

Guideline to Assessment, Cleaning, and Restoration of HVAC Systems *ACR 2002*

The following guideline provides supplementary reference information for users of *ACR 2002*. The material contained within the guideline does not carry the official status of a standard, and the guideline recommendations are not mandatory under *ACR 2002*. However, the two sections compliment one another and should always be considered in tandem.

Chapter 1 Containment Strategies

Containment strategies are used to isolate a workspace from other areas of a building. Most containment strategies involve creating barriers that prevent the dispersal of airborne particulate. Depending on the use classification of a building and the contaminants known to exist within the HVAC system, several different containment strategies may be employed. Four levels of work site containment are described below. The containment requirements for each level increase in stringency. The highest levels of containment are applicable to areas where significant microbial growth exists, or where the building use classification mandates special protection, as in a healthcare facility.

As new information comes forth regarding microbiological contaminants and their affect on human health, the containment strategies recommended below may require enhancements.

Level 1 Containment – Minimum Engineering Controls

Level 1 Containment is applicable to HVAC system cleaning in buildings classified as residential, industrial, light commercial and marine, provided that there is no known microbial contamination. If microbial contamination is known to exist, Level 2 Containment may apply. The following protective actions are required under Level 1 Containment strategies.

- **Protective Coverings** – Clean, protective coverings shall be used within each work area. Protective covering must extend beyond the work area to provide protection of flooring, equipment, and furniture whenever necessary.
- **Cleaning Equipment** – Inlet openings on all vacuum collection devices and negative air machines shall be properly sealed during transport and when the equipment is not in use. Vacuum hose openings shall be sealed during transport. All tools, equipment, and equipment components that enter the HVAC system from an occupied space shall be wet-wiped, HEPA vacuumed, or sealed in a disposable polyethylene bag during removal from the HVAC system.

- Cross Contamination Control – Suitable provisions shall be made to control contaminant discharge from the HVAC system and cross contamination into occupied space during the cleaning process. This may require temporary sealing of existing duct joints, seams and other system components.

Level 2 Containment – Work Area Containment Without Decontamination Unit

Level 2 Containment may be applicable to HVAC system cleaning in any building use classification when microbial contamination is known to exist within the system. In cases when microbial amplification covers a surface area greater than 5 square feet, Level 3 Containment must be used. Level 2 Containment is the minimum level of containment appropriate to a healthcare facility. All of the Level 1 Containment requirements apply to Level 2 Containment areas. In addition, the following protection actions are required under Level 2 Containment strategies:

- Work Above Ceilings – Above ceiling work area must be completely isolated from occupied spaces within containment barriers utilizing 6-mil fire retardant polyethylene or equivalent. These barriers shall be sealed airtight where they meet the ceiling, floor, and walls.
- Containment Area Floor – The containment shall have a two-layer floor utilizing 6-mil fire retardant polyethylene or equivalent. The floor material shall extend at least 6 inches (15.2 centimeters) up the containment side walls. The floor material must be sealed to side walls with two layers of duct tape in an airtight manner.
- Containment Area Access – A vertical cut in the containment side wall shall provide access into the containment area. This vertical cut must begin no less than 6 inches (15.2 centimeters) from the floor and must be at least 5 feet (12.7 centimeters) long. The entrance shall be entirely covered by two flaps (one on each side of the polyethylene).
- Negative Pressure – The containment area should be kept under negative pressure at all times to the degree feasible. Negative pressure must be sufficient to prevent migration of particulate material out of the containment area. Exhaust from the device providing negative pressure must be HEPA filtered. If this device does not exhaust directly outdoors, it must be possible to verify that there is no leakage through or around the HEPA filter.
- Dismantling – Interior surfaces of the containment enclosure must be wet-wiped or HEPA vacuumed before moving or dismantling the containment enclosure.

Level 3 Containment - Work Area Containment with Single Chamber Decontamination Unit

Level 3 Containment may be applicable to HVAC system cleaning in buildings where severe cases of microbial amplification or hazardous substances are known to exist within the HVAC system or indoor environment. Level 3 Containment is commonly the level of containment appropriate to healthcare facility cleaning projects, including those where microbial contamination may not exist. All of the Level 1 Containment and Level 2 Containment requirements apply to Level 3 Containment areas. In addition, the following protection actions are required under Level 3 Containment strategies:

- HEPA-filtered negative air machines may be utilized as a supplement to containment techniques described herein to control ambient airborne particulate levels.