Railroad Applications



Sole Source Technology with 33 Issued Patents





Energy and Emission Solutions



Rentar Fuel Catalyst is Independently Verified to:



- Reduce Fuel Consumption And Extend Range 2.0% To 12.0%
- Reduce Greenhouse Gases (NOx, CO and CO₂) Up To 19.2%
- Reduce Particulate Matter (PM) Up To 58.2%
- Reduce Black Smoke (Opacity) Up To 44.8%
- Extend Engine Life Between Engine Rebuilds 20% to 50%
- Reduce Organic And Elemental Carbon Up To 35.0%
- Reduce Volatile Organics up to 63.0%

Results vary based on the applications, type of engine and type of fuel utilized





Benefits of the Rentar Fuel Catalyst to the Generator / Genset Industry

- Reduces Fuel Consumption
- Increases Work per Gallon
- Reduces Greenhouse Gas Emission
- Extends Engine Life
- Extends Oil Life
- Reduces Engine Maintenance
- 10 Year Warranty
- Easy to Install
- Pays for Itself in Fuel Savings in 3 to 12 Months

Rentar Is Independently Verified By:



- Southwest Research Institute
- EPA & CARB Recognized Laboratories
- Aberdeen Proving Grounds
- Olson Ecological Laboratories
- Engine System Development Center
- Virginia Tech University
- SGS,SA
- Vale Mining
- Yamana Gold
- CEMEX



Reduce Fuel Consumption and Exhaust Pollution Extend Engine and Oil Life















Extend Engine Life 20% Between Rebuilds

RENTAR Fuel Catalyst

Testimonial Letters



Date: 02/05/2012

To whom so ever it may concern

This is to certify that HBL -Rentar Fuel Catalyst having following specifications have been installed at Tata Motors Ltd., Lucknow plant

Sr No.	Model No.	Qty	Mounted on Equipment
1	HBEN 2012	02 Nos.	1010 KVA Cummins DG
2	HBEN 2012	02 Nos.	1010 KVA Cummins DG

Since the installation, Fuel catalysts are performing to our satisfaction at above mentioned DG sets. We are pleased to confirm that we have achieved saving of 15.57% on specific fuel consumption.

For M/s. Tata Motors Ltd.



TATA MOTORS LIMITED Chinhat Industrial Area Lucknow 226 019 Tei 91 522 2818012 2818020 2818032 Fax 91 522 2818246 steed 081cs Banbar Hours 24 Horei Mari Street Murt hai 420 001



Mahindra & Mahindra Ltd Agri Development Centre Tractor Division Kichha Road, Lalpur (Rudrapur) DistL Udham Singh Nagar - 283143 Tel: 91-05944-280724 Fax: 91-05944-280724

Ref no: M&M/RDP/HBL/1204/24

Fel : 91-05944-280723 / 25 Fax: 91-05944-280724 Date: 24th April'12

TO WHOM SO EVER IT MAY CONCERN

This is to certify that HBL RENTAR fuel catalyst has been installed on our generators and boiler applications.

The performance of HBL RENTAR Fuel Catalyst has been good and about 6% HSD saving achieved.

We appreciate the green energy efforts of M/S HBL Power System LTD. towards reducing the fuel consumption and carbon emission.



ered Office: Gateway Building, Apollo Bunder, Mumbai-400001. Phone:2202.1031.Fax : (022) 2202.8780 / 8990



March 21st 2019

We at Mineração Maracá Indústria e Comércio, a YAMANAGOLD job site, have successfully piloted the Rentar fuel catalyst model HBEN 2012 on our CAT 785C haul trucks with results that surpassed our objectives for fuel efficiency with a payback of less than a year. As a result, we have purchased the Rentar fuel catalyst for installation on our fleet.

We are pleased with the support from SOTREQ, our Rentar dealer, and from the direct relationship with the manufacturer itself. We are also pleased with the trouble-free performance of the catalysts, to date.

We are looking forward to our continued use of the Rentar fuel catalysts.



