

## PUMPS FOR BIOETHANOL AND BIODIESEL

Fuel your business with Grundfos



# GRUNDFOS AND THE BIOFUEL INDUSTRIES

Oil prices and concerns about future energy supplies have propelled biodiesel and bioethanol high up on the world agenda.

As demand for new biofuel installations gains momentum, there is a distinct advantage in bringing Grundfos on board as a total supplier. We can cover your pumping need throughout a biodiesel or bioethanol plant, for continuous operation day in and day out.

## **Bioethanol**

We have customised pumps that move complex liquids, comply with ATEX and pump very high volumes of ethanol and cooling water. Our sanitary pumps play an important part in maintaining purity levels and are CIP-capable for fast and very effective cleaning.

## **Biodiesel**

Customised pumping solutions and Grundfos' expertise combined increase operating reliability and safety despite the aggressive and difficult media. You can expect the very best energy efficiency from Grundfos solutions.

## **Full-line, customisable range from one supplier**

The broad range of pumps required for biofuel production can be customised to specific requirements. That's where Grundfos Industrial Solutions come in – offering the variety,

quality and toughness you need to ensure that your system is operating to its full potential. Our range covers all aspects of bioethanol and biodiesel production including all the support utility applications, such as water supply and wastewater.

## **Quality products need quality pumps**

Grundfos is the world's largest pump manufacturer with pump ranges covering every end of the industrial spectrum. You can find us in biodiesel and bioethanol plants, sanitary applications and all kinds of heavy-duty industry around the world.

Synonymous with reliability our industrial pumps are backed by a global network complete with 530 service partners in more than 46 countries.

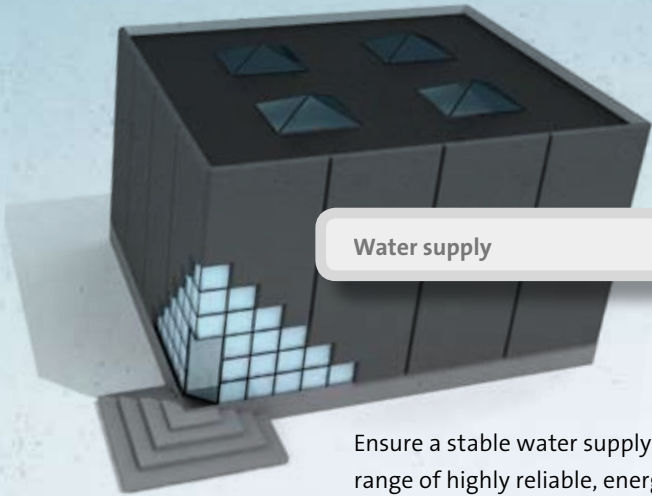
## **The sign of top industrial quality**

The characteristic stainless steel "Grundfos Industrial Solutions" sign symbolises our commitment to industrial professionals. Our pump ranges cover it all: cleaning, dosing, water treatment, water supply, wastewater, cooling, boiler feeding, heating, fire protection and general or sanitary processing. Grundfos Industrial Solutions is determined to become your preferred pump supplier. Read on and let us convince you.



## FULL-LINE SUPPLIER TO COVER YOUR EVERY NEED

Grundfos is a full-line supplier for plant service systems and processes. We produce pumps for moving the numerous substances in the biodiesel production. And we can deliver water to the plant and move it anywhere it's needed, e.g. for boiler feeding or cooling systems. Finally, we have pumps for leading the wastewater out of the plant to a treatment facility.



