

# CANADIAN ETV PROGRAM VERIFIED

## Cleanalytic™ Technology

Technology Fact Sheet for Vida Holdings Corp. Ltd.



### Performance Claims

1. A fuel savings of 2% was achieved by the Cleanalytic™ Technology installed on a 2007 Ford Edge 3.5L Duratec engine, operated in accordance with the US06 & FTP drive cycles.
2. Emissions equivalent to the OEM were achieved by the Cleanalytic™ Technology installed on a 2007 Ford Edge 3.5L Duratec engine, operated in accordance with the US06 & FTP drive cycles.

### Performance Conditions

#### Emissions Testing

Prototypes were aged to an equivalent of 100,000 miles (160,000 km) by 4-mode on-engine aging cycle (approximately 260 hours on engine with 240 hours under steady-state 2900 RPM and exhaust temperature 840°C). Aging was conducted on the engine dynamometer with a 3.5L Duratec engine. Emissions testing was conducted on a chassis dynamometer using three US EPA approved drive cycles: FTP-75, US06 and HwyNOx. Both bag and modal (1 Hz frequency) emissions were recorded for FTP-75 and US06 cycles. Only bag emissions were recorded for HwyNOx drivecycle. A minimum of 3 tests per prototype were completed to assess the statistical significance.

#### Fuel Economy Testing

Fuel consumption was recorded under steady state conditions during aging (240 hours, constant 2900 RPM on a stationary engine dynamometer), both as the total fuel consumption over 240 hours and modally (1 Hz frequency). Fuel consumption was again tested during chassis dynamometer testing, both as bag and modal (1 Hz frequency) CO emissions.

Steady state aging testing was repeated with a new set of prototypes in 2012 on the same engine system.

### Technology Application & Description

The Cleanalytic™ Catalytic Converter is a simple modification of the conventional catalytic converter. Cleanalytic™ incorporates a layer of insulating material into the ceramic substrate of the catalytic converter, affecting the flow of gas and heat in the substrate.

The addition of insulation separates the substrate into distinct thermal zones with a heat exchange barrier between them. Changes in thermal properties of the substrate affect the flow of the exhaust gas through it, vis-à-vis gas viscosity and gas turbulence.

One of the principal issues in catalytic converters is that they present a flow obstruction for the exhaust gas coming out of the engine and generate engine back pressure. The excessive engine back pressure reduces the efficiency of the internal combustion engine, thus increasing vehicle fuel consumption.

# Environmental Technology Verification

## Technology Application & Description (continued)

The strategic placement of the insulating layer in the Cleanalytic™ will alter the flow of exhaust gas through the catalytic converter, increasing flow uniformity and reducing the generated engine back pressure. In the systems that suffer from excess back pressure Cleanalytic™ will increase engine efficiency and restore some or all of the fuel economy lost due to back pressure.

Typically, it is difficult to reduce the engine back pressure generated by the catalytic converter without affecting vehicle emissions. A common way of reducing the back pressure is the use of lower flow resistance substrates, for example replacement of a 900 Cells Per Square Inch (CPSI) substrate with a 600 or a 400 CPSI substrate. Lower cell density substrates have less surface area to facilitate catalysis of exhaust gases and so will increase vehicle emissions. Cleanalytic™ utilizes the same cell density substrate as the original vehicle catalytic converter and the insulation-induced thermal effect allows it to equal or exceed the emissions performance of the original part.

## Verification

The data and information provided by Vida Holdings Corp. Ltd. to support the performance claim included the following:

1. "Confirmation Letter" prepared by Johnson Matthey Testing of Taylor, Michigan (USA), summarizing the test procedures and results obtained through installation of Cleanalytic™ Technology on a 2007 Ford Edge vehicle.
2. Baseline data and test data in MS Excel and raw data format

The verification was completed by the Prairie Agricultural Machinery Institute (PAMI) of Humboldt, Saskatchewan, using the Canadian ETV Program's General Verification Protocol (June 2012)

## What is the Canadian ETV Program?

The Canadian Environmental Technology Verification (ETV) Program is delivered by GLOBE Performance Solutions under a license agreement from Environment Canada. The Canadian ETV Program is designed to support Canada's environment industry by providing credible and independent verification of technology performance claims.

### For more information on Cleanalytic™ Technology please contact:

Vida Holdings Corp. Ltd.  
Plaza I Suite 301  
2000 Argentia Rd  
Mississauga ON  
L5N 1P7 Canada  
Tel: 905-631-6161  
Fax: 905-631-1852  
Email: [info@vidahc.com](mailto:info@vidahc.com)  
Website: [www.vidahc.com](http://www.vidahc.com)



### Canadian ETV Program Contact Information:

c/o GLOBE Performance Solutions  
World Trade Centre  
578 – 999 Canada Place  
Vancouver, BC  
V6C 3E1 Canada  
Tel: 604-695-5018  
Toll Free: 1-855-695-5018  
Fax: 604-695-5019  
[etv@globepformance.com](mailto:etv@globepformance.com)  
[www.etvcanada.ca](http://www.etvcanada.ca)



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