



Spiral duct is a contractor's best choice

By [Jeff Rogers](#)

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Getting something for nothing is rare, but by switching from traditional rectangular ductwork to spiral, you can do just that.

Spiral ductwork is cheaper to install and cheaper to use throughout the life of the HVAC system.

John Reints, president of StaticRegain.net, presented a study at the 2012 AHR Expo that proved the point. It showed that spiral static regain systems were 37 percent cheaper than rectangular systems and used 46 percent fewer materials. Because of the acoustical characteristics of the spiral design, these systems are also typically much quieter.

“Spiral static regain” is a design that sizes the spiral supply duct system to obtain uniform static pressure at all branches and outlets. Static regain can be used to design systems of any pressure or velocity. Duct velocities are systematically reduced over the length of the distribution layout, which allows the velocity pressure to convert to static pressure. This type of system requires little or no balancing.

“Using lighter-gauge spiral duct reduces material weight by 25 percent compared to rectangular ducts,” Reints said. “The enhanced computer engineering used to design spiral static regain systems can produce total material weight savings of 40 percent to 50 percent. Spiral ductwork design enhancements and the resulting savings are the next major market change for sheet metal contractors. Class A sealing requirements are the final nail in the cost coffin for rectangular ductwork.”



'Green cubed'

Spiral ductwork is “green cubed” because it’s a far more sustainable product for the environment and it saves green - money - for contractors and more green - money - for building owners. Building owners can save up to 30 percent on fan energy.

Spiral ducts were introduced to the United States in the 1950s with the development of machines that fabricated the ducts from rolls of steel or aluminum. It has gained a market share of over 95 percent in parts of Europe. Spiral duct’s market share in North America continues to grow.

The American Society of Heating, Refrigerating and Air-Conditioning Engineers recommends that circular duct be used whenever feasible.

Spiral duct, fittings, and takeoffs are stocked for immediate shipment at numerous manufacturers throughout North America. Although 10-foot lengths are the most common, you can order almost any length you would like. Diameters typically range from 3 inches to 8 feet. The spiral, four-ply lock seam, round shape and higher design velocities enable the duct to be up to 50 percent lighter than rectangular duct with the same ventilation capacity.

The round shape and smoother turns also reduce pressure drop throughout the system, offsetting the increased friction losses caused by higher air velocity.

Precision workmanship allows spiral duct to be lighter, structurally stronger and more airtight than rectangular duct with the same capacity. Spiral duct can be manufactured to provide minimal leakage up to 10-inch water gauge, so you can use the same duct throughout the job.

Superior performance

According to Bob Reid, technical director of the Spiral Duct Manufacturers Association, the reasons spiral duct leaks less than rectangular are pretty basic: It has no longitudinal seams, something that accounts for about 15 percent of rectangular duct leakage. The four-ply spiral lock seam is the only duct seam exempted from sealing under the new ASHRAE standard 90.1. Most duct leakage occurs where you assemble two duct sections together. Spiral duct is typically provided in 10-foot lengths or longer versus 5-foot lengths for rectangular duct, so there are usually less than half as many joints. The connectors used for round duct are also easier to seal than their rectangular counterparts. Self-sealing connectors are also available. The corners are often the most difficult part of a rectangular joint to seal and, of course, round duct has no corners.

Well-installed spiral-duct systems with factory-fabricated fittings can have leakage rates as low as half a percent. Although it is possible to seal rectangular ducts to approximately the same leakage level, it is very expensive and time consuming to do so.

Now let’s look at how spiral duct saves time and money for contractors. Because spiral duct comes in standard sizes with standard fittings, you can purchase many components of a typical installation from stock. Try doing that with rectangular ducts. A spiral-duct system cuts 25 percent off the installation time. If there is a measurement error, long duct can be easily cut down to size at the jobsite. Short ductwork can be saved for use elsewhere and a new, longer pipe can be picked up from the

fabricator's inventory.



Light and strong

Because spiral duct is lighter and stronger than rectangular, a single worker can install duct that is up to about 18 inches in diameter and 10 feet long. A scissor lift enables a single worker to install even larger duct sections. Duct can be easily slid into slip-joint fittings. A fitting can be connected to duct up to 10 inches in diameter with just three self-tapping sheet metal screws. If a self-sealing fitting is used, the transverse joint needs no additional messy and labor-intensive sealing.

Spiral duct needs about 20 percent fewer hangers, and these hangers are similar to pipe straps which require only one anchoring point above the duct. Spiral is cheaper and easier to transport and store because smaller diameter pieces can be nested in larger ones.

Spiral ducts will also save energy and provide excellent indoor air quality for the life of the HVAC system. The gaskets and O-rings in factory components never need to be resealed. Their lower leakage rates reduce the need for fan energy to make up lost ventilation.

The reduced surface area of the duct reduces the amount of unintended heat transfer as the ductwork passes through unconditioned spaces. Indoor air quality is also improved because volatile organic compounds are not needed to seal gasketed spiral ductwork. Ungasketed spiral ductwork has far less VOCs because the linear feet of joints is much lower than for rectangular systems.

Easy maintenance

Maintaining spiral systems is easier. They do not have large flat surfaces and corners inside to collect dust and other contaminants. Spiral duct can be cleaned efficiently with spinning brushes.

To maintain air quality and HVAC effectiveness, it is helpful to monitor airflow. For round ducts, only two holes are needed to measure airflow. Rectangular ducts need multiple measurement holes based on the size of the duct.

Spiral duct also offers more flexibility. Because spiral duct is fabricated for up to 10-inch water gauge and is less prone to noise and leakage, if more ventilation is needed, it is often possible to increase system pressure and velocity without altering the existing round duct.

There are some downsides to spiral. If there is limited clearance for ductwork, a rectangular duct can always be made wider, while a round duct might not fit. However, in most cases, there is a spiral alternative which is cheaper to install, lighter and more energy efficient. Multiple round ducts or a flat-oval duct can be used instead of high-aspect-ratio rectangular duct. Because spiral ducts have an attractive appearance, it may also be possible to eliminate drop ceilings and expose the ductwork. The lower initial costs for spiral duct will usually more than pay for a nice paint job for the ductwork. It is easier to wrap spiral duct in insulation, but more difficult to line the inside of the duct with insulation.

However, it is cheaper to sandwich insulation between round double walls than rectangular double walls.

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