

Environmental Analysis Associates, Inc.

Identifying the fiberglass fibers and debris produced from the shedding of HVAC black soundliner insulation

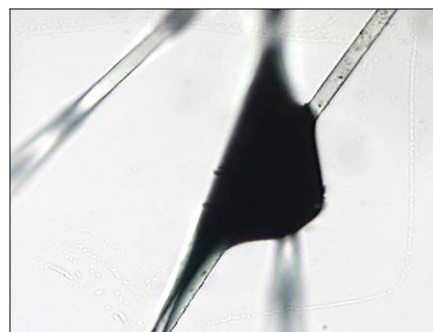
The observation of "black dust" accumulating on supply diffusers and interior surfaces is sometimes caused by the degradation of black pigmented soundliner insulation typically used in mixing boxes of HVAC systems. Because the fibers are relatively smaller in diameter than yellow or pink fiberglass insulation, they are more likely to cause irritation and indoor air quality problems.

Soundliner insulation can effectively be identified in air and surface samples by using a combination of light microscopy and scanning electron microscopy / dispersive X-ray analysis. When characteristic fibers with black pigmented binder resin are present, they are readily identified by optical microscopy. However, sometimes the fibers are not present when the binder resin particles are elevated. Examples of the residue particles generated by soundliner insulation are shown below and on the back side of this flyer.



Black soundliner insulation :

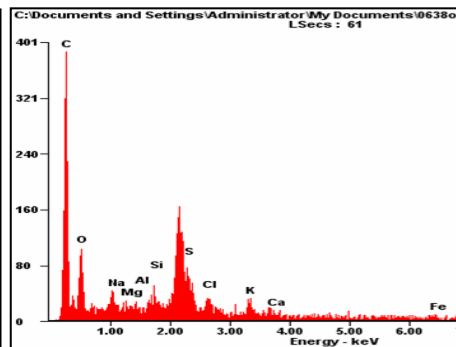
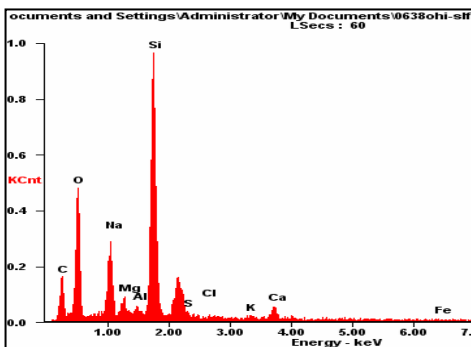
Example of fiberglass fibers associated with black soundliner insulation (Photo #1). Photo #2 shows intact black binder resin



X-ray spectra of insulation and resin binder :

Spectra #1 is of the fiberglass fiber. The fiber is a low calcium / high sodium silicon dioxide glass.

Spectra #2 is of the black organic binder resin attached to the fiber



Resin binder dust

Examples of black and rust colored resin binder particles using optical microscopy (~1000x). Particles appear black with an irregular or plate-like morphology.

When the particles are thick, they appear black (opaque) and brown or rust colored when they are thin and plate-like.



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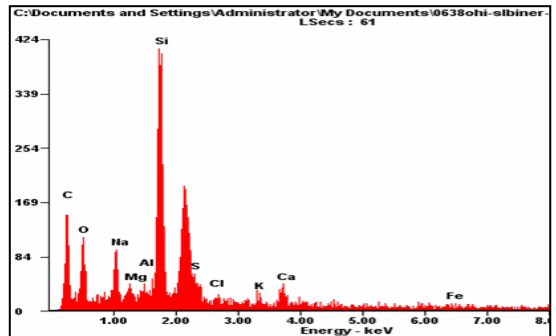
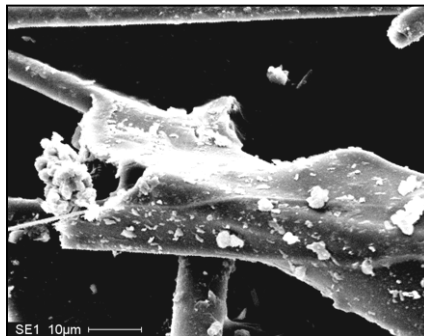
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Examples of the variation in soundliner binder x-ray spectra when mixed with other particle debris

