



## CASE STUDY

## NYSP21 Performs Fuel Efficiency Evaluation of Fuel Additive for O'Brien & Gere

O'Brien & Gere, Inc. of North America (OBG), located in Rochester, New York offers comprehensive, sustainable, and affordable solutions for clients in areas of advanced manufacturing, energy, environment, and water services. They strive to make the world better with every project especially as sustainability and the environment have become global topics.

In a prior project with OBG, the New York State Pollution Prevention Institute (NYSP21) performed an assessment of the proprietary diesel fuel additive using Rochester Institute of Technology's (RIT) Vehicle Dynamics Test Lab. NYSP21 evaluated the additive's impact on fuel efficiency and exhaust gas emissions: CO<sub>2</sub>, NO, NO<sub>2</sub>, O<sub>2</sub>, unburned hydrocarbons, and excess air.

### Challenge

As a result of the prior work conducted, OBG requested that NYSP21 support testing on a larger engine and dynamometer combination. OBG requested NYSP21 to compare the performance and efficiency of a Volvo 13L engine operating on Ultra Low Sulfur Diesel (ULSD) fuel and ULSD treated with the proprietary fuel additive. The formulator of the additive claims to have seen improvements in fuel efficiency of various combustion processes of approximately 20%. If these claims were accurate, OBG would consider building a formulating plant in New York State.

### Solution

NYSP21 worked with G.W. Lisk for the use of their Volvo engine and engine dynamometer test lab to perform a series of tests designed to evaluate the additive's impact on fuel efficiency. Additionally, NYSP21 used RIT's Enerac 700 seven-gas analyzer to compare exhaust gas products with and without the fuel additive. Extensive data analysis was performed on the resulting data using processes developed by RIT using MATLAB™, and Analysis of Variance (ANOVA) and other statistical analyses using Minitab™.

### Results

The work performed by NYSP21 led to key findings of fuel efficiency with a Volvo 13L engine running on ULSD and ULSD treated with the proprietary fuel additive.

Carefully controlled steady state test conditions and statistical analysis of the collected data confirmed that the fuel additive, run profile, and the interaction between them each had very small, but statistically significant, impacts on Brake Specific Fuel consumption.

- Fuel treatment was found to reduce Brake Specific Fuel Consumption from 1.2533 lbs/hp\*hr to 1.2532 lbs/hp\*hr - a decrease of 0.0016%.
- Fuel treatment also showed a significant reduction in CO emissions from a pooled untreated mean of 361 ppm CO to a pooled treated mean of 181 ppm CO, a reduction of 50% when operating in steady state conditions.

### Testimonial

*"I wanted to thank each of you for the support and time you took with this project. I would recommend RIT to my clients and colleagues as a place to come for independent analysis and technology development."*

- Chris Marinucci, Sr. Process & Automation Manager; O'Brien & Gere, Inc. of North America

### CHALLENGE

- OBG requested NYSP21 to compare the performance of Ultra Low Sulfur Diesel Fuel and ULSD treated with a proprietary fuel additive

### SOLUTION

- NYSP21 worked with G.W. Lisk for the use of their Volvo 13L engine and engine dynamometer test lab to perform a series of tests designed to evaluate the additive's impact on fuel efficiency

### RESULTS

- The work performed by NYSP21 led to the identification of a small but measurable change of fuel efficiency with a Volvo 13L engine running on ULSD and ULSD treated with the proprietary fuel additive



## NYSP21 PARTNERS



New York Manufacturing Extension Partnership

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