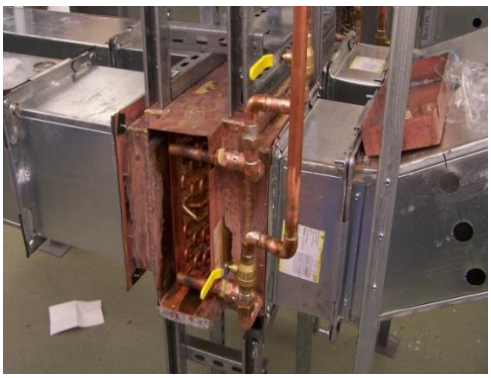
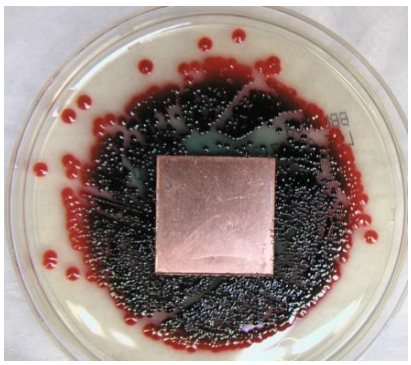
Copper Air Quality Program

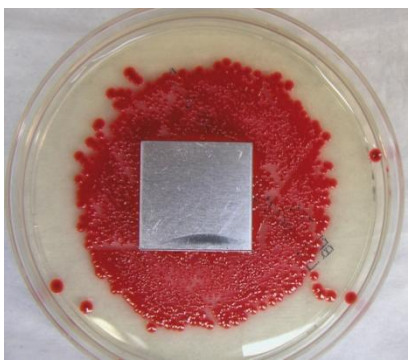
Microbial growth in heating ventilation and air-conditioning (HVAC) systems and their contamination of the indoor air environment is a growing concern. Pathogenic fungi and bacteria that are threats to public health thrive in moist, dark HVAC environments. Researchers have found these conditions to be viable environments for the growth and propagation of harmful microbes. The Copper Air Quality Program has designed and produced for evaluation copper components for HVAC systems to demonstrate the effectiveness of copper surfaces for reducing the incidence of harmful airborne microbes within these systems and throughout buildings and other indoor civilian and military settings.

The program is conducting its research in the laboratory as well as in the field. At the University of South Carolina, a scaled air handling system has been built which will enable researchers to track microbial concentration on copper and aluminum heat exchangers. Biofilm buildup will also be measured. In the field, at the Fort Jackson Army Post in South Carolina, one barracks was retrofitted with all copper heat exchangers while an adjacent barracks was retrofitted with aluminum heat exchangers. These two barracks will be sampled using gelatin filters in designated points for comparison to each other and the outside air.



Air Handling System
Copper Heat Exchanger at USC





Serratia Marcescens surrounding Copper and Aluminum Plates

Also in the field, comprehensive measurements on one retrofitted copper HVAC and one retrofitted aluminum HVAC on water flow, temperatures, humidity content, and energy transfer from the water system to the coils are being taken for comparison and further analysis. The energy-wise results will compliment the air quality findings in the other experiments to provide compelling data for Green Building work moving forward.

Copper Heat Exchanger installation at Fort Jackson, SC

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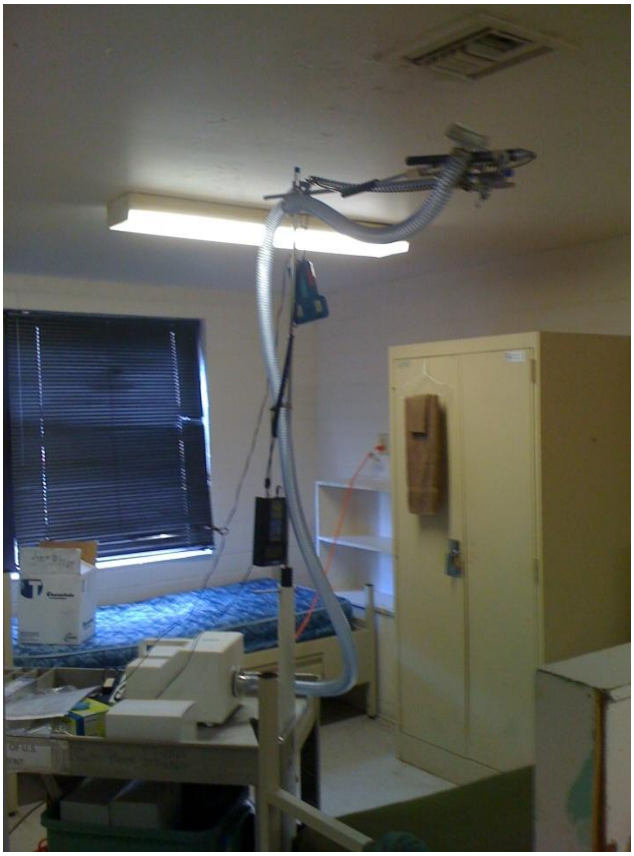
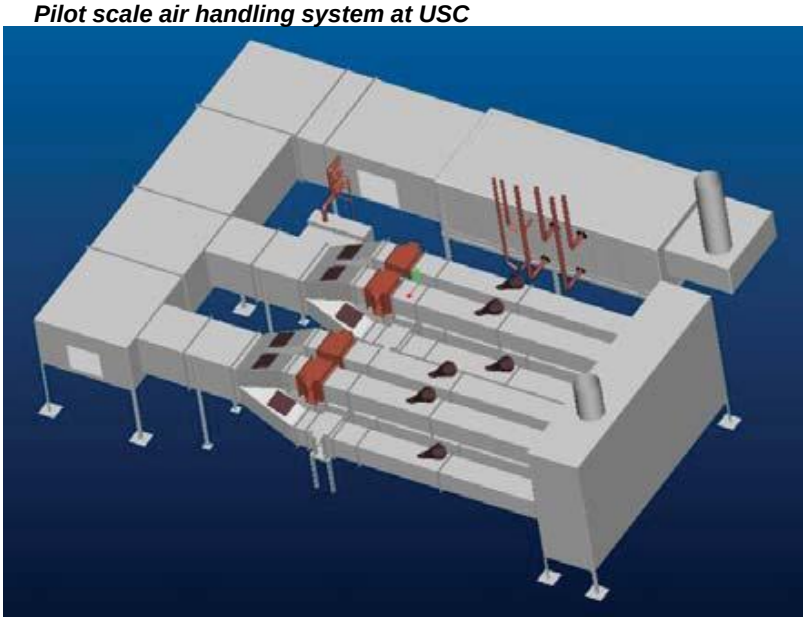
Barracks at Fort Jackson, SC



Sampling Apparatus-Fort Jackson, SC Barracks

The Copper Air Quality Program is a partnership comprised of government, industry, and academic team members. The team includes three renowned academic institutions: the University of South Carolina Arnold School of Public Health and College of Mechanical Engineering – engineering resources and indoor air quality laboratory facilities; the Medical University of South Carolina – state-of-the-practice procedures based on modern molecular biology; and Washington State University – supplying expertise in Green Building and Leadership in Energy and Environmental Design research. BCS, Inc. is providing energy efficiency analysis. The team also includes representatives from the U. S. Army Basic Combat Training Center of Excellence and the Copper Development Association. ATI, a specialist in consortia formation, provides leadership and program management.

Pilot scale air handling system at USC



Copper Air Quality Program

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