

# HydraGEN™

## ACHIEVED UP TO 24 % FUEL SAVINGS AND SIGNIFICANT EMISSION REDUCTIONS IN THE MIDDLE EAST

A recent field trial confirms that considerable reductions in fuel consumption and emissions can be realized by using HydraGEN™, even in extreme temperatures.

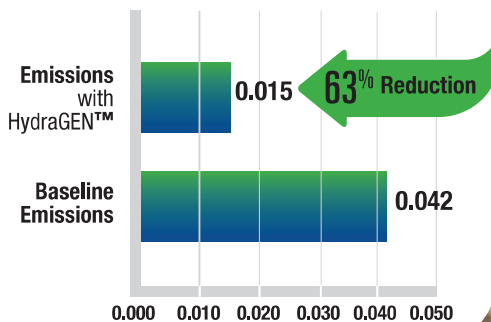
Castle Star installed HydraGEN™ on a crane in the Middle East to see how effective it would be in temperatures up to 58° Celsius. The unit reduced fuel consumption by 18 to 23% at elevated RPM's and showed a reduction of TSP emission by 63% and NO<sub>2</sub> by 18%, thus qualifying for a higher emissions tier limit.



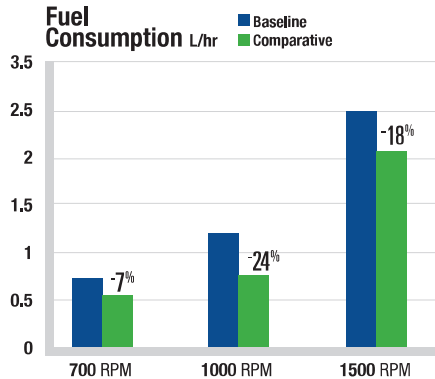
HydraGEN™ is a carbon emission reduction technology designed for all types of diesel engines. The technology uses electrolysis to turn distilled water into H<sub>2</sub> & O<sub>2</sub> gases which are added to the engine airflow. The process enhances the combustion of diesel fuel resulting in more effective elimination of engine particulates and reduced fuel consumption.

**Ask how a HydraGEN™ unit can reduce emissions, fuel costs and maintenance costs on your equipment.**

### Particulate Matter



### Fuel Consumption L/hr



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## TRIAL OVERVIEW:

**DATES:** July - November 2018

**LOCATION:** Dubai, United Arab Emirates

### MACHINE & ENGINE:

A **HydraGEN™** HG1-45 unit was installed on a 90-ton mobile crane with a 11.9 litre, turbo, Mercedes OM 501 engine manufactured in 2004, and rated at Euro II emission standards.

### FACILITATORS:

The emission testing was carried out by a third party - Element Materials Technology - in accordance with US EPA methods. The fuel consumption test was conducted by Castle Star and the client.

### METHODOLOGY:

A baseline test was conducted to measure emissions and diesel consumption without the **HydraGEN™** for comparison. Following the baseline tests, the crane - with the **HydraGEN™** - was then put into service for 500 hours in the peak summer months to ensure the engine was clean and the results of the upcoming test would be uncompromised. On November 9, 2018, the comparative tests were conducted.

## TRIAL DETAILS:

The crane was run at three different load settings (700, 1,000, and 1,500 RPMs) for 6 hours during which periodic readings of the following were taken:

Flowrate & temperature

Total Suspended Particles (TSP)

Carbon Monoxide

Oxides of Nitrogen (as NO<sub>2</sub>)

Carbon Dioxide

Oxygen

*Fuel consumption (L/h) was measured by weighing an external tank over the 6 hour period.*

Parameter g/kWh	Baseline Emissions (vs without HydraGEN™)	Emissions (with HydraGEN™)	% Reduction
Particulate Matter	0.420	0.015	63%
Oxides of Nitrogen (as NO <sub>2</sub> )	0.706	0.581	18%
Carbon Monoxide	0.082	0.081	2%

## CONCLUSION:

The HydraGEN™ unit performed well under the Middle East climate and environmental conditions (up to 58° Celsius) and was successful in reducing emissions and fuel consumption.