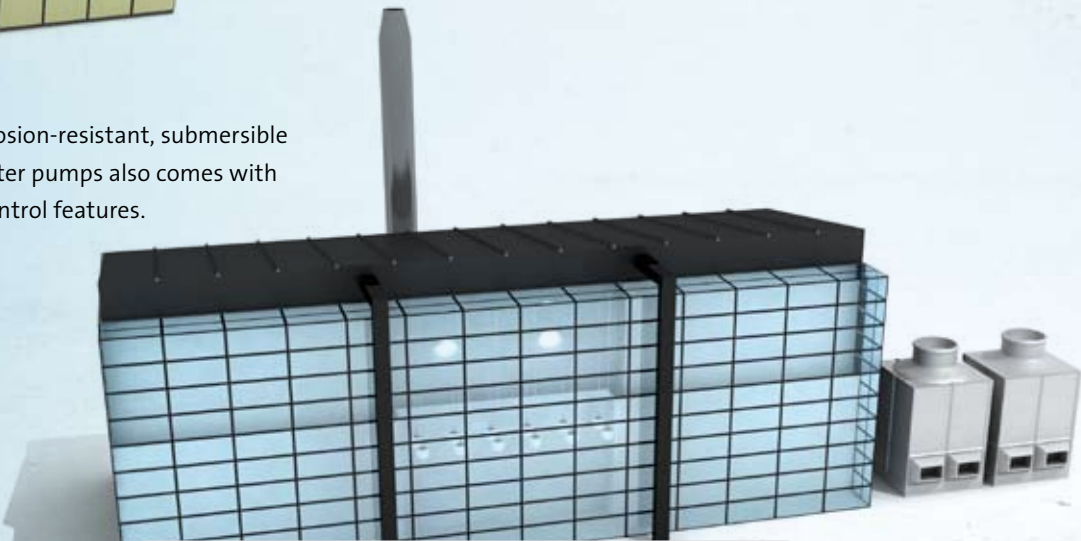
Water supply

Ensure a stable water supply with our complete range of highly reliable, energy-optimised pumps with valuable monitoring and control features.



Wastewater

Our complete range of corrosion-resistant, submersible and dry-mounted wastewater pumps also comes with valuable monitoring and control features.



Process heating – steam production

Grundfos offers efficient, speed-controlled pumps for heating and boiler feed in tough applications with varying inlet conditions.

## Esterification

Grundfos can move aggressive substances safely with robust, heavy-duty pumps.



