

INDUSTRY NEWS



Environmental Solutions Worldwide Inc. (ESW) recently completed a significant expansion of its Air Testing Services (ATS) operation in Montgomeryville, Pa., and the company now offers a complete array of engine testing services. As part of that capability, ATS maintains a range of test systems, including a 600 hp Dyne Systems steady-state engine dynamometer for off-road engine testing, a 500 hp Mustang engine dynamometer for transient testing of on- and off-road engines and a Magtrol midrange utility engine dynamometer for testing 10 to 25 hp off-road engines.

A GROWING FOCUS ON CLEANER AIR

Environmental Solutions Worldwide expands both its product line and its 2007-compliant emissions testing capabilities

BY MIKE BREZONICK

Since its founding in the late 1990s, Environmental Solutions Worldwide Inc. (ESW) has been dedicated to supplying emissions reduction technology for internal combustion-powered vehicles, equipment manufacturers and the retrofit market. While that focus has never wavered — as exemplified by the recent introduction of a new aftertreatment system for commercial vehicles — ESW has also expanded its activities to include a range of engine testing services and recently completed a significant expansion of its Air Testing Services (ATS) operation in Montgomeryville, Pa.

"ATS is a contract testing and service division operated by ESW America Inc., a wholly owned subsidiary of Environmental Solutions Worldwide Inc.," commented Juergen Jennewein, vice president of sales at ESW. "The genesis of the whole operation is that ESW acquired ATS' assets in 2001. The company continued to expand the facility and has made strategic investments in the latest

emissions testing equipment and engine testing technology.

"In late 2006, ESW opened the doors to its state-of-the-art contract R&D and emissions testing center, catering its services to internal combustion engine manufacturers and users, equipment importers and exhaust aftertreatment device manufacturers."

The 40,000 sq.ft. facility offers a wide range of services, including complete engine and exhaust gas testing and analysis, engine performance and fuel economy evaluation, in addition to development and testing of exhaust aftertreatment technologies. The facility houses eight dedicated engine and vehicle dynamometer emissions test cells. Six of the eight contract cells are dedicated to engine testing and durability, while two cells are set up specifically to run vehicle/chassis testing.

The engine and chassis dynos are used to simulate on-road and off-road load and operating conditions to vehicles and engines during specified driving cycles and test protocols. The line-

up includes the following eddy current engine and chassis dynamometers:

- A 600 hp Dyne Systems steady-state engine testing dynamometer for off-road engine applications such as construction, mining and generator set engines.
- A 500 hp Mustang engine dynamometer capable of performing FTP transient cycle testing of on-road vehicle engines used in school buses and trucks, as well as off-road transient cycles as recently required by the California Air Resources Board (CARB) for construction equipment.
- A 300 hp General Electric dynamometer specifically for on-road and off-road engine and exhaust aftertreatment durability testing.
- A Borghi 175 hp midrange dynamometer capable of performing steady-state and simulated transient cycle testing suitable for automotive and small off-road vehicle applications.
- A Magtrol midrange utility engine dynamometer for testing of 10 to 25 hp off-road engines found in lawn and garden equipment, portable irrigation and generator applications.
- A Magtrol low-range dynamometer for testing 0.5 to 10 hp off-road engine applications typically used in lawn mowers, chain saws and other small utility equipments.
- A Mustang six-roller heavy-duty

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Along with its base engine testing capabilities, ATS also offers chassis dyno testing services (left) for light-, medium- and heavy-duty vehicles. ESW is also offering a new particulate filter system (right) for commercial vehicles and equipment operating in stop-and-go or low-speed applications. The Therma Cat is a particulate reduction technology engineered to combine automatic regeneration and automated diesel post-injection into a single system. It was originally developed by ESW and German manufacturer PURltech, and with its successful launch in Europe the decision was made to bring the system to North America.

vehicle chassis dyno that provides 50,000 lb. of simulated inertia. This cell is set up to perform transient test cycles on school buses, transit buses, waste hauler trucks and Class 8 transportation vehicles.

- A Clayton medium-duty vehicle

chassis dyno that incorporates a 50 rolling hp absorber providing up to 20,000 lb. of inertia. This cell is set up for passenger vehicles and light-duty truck applications.

