

A close-up photograph of a red industrial machine. A black component is visible, with a white tube or pipe entering it. The machine has several circular openings and bolts. The background is dark and out of focus.

oilon

Oilon - One degree better

“ Creating energy technology
for sustainable future



OILON GROUP

Creating energy technology for sustainable future.

Oilon is a family-owned, global energy and environmental technology company, founded in 1961. Oilon specializes in environmental technology with a special emphasis on research and development. The focus areas of the research and development are on improving energy efficiency, decreasing emission levels, and developing new solutions using renewable energy sources.

The focus technologies are:

- industrial heat pumps and chillers
- ground source heat pumps
- burners and combustion systems for liquid and gaseous fuels in the capacity range of 10 kW – 90 MW

The service activities are in an important role throughout the product life cycle.

Oilon solutions and systems are used for heating and cooling large buildings and facilities, and for heating private houses. Key industrial customers include power plants, pulp and paper mills, process industry, waste incineration plants, marine operators, and districts heating plants.

Oilon with its turnover of 85 million euros has 400 employees. Oilon has operations in Finland, USA and China, and sales offices in Brazil and Germany, and in addition, more than 70 resellers worldwide.





Burners

The art of clean combustion

Oilon is an international energy technology company whose products support sustainable development by directly and measurably reducing emissions. Oilon's goal is to promote sustainable development and set a good example in the fight against climate change. As a 60-year-old family business, we find it important to preserve nature for future generations as well.

Oilon is a pioneer in first-rate low emission burner technology. Our selection of burners promotes the transition to cleaner and renewable fuels.

Oilon is a pioneer in first-rate low emission burner technology.

The excellent performance and reliability as well as the low emissions of Oilon burners are the result of decades of experience and long development. Depending on the solution, our burners can achieve the most stringent emission requirements in the world.

Additionally, we provide combustion solutions for hydrogen, biogases, bio-oils, and other renewable fuels.

We have wide-ranging experience in firing different liquid and gaseous fuels. Thanks to our global dealer network, local presence on five continents, and extensive product ap-

proval and certification, we can offer burners and combustion technology to different customers and a wide range of applications across the globe.

Our modern research and development center in Lahti, Finland is equipped with the latest technology for combustion research,

testing and data collection. In addition to testing, we simulate combustion processes with computational fluid dynamics (CFD) modeling.

We are especially committed to reducing nitrogen oxides (NOx) and particulate emissions.



Sustainable fuels – Oilon solutions for a better future



In the dialogue on renewable energy, the concepts that come up most often are solar power, wind power, hydro-electric power, and ground-source heating. However, there are many applications where biofuels are an unbeatable solution.



Currently, fossil fuels have a tremendously strong position in the energy sector, while the trend for the next decades is clearly shifting towards sustainable solutions. Oilon's product development stands at the forefront of utilizing renewable energy solutions.

Examples of sustainable fuels include biogases, bio-oils, and pyrolysis oils produced from biomass. As such, there is nothing new about using renewable fuels. At pulp mills, for example, the black liquor produced as a byproduct of the pulping process has been used for decades to produce heat and electricity.

Pyrolysis oil is a liquid substance created through dry distillation of organic material. When made of biomass, it is called either bio-oil or wood oil depending on the raw material. Typical sources of pyrolysis oil include wood, bark, straws as well as rice and grain chaff.

Pyrolysis oils are a challenging fuel. They have a high acidity and water content, and their viscosity and other physical properties tend to be unstable. Additionally, many

pyrolysis oils have a high content of solids, requiring special solutions for combustion.

"Oilon has a long experience in firing different pyrolysis oils and the necessary competence to select the best materials and the best combustion technology for the purpose. For example, when using these fuels, selecting the right fuel pump is critical. Many bio-oils have a low heating value, and we consider each site's and application's characteristics to determine the right combustion technology solution for the site," says Chief Business Officer Tapio Murtonen.

Additionally, there are renewable oils whose properties are nearly identical with fossil oils. Hydrotreated vegetable oil (HVO), for example, is a type of high-quality renewable diesel that has the same high heating value as light fuel oil. However, an HVO flame emits different wavelengths of light than a fossil oil flame, which means that it is important to select the right flame detector for the flame. Oilon has performed extensive research on HVO combustion in their own product development laboratory. Thanks to extensive testing, Oilon has now the competence for selecting and

adjusting flame detectors and other burner components for different fuels.

Renewable oils are becoming more widely available. As combustion technology allows companies to create and promote sustainable energy solutions, an increasing number of oil companies are bringing new renewable liquid fuels to the market alongside their traditional products.