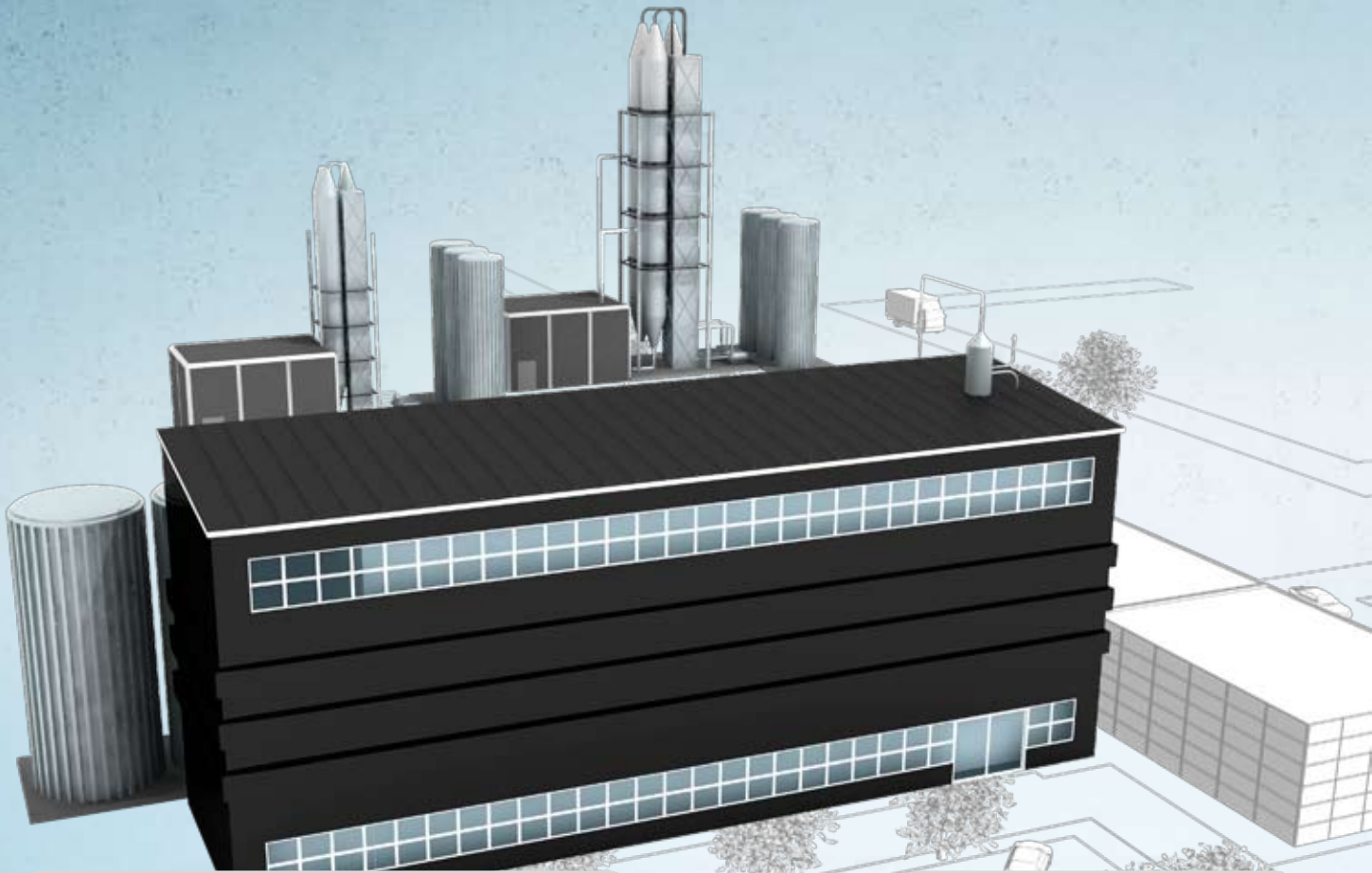
## Glycerine purification



Customised pumps with specially designed shaft seals offer flexibility for glycerine and alcohol distillation.

# WE HAVE YOUR PRODUCTION FLOOR COVERED

Grundfos is a leading international producer of pumps and pumping systems. We supply some of the most reliable and cost efficient pumps, meeting virtually every need across a wide range of industrial applications. By carefully listening to our customers we continually make improvements to our pump solutions, which have given us a reputation as a leader in pump technology. We can cover both your production processes and your service systems.



Fermentation



Stainless steel sanitary pumps ensure a controlled fermentation process. Our pumps are CIP-capable for fast, effective cleaning.

Distillation



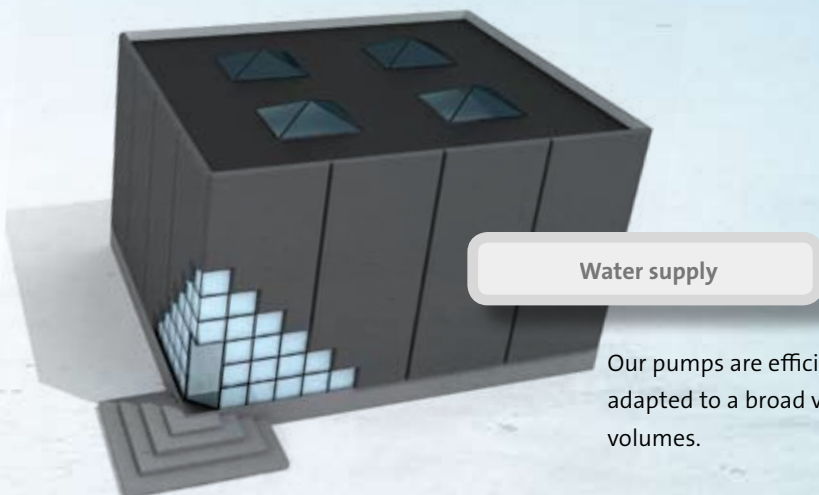
In potentially explosive environments, Grundfos pumps are easily customised for ATEX compliance.



Grundfos wastewater pumps meet all needs and conditions without clogging or blockage.



The Grundfos pump range has numerous efficient solutions for cooling applications based on a variety of media.



Our pumps are efficient, easy to install and can be adapted to a broad variety of high flows and volumes.

# KEEP THE FLOW GOING WITH GRUNDFOS

Grundfos is a full-line supplier of premium pump solutions. Our range has a variety of models suited to different stages of biofuel production processes. We can also outfit your entire plant with general process pumps.

## PROCESS PUMPS

### Fermentation

Use our reliable and flexible pumps to move liquids under hygienic and temperature-controlled processes. All Grundfos pumps are CIP-compatible.



F&B HYGIA®

### Water treatment

Highly cost-efficient pumps for moving large volumes of water at whatever pressure required. Long and close-coupled versions.



NBK/NKG

### Distillation

The ideal solutions designed for operation in hazardous environments or where a low NPSH is required. ATEX (EX) compliant.



Contra

### Customised solutions

Design the solution that gives you the exact level of reliability and safety you require. Try the most efficient magnetic drive available and completely eliminate the risk of leakage.



CRN MAGdrive

### High flows and aggressive liquid

For moving large volumes of process liquids and liquid transfer in biofuel installations. Grundfos can deliver as much flow as you need.



MAXA

## UTILITY PUMPS

### Raw water intake

Reliable, abrasion-resistant (sand) submersible pumps for stable raw water intake from surface or groundwater sources.



SP



### Water supply and treatment

Our range covers both pressure tank systems and frequency-controlled systems. It includes pressure-boosting systems, in-line and end-suction pumps for backwash and DMS/DME dosing pumps for water chlorination.



Hydro Booster system

### Boiler feeding

Grundfos has customised a CR pump version with low NPSH, specially designed for systems with poor inlet conditions. This ensures cavitation-free operation even outside the pump's normal duty range. We recommend speed-regulated pumps (E-pumps) for boiler feed. CRN/BM pumps are ideal for water replenishment.



