.3 Hot surfaces: Space-heating appliances, steam pipes, or hot surfaces shall not be located in a spraying area where deposits of combustible residues may readily accumulate.
- 3.1.4 Approved eye wash stations shall be, accessible and properly maintained, within a "10" second response of spraying operations.

#### 3.2 Ventilation:

- 3.2.1 Shop bay doors will be opened to a minimum of one (1) foot in bays up and down wind of the unit being painted to provide adequate ventilation during paint mixing and spraying operations.
- 3.2.2 Paint booth doors shall be kept closed while spray finishing operations are conducted, to provide adequate ventilation through the fan and filter system during paint mixing and spraying operations.
- 3.2.3 The ventilation system will be turned on prior to painting and will remain on 30 minutes after painting has stopped.
- 3.2.4 Spray finishing shall be conducted only when ventilation systems are operating properly.
- 3.2.5 Parts shall be kept in the booths, with the ventilation system running, for at least 10 minutes after coating.

#### 3.3 Grounding:

- 3.3.1 All metal parts of spray booths, exhaust ducts, paint storage lockers and piping systems shall be properly electrically grounded in an effective and permanent manner.

#### 3.4 Signage:

- 3.4.1 Prior to commencing spray-painting operations in booths, all entrances to the spray booth will be posted with signs restricting entry and explaining that spray finishing is in progress.

- 3.4.2 Prior to commencing any spray-painting operations in shops, all entrances to the shop area will be posted with signs restricting entry and explaining that spray painting is in progress.
- 3.4.3 Even though all Company locations are “smoke free” environments, “No Smoking” signs in large letters on contrasting color background shall be conspicuously posted at all spraying areas and paint storage rooms.

3.5 Spray Painting:

- 3.5.1 Spray painting in the spray booth will be conducted during normal day shift (or first shift) and night shift (2nd shift) working hours.
- 3.5.2 All spray painting conducted outside the spray booth will be conducted prior to or after normal day shift (or first shift) working hours.
- 3.5.3 High-volume, low pressure (HVLP) guns (or equivalent) shall be used for all painting and priming operations. Spray guns shall be designed and operated to achieve a minimum transfer efficiency of 65 percent.

3.6 Electrical/Wiring:

- 3.6.1 Combustible residue areas: Unless specifically approved for locations containing both deposits of readily ignitable residue and explosive vapors, there shall be no electrical equipment in any spraying area where deposits of combustible residues may readily accumulate.
  - Wiring in rigid conduit or in boxes or fittings containing no taps, splices, or terminal connections are acceptable.
- 3.6.2 Electrical wiring and equipment not subject to deposits of combustible residues, but located in a spraying area, shall be of explosion-proof type approved for Class I, group D locations and shall otherwise conform to the provisions for Class I, Division 1, Hazardous Locations.
  - Electrical wiring, motors, and other equipment outside of but within twenty (20) feet of any spraying area, and not separated by partitions, shall not produce sparks under normal operating conditions and shall otherwise conform to the provisions for Class I, Division 2 Hazardous Locations.
- 3.6.3 All non-explosion proof electrical devices will be cleared from the area prior to the beginning of spray-painting operations.
- 3.6.4 Power to all electrical outlets and non-moveable electrical tools and equipment in the spray booth are to be explosion proof.
  - Prior to the start of spray-painting, the supervisor or lead person will ensure the paint booth complies with explosion proof requirements.

- 3.6.5 When painting in shops, power to all electrical outlets and non-moveable electrical tools and equipment in the 20-foot area will be shut off at the junction box.
- The junction box for these outlets and other devices will be locked and tagged in accordance with the Company Lockout/Tag-out Procedures.
  - Prior to the start of spray- painting, the supervisor or lead person will test outlets and other equipment to ensure the power is off.
- 3.6.6 Electric lamps outside of, but within twenty (20) feet of any spraying area, and not separated there from by a partition, shall be totally enclosed to prevent the falling of hot particles and shall be protected from mechanical injury by suitable guards or by location.
- 3.6.7 Portable electric lamps shall not be used in any spraying area during spraying operations.
- Portable electric lamps, if used during cleaning or repairing operations, shall be of the type approved for hazardous Class I locations.

### 3.7 Personal Protective Equipment:

- 3.7.1 Material Safety Data Sheets (MSDS) shall be reviewed on all products being used in each particular spray-painting operation to determine the appropriate personal protective equipment required.
- 3.7.2 Once the appropriate PPE has been selected, each Company employee and all sub-contractors involved with spray-finish operations will be required to wear, maintain and store the selected PPE.

