Building Mobile Work Spaces:

One Manufacturer's Approach to Workshops That Go Where Needed.

Ocean cargo containers have always been the perfect way to move goods around the world, but today they do much more than move cargo. They move capabilities to where they are needed, and innovative companies are converting the ubiquitous steel containers into mobile workspaces of amazing variety.

One of the leaders in this specialty field is Sea Box, Inc., of East Riverton, New Jersey. The customer list for Sea Box includes all branches of the U.S. armed services as well as many defense contractors and a wide range of civilian organizations.

Mobile Machine Shop

Recently, Sea Box has been actively involved in developing solutions to support the US military's rapid deployment requirements. For example, Sea Box won a contract to build the Mobile Machine Shop for the US Marine Corps.

"We install the cabinets, fit the tools, run the cables, and make it all work together," according to Kevin Eifert, Supervisor Engineering for Sea Box, Inc. "But most important, we make the repair operation mobile."

Atlas Copco

On the left, John Goodgion, Atlas Copco Sales Manager, and on the right, Patricia DelBuono, National OEM Business Development Manager.

The Mobile Machine Shop is comprised of two matching 15,000 pound, 20-foot ISO containers. Painted green, they look like ordinary shipping containers from the outside, but look inside and you'll find tools enabling the machinists of the 2161 MOS (Military Occupational Specialties) to perform their maintenance and repair mission in a deployed environment.

One container has been built out to accommodate a lathe, and the other a milling machine. On location they are bridged together by a walkway that transforms them into one repair shop.

The Mobile Machine Shop is outfitted with an electrical generator that provides 104 amps of three-phase power to operate the air conditioning, lighting, machinery and tools. Originally, two conventional piston air compressors (one for each container) were specified, but as Kevin explains, two such air compressors were going to create some problems.

"Each compressor uses 15 amps on start-up," says Kevin. "The air conditioning could draw upwards of 40 amps, and the lights pulled 5 amps. The short story is we were pulling too many amps. The piston compressors draw a lot of current and they were noisy. There was also the issue of lubricating oil and filters to clean the compressed air. We were looking for a better idea."

A Better Air Compressor For The Job

Patricia Del Buono, National OEM Business Development Manager for Atlas Copco Compressors LLC, worked with Kevin on a solution. "After I discussed with Kevin what he needed," Pat recalls, "I came back to him with the idea of a scroll compressor." Atlas Copco offers scroll compressors in the two-to-twenty horsepower range. Pat recommended a three horsepower SF 2 scroll compressor which met the air production requirements while providing much lower amp draw, quieter operation, less maintenance, more reliability, and superior quality oil-free air.

"I hadn't seen a scroll compressor before," Kevin admits. "I like the high reliability and low maintenance because this compressor has to work in a deployed environment. I like that it's oil-free so we don't have to deal with providing vegetable oils for lubrication, which other machines required. In military applications, having one

less thing to worry about is always an advantage. With Atlas Copco's presence around the globe, we also have the ability to get parts to places like Afghanistan if we ever need to. The scroll compressor costs more than a conventional compressor, but we solved the amperage draw problem, got more reliability, got oil-free air, and got a much quieter compressor to use in an enclosed space. The scroll compressor tested fine with no problems. It works perfect for this application."

How A Scroll Compressor Works

Unlike piston compressors, Atlas Copco scroll compressors use two spiral elements (or "scrolls"). One element is fixed and a second one orbits about the first. Air is drawn in from an exterior port and continually compressed into a smaller and smaller pocket. A smooth stream of compressed air is released through a port in the center. The scroll element is belt-driven and because there is no metal-to-metal contact there is no need for oil lubrication in the compression chamber. As a result, air quality is exceptional and 100% oil-free.

Compared to conventional compressors, scroll compressors are more energy efficient and compact. Because there are so few moving parts, scroll compressors offer high-reliability operation with minimal service interventions. They are much quieter than piston compressors, too. Atlas Copco scroll compressors are

Sea Box products end up in "hot spots" around the world, such as Afghanistan and the demilitarized zone between North and South Korean, but there are many applications for their customized containers outside the military. Among the most impressive civilian projects is a mobile shore team center for the Puma Ocean Racing sailing team.

Years ago, ocean sailors carried the spare parts they needed onboard and did most maintenance and repairs themselves. Today ocean racing boats are supported by a shore team that typically has twice as many members as the crew on board the boat. The tooling required to support these teams is impressive, to say the least.

Ocean sailing is a sport that can put you anywhere in the world, so Sea Box built a mobile tool shop in containers so the race team can ship it to wherever the next race is. Two sets of five 40-foot shipping containers move from port to port ahead of the boat. Once unloaded and positioned, the containers form the outer walls of the shore base. Tents are erected between the containers to form the sail loft and boatbuilding workshop space. Connections are made for power, running water and drainage.

By the time the boat arrives, the shore station is fully operational. When the race is over, it all gets packed back into the shipping containers and sent to the next race site.

First in Oil-free air technology

WorkPlace Systems – so quiet they are installed right at the point of use rather than in a remotely located compressor room.

"The Mobile Machine Shop is an ideal application for scroll technology," Pat explains. "They are quiet (55 dBA) so the doors of the shop can be kept closed if necessary. Plus oil-free air helps protect the sensitive equipment downstream. With two integrated 16-L air receiver tanks located in the bottom of the cabinet, it is an all-in-one space saving unit.

Sea Box has built one Mobile Machine Shop and won a five-year contract to build up to 40 per year. "Now that the Marine Corps has the first shop in their hands," says Kevin, "we are looking forward to receiving more orders."

The Oil-Free Advantage

Atlas Copco – the global leader in compressed air – utilizes six different technologies in the production of oil-free air:

- rotary scroll
- rotary screw
- water-injected rotary screw
- centrifugal
- rotary lobe
- reciprocating

Oil-free compressors range in size from three horsepower to well over 1,000 horsepower, and each mechanical design offers a distinct set of advantages.

To learn more, contact your Atlas Copco Sales Engineer.

Atlas Copco Compressors LLC
1800 Overview Drive
Rock Hill, SC 29730
www.atlascopco.us