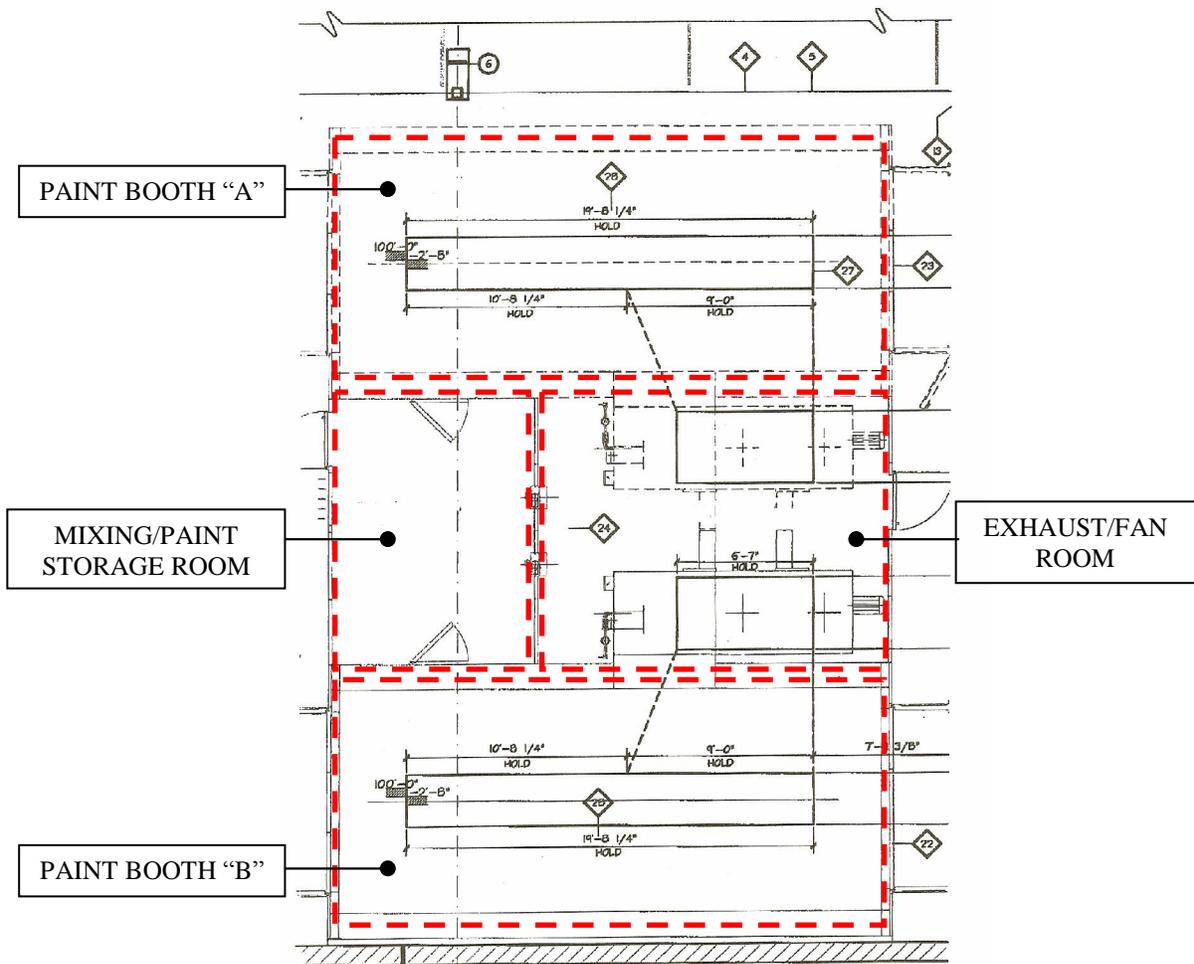




MINNESOTA DEPARTMENT OF PUBLIC SAFETY
State Fire Marshal Division
Interpretation

Interpretation # INTERP FP 12 (2007)	Subject of Interpretation: Design criteria for multiple spray booths		
Reviewed and Approved By: Jerry Rosendahl	Title: State Fire Marshal	Effective Date: July 10, 2007	Revision: July 10, 2007

A number of questions have been submitted to the State Fire Marshal Division – Fire Protection Section regarding the design criteria for multiple attached/adjacent spray booths. The following floor plan serves as an example:



Question #1: Can I use one control valve for all the sprinklers in the spray area?

