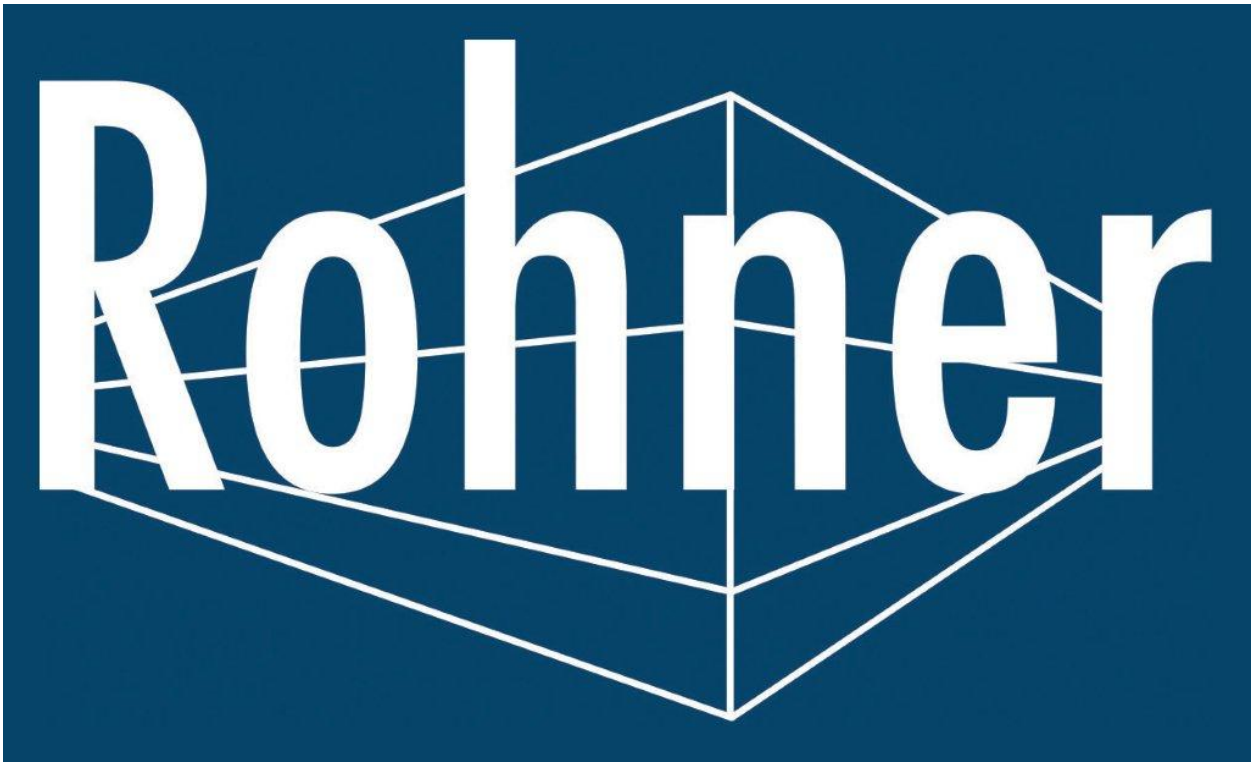

Safety &

Code Compliance

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SAFETY AND CODE COMPLIANCE

Equipment Description

Know your equipment's intended use and function. This manual outlines the critical compliance guidelines that must be understood and followed to ensure safe and trouble free use of the equipment for years. Failure to understand and follow the processes outlined in the booth operation guidelines, standard maintenance procedures and safety code compliance are a minimum expectation for the safe use and operation of your Rohner equipment.

ROHNER equipment is designed to provide years of safe trouble free service when installed, maintained, and used properly.

Purpose and Intended Use of a Liquid Spray Booth

The manufacturer's intended use of a liquid paint style paint spray booth is to provide a controlled environment in which many types of liquid paint can safely be applied. The cabin provides a safe means to contain and effectively remove paint overspray. Spray booth construction and designed airflow velocities are designed to meet appropriate OSHA & NFPA Article 33.

