

September 2013, Carlisle HVAC Products received a call in regards to the Salem Community Hospital Addition in Salem, Ohio. The first application of another manufacturer's duct sealant had blown out of the system's joints during pressure testing, and the project was at a standstill until the cause of the problem was identified and all the ductwork could be re-sealed.

The duct system was originally sealed with mastic using the traditional bucket and brush method. Immediately after sealing, the ducts were externally wrapped with insulation. An investigation determined that the insulation was applied to the ducts before the sealant had adequate time to cure, which caused it to blow out of the joints when pressure testing was performed.

This issue could have set the job's schedule back for weeks, and cost tens of thousands of dollars to resolve. In order to re-seal the ductwork externally, the insulation would have to be unwrapped from the duct so the mastic could be re-applied with a bucket and brush. In addition to being extremely time-consuming, this plan was further complicated by the fact that the duct system was nearly impossible to access because of the piping and conduit surrounding it. In light of these complications, re-sealing

the ductwork using traditional methods was not an option. Luckily, there was a much faster and more cost-effective solution; remediating the ductwork internally.

Carlisle HVAC Products' technical specialists suggested using their ISAAC HVAC Robotic System with RS-100™ Remediation Duct Sealant. ISAAC, which stands for the Inspecting, Sealing, and Advanced Cleaning robot, is a remotely operated robotic vehicle outfitted with a digital video recorder. ISAAC can inspect, coat, and seal all types of ductwork from the inside and is capable of hard-to-reach remediation which would otherwise require much more complex and costly renovations.

On the Salem Hospital Addition, ISAAC was used in conjunction with RS-100, a sprayable duct sealant that is specially engineered to seal all joints and seams internally. RS-

Salem Community Hospital Addition

Contractor:

Lloyd's Systems

Job Started:

September 2013

Job Completed:

September 2013

Carlisle HVAC Products Used:

- ISAAC™ HVAC Robotic System
- RS-100™ Robotically Applied Water Based Duct Sealant



“Given the nature of the situation, the best, and really the only option, was to remediate the ductwork using the ISAAC Robotic System and RS-100 Sealant”

— Lance Weaver

100 is NSF-tested and approved, and meets and exceeds all Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) pressure classes, while providing a true SMACNA Class A seal. RS-100 provides a smooth, non-tack surface and its flexibility allows for system vibration without cracking, providing a permanent solution for leaking ductwork and ensuring future indoor air quality.

With a solution in place, Lloyd's Systems was awarded the contract to re-seal the ductwork. Lloyd's, a Carlisle HVAC Authorized Applicator, offers high levels of experience and expertise in internal duct sealing. Within a few days, Lloyd's owner Lance Weaver and his crew were on-site to rectify the problem. "Given the nature of the situation, the best, and really the only option, was to remediate the ductwork using the ISAAC Robotic System and RS-100 Sealant. Other methods would have been cost-prohibitive and extremely time-consuming," Lance stated.

Through inspection and isolation-testing, it was determined that the bulk of the leakage was occurring at the system's 400 transverse joints, so Lloyd's Systems used the ISAAC Robot as well as hand sprayers to seal the leaking joints with RS-100. Testing was performed while the job was in progress, and it immediately showed excellent results. During a pre-internal sealing test of the first floor, one 50-foot duct section was found to be leaking almost 700 cfm of air; testing after re-sealing showed this same section of duct was leaking only 101 cfm, well below the maximum allowable level of 132 cfm, and an approximate 85% leakage reduction. Over the course of only three-and-a-half days, the robotic sealing experts at Lloyd's Systems were able to achieve an overall leakage reduction of more than 86%. Upon completion, every section of the ductwork was well within the parameters of allowable leakage. Lloyd's Systems owner Lance Weaver said, "The required sealing was performed in a single pass. The system passed the leakage test the first time it was administered, so no re-application was necessary. Using ISAAC and RS-100 was the quickest, most cost-effective, and most efficient way to get the job back on track."

Properly sealed ductwork is critical to the health and comfort of building occupants. Carlisle HVAC Products provides innovative and efficient methods and materials for sealing ductwork and ensuring proper airflow to your whole facility. For more information about Carlisle HVAC Products, call 877-495-4822 or visit carlislehvac.com.

| Location | Allowable Leakage (cfm) | Pre-Sealing Leakage (cfm) | Post-Sealing Leakage (cfm) | Leak Reduction |
|------------------------------|-------------------------|---------------------------|----------------------------|----------------|
| 1 st Floor - West | 132 | 670 | 101 | 85% |
| 1 st Floor - East | 132 | 1140 | 119 | 90% |
| 2 nd Floor - West | 127 | 510 | 74 | 85% |
| 2 nd Floor - East | 127 | 720 | 99 | 86% |
| 3 rd Floor - West | 122 | 540 | 90 | 83% |
| 3 rd Floor - East | 122 | 640 | 94 | 85% |
| Totals | 762 | 4220 | 577 | 86% |

Total Leakage Reduction: 86.30% or 3,643 cfm or 9.1 tons of conditioned air.

