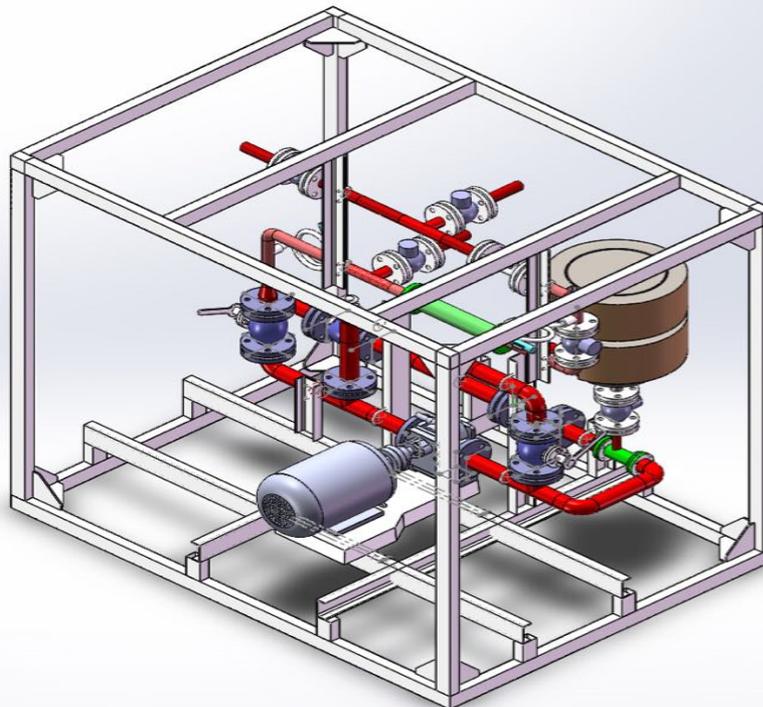
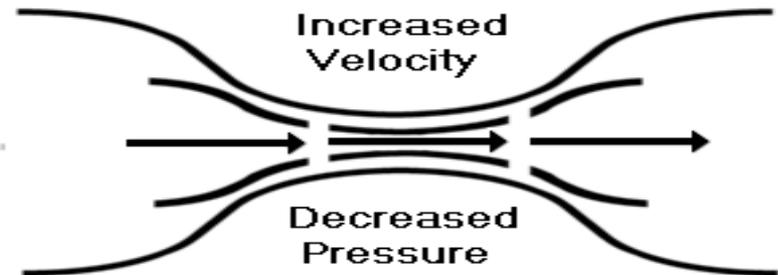
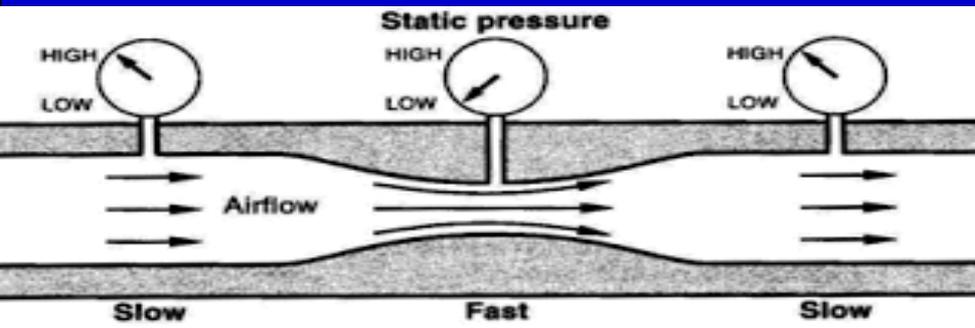


FUEL MODIFICATION SYSTEM



Why You need Fuel Modification System

Fuel Oil (FO) and especially Heavy Fuel Oil (HFO) is not homogenous and has an average droplet size of 70 micron and larger. **It contains numerous much larger clusters of asphaltenes and complex long-chain hydro-carbons, which will not burn completely.**

HFO is a refinery waste stream product with a high BTU content used as fuel oil. Centrifuges and automated filters are used to clean the fuel and **a percentage of the purchased fuel ends up in the slop tank, which is waste to the user.**

HFO needs to be heated and pressurized before it can be used to operated engines or boilers. Exposing fuel to heat and pressure will unavoidably **increase the size and mass of the fuel droplet, change the physical condition of the oil and negatively impact the combustion process.**

Our Fuel Modification System (FMS) will resolve those problems.