"ESW's engine test cells can be contracted for certification and/or R&D pur-

poses, including durability testing, and can accommodate engine testing from 0.5 up to 600 hp," said Jennewein. "We have taken many North American and offshore companies' engines and/or emissions aftertreatment devices through the complete programs re-

quired by the Environmental Protection Agency and CARB. These comprehensive programs involve all aspects of achieving agency verification or certifications for the customer including necessary interaction with both CARB and EPA and all associated paperwork."

For emissions testing, ESW utilizes a diluted-stream Constant Volume Sampling system (CVS), in this case, a Critical Flow Venturi (CFV) type system coupled with a turbine vacuum blower. The CFV-CVS is integrated with a six-bag sample collection system in which three bags are dedicated to dilute exhaust sample collection and three bags are dedicated to background air sample collection. The CVS and Bag Bench systems are integrated with either a four- or five-gas analyzer bench that measures HC, CO, NO_x, O₂ and CO₂.

For diesel testing, an 18 in. particulate mixing tunnel is located between the test vehicle and the CVS. The tunnel has a particulate sampling probe, sample filters, gas meters, sample pump, as well as the solenoid valves and sample flow-switching equipment required. Also tied into the tunnel is a heated sample probe, sample line and heated hydrocarbon analyzer. In certain cases a heated NO_x analysis system is also integrated into the tunnel.

The heated HC and NO_x analyzer systems sample continuously during a test and operate independently from the bag collection systems. Besides the CVS system the company also features Raw Gas Sampling as required by Mine Safety and Health Association (MSHA).

Collecting and analyzing all of the information from the dyno's and CVS system is managed by an extensive infrastructure data acquisition technology. "The two large engine cells, up to 500 and 600 hp, are equipped with a Horiba 9000 analyzer console, CP engineering controls and data acquisition, and an 18 in. full dilution tunnel, 5000 CFM constant volume sampling system," noted Jennewein. "These two engine cells were specifically designed and engineered to be 2007-compliant for engine testing and certification projects.

"The three smaller engine cells may be contracted for engine certification testing, engine performance and research and development test plans. The cells are equipped with a Horiba constant volume sampling system, Horiba 200 series analyzer console, CP Engineering and Omega data acquisition and controls, Magtrol and Borghi eddy current dynamometers.

"The final jewel in the ATS crown,"

Jennewein added, "is our management, technicians and engineering staff. With over 50 years of combined experience in the industry, no job is beyond the scope of our capabilities."

On the hardware side, ESW partnered with German manufacturer PURltech in 2004, to engineer and introduce a new diesel particulate filter system for commercial vehicles in

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Europe. This new technology, capable of achieving CARB Level 3 particulate matter reductions, was engineered specifically for DaimlerChrysler Unimog utility vehicles and was adapted into a number of other applications. With the successful launch of the system, branded DBS/DAS for the European market, the decision was made to bring the system to North America and other selected countries.

This new particulate filter system, branded Therma Cat for the North American market, is a particulate reduction technology engineered to combine automatic regeneration and automated diesel post-injection into a single system targeted toward vehicles and equipment operating in stop-and-go or low-speed duty cycles.

The Therma Cat system provides automatic regeneration through use of

a catalytic coating over the company's proprietary high-performance wire mesh pre-cat substrate coupled with a silicone carbide filter substrate that is activated at exhaust gas temperatures above 375°F. "This mode is ideal for vehicles in continuous operation or working in multishift operations," Jennewein said.

When the vehicle is not working at sufficient load and the exhaust temperature drops below that temperature, a purely passive regeneration is not possible and the filter can become clogged with particulate matter, resulting in a consequent increase in backpressure. The Therma Cat system incorporates a proprietary electronic control unit that monitors backpressure and temperature; when a preset limit is reached, it automatically activates a diesel post-injection in the exhaust gas upstream of the filter. The mixture of diesel fuel and exhaust gas oxidizes over the wire mesh pre-cat, which triggers an exothermic reaction, burning off the particulates. The temperature is monitored before and after the preliminary filter and when the necessary temperature is reached, the system reverts to passive regeneration.

"The active operating mode is necessary for vehicles with stop-and-go cycles, such as transit buses, municipal vehicles, refuse trucks, material handling and construction equipment," Jennewein said.

Advantages cited by ESW include the avoidance of vehicle downtime for regeneration, as well as the system's retrofit capability. The Therma Cat system is designed to replace the conventional engine muffler. **dp**

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