Maintenance Coordinator Tel: +55 62 3383-4049

YAMANAGOLD 15

Mineração Maracá Indústria e Comércio Rodovia GO 347 s/n – Fazenda Genipapo Alto Horizente GO – Brasil 76560-000

http://www.yamana.com





Automotive Research Association of India is co-operative industrial research association by the automotive industry with the Ministry of Industries, Government Of India



Testing Conducted on 6SL8800TA 200 KW Kirloskar 250 Genset Engine Tested with ISO: 8178 D2 - 5 Mode Test Protocol 3.04% Fuel Improvement 58.2% Reduction of Particulate Matter 7.9% NOx Reduction 35.4% CO Reduction 15.4% Hydrocarbon Reduction See Test Study



World's Largest Inspection and Technology Verification Company



SGS Verifies a 17.05% Fuel Reduction*, a 27.5% Reduction of NO_x and 32.5% Reduction of CO.

- Over 97,000 employees
- Over 2,600 offices and laboratories worldwide
- Conducted an emissions study on the Rentar fuel catalyst in 2016
- World's largest inspection and technology verification company





Railroad Engine Laboratory Results



PROJECT NO.: 400-163

REPORT NO.: ARD- 0027

AAR 3-MODE EVALUATION OF THE RENTAR IN-LINE FUEL CATALYST

FINAL REPORT

Prepared for Rentar Environmental Solutions

Compiled By: _______

Distribution:

Distribution Rentar Environmental Solutions ESDC Server

LIBRARY REF. NO .: ESDC 00027-ARD

DATE: May 30, 2003

155 Montreal - Toronto Highway Lachine, Quebec. H8S 1B4 Tel: (514) 634-7700 Fax: (514) 634-3932 Laboratory Recognized by American Railroad Association

Laboratory Reduction Results: At Idle 7.5% At 50% and 100% Power 1.5% Particulate Matter Reduction 11.8% NOx Reduction 15.3% CO Reduction 9.1% Benzene* Reduction 28.3% Toulene* Reduction 36.2% Ethylbenzene* Reduction 35.2% M-xylene* Reduction 52.1

- Cancer Causing Volatile Organic Emissions
- See Published Report



31.1% Average Improvement in Kilowatts Per Gallon



Summary of Findings

The test was performed at the CEMEX Plant at Terminal Varreux (Port au Prince) Haiti. The test was managed, and all data was collected by CEMEX technicians. The generator used was a Caterpillar 3406 C.

A baseline was created, the catalyst was installed (a conditioning clean-out period was observed) and "post" data information was gathered.

The data collected demonstrated a 31.1% average improvement in Kilowatts per Gallon

BASE-LINE (Before Installation) December 2015 January 2016 February 2016 <u>March 2016</u> Base-line Average	7.29 KW per Gallon 8.17 KW per Gallon 8.19 KW per Gallon <u>8.72 KW per Gallon</u> 8.09 KW per Gallon
April 2016	Installation of the Rentar Fuel Catalyst
Conditioning Period April 2016 May 2016	
POST DATA (After Installation) June 2016 July 2016 August 2016 September 2016 October 2016	8.85 KW per Gallon 11.9 KW per Gallon 10.71 KW per Gallon 11.81 KW per Gallon
Post Data Average Improvement In Kilowatt Per Gallon	10.61 KW per Gallon 31.1%

Generators / Gensets







Stationary Generators Fuel Consumption Reduced 4% to 12%

RENTAR Fuel Catalyst



22.1% Fuel Improvement



Summary of Findings

Hanson Aggregate conducted fuel economy studies. They solely managed and collected the data. The results are reported below.

At the Wickenburg, AZ quarry facility, Hanson Aggregate managed the creation of a baseline/ installation of the Rentar Fuel Catalyst under supervision of Mark Jaynes and collection of the "post" data.

The result, as documented in the attached report/ due to the Rentar Fuel Catalyst is a 22.1% average improvement in fuel consumption on a Caterpillar 3406 gen-set.

