



Eneco Holdings

Fuel Business

Eneco Holdings has succeeded in the technological development of complete fusion of water and oil



Compared with current mixing technologies that allow for easy separation, Eneco achieves "complete fusion" of water and oil by ultra-purifying components to the molecular level, thus realizing a safe next-generation high quality and environmentally friendly fuel. Originally, due to specific gravity, the mixing ratio of water was limited to 20 percent. By applying nano-emulsion technology, a ratio with about 50% water can be used as fuel regardless of oil type.

The technology that achieves a mixing ratio of about 50% using tap or well water is "Eneco PLASMA FUSION".

From mixing to fusion

"Eneco PLASMA FUSION"

Course of evolution

Conventional emulsion

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Nano emulsion

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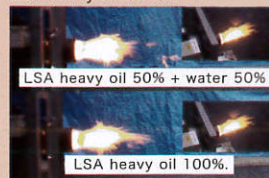
Eneco PLASMA FUSION

The most advanced technology that evolves the conventional emulsion technology of "mixing" water and oil into a "complete fusion" is "Eneco PLASMA FUSION".

Eneco PLASMA FUSION combustion experiment

Experiment was conducted to confirm whether the energy source that was generated by Eneco PLASMA FUSION produces effective energy. High numerical values are recorded in combustion tests and environmental tests. By utilizing our unique technology, we succeeded in "reforming technology of oil and water" and in purifying next-generation fuel with high combustion efficiency and environmental characteristics equivalent to that of base oil.

Combustion experiment of LSA heavy oil 50% + water 50%, LSA heavy oil 100%.



Combustion experiment of kerosene 50% + water 50%, kerosene 100%.



Our factory has been already using this.



1 - 1.5t is used per day

Environmental test result (heavy oil)

| Classification | Water addition rate 0% | Water addition rate 70% | Reduction % |
|---------------------|------------------------|-------------------------|--------------|
| CO ₂ (%) | 15.6 | 8.6 | 44% decrease |
| Carbon Dioxide | | | |
| SOx (ppm) | 38 | 13 | 65% decrease |
| Sulfur Oxide | | | |
| NOx (ppm) | 87 | 72 | 17% decrease |
| Nitrogen Oxide | | | |

*Above figures are measurement results of a boiler installed at our factory. Depending on the equipment used by the customer, in some cases the above measurement results may not be obtained.

Component/caloric value test result (heavy oil)

| Classification | Water addition rate 0% | Water addition rate 70% | JIS2205 Standard Requirement | Comparison |
|---|------------------------|-------------------------|------------------------------|-------------------|
| Reaction | Neutral | Neutral | Neutral | Equivalent |
| Ignition point (°C) | 68.5 | 85.0 | 60 or more | Equivalent |
| Heavy viscosity @ 50°C (mm ² /s) | 2.296 | 2.690 | 20 or less | Equivalent |
| Pour point (°C) | -22.5 | -25.0 | 5 or less | Equivalent |
| Residual carbon content(% by mass) | 0.16 | 0.04 | 4 or less | Equivalent |
| Water (% by volume) | 0.00 | 0.25 | 0.3 or less | Equivalent |
| Ash (% by mass) | 0.010 | 0.010 | 0.05 or less | Equivalent |
| Sulfur content (% by mass) | 0.245 | 0.078 | 0.5 or less | Approximately 1/3 |
| Net calorific value (J/G) | 45,120 | 44,820 | - | Equivalent |

Eneco PLASMA FUSION product comparison

Using a 50% water ratio with each heavy oil, light oil, kerosene and BDF(biodiesel fuel), we compared conventional emulsion technology and Eneco PLASMA FUSION technology. The superiority of the technology is evident not just by details but even in the appearance.