CR

### Wastewater

Solids and other particles in wastewater cause wear, requiring robust pumps. Our range varies from small stainless steel drainage pumps to large wastewater pumps with up to 600 kW motor power.



SE

### Dosing

You can make a DME pump run at full capacity simply by pressing the 100% key. This means that the pump is fully primed for the next cycle. And with a turndown ratio of 1:1000, DME pumps are accurate at even the smallest dose.



DME

### Cooling & Heating

The range includes numerous in-line types for cooling and heating applications, water-borne as well as various other media. Solutions for high-temperature applications are also available. All pumps can be supplied with speed-regulated motors, which offer major advantages in terms of dimensioning and energy savings.



TP

### Fire-fighting systems

To safeguard personnel, equipment and production. Grundfos has fire pumps that fulfil the VdS standards – an internationally recognized standard of sprinkler systems. Our fire pumps are also available on request with all other major international certifications.



Fire-fighting system

# SURPRISE SOLUTION

**When the Arkansas SoyEnergy Group planned their all-new soybean crushing and biodiesel production plant, they were surprised to learn that centrifugal vertical pumps could be customised to meet their needs every bit as well as more conventional options. Eventually, they chose CR pumps for a wide range of biodiesel production processes.**

## **Surprisingly customisable vertical pumps**

The biodiesel business is still new, but even so certain conventions have already taken hold. For example, the business has traditionally used end-suction pumps, ordering them in special versions to suit the particular demands of biofuel production.

However, the Arkansas SoyEnergy Group was ready to pursue new approaches when planning their all-new, fully automated biofuel production plant. When experts from ePlus (see box below) informed them that vertical pumps could meet the same demands as end-suction pumps, they were pleasantly surprised. Eventually, CR pumps – in many different versions and configurations – were chosen to handle a wide range of the processes involved in biodiesel production:

### **Processes handled**

- Oil and fat pre-treatment
- Sodium methoxide preparation
- Transesterification
- Biodiesel clean by liquid wash – zero effluent
- Glycerine purification

### **Media handled**

- Biodiesel
- Glycerine
- Vegetable oil
- Animal fat
- Sodium methoxide
- Methanol

## **Customisation made easy**

The capacity to handle such a wide range of applications is characteristic of the Grundfos CR range: it was created to be easily customised. Clients can combine materials (from cast iron to pure titanium), motor types, shaft seal solutions, connection options, etc. to create pumps capable of pumping any media.

The number of potential combinations is greater than one million. And because all the options are pieced together from parts already in production, completely customised products are available without the substantial price jump usually associated with tailor-made solutions.

## **High quality a key concern**

The choice of Grundfos pumps also ties in well with the intense focus on quality at the Arkansas SoyEnergy plant. For example, an onsite testing lab ensures that only the highest quality products are sold, operating according to BQ9000 testing procedures using infrared technology. The group also verifies results with outside certified testing laboratories and meets new quality specifications set forth by the American Society of Testing and Materials (ASTM). Having high-quality pumps from Grundfos helps meet these stringent requirements.

### **About ePlus**

For this project, pump selection, sales, and installation were all handled by ePlus (then trading as Bionerg SA.) As its name and payoff suggests, ePlus Renewable Energy Solutions offers services aimed at making renewable energy, particularly biodiesel, more feasible and more efficient. Offerings include oils extraction and refining plants, reaction phase modules, and more.



### **About Arkansas SoyEnergy**

The Arkansas SoyEnergy plant, located in the south of Arkansas, USA, was officially opened in February 2008. The company engages in soybean crushing and biodiesel production, aiming to create biodiesel of the highest quality – in quantities of 4.5 million gallons (17 million litres) a year. In doing so, they help reduce dependency on fossil fuels, improve the environment, and create new opportunities for the agricultural community. The state-of-the-art plant is fully computerised – and uses Grundfos pumps throughout.

## GRUNDFOS INDUSTRIAL SOLUTIONS

The full-line Grundfos range caters to the specific needs of biodiesel and bioethanol plants. Grundfos pumps give you better peace of mind and optimal pump-application compatibility for every stage in your production process. Our range has models specifically designed to handle viscous, hazardous substances and sensitive processes – all with maximum care and effectiveness.

At Grundfos we know that reliability and easy maintenance are critical factors in keeping the production flow going. That is why our sanitary pumps are SIP/CIP-compatible and can be customised for optimal performance. And all Grundfos pumps come with the expertise and global support network of the Grundfos Group.

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