RENTAR Fuel Catalyst

Caterpillar 3508B Engine Schedule of Annual Fuel Savings at Various Fuel Cost Using the Rentar Fuel Catalyst



Assuming the Caterpillar 3508B Engine Powered Equipment Consumes 20 GPH / 20 Hours per Day / 6 days per Week / 50Weeks per Year

Per Ga	llon Price	\$4.00	\$6.00	\$8.00	\$10.00	\$12.00
	2% Savings =	\$ 9,600	\$14,400	\$19,200	\$24,000	\$28,800
	4% Savings =	\$19,200	\$28,800	\$38,400	\$48,000	\$57,600
	6% Savings =	\$28,800	\$43,200	\$57,600	\$72,000	\$86,400
	8% Savings =	\$38,400	\$57,600	\$76,800	\$96,000	\$115,200

Results vary based on the applications, type of engine and type of fuel utilize



VALE S.A. (SOSSE	GO MINE)	Actual			
<mark>САТ 793D</mark> (САТ3516В)	Liters	<mark>US\$0.59/L</mark> (\$ cost)	4% fuel reduction (\$ savings)	<mark>5.29%</mark> fuel reduction (\$ savings)	7% fuel reduction (\$ savings)
Hourly	<mark>157.33 L</mark>	\$92.82	\$3.71	\$4.91	\$6.50
Day – <mark>12 hours</mark>	1,887.96	1,114	44.56	59.00	78.00
Month – 30 days	57,426	33,881	1,355	1,792	2,372
Year	689,106	406,573	16,263	<mark>21,508</mark>	28,460
Five Years	3,445,531	2,032,863	81,315	107,538	142,300
10 Years	6,891,062	4,065,726	162,629	215,077	284,601

Approximate time to payback for a haul truck at SOSSEGO Mine is 5.6 months*

* Using a total product cost of US\$10,000 for two Rentar fuel catalysts on a CAT 793D haul truck at 5.29 percent fuel reduction

The haul truck requires two HBEN2012 units at an MSRP of US\$5,000 per unit.





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Simple Installation







\$2 Million International Product Liability Insurance

Credentials



World's 4th Largest Caterpillar Dealer A Rentar Distributor 400 Offices - 4300 Employees



Export-Import Bank of the United States Official Export Credit Agency







Rentar Case Studies

CASE STUDY



COVANTA ENERGY

Covanta Holding Corporation (NYSE: CVA) is an international owner and operator of Energy-from-Waste power generation projects converting municipal solid waste into renewable energy for numerous communities throughout the United States.

2009 consolidated operating revenues were \$1.55 billion with \$397 million in operating cash flow and adjusted EBITDA of \$515 million.



Installed Rentar Fuel Catalyst on entire fleet of heavy-duty diesel vehicles at 28 plants around the United States.

- 5% reduction in fuel consuption.
- 43.6% reduction in CO2 emissions.
- 75.9% reduction in CO.
- 47.7% reduction in NOx
- 52.6% reduction in particulate matter.

CASE STUDY



U.S. ARMY

Located in Hartford County, Maryland on 79,000 acres with research capabilities in Automotive; Environmental Effects & Technologies; Fire Control; Firepower; Support and Survivability/Lethality; Warfighter & Support Equipment.





The Aberdeen Test Center tested Rentar units on a Navistar International 359.9 cu. in, 170 hp. diesel engine and reported the following:

- 3.6% Fuel Consumption improvement.
- 3.6% Extended Range improvement.
- 12% NOx improvement.
- •14% CO2 improvement.
- 17.4% CO improvement.
- 12.6% HC improvement.
- 10.9% O2 improvement.

CASE STUDY



TOYOTA

Toyota Motor Company, established in 1937, is today the world's largest automobile manufacturer by sales (7,051,000 units FY 2009), with 320,808 employees building autos under the DAIHATSU, HNO, LEXUS and TOYOTA brands.



Toyota has installed Rentar Units of all their auto transport trucks operating in the Port(s) of Long Beach & Los Angeles with the following results:

STEADY STATE (Highway Driving)

- 11.3% Fuel Consumption improvement.
- 42.2% Particulate Matter improvement.
- 9.7% CO₂ improvement.
- 33.5% Carbon Monoxide improvement.
- 36.8% Total Hydrocarbon improvement.

Logos of Rentar Fuel Catalyst Purchasers







THANK YOU

Rentar Environmental Solutions, Inc. Manufacturer of the Rentar Fuel Catalyst

Contact: Joel Ratner - Telephone: (561) 790-0093 Email: JoelRatner@Rentar.com

Website: DieselCatalyst.com