Answer: Yes. A “spray area” is not the same as a spray booth; multiple booths can make up a spray area. Each booth does not need its own control valve.

NFPA 13(2002 edition) 13.4.2.1: *The sprinklers for each spray area and mixing room shall be controlled by a separate, accessible, listed indicating valve. Sprinkler systems in stacks or ducts shall be automatic and of a type not subject to freezing.*

NFPA 33(2003 edition) 9.4.5: *The sprinklers for each spray area and mixing room shall be controlled by a separate, accessible, listed indicating valve.*

Question #2: Do I calculate only one booth at a time or do I calculate the entire spray area as an Extra Hazard Group 2, 0.4/2000 (in this case the full 1080 sq. ft.)?

Answer: Design the hydraulically most demanding single booth and associated exhaust ductwork to Extra Hazard Group 2. The single booth calculations are independent and do not have to be added to the overhead system calculations.

Attached booths with openings in common wall(s) are considered as one single booth. Example: Two booths have a common wall with a walk-thru opening. The “door” of the opening consists of strips of heavy plastic material commonly found in coolers and freezers. For calculation purposes the entire area of both booths shall be considered as one booth. If the “door” of the opening is of material consistent with the remainder of the booth, for calculation purposes this would be considered as two independent booths.

NFPA 13(2002 edition) 13.4.1.1: *Automatic sprinkler systems in spray areas and mixing areas shall be designed for Extra Hazard (Group 2) occupancies.*

NFPA 33(2003 edition) 9.4.2: *The automatic sprinkler system shall be designed for Extra Hazard (Group 2) occupancies, as defined in NFPA 13.*

NFPA 13(2002 edition) 13.4.1.3 and NFPA 33(2003 edition) 9.4.3: *Water supply for sprinklers shall be sufficient to supply all sprinklers likely to open in any one fire incident without depleting the available water for use in hose streams.*

Rationale: The paint spray booth is self contained and fire shouldn't spread beyond the walls of the booth therefore the sprinklers likely to open in a fire incident would be confined to a single booth and associated exhaust ductwork.

Question #3: Assuming in Question #2 the whole area needs to be calculated; a new twist is if the booths are not attached to each other, how far apart do they need to be to become separate booths and calculated individually. 1", 1', 5'....etc?

Answer: The whole area is not required to be calculated (refer to Question #2). It is important to note that MSFC (07) 1504.1.2.5 requires that booths have a 3-foot clearance.

Question #4: Does the code actually say the heads behind the filter and in the exhaust duct need to be calculated together with the heads in the booth?

Answer: Yes

NFPA 13(2002 edition) 13.4.1.3 and NFPA 33(2003 edition) 9.4.3: *Water supply for sprinklers shall be sufficient to supply all sprinklers likely to open in any one fire incident without depleting the available water for use in hose streams.*

NFPA 33(2003 edition) A.9.4: *...Because of the rapidity and intensity of fires that involve spray operations, the available water should be ample to simultaneously supply all sprinkler heads likely to open in one fire without depleting the available water for use by hose streams.*

NFPA 33(2003 edition) 9.1: *Spray areas, which include by definition any associated exhaust plenums and exhaust ductwork, any particulate filters, any solvent concentrator units, any recirculation air supply units, and mixing rooms shall be protected with an approved automatic fire protection system.*

NFPA 33(2003 edition) A.9.1: *...Because the ductwork is part of the spray area, it must be protected in accordance with Chapter 7. This includes the ductwork from a water-wash booth.*

NFPA 33(2003 edition) 9.3: *Air make-up systems and spray area exhaust systems shall remain functioning during any fire alarm condition.*

The water supply for sprinklers shall be sufficient to supply all sprinklers likely to open in any one-fire incident without depleting the available water for use in hose streams. It also requires that the air make-up and spray area exhaust systems not be interlocked with the fire alarm system and remain functioning during any fire alarm condition. Because of this, an event occurring in a paint spray booth will have a strong probability of operating sprinklers on both sides of the filters. As such all of the sprinklers involved in a paint spray booth should be treated as a single subsystem. Sprinklers inside ducts are exposed to the same conditions as the paint spray booth because of the ventilation system. The exhaust system demand shall be added to the water supply requirements of the paint spray booth.