(Booth is not designed to remove V.O.C. from discharge air stream unless specifically called in in the system description with special filtration and optional monitoring. Additional equipment can be purchased from ROHNER to accomplish this when needed.)

Installation Requirements:

Enclosure Electrical Bonding: All metal raceways and all non-current carrying metal portions of fixed or portable equipment, regardless of voltage, shall be

bonded to ground in accordance to section 10 of the CEC (Canada only) or OSHA 1926.66(c)(9)(i) (USA).

Code Compliance – The following summary has been developed from portions of "NFPA 33: Standard for Spray Application Using Flammable or Combustible Materials, 2016 Edition". This material is not complete, full review and understanding of the NFPA 33 standards is recommended.

NFPA 33 Chapter 4: Location of Spray Area, Spray Rooms and Spray Booths

- In reference to 4.2
  - Sprinkler system must be used in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems.

NFPA 33 Chapter 5: Construction and Design of Spray Areas, Spray Rooms and Spray Booths

- In reference to 5.1.1
  - Air filters must be listed Class 1 or Class 2 in accordance to ANSI/UL 900, Standard for Air Filters. Rohner provided filters are listed as Class 1 or Class 2, refer to equipment specific owner's manual for the specifics of your equipment.

NFPA 33 Chapter 6: Electrical and Other Sources of Ignition

- In reference to 6.2.6
  - Use of equipment that creates sparks or particles of hot metal should not be used in the spray area or surrounding Division 2, Zone 2 or Zone 22 should on be done within a fully enclosed control area, per the area classification drawing posted on the equipment.
- In reference to 6.4.1
  - The spray area as defined in NFPA 33 3.3.2.3 shall be Class 1, Div 1; Class 1, Zone 1; Class II, Div 1 or Zone 21.
- In reference to 6.4.2 and 6.4.3

- Electrical wiring and equipment in the spray area must be suitable for Class 1, Div 1; Class 1, Zone 1; Class 2, Div 1; or zone 21.

- In reference to 6.5.1

  - Electrical wiring and equipment outside of the spray area but within 20' horizontally or 10' vertically of an unenclosed spray area that has not been physically separated must be suitable for Div 2, Zone 2; Class 1, Div 2; Class 1, Zone 2;. Class 2, Div 2 or 22.

- In reference to 6.5.2

  - Electrical wiring and equipment outside of the spray area but within 3' of closed top, open face or orpen front booth or room must be suitable for Class 1, Div 2; Class 1, Zone 2;. Class 2, Div 2 or 22.

- In reference to 6.7

  - Electrically conductive materials in the spray area shall be grounded with a resistance of 106 ohms maximum. Exceptions apply, see the NFPA code.

NFPA 33 Chapter 7: Ventilation

- In reference to 7.1

  - Exhaust and ventilation systems must meet the requirements of NFPA 91.

- In reference to 7.3

  - Make up air must be supplied to replace the air exhausted from a spray operation. Intake air must be located far enough from exhaust air that spray air is not recirculated.

- In reference to 7.4

  - Spray air exhaust from a spray booth must be exhausted outside of the building without passing through a firewall. The discharge point must not be in the direction of a fresh air intake and be at least 6' from a wall/roof and shall not be directed toward combustible materials within 25' of the exhaust discharge.

- In reference to 7.11

  - The spray area shall not be used as a flash off area when the exhaust air is not running.

NFPA 33 Chapter 8: Storage Handling, and Distribution of Flammable and Combustible Liquids

- In reference to 8.2.1

- No more than 120 gallons of Class I, II and IIIA liquids may be stored in a storage cabinet.

