

Animal Food Products



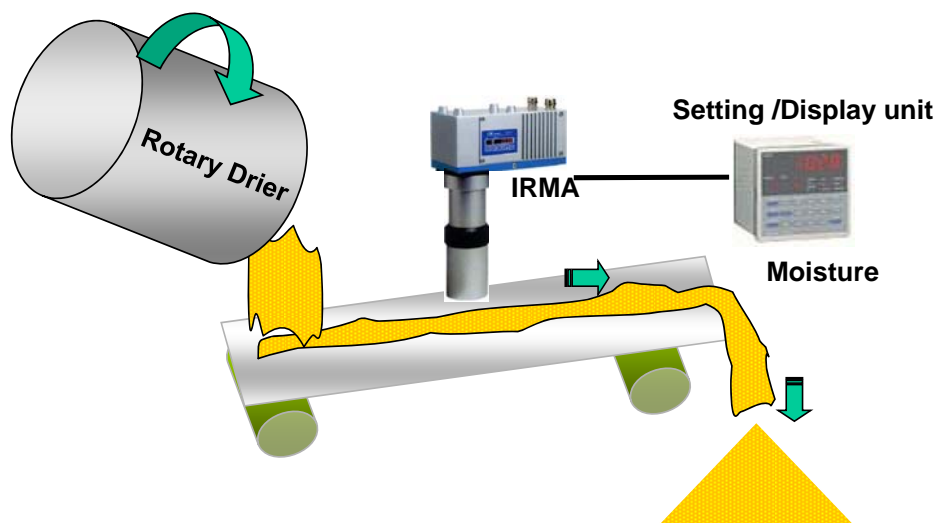
Application notes

Moisture Measurement for DDG

During the distillation process of ethanol from crops such as corn, sorghum, or barley, DDG, Dried Distiller's Grains, are produced as cereal byproduct. These DDG have been used mainly as animal feed, pet food, or fishing bait. Recently, DDG are occasionally used for mulch farming to suppress weed growth.

It is crucial to control moisture of DDG while they are produced. These days, DDG are produced under the better combustion rate to reduce burning time; or DDG need to be prevented from growing mold or damaged by excessive moisture while they are stored. CHINO's IM series measures the moisture from 5% to 30% ($\pm 0.5\%$ accuracy) after dried process of DDG, and also maintain product quality as well as cut costs of production.

IM Series is equipped w/ 4-20mA Analog output which can be easily incorporated with existing process control systems.



Products / Location	Parameter	Range
Dried Distiller's Grains (DDG)	Moisture	5 to 30%

Recommended model / Item

A. Moisture over 40% - High moisture unit and associated accessories

Model: IRMA1200S, IR-WEA, IR-WEB

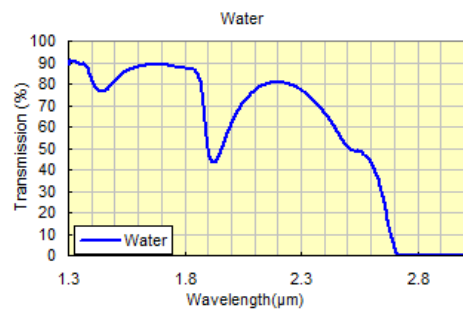
B. Up to 40% - General moisture unit and associated accessories

Model: IRMA1100S, IR-WEA, IR-WEB

Installation

