



## How to Improve the Profitability of a Bioethanol Plant?

Relevant for: bioethanol industry, biofuels, ethanol measurement, detergents, chemical industry, alcoholic beverages



### Bioethanol Production

For the production of bioethanol the biomass (corn, barley or wheat) is milled to a fine powder and is cooked together with water to extract the starch. Afterwards the mash is cooled and enzymes are added to convert the liquefied starch to fermentable sugars, a process called saccharification. Then yeast is added to ferment the sugars to ethanol and CO<sub>2</sub>.

The fermented mash contains up to 15% alcohol, as well as the non-fermentable solids from the corn and yeast cells. The mash is then pumped into a continuous flow distillation system where the alcohol is separated from the solids and water. The product leaves the top of the final column with an alcohol content of about 96% and is stored or further dehydrated up to 99,5%, mostly in a molecular sieve. In case of using the ethanol as biofuels it is denatured with a small amount of ketones or other alcohols.

### Mash Measurement

To increase the alcohol content of the mash after fermentation the composition of the mash before the entry into the fermentation tank is monitored with the process density sensor DPRn 4122. The control of the mash dilution results in higher production and throughput and hence higher profit of the bioethanol plant.

### Fermentation Monitoring

To optimize the ethanol yield and the end point of the fermentation process the sugar conversion and ethanol concentration during fermentation can be determined with the process density sensor DPRn 4122. Additionally infections can be observed immediately. The installation of a fermentation monitor increases the profitability of an ethanol plant and pays off in a very short time.

### Ethanol Concentration Measurement

The Anton Paar alcohol monitors provide continuous ethanol concentration measurement with an accuracy of up to 0.03%. The installation of an alcohol monitor increases production accuracy and generates savings of several tons of ethanol per year.

### Benefits

- Higher throughput of fermentation process
- Increased product accuracy and savings of ethanol
- Higher product yield and plant profitability

### Specifications alcohol monitor

Accuracy [% w/w]	Repeatability [% w/w]	Concentration [%]
<b>DPRn 427 (I)</b>		
0.05	0.02	0 - 100
0.03	0.01	90 - 100
<b>L-Dens 427E Ex</b>		
0.10	0.04	0 - 100
0.05	0.02	90 - 100

### Measuring range alcohol

Sample concentration	up to 100 %
Sample temperature	up to +100 °C

### Specifications DPRn 4122

Measuring range	up to 3 g/ cm <sup>3</sup>
Temperature	-25 to +125 °C
Accuracy	1 x 10 <sup>-4</sup> g/cm <sup>3</sup>

Specifications after product specific adjustment



Do you have any questions?

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