

Unilever
El Dorado Plant
Central America



Fuel: Bunker

Machine/Type: Boiler

Test: Combustion Efficiency

Xp Lab, Inc.

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OBJETIVE

Testing the combustion efficiency and Fuel Oil consumption saving when Xp3 fuel treatment is used.

Combustion tests allow us to determine the behavior of the fuel with and without Xp3 treatment at different loads of operation (fire: low, medium, high); including steam produced per gallon of fuel consumed.

TESTING

This work was carried out from October 30 to November 30, 1999 using the following tests procedures and equipment:

- The flue gases were measured using a Testo 325-1.
- The parameters measured were: O₂, CO₂, excess air, temperature, gas, and efficiency.

Detail data of the everyday steam produced at the Dorado plant and correspondent fuel consumption were provided.

EQUIPMENT

York Shipley 800 HP Firetube Boiler with an income capacity of no more than 32,200,000 BTU/Hr.

Measurement equipment used for combustion control:

- Fuel Temperature
- Fuel Pump Pressure
- Air Pressure
- Fuel Pressure
- Vapor Pressure

OBTAINED RESULTS

The results (averages) obtained in the combustion gases tests were as follows:

Oxygen O2%

Load	Without Xp3	With Xp3
Low	6.5%	4.0%
Medium	4.5%	3.7%
High	2.0%	1.5%

CO2

Load	Without Xp3	With Xp3
Low	11.3%	13.2%
Medium	12.8%	13.4%
High	14.8%	15.2%

Excess of Air

Load	Without Xp3	With Xp3
Low	45.1%	24.2%
Medium	27.7%	21.8%
High	10.6%	7.8 %

Efficiency

Load	Without Xp3	With Xp3
Low	87.7%	88.6%
Medium	87.8%	88.2%
High	88.6%	88.7%

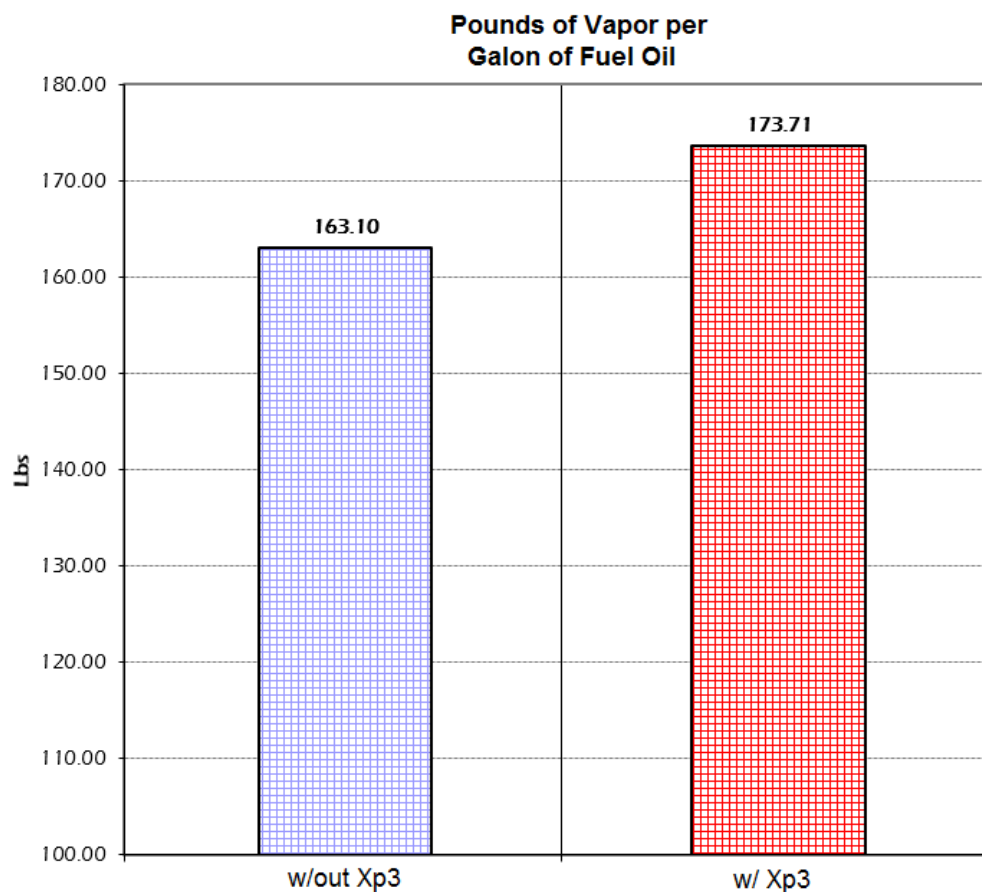
From the very start of the test an increase in the combustion efficiency was noted with Xp3. This provided an end result average reduction in soot of about 20%, which meant a reduction of 1,872 pounds of soot in a year and a 6311% savings of fuel consumption.