Biogases are another fuel with massive potential. Biogas can be produced from all organic matter, the most important sources being waste, crop residue, and wood. Additionally, biogas is generated as a byproduct of agriculture and processes such as wastewater treatment. As a fuel, biogas is excellent: it has a good heating value and low particulate emissions.

Refined biogas is completely free of heavy metals. Biogas is produced from waste and field residues through anaerobic digestion. Organic matter, such as municipal biowaste, manure, or straws, is placed in an oxygen-free environment. Bacteria break up the matter, releasing methane and, in most cases, byproducts that are suitable for use

as fertilizer. In other words, both the energy and the nutrients can be recovered and returned to circulation.

Wood-based biogas is typically produced through gasification. Woodchips, forest residues, and other materials are headed up at a high pressure in a low-oxygen environment, releasing gas from the material. This gas can be further refined into a fuel that was nearly the same composition as natural gas. Naturally, compared to other biofuels, this type of biogas is relatively easy to adopt.

Whatever the energy source may be, Oilon's professional sales team makes it easy for customers to select an energy-efficient burner and sustainable solution for their needs.

Oilon delivers low NOx combustion equipment to a pioneering 1400 MW district heating project in Kazakhstan



Oilon is delivering 20 low NOx burners to a massive district heating project in Astana, the capital of Kazakhstan. Two large district heating plants with a heating power of 700 MW each will be serving new advanced residential areas of Astana, called Telmana and Turan.

The identical plants, which use natural gas as their primary fuel, will each host ten Oilon ACE burners.



“This deal is the largest for us in Central Asia to date and we see it as just the beginning,” says Taras Golub, Sales Director at Oilon.

Positive and significant market outlook in Central Asia

The continental climate in Astana brings winter temperatures as low as -30°C or -40°C . Previously, the heating solutions in the city, which has a population of 1.4 million, were very localized and fossil-fuel

based, relying on light fuel oil and heavy oil that resulted in high emissions and poor air quality.

Now, Astana is taking a lead in investing in gasification, and smaller cities are likely to follow. A major driver for energy technology improvements in this former Soviet market is their newly formed government with a new, more western-oriented approach to politics and a focus on improving the quality of life for citizens and allocating resources to

support this goal.

“Kazakhstan is contributing to the green transition, applying the most stringent European and North American emission level standards. Along with high performance, clean combustion was a top priority for the client, and the burners’ emission levels are well below the European standards”, says Golub.

“This pioneering project is a great example of how the government is investing in regular people’s lives. The new district heating power plants will be an important step towards a more environmentally-friendly way of keeping citizens warm and improving air quality.”

Fuel flexibility and low emissions

Oilon’s delivery includes three types of ACE burners: models GT-70A, GKT-70 A, and GT-90 A. ACE burners can typically reach NOx emissions as low as $60 \text{ mg} / \text{nm}^3$ and adding flue gas circulation NOx can reach emission levels as low as $30 \text{ mg}/\text{nm}^3$.

“Along with low emissions, Oilon ACE burners have a high capacity and performance, making them a great reference case for us in this market. They are also fuel-flexible, with natural gas as the primary fuel and the ability to use light oil as a secondary backup when needed,” explains Anton Spiridonov, Regional Director at Oilon.

In addition to the 20 low NOx burners, the delivery package also includes the designated combustion air fans and automation.

“This case is a great example of our ability to provide clients with a ‘full package’, including not only the burners but also the related equipment and software,” says Spiridonov.

Oilon’s entire delivery will be ready by the end of this year, with the entire boiler plant project estimated to finish in 2025.





Customer: Ganz Danubius HungaroSteel Kft.
Boiler: Hot water boiler
Burner: 4 pcs GT-16A (15,7 MW each),
Fuel: Natural gas
Location: Győr, Hungary



Customer: Ganz Danubius HungaroSteel Kft.
Burner: 4 pcs GT-16A (16 MW each),
Boiler: Hot water boiler
Fuel: Natural gas
Location: Debrecen, Hungary



Customer: Control Process SA, Poland
Boiler: Hot water boilers
Burner: 6 pcs GT-70A (68,5 MW each)
Fuel: Natural gas
Location: Warszawa, Poland



Customer: SPOMLEK Co. - Dairy factory
Boiler:
Burner: KP-140M WD33 1pc
Fuel:
Location: Parczew, Poland



Customer: SLOVENSKÉ ENERGETICKÉ STRO-
 JÁRNE a.s.
Boiler: Hot water boiler
Burner: 4 pcs GT-35A (32 MW each)
Fuel: Natural gas
Location: Budapest, Hungary



Customer: SLOVENSKÉ ENERGETICKÉ STRO-
 JÁRNE a.s.
Boiler: Hot water boiler
Burner: 4 pcs GT-35A (32 MW each)
Fuel: Natural gas
Location: Budapest, Hungary



Customer: SLOVENSKÉ ENERGETICKÉ STROJÁRNE a.s.