- In reference to 8.2.1.1
  - Based on the occupancy limits set forth in Section 9.6 of NFPA 30, the total volume of Class I, II and IIIA liquids may not be exceeded for a group of cabinets.
- In reference to 8.2.1.2
  - For industrial application the total volume for Class I, II and IIIA liquids in a group of storage cabinets shall not exceed the maximum allowable quantity as referenced in the table located in the NFPA 33 table 8.2.1.2. Reference this table for your specific industrial condition.
- In reference to 8.2.2
  - A maximum quantity of flammable liquids located outside of the spray and storage areas must be separated from the spray operation by a 2-hour fire rated barrier. Reference the NFPA 33 table 8.2.1.2 for your specific maximum allowable quantity.
- In reference to 8.3.1
  - Transferring paint liquids to and from containers, mixing vessels or pressure pots must be done in the spray area with the ventilation running. Mixing of paint in the spray area is not permitted
- In reference to 8.3.2
  - Paint mix rooms must maintain continuous mechanical ventilation.
- In reference to 8.3.3
  - No more than 60 gallons of liquid is permitted in a single spray area.
- In reference to 8.3.4
  - When a mix room is located within 6’ of the spray area, the maximum allowable quantity of combined liquids in the two booths is 120 gallons. Reference the figure in NFPA 33 figures 8.3.4(a) and 8.3.4(b).
- In reference to 8.3.5
  - When a mix room is located beyond 6’ of the spray area, the maximum allowable quantity of liquid in the mix room shall not exceed 2 gal/ft^2 up to 300 gallons and cannot exceed 60 gallons in the spray area. Reference the figure in NFPA 33 figures 8.3.5 and the exception in 8.3.6.
- In reference to 8.3.6

- When the quantities exceed those provided by the mixing room in 8.3.2 to 8.3.5, the mixing room must meet the requirements of NFPA 30, Flammable and Combustible Liquids Code.

- In reference to 8.5.1

  - Open containers are not permitted to transport liquids. Liquids must be transported in closed containers, safety cans, other approved enclosed vessels or a piping system.

- In reference to 8.5.2

  - When liquids are transferred from one container to another both must be grounded to dissipate static electricity.

- In reference to 8.5.3

  - Containers that supply spray nozzles must be closed or have a metal cover that is kept closed. If the system is a gravity feed then the maximum volume permitted is 10 gallons.

- In reference to 8.5.4

  - Original shipping containers must not be pressurized to supply paint to the paint nozzle.

- In reference to 8.5.5

  - Pressurized containers supplying nozzles, tanks and coolers must comply with ASME Boiler and Pressure Vessel code, section VIII. See exceptions referenced in NFPA 33 section 8.5.5.

- In reference to 8.5.7

  - Cleaning paint circulation systems shall meet the requirement of 7.3.7 of NFPA 30.

- In reference to 8.5.8

  - Compressed air may be used to clean paint delivery systems when the booth ventilation is operating, and the maximum air pressure drop doesn't not exceed the maximum working pressure of the piping system.

NFPA 33 Chapter 9: Protection

- In reference to 9.1

  - Spray areas, exhaust plenum and duct work, filters, concentrators and recirculation equipment and mixing room must have protection from fire by automatic approved equipment.

- In reference to 9.1.1

- Automatic approved fire suppression equipment must be one of the following, an automatic water sprinkler system that meets the requirements of NFPA 13 or a foam water system that meets the requirements of NFPA 16.

- In reference to 9.1.2
  - The fire system must meet all requirements of NFPA 33 9.2 and 9.3.
- In reference to 9.1.3
  - Fire alarm and protection must meet requirements of NFPA 72.
- In reference to 9.2.1
  - An automatic fire suppression system in a continuous paint operation must activate a local alarm, send a signal to the building fire system (if present), shutdown the application equipment and any associated conveyance systems.
- In reference to 9.2.1.1
  - Reference NFPA 33 9.7 for continuous stray systems and NFPA 33 9.8 for automated electrostatic equipment.
- In reference to 9.2.2
  - Continuous spray applications system must have one or more means of shutting the system down in case of an emergency.
- In reference to 9.3
  - During fire alarm conditions both supply and exhaust air must remain in operation, the only exception being when a fire suppression system requires air flow to be off.