### 3.8 Storage and Handling:

- 3.8.1 The quantity of flammable or combustible liquids kept in the vicinity of spraying operations shall be the minimum required for operations and shall not exceed a supply for 1 day or one shift. Bulk storage of portable containers of flammable or combustible liquids shall be in a separate, constructed building detached from other important buildings or cut off in a standard manner.
- 3.8.2 Paint shall be stored in its original closed container or an approved safety can.
- 3.8.3 The withdrawal of flammable and combustible liquids from containers having a capacity of greater than 60 gallons shall be by approved pumps.
- 3.8.4 The transferring of flammable or combustible liquids from containers and the filling of containers, including portable mixing tanks, shall be done only in a suitable mixing room or in a spraying area when the ventilating system is in operation.

- 3.8.5 Adequate precautions shall be taken to protect against liquid spillage and sources of ignition.
- 3.8.6 Containers not resting on floors shall be on metal supports or suspended by wire cables.
- 3.8.7 Containers supplying spray nozzles by gravity flow shall not exceed 10 gallons capacity. Original shipping containers shall not be subject to air pressure for supplying spray nozzles.
- 3.8.8 Containers under air pressure supplying spray nozzles shall be of limited capacity, not exceeding that necessary for 1 day's operation; shall be designed and approved for such use; shall be provided with a visible pressure gage; and shall be provided with a relief valve set to operate in conformance with the requirements of the Code for Unfired Pressure Vessels, Section VIII of the ASME Boiler and Pressure Vessel Code.
- 3.8.9 All containers or piping to which is attached a hose or flexible connection shall be provided with a shutoff valve at the connection.
- Such valves shall be kept shut when spraying operations are not being conducted.
- 3.8.10 All pressure hose and couplings shall be inspected at regular intervals.
- The hose and couplings shall be tested with the hose extended, and using the "in-service" maximum operating pressures.
  - Any hose showing material deteriorations, signs of leakage, or weakness in its carcass or at the couplings, shall be withdrawn from service and repaired or discarded.
- 3.8.11 Whenever flammable or combustible liquids are transferred from one container to another, both containers shall be effectively bonded and grounded to prevent the discharge of static electricity.

3.9 General:

- 3.9.1 In un-sprinklered buildings, where sprinklers are installed only to protect spraying areas, the installation shall conform to such standards insofar as they are applicable.
- Sprinkler heads shall be located so as to provide water distribution throughout the entire booth.
- 3.9.2 Valve access: Automatic sprinklers protecting each spray booth (together with its connecting exhaust) shall be under an accessibly located separate outside stem and yoke (OS&Y) sub-control valve.

- 3.9.3 Cleaning of heads: Sprinklers protecting spraying areas shall be kept as free from deposits as practical by cleaning daily if necessary.
- 3.9.4 Portable extinguishers: An adequate supply of suitable portable fire extinguishers shall be installed near all spraying areas.
- 3.9.5 Spraying: Spraying shall not be conducted outside of predetermined spraying areas.
- 3.9.6 Cleaning: All spraying areas shall be kept as free from the accumulation of deposits of combustible residues as practical, with cleaning conducted daily if necessary.
- Scrapers, spuds, or other such tools used for cleaning purposes shall be constructed of non-sparking material.
- 3.9.7 Residue disposal: Residue scrapings and debris contaminated with residue shall be immediately removed from the premises and properly disposed of.
- 3.9.8 Approved metal waste cans shall be provided wherever rags or waste are impregnated with finishing material and all such rags or waste deposited therein immediately after use.
- The contents of waste cans shall be properly disposed of at least once daily when full or at the end of each shift.
- 3.9.9 Cleaning solvents: The use of solvents for cleaning operations shall be restricted to those having flashpoints not less than 100 degrees F, however, for cleaning spray nozzles and auxiliary equipment, solvents having flashpoints not less than those normally used in spray operations may be used.
- Such cleaning shall be conducted inside spray booths and ventilating equipment operated during cleaning.
- 3.9.10 Hazardous materials combinations: Spray booths shall not be alternately used for different types of coating materials, where the combination of the materials may be conducive to spontaneous ignition, unless all deposits of the first used material are removed from the booth and exhaust ducts prior to spraying with the second used material.
- 3.9.10 Outdoor painting at field shops or on field site locations shall follow equipment and PPE requirements as established for booth and shop painting procedures.

### 3.10 Training:

#### 3.10.0 Training shall include:

- PPE
- Lockout/Tagout

- Fire Prevention
- Best Practices for General Housekeeping.
- Best Practices for the spray-painting equipment according to manufacturers requirements.
- Best Practices for the spray booth operations according to manufacturers requirements.

4 References:

- 4.1 Standard for Blower and Exhaust Systems for Vapor Removal, NFPA 91.
- 4.2 Code for Unfired Pressure Vessels, Section VIII of the ASME Boiler and Pressure Vessel Code—1968.
- 4.3 29 CFR 1910.107, Spray Finishing Using Flammable and Combustible Materials.

5 Exhibits:

None.