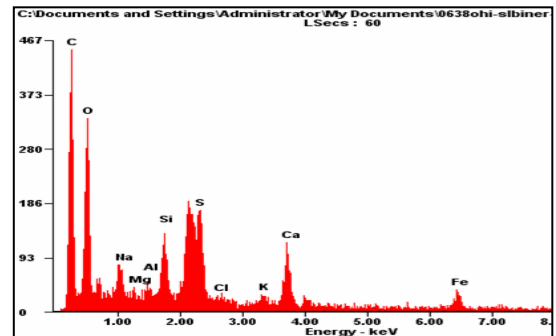
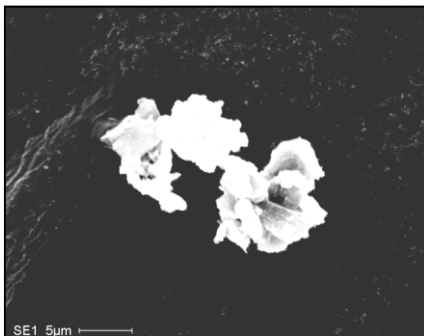
SEM photo 1440x

Mixed spectra of the fiberglass fiber and binder matrix



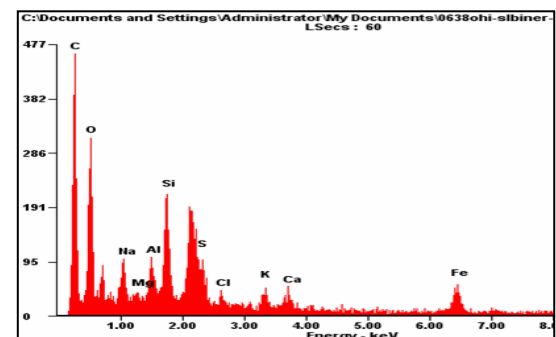
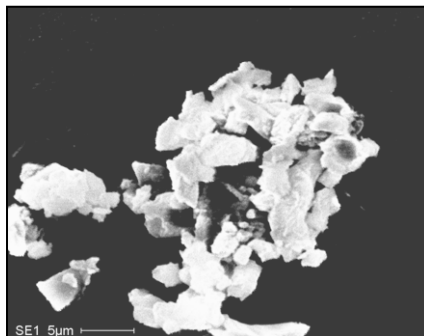
SEM photo 2890x

Particle binder agglomerate mixed with drywall dust. Note the presence of calcium, sulfur and iron.



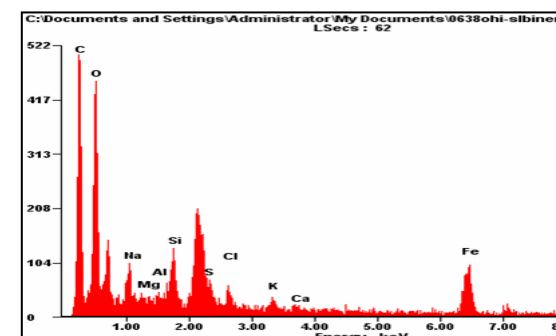
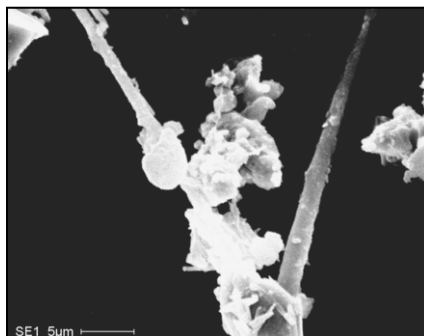
SEM photo 2890x

Particle binder agglomerate likely mixed with minor amounts of calcium, sulfur, and iron.



SEM photo 2890x

Particle binder agglomerate mixed with moderate concentrations of iron.



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