



S&P GLOBAL PLATTS  
GLOBAL ENERGY AWARDS  
2018 Finalist

# Sulfex™ - Desulfurization simplified

Stringent EPA and global environmental regulations are demanding dramatic reductions in sulfur levels in fossil fuels to less than 15 parts per million (PPM) from several hundred PPM and heavy oils from several percent to less than 1%. Currently, desulfurization occurs in a process called Hydro-Desulfurization that uses hydrogen gas, high temperatures (300 to 400 degrees Celsius), and high pressures (30 to 130 atmospheres) to modify sulfur bearing compounds so they can be removed. However, this process is limited to large refineries because capital and operating costs are too high. In order to meet the needs of small refineries and pipeline end users such as fuel distributors, AET has successfully designed and built a cheaper method of reducing the sulfur content of fossil fuels. The main cost-saving advantage of AET's patent-pending approach is that the fuel is not processed under high temperatures and pressures. It also does not need large amounts of ancillary equipment. These items are both capital and operationally expensive. Sulfex™ is operationally much simpler and thus not just much cheaper but also much safer to use than traditional processes.

AET's laboratory, pilot plant, and small-scale industrial plants have resulted in as much as 99.9% reductions of all sulfur compounds found in existing high sulfur fuels and middle distillates sourced from various refineries. AET has treated twenty (20) different types of diesel and gasoline fuels including U.S. Navy JP-5 jet fuel, U.S. Marine F-75 diesel fuel, high sulfur kerosene, other middle distillates along with heavier fuels such as mazut, bunker fuel and tire pyrolysis oils. In addition to dramatically decreasing sulfur levels, AET's process can simultaneously remove other contaminants such as dirt, water and polar chemical contaminants to comply with EPA regulations.

**ALTERNATIVE ENVIRONMENTAL TECHNOLOGIES**

**Sulfex™**  
**Desulfurization Simplified**

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**No need for High Heat or High Pressure vs. HDS**

**1/10<sup>th</sup> of the Capital Costs**  
**1/2 of the Operating Costs**  
**+ Cleaner and Safer**

**Much Lower CO<sub>2</sub> than HDS**

**Removes Contaminants**

**Original Reacted Desulfurized**  
**High Sulfur Fuel**

**Validated by:**  
**Argonne NATIONAL LABORATORY**  
**U.S. DEPARTMENT OF ENERGY**

To fully demonstrate the its Sulfex™ system, AET has also built two pilot plants at its Reno, Nevada facility. AET's Sulfex™ processes have been independently verified by the U.S. Department of Energy's Argonne National Laboratory (www.anl.gov). Separately, Fluor (NYSE: FLR), a global engineering firm, has reviewed and confirmed the accuracy of the initial plant heat and mass balance.