NFPA 33 Chapter 10: Operation and Maintenance

- In reference to 10.1
  - Proper routine maintenance is required to ensure spray equipment is maintained to OEM specifications.
- In reference 10.1.1
  - Paint spraying is only allowed in the spray area.
- In reference to 10.1.2

- Routine inspection of fire system equipment is required to ensure overspray and other contaminates don't compromise equipment performance.

- In reference to 10.2.1
  - Combustible residues are not permitted to accumulate in the spray area.
- In reference to 10.2.2
  - Combustible coverings may be allowed to enable efficient cleaning of the surfaces in a spray area.
- In reference to 10.2.2.1
  - Plastic covers must have a maximum breakdown voltage of 4 kilovolts to prevent static buildup.
- In reference to 10.2.3
  - Spraying operations must be stopped when accumulated combustible residues in a spray area are in excess.
- In reference to 10.3
  - Flammable liquids pumped through hoses in an airless spray system must be maintained on a routine and frequent basis to ensure safe operation.
- In reference to 10.4.1
  - Overspray collector filters must be replaced before excessive airflow restriction occurs. Refer to the filter manufacturer static specification.
- In reference to 10.4.2
  - All discarded overspray collector filters must be removed from the spray area daily and stored in a designated location in a noncombustible container.
- In reference to 10.5.1
  - A designated and approved waste container must be used to immediately dispose of rags saturated with liquids from the spray area after use.
- In reference to 10.5.2
  - Designated and approved waste containers must be located in a ventilated area.
- In reference to 10.5.3

- Designated and approved waste containers must be grounded if made of a conductive material.

- In reference to 10.6
  - Clothing contaminated with a flammable liquid cannot be left on the jobsite unless it is located in a metal locker.
- In reference to 10.7.2
  - Class I and II cleaning liquids must be stored in the original containers or an approved and marked safety container.
- In reference to 10.7.3
  - Cleaning operations using flammable materials must be conducted in a ventilated area.
- In reference to 10.7.4
  - Equipment using flammable liquids shall be grounded.
- In reference to 10.7.5
  - No more than one gallon of cleaning liquid may be used per individual in a manual cleaning operation.
- In reference to 10.7.6
  - Containers used for storing or holding Class I liquids must be constructed of conductive metals that are grounded and bonded.
- In reference to 10.9
  - If a spray area is used for multiple liquid coatings then all residue of the first coating must be completely removed from the spray area and exhaust ducts before the second coating is dispensed.
- In reference to 10.10
  - Chlorinated solvents must not be used in any system where the liquid may come in contact with aluminum.
- In reference to 10.11
  - “No Smoking or Open Flame” signs must be present in large letters at all paint spray areas and paint storage areas.
- In reference to 10.12

- A Hot Work Permit must be issued prior to any work that may produce sparking operations in a spray area.

NFPA 33 Chapter 12: Handheld Electrostatic Spray Equipment

- In reference to 12.3
  - Only listed handheld spray devices may be used in the spray area. Proper grounding and control of high-voltage circuits must prevent the ignition of hazardous vapors.
- In reference to 12.3.1
  - The actuator that controls the paint coating material must also energize the electrostatic elements of the hand gun.
- In reference to 12.3.2
  - Precautions must be put in place to prevent electrically energized liquid coatings to ensure they are protected from electrical shock.
- In reference to 12.4
  - All electrical components accept the paint system hand gun and its connection shall be located outside of the pain spray booth.
- In reference to 12.5.1
  - The spray gun handle must be electrically grounded to conductive material by no more resistance than 106 ohms. Signs must be posted that state this for persons entering the spray area.
- In reference to 12.5.2
  - All electrically conductive components accept those that are charged by high voltage must be grounded to conductive material by no more resistance than 106 ohms in the spray area.
- In reference to 12.5.3
  - Conductive objects that are being coated must be grounded to conductive material by no more resistance than 106 ohms in the spray area.
- In reference to 12.5.4
  - High resistance objects that surface voltage is below 2500 volts shall be considered adequately grounded.
- In reference to 12.5.5

- Objects passing through the spray area via conveyor shall be maintain ground contact through hooks/hangers. Hooks/hangers must be routinely maintained to ensure they are clean enough to provide an adequate grounding surface.