Left -> Heavy oil 100%

Middle -> Heavy oil 50% + Water 50% (conventional technology)

Right -> Heavy oil 50% + Water 50% (Eneco technology)



Heavy oil

Left -> Light oil 100%

Middle -> Light oil 50% + Water 50% (conventional technology)

Right -> Light oil 50% + Water 50% (Eneco technology)



Light oil

Left -> Kerosene 100%

Middle -> Kerosene 50% + Water 50% (conventional technology)

Right -> Kerosene 50% + Water 50% (Eneco technology)



Kerosene

Left -> BDF 100%(raw material:Jatropa)

Middle -> BDF 50% + Water 50% (conventional technology)

Right -> BDF 50% + Water 50% (Eneco technology)



BDF (raw material:Jatropa)

Bus runs on public roads with Eneco PLASMA FUSION fuel

Since Eneco PLASMA FUSION fuel has no change in output compared to normal fuel, we not only can run on public roads, but also significantly reduce carbon dioxide and carbon monoxide emissions.



Currently, it runs on public roads with Eneco PLASMA FUSION fuel.

Eneco PLASMA FUSION fuel (water 50% + light oil 50%)

Light oil 100%

CO₂ %

2.5

4.6

CO ppm

154

519

It reduces carbon dioxide and carbon monoxide emissions dramatically as opposed to using 100% light fuel.

Eneco PLASMA FUSION H EPF-H500

Eneco PLASMA FUSION H
EPF-H500 video



Complete fusion is possible between heavy oil, light oil, kerosene and BDF(biodiesel fuel) with a water rate of about 50%. The equipment has purifying capacity of "500ℓ/h, 12t/day" and 24 hours x 365 days continuous operation is possible.

Product specifications

- Size: W10,500mm×D4,900mm×H4,000mm
- Weight: about 21.2t (with no water or oil)
about 60.7t (with water and oil/MAX)

*Specifications may be changed depending on the location to be introduced.

Applications

- Industrial field (burners)
- Boilers (steam/hot water)
- Generators (applicable from small to large size)
- Ships

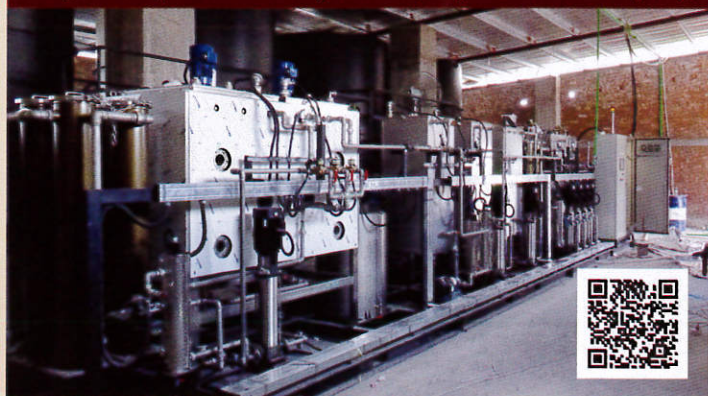
*Other uses of purified fuel may require separate confirmations.

PL insurance application

Applicable when equipment failures result from use of Eneco PLASMA FUSION fuel.

Introduction example of Eneco PLASMA FUSION H EPF-H500

People's Republic of Bangladesh (Major textile company)



Republic of Indonesia (Major oil company)



Eneco PLASMA FUSION fuel improving all the problems of conventional emulsion fuel

The reason why emulsion fuels global development has not reached a practical level yet ...



1. Water and oil separate with time, engine and equipment break down.
2. Mixing water causes reduction of output.
3. Color of fuel after emulsion is not equivalent to base oil.
4. Base oil and specific gravity change.
5. Equipment and engines must be converted to emulsion fuel specifications.

Conventional technology



We have improved all of the above issues for the first time in the world

1. It does not separate with time even when mixing water and oil. The engine and equipment are no damage accordingly.
2. Output does not decrease.
3. Color equivalent to base oil.
4. Same specific gravity.
5. There is no need to modify equipment or engines.
6. PL insurance is applied to fuel which is refined by Eneco PLASMA FUSION.

"Eneco PLASMA FUSION fuel" possible for use in present day equipment/vehicles (cars heavy machinery, ships, equipment, engine, etc.), without modification, that are currently using fossil fuels (light oil, heavy oil, kerosene, etc.).

Our technology