Boiler: Hot water boiler

Burner: 4 pcs GT-35A (32 MW each)

Fuel: Natural gas

Location: Budapest, Hungary



Customer: CNIM, La Seyne Sur Mar, France

Boiler: Grate boiler

Burner: 4 pcs KL-550 (21,7 MW each),

Fuel: Light fuel oil

Location: Avonmouth, United Kingdom



Customer: CNIM, La Seyne Sur Mar, France

Boiler: Grate boiler

Burner: 4 pcs KL-750 (35 MW each)

Fuel: Light fuel oil

Location: Kemsley, United Kingdom



Customer: Boeing, Hester-Bradley
Boiler: Watertube water heating boiler
Burner: 2 pcs GT-13A WD200 with O2 trim. Retrofit.
Fuel: Natural gas
Location: St. Louis, Montana



Customer: Texollini Textiles
Boiler: 350 BHP Superior Super Siminole, Nationwide Boiler
Burner: GP-600M LN30 WD200 - 7ppm NOx
Fuel: Natural gas
Location: Long Beach, California



Customer: ANIMEX FOODS Co
Boiler: Danstoker 12t/h steam boilers
Burner: 2 pcs GKP-700M-III LN80, 1 pcs GP-700M-III LN80
Fuel: Gas and light fuel oil
Location: Starachowice, Poland



Customer: Novo Nordisk , Hurst Boiler
Boiler: Firetube, HP 800, 500 Series 4 pass wet-back, Hurst Boiler
Burner: GP-1000M WD200 LN80 FGR
Fuel: Natural gas
Special: Pharmaceuticals
Location: Clayton, NC



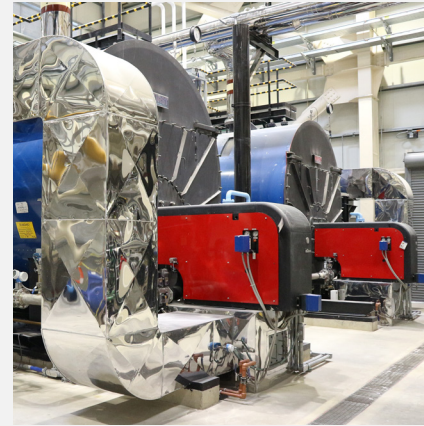
Customer: POLMLEK Co.- Dairy Factory
Boiler: Standard Kessel 10t/h steam boilers
Burner: GKP-700M-III LN80, GP-700M-III LN80
Fuel: Gas and light fuel oil
Location: Raciaz, Poland



Customer: Dairy Farmers , North Point Boiler
Boiler: Watertube Keeler 1593 BHP
Burner: GKT-19A WD200
Fuel: Natural gas, light fuel oil
Location: Springfield, Montana



Customer: North Point Boiler / Alexander Mechanical
Boiler: Steam, HP1,800, Super Seminole 3 Pass Wetback
Burner: 2 pcs GP-2000 ME WD200 with O2 trim.
Fuel: Natural gas
Location: Kansas City Int'l. Airport OHB



Customer: Central Cervecería Colombia (Heineken - Postobon)
Boiler: 1500 BHP Hurst Boiler - Euro
Burner: GKP-2000ME Hot Air
Fuel: Biogas, natural gas and light fuel oil
Location: Sesquile, Colombia



Customer: Nutrimenti Postobon
Boiler: 100 BHP Hurst Boiler - Series 500
Burner: GKP-140MH WD100i
Fuel: Natural gas, light fuel oil
Location: Copacabana, Colombia



Customer: BioD Colombia
Boiler: 1500 BHP Hurst Boiler - Series 500
Burner: GKP-2000ME WD200
Fuel: Natural gas, light fuel oil
Location: Facatativa, Colombia



Customer: Compañía Nacional de Chocolates (CNCH - Grupo Nutresa)
Boiler: 80 BHP and 100 BHP Boilers
Burner: GKP-90MH WD34
Fuel: Natural gas, light fuel oil
Location: Bogota, Colombia

oilon

www.oilon.com