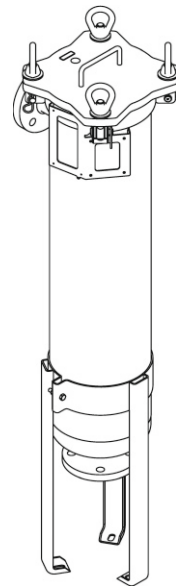
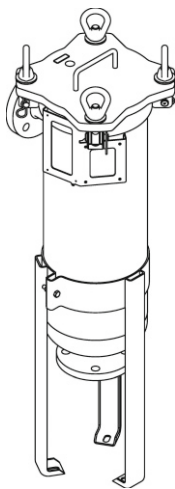




# GREEN FUEL CATALYST

## Onboard “Mini Refinery”

For Reduction of Fuel Consumption and Emissions



[www.greenfuelcatalyst.com](http://www.greenfuelcatalyst.com)

Made in USA

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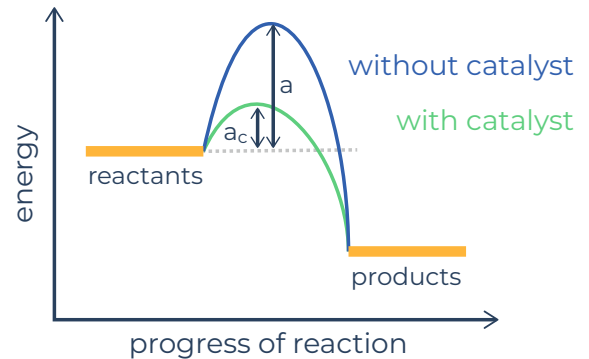
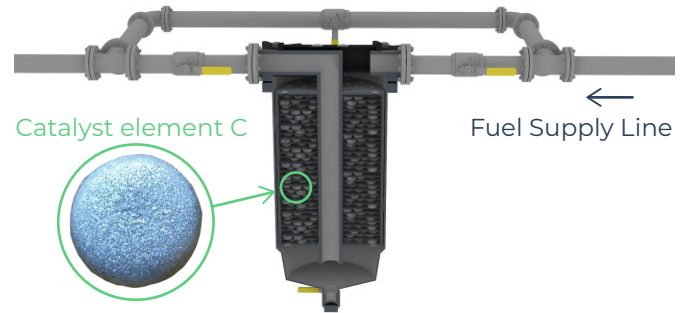
Patented Fitch® fuel catalyst technology

## Operating Principle

Patented Fitch® catalyst technology consists of a Heterogeneous Metallic Alloy Composition (HMAC) which reduces activation energy of the chemical combustion reaction.

Catalyst reverses the naturally occurring hydrocarbon fuel biodegradation (Oxidation-Reduction) process by inducing selective hydrogen abstraction and redistribution (Hydrogenation) that promotes selective Oxidation (formation of Alcohols, Aldehydes). Catalyst cracks the aromatic (non-reactive) compounds forming oxygen containing molecules with greater energy yield and higher combustibility.

Catalyst alloy performs at ambient temperatures and pressures, and in the fuel restoration process is not consumed lasting for 10,000 operating hours.



## Overview

- ◆ Reformulating all fuel oil types
- ◆ Average ROI 4 to 6 months
- ◆ No moving parts
- ◆ No electrical hook up
- ◆ No significant pressure loss
- ◆ No magnets
- ◆ No chemical additives
- ◆ Minimum overall maintenance with no maintenance for lighter fuels
- ◆ Easy to install
- ◆ Excellent results with all marine fuel oils
- ◆ US Coast Guard accepted
- ◆ Military grade and quality
- ◆ Housing assembly ABS Design Assessed

## Benefits

- ◆ Reduce fuel consumption by over 2%
- ◆ Reduce carbon footprint and greenhouse gases by over 2%
- ◆ Reduce bacteria growth
- ◆ Enhance and stimulate combustion
- ◆ Enhance useful energy content
- ◆ Ensure fuel quality during storage
- ◆ Improve fuel lubricity
- ◆ Increase cetane number
- ◆ Improve engine power and torque
- ◆ Lower soot content in the lubricating oil
- ◆ Minimize fuel system maintenance
- ◆ Minimize exhaust system maintenance
- ◆ Reduce carbon build up within engine
- ◆ Extend engine lifetime

## Application Range

- ◆ Container ships
- ◆ Bulk carriers
- ◆ Oil & chemical tankers
- ◆ Gas carriers
- ◆ Passenger ships
- ◆ Offshore service vessels
- ◆ Tugs
- ◆ Yachts
- ◆ Dredgers
- ◆ Fishing vessels
- ◆ Navy ships
- ◆ Cargo ships
- ◆ Roll-on, roll-off ships

## Technical Specification

- ◆ Steel bowl assembly
- ◆ NPT or flanged versions available
- ◆ Hardware is black zinc plated
- ◆ Designed to withstand 300 PSI (20 bar)
- ◆ Designed temperature -20° F (-28,9° C) Min., 500° F (260° C) Max.
- ◆ Fuel flow rate up to 379 l/min
- ◆ Manual drain and vent valves
- ◆ Low pressure drop of 1.5 PSI (10 kPa)

## Fuel Flow Rate per Catalyst Model

Catalyst Model	MGO/MDO		HFO	
	GPM	LPM	GPM	LPM
FHD-5-19-1.5	5	19	4	13
FHD-10-38-1.5	10	38	7	26
FHD-15-57-1.5	15	57	11	40
FHD-20-76-1.5	20	76	14	53
FHD-25-95-1.5	25	95	18	66
FHD-30-114-2	30	114	21	79
FHD-40-151-2	40	151	28	106
FHD-50-189-2	50	189	35	132
FHD-60-227-2	60	227	42	159
FHD-70-265-2	70	265	49	185
FHD-80-303-2	80	303	56	212
FHD-90-341-2	90	341	63	238
FHD100-379-2	100	379	70	265

GPM – gallons per minute  
LPM – liters per minute

# Installation Samples

## ◆ Ocean Class Tug project

Engine: Twin Caterpillar

C280-12 – 8,133 kW

Engine: Wärtsilä – 5,800 kW

**Fuel Savings: 4-9%**



## ◆ Cruise ship operator

Engine: 4 x MAN B&W 14V 48/60

58,800 kW Combined Power

**Fuel Savings: 4%**



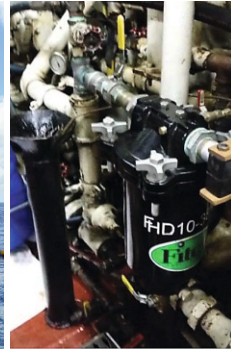
## ◆ Marine operator installed catalysts on 30 super seiners

Engine: GE16V250MDB, 4038 kW

Other engines: EMD645F, CAT3412,

MAK 6M551AK, CAT C32.

**Fuel Savings: 5-8%**



# Certificates, Tests, and Approved Inspection Reports



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