SOUND CURTAINS
BY SOUND SEAL

CASE STUDY NO. 11

A DIAMOND IN THE ROUGH: HOW SOUND SEAL HELPED 'POLISH' ARCH RESOURCES' ACOUSTICS

Arch Resources | Philippi, West Virginia

Arch Resources, a leading U.S. producer of metallurgical products for the global steel industry, is renowned for its ability to set the industry standard for both mine safety and environmental stewardship. Now, with the help of Sound Seal, the organization can also cite another remarkable company achievement: improved acoustics.

THE PROBLEM

A large axial fan located within Arch Resources operational complex is critical to circulating clean air within mine shafts and ensuring worker safety. A downside to the fan, however, is the high level of low frequency sound and subsequent harmonics it emits during its operation.

Prior to the installation of a solution, the axial fan generated approximately 112 dBA at 25' (45° off inlet axis) from the discharge point. A subsequent measurement of 101 dBA at 25' (135° off inlet axis) established the inlet opening as being the dominant noise path, while secondary sound paths (fan and duct radiation noise) were also evaluated. These measurements all established that treatment of the inlet noise would result in a reduction of noise levels throughout the complex.

THE SOLUTION

While multiple mitigation techniques were evaluated for cost and performance, Sound Seal BBC-13X-2" Sound

BEFORE

INTERIOR

Curtains were ultimately selected based on cost, flexibility and schedule performance—the product could be installed in such a way to minimally impact the fan performance and allow the motor located within the plenum to received adequate ventilation—all without impacting operations or necessitating downtime.

THE RESULTS

Arch Resources contracted O'Neill Engineered Systems, Inc. to visit the site, measure the sound levels, determine the dominant sound paths and provide a variety of commercial options available that would provide relief for the workers impacted by the fan noise. In consideration were modular steel sound panels, concrete block walls with absorptive liners and the Sound Seal option of vinyl coated fiberglass exterior curtains.

Working with partners Alpha Engineering Services, Inc. for aerodynamic and structural design and consultation and Wilson Works Corporation, who performed the installation, the Sound Seal product was positioned 25' above grade. Once installed, it was confirmed that a 12–20 dBA sound reduction was achieved, handling transmission loss properties from 250 -1000 Hz, and helping to improve worker conditions.