What is our Fuel Modification System

FMS is Equipment based **on the cavitations principles**, which will create a high speed flow of the fuel/heavy fuel, water and fuel waste in the reactor and **through cavitations process** will create a homogenized stable fuel with smaller fuel particles

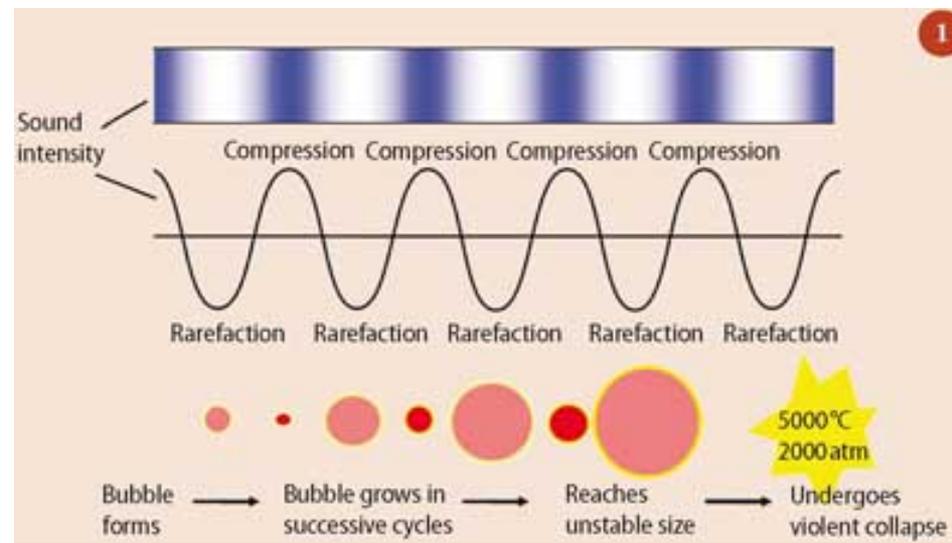
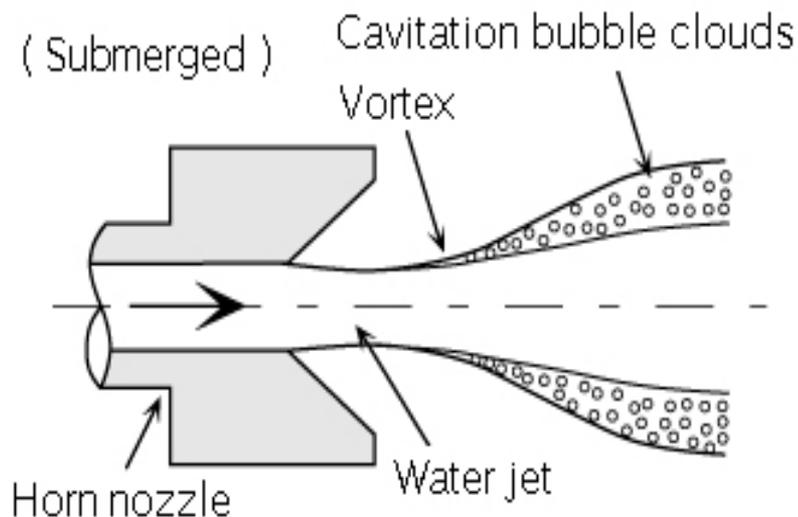


What is our Fuel Modification System



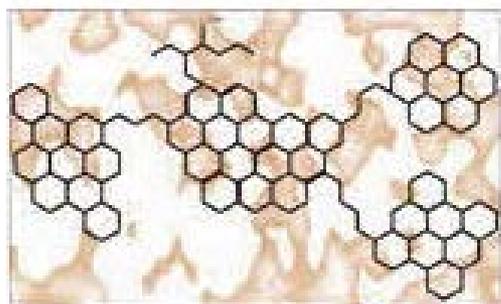
What is cavitation

Cavitation is the formation of vapor cavities in a liquid – i.e. small liquid-free zones ("bubbles") – that are the consequence of forces acting upon the liquid. It usually occurs when a liquid is subjected to rapid changes of pressure that cause the formation of cavities where the pressure is relatively low. When subjected to higher pressure, the bubbles will implode and can generate an intense shock wave.

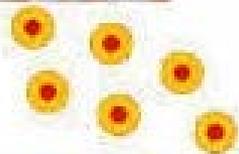


How cavitation principle works in FMS

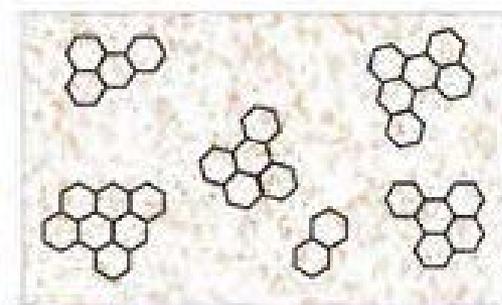
Cavitation is well known for its negative effects of destruction of ship rotating blades or other objects in high speed flow of liquid, but we construct **a reactor which use the imploding power of the bubbles to break the big size molecules of the heavy oils into the smaller particles.**



