



Application Notes

Bioethanol Production - Moisture in Corn Distillers Grains

Owing to the ever increasing demand for environmentally friendly renewable fuel sources, the number of Bio-fuel Processing Plants is rapidly expanding. Bio-fuels are typically divided into bio-diesel and bio-ethanol products. This application note concentrates on an important by-product of bioethanol production from corn and/or spent grain, also termed **Distillers Dried Grains (DDG)**. These by-products are high in proteins, fat, minerals and vitamins, and are further processed to produce **Distillers Dried Grains with Solubles**. **DDGS** is sold as livestock and poultry feed. The moisture content of **DDGS** impacts the profitability of the production facility; when tightly controlled dryer costs and wastage are reduced and product yield increases. On line Near Infrared Moisture Measurement provides the means to optimize the drying operation.

DDGS Dry Milling Production

Corn is ground into a coarse flour to which a water and enzyme mix is added. The enzymes break the starch down into sugar turning the mix into a mash which is heated then cooled before the addition of yeast. This causes the sugar to ferment producing ethanol, carbon dioxide and other by-products. The ethanol is distilled from the mash leaving spent mash which is separated into a solid and liquid fraction through press screens or centrifugation. The liquid fraction passes through an evaporator to drive off water before being added to the wet grains, and dried to approximately 12% moisture.

Measurement Location and Installation

Measurement is typically made post dryer such that the dryer temperature or load can be controlled through a feed-back control loop. The gauge can be installed over an open conveyor or at the end of a screw conveyor provided the flytes do not interfere with the Near Infrared beam.

Measurement Performance

Measurement	Location	Target	Typical Accuracy
Moisture in DDGS	Exit of dryer	12%	0.25%