NFPA 33 Chapter 13: Drying, Curing and Fusion Processes

- In reference to 13.4.1, 13.4.3, 13.4.4, 13.5.1, 13.5.2 and 13.6
  - If the spray area is to be used as a flash off area when spray operations are not taking place the booth ventilation must continue to run, all electrical zone classifications must continue to be observed (class 1 Div 2, class 1 zone 2, Cass 2 div 2 and zone 2) as outlined in NFPA 33 6.5.4.
- In reference to 13.7
  - Warning signs must be posted on the equipment that ventilation must be maintained when the spray area is being used for flashing off.

NFPA 33 Chapter 18: Training

- In reference to 18.1
  - Only qualified individuals shall be authorized to take part in the spray application process. Material that must be reviewed with qualified operators shall include:
    - Customer identified potential safety and health hazards of the spray equipment and product being applied. Review all OEM equipment materials and product MSDS.
    - Operational, maintenance and emergency procedures per the paint spray equipment OEM, ventilation equipment OEM recommendations and by job/equipment hazard analysis.
    - Importance of constant operator awareness.
- In reference to 18.1.1
  - Only qualified individuals shall be authorized handle combustible material after being trained in proper handling, storage of such chemicals and the proper emergency procedures.
- In reference to 18.1.2
  - Confined space areas must be identified and the personell entering such area must be properly training in the hazards and use of the necessary PPE.
- In reference to 18.1.3

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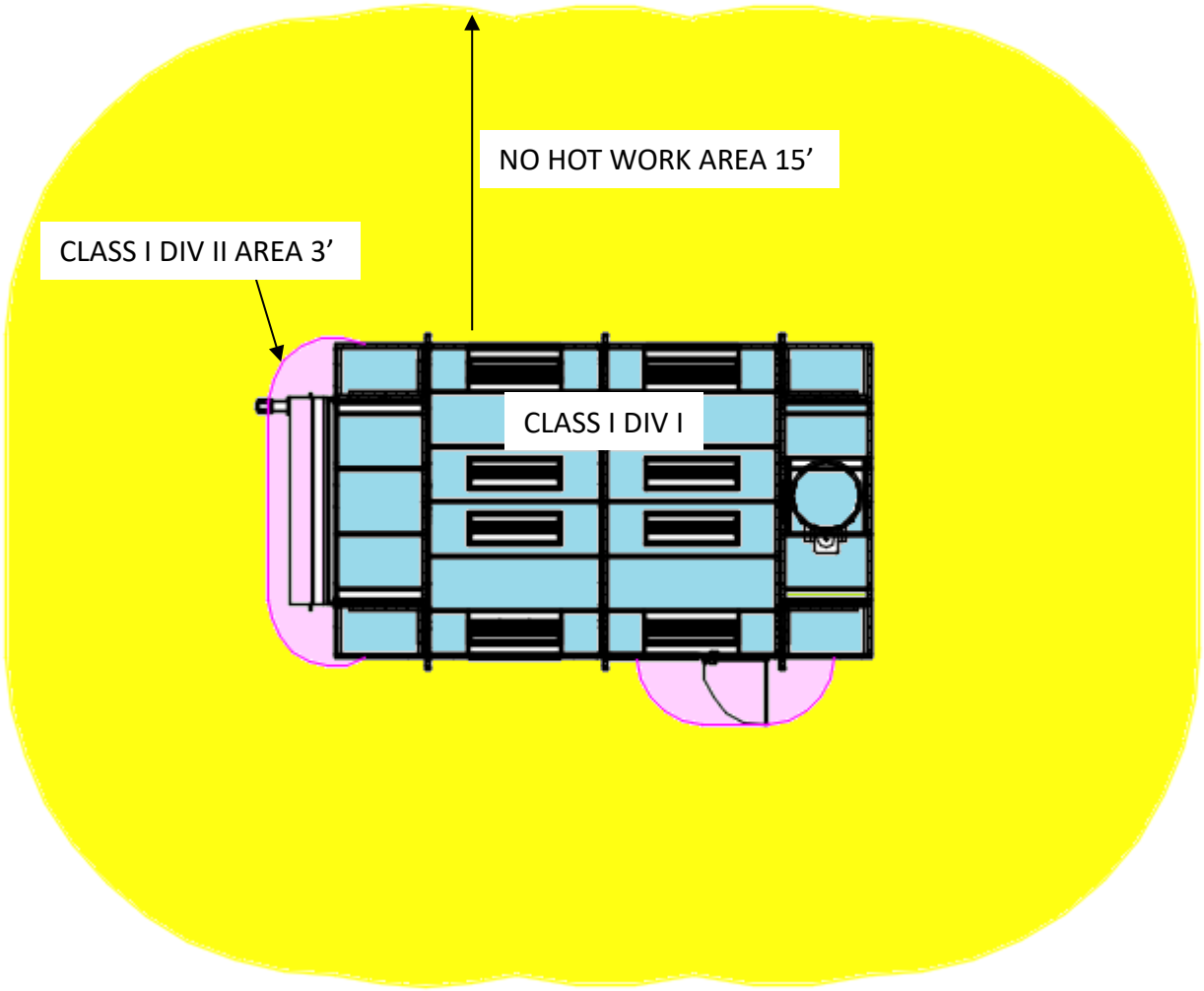
- Qualified individuals shall be trained in the proper use, care, maintained and training of require PPE.