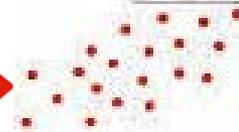
asphaltenes formed
into cotton-like strands
in residual oil



CAVITATION
REACTOR



asphaltenes sheared back
to ca. 5 μm and
homogeneous blend



Benefits of Using Equipment

Implementing FM shall:

- Enhance combustion and increase heating value (BTU) of fuel oil;
- Improve fuel economy, extend engine overhaul intervals and lower overall operating costs;
- Make light fuel oil (viscosity 10 cst) from heavy fuel oil with minimum use of light fractions (gas oil, diesel, etc.);
- Use fuel oil with water by distillation up to 10%-18% (without dewatering)
- Reduce emissions of CO and NO and reduce sulphur content
- Reduces fuel droplet size to 3 micron and smaller to enhance the cleaning process
- Reduce the waste sludge going to the slop tank for disposal by 80%-90%.
- Use sludge together with fuel oil in boilers and burners
- Chemical-free approach for best treatment of heavy fuel oil, water in-fuel-emulsion and sludge
- Equipment doesn't need big capital expenses and changes to existing companies' schemes of fuel oil consumption

Scope of application

Boilers (with fuel oil or heavy fuel oil consumption)

(food industry, heat generation, pharmaceuticals, alcohol industry)

Open Flame Burners

(metallurgy, cement industry, asphalt production plants)

Ship Engines (with fuel/heavy fuel oil use)

Any applications for blending fuels to adjust viscosity or sulfur content

(Blending fuels of different viscosities to produce a stable homogenous fuel of the desired viscosity. The system can also be utilized to blend batches of fuel to adjust for sulfur content.)

Any applications to reuse sludge & waste oil

(The current “waste stream” can now be converted to “fuel” and the “new” fuel will have the same efficiency as the conventional fuels)

Specification of the FMS

Pressure: 3-15 bar

Temperature: 90°C- 250 °C for HFO

Power supply: 400V@50 Hz / 460V@60Hz

Control Panel: 230V@50Hz / 250V@60Hz (Transformer in control panel)

Protection Class: IP54

Capacity and power:

Flange Connections: SAE Flange (counter SAE flange is supplied with system.) or other as per contact specification

Score of delivery of FMS include the following components:

Fuel Modifier reactor

Electronic Cabinet

Frame

Pumps, flanges, valves

4 hrs Workshop Test and training

2 x Operating Manuals

Laboratory Analysis Results

IFO60 + 20% H2O Specifications

Parameter		IFO60	H2O	SFO 60
Sulphur, wt %, max.		3		1.65
Viscosity @ 50 deg C, cst, max.		10		10
Density @ 15 deg C, kg/l, max.		0.87		
Heating Value, Btu/lb				18760
*Water by Distillation				1.0
Remarks: Sample tested as received.				
*Test is accredited by Philippine Accreditation Bureau (PAB), DTI, Philippines in accordance with the scope of PNS ISO/IEC 17025:2005.				

IntElorg at a Glance

- Incorporated on 22 February 1990 as a joint venture between Intraco, Singapore , (Temasek Holding) and Elorg, USSR, (Foreign Trade Ministry)
- Headquartered in Singapore and regional offices in Russia (Moscow), Taiwan (Taipei), China (Shanghai), Thailand (Bangkok), South Korea (Seoul).
- Rank within Singapore 1000 Companies, Top 100 International Company and Top 50 Fastest Growing Company.
- Have over 200 long term customers
- Provide turn key solutions for upgrading the furnaces , using HFO, including expertise, equipment delivery, installation services, training.

How to Start

If you are interested to investigate the opportunities in saving costs for fuel consumption , reducing emissions and waste sludge please send us your inquiry and answer the questions below:

1. What fuel/fuels do you use? Please specify the specifications of the fuel (viscosity,flash temperature) if you have them?
2. What is fuel consumption per day?
3. How you measure the fuel consumption? Do you have fuel consumption statistics ?
4. Please inform the cost of the fuel for your application?
5. What is the size of the fuel tanks , which you have?
6. What kind of burner do you use and its specifications?

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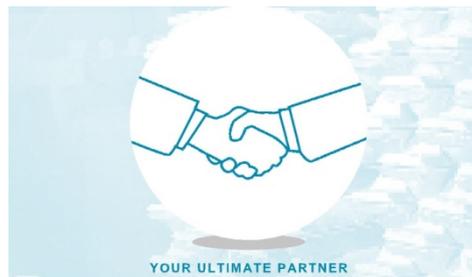
Igor.khilko@intelorg.com.sg

The End

Contacts

Hope you enjoyed our presentation

Please feel free to ask us any questions
We'll be most happy to answer them



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The End