

**CHAPTER 5
EXHAUST SYSTEMS**

**SECTION 510.4
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510.4 Independent system. Hazardous exhaust systems shall be independent of other types of exhaust systems. Incompatible materials, as defined in the International Fire Code, shall not be exhausted through the same hazardous exhaust system. Hazardous exhaust systems shall not share common shafts with other duct systems, except where such systems are hazardous exhaust systems originating in the same fire area.

Exception: The provision of this section shall not apply to laboratory exhaust systems where all of the following conditions apply:

1. All of the hazardous exhaust ductwork and other laboratory exhaust within both the occupied space and the shafts are under negative pressure while in operation.
2. The hazardous exhaust ductwork manifolded together within the occupied space must originate within the same fire area.
3. Each control branch has a flow regulating device.
4. Perchloric acid hoods and connected exhaust shall be prohibited from manifolding.
5. Radioisotope hoods are equipped with filtration and/or carbon beds where required by the registered design professional.
6. Biological safety cabinets are filtered.
7. Provision is made for continuous maintenance of negative static pressure in the ductwork.

Contaminated air shall not be recirculated to occupiable areas. Air containing explosive or flammable vapors, fumes or dusts; flammable, highly toxic or toxic gases; or radioactive material shall be considered to be contaminated.



Q: If a hazardous exhaust system complies with the provisions of items 1 – 7 listed in the exception to Section 510.4, is the hazardous exhaust ductwork originating from separate fire areas permitted to be manifolded in a rated shaft?

A: No. Item No. 2 specifically permits hazardous exhaust ductwork to be manifolded together “within the occupied space” as long as it originates within the same fire area. Item No. 2 is clear regarding “within the occupied space” but is conspicuously silent regarding “within an unoccupied space”. The silence does not imply that ducts can originate from different fire areas if manifolded together within an “unoccupied space” such as within a rated shaft. There is no justification to permit manifolding from separate fire areas even when within a rated shaft.

The location of the manifold is not the issue. Since the code intent is to prevent the spread of contaminants and/or fire from one fire area to another, the location of the manifold is not relevant. Whether manifolded within a rated shaft or an “occupied space”, ducts from different fire areas could act as a direct link between such areas allowing contaminants and/or fire to spread, especially considering that such ducts cannot have fire or smoke dampers.