- In reference to 18.1.4

  - All training of qualified individuals must be documented and maintained with the type and date and the training received.

CSA – Canada Specific Regulations

- Enclosure area classification drawing.



RESTRICTED HOT WORK AREA WITHING 15’ ALL DIRECTIONS
CLASS I DIV II WITHIN 3’ OF ANY OPENING
CLASS I DIV I WITHIN ENCLOSURE & EXHAUST DUCT WORK

SAFETY AND CODE COMPLIANCE

- Portable Fire Extinguishers - portable fire extinguisher installations are evaluated by building codes inspector and finally by the fire inspector. All fire extinguishers must have either a CSA or ULC approval mark or both.

- Pressure vessels rated at greater than 149 pounds must have a CFN (Canadian Registration Number).

- Automatic Water Sprinkler systems in any spray areas, exhaust plenum and/or exhaust duct work require maintained documentation of an approved system that meets National Fire Code of Canada, the Canadian Environmental Protection Act and the Occupational Health and Safety Act, Regulation and Code for the corresponding providence .

- Optical flame detection apparatus must have the appropriate Canadian certification mark.

- Equipment used to dry, cure or fuse or dry at elevated temperatures, require all electrical apparatus have an appropriate Canadian certification mark.

- Drying, curing or fusing process with a non-recirculating gas fired heater with a discharge temperature of 160F - 71C or less require CSA3.7/ANSI Z83.4.

- Drying, curing or fusing process with a recirculating gas fired heater with a discharge temperature of 160 - 71C or less requires CSA/ANSI Z83.18.

- Drying, curing or fusing process with a recirculating gas fired heater or non-recirculating above 160F - 71C but less than 250F - 121C require CSA3.19/ANSI Z83.25.

- Drying, curing or fusing process with a electric heater require a CSA C22.2 No. 236-15 / UL 1995.

- The gas detection system (LEL monitors) must meet AHJ approval, the gas detection system must meet the requirements of OH&S regulations. In particular compliance to Part 5 - confined spaces; part 10 - fire and explosion hazard; and part 26, ventilation. Hand held detectors are not authorized for compliance in Rohner equipment.

- Heating and cooling equipment must be certified to CSA C.22.2.236.

- Only a qualified electrician may service or install the spray booth. Installation must meet code compliance for CSA C22.1.