

Ammonia Odor Causes Concern *for Home Builders and Residents*

SCI recently investigated four residential units which were experiencing a problem with an ammonia-like odor. These units were built by two different builders on different sides of the river. In both cases, the units were part of a villa or townhouse-style building. Three of the four units were occupied and had been completed for approximately six weeks. The fourth unit was occupied and had been insulated approximately two weeks prior.

SCI was requested by the builders to investigate the odor and if possible find its source and recommend a solution. Site visits confirmed the odor was ammonia and testing seemed to indicate the source was inside the wall cavities of the exterior and partition walls. Ammonia has an odor threshold (the level at which an average person can detect the odor) of approximately 1.3 to 1.75 parts per million. Ambient levels of ammonia in the units was approximately 2 to 5 parts per million with concentration of 10 to 15 parts per million in the wall cavities. Additional research and testing indicated the most likely cause was outgassing from the wet spray applied cellulose insulation (WSACI) which was used in all four units.

Fungistats (to prevent mold growth) and fire retarders are typically mixed into the WSACI. In the case of these four units, the WSACI contained ammonium sulfate as a fire retarder and it is believed that the ammonium sulfate was the source of the ammonia odor. Manufacturers of ammonium sulfate-treated WSACI indicated that an ammonia odor is sometimes present for a few days after installation, but the odor typically dissipates quickly. In the case of these units, the odor had persisted for weeks, despite efforts to solve the problem with additional ventilation. Opening the windows would dissipate the odor rather quickly, but the ammonia would return as soon as the windows were closed. It was theorized that the outgassing might be reduced by dehumidifying the units, but short term tests did not seem to have a significant effect on ammonia levels. Because of the odor, the residents had to be relocated and a quick solution was needed. It was therefore decided that the best solution would be removal and replacement of the WSACI. Removal and replacement of the WSACI with a non-ammonium sulfate containing insulation eliminated the odor almost immediately.

Conversations with the manufacturer and installers of the WSACI as well as SCI's testing and research did not indicate an underlying cause for the outgassing in these four units. In both residential developments, several other units were insulated with ammonium sulfate containing WSACI by the same installers using the same brand of insulation under similar conditions, and have not created problems.

There are several options for spray applied cellulose insulation which do not contain ammonium sulfate, but regardless of what brand is used, all WSACI should have a fungistat to prevent mold growth.

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