CASE STUDY



An everyday control of steam production vs. fuel consumption was measured in order to quantify the fuel savings when Xp3 fuel treatment was used. In addition, soot production and lbs. of steam from water used were measured, with the following results:

Description	Without Xp3	With Xp3
Lbs. Steam/Glls. Fuel:	163.10	173.71
Lbs. Steam/Glls Water:	15.89	15.89
Lbs. Soot/Glls Fuel:	26.91	21.71



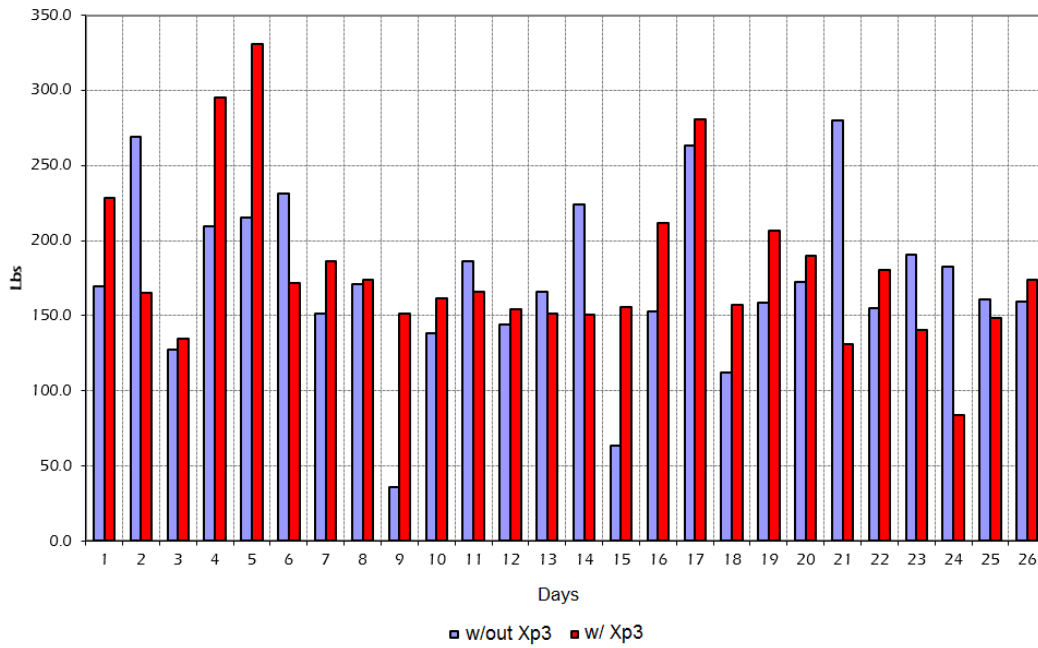
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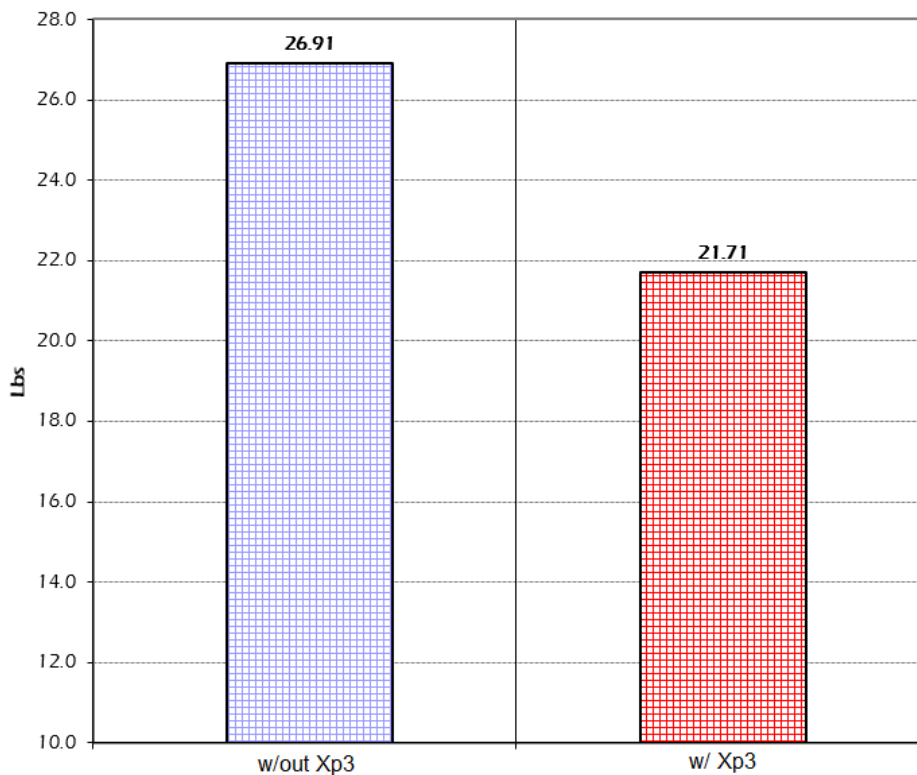
CASE STUDY



Pounds of Steam per Fuel Oil Galons per day



Pound of Ash per Gallon of Fuel Oil



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