Coffee Break Training - Fire Protection Series

Inspection Techniques: Spray Booth Exhaust Ducts

No. FP-2012-3 January 17, 2012

Learning Objective: *The student shall be able to describe the construction requirements for spray booth exhaust ducts.*

The flammable vapor:air environment that exists in a spray finishing area is highly explosive, so the model fire codes require that it be vented to a safe atmosphere.

In today's illustration, a small business owner was aware of the hazardous conditions and tried to satisfy the safety concerns with an unpermitted homemade spray booth and exhaust system. The combustible construction of this assembly does not meet the requirements of the model fire codes.

This combination wood and metal structure was an attempt to create a flammable vapor exhaust duct from a homemade spray booth.

Ventilating and exhaust systems should be designed and installed in accordance with the applicable requirements of the National Fire Protection Association (NFPA) 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids*.

Generally, exhaust ducts and fasteners must be constructed of steel, except in the following situations:

- In spray booths used exclusively for powder coating, ducts may be constructed of fire-retardant combustible materials.
- Concrete is permitted to be used. The interior surfaces of the concrete exhaust plenum or exhaust duct must be smooth and sealed to facilitate cleaning.
- Other construction materials are permitted to be used in cases where the conveyed materials are not compatible with steel.
- Combustible duct material, when protected in accordance with NFPA 91, is permitted to be used when the material being conveyed is incompatible with noncombustible construction materials.
- Listed duct systems approved for use without automatic fire protection and not subject to combustible residue buildup are permitted to be used.

Aluminum should not be used for ventilation associated with a spray booth or spray room.

Duct supports must be designed to carry the weight of the duct system itself, plus the anticipated weight of any residues. Hangers and supports should be fastened securely to the building or to the structure to avoid vibration and stress on the duct system. If sprinkler protection is provided inside the duct system, the duct supports also must be designed to carry the anticipated weight of any accumulation of sprinkler discharge.

For additional information, refer to *International Fire Code*®, Chapter 15 or NFPA 1, *Uniform Fire Code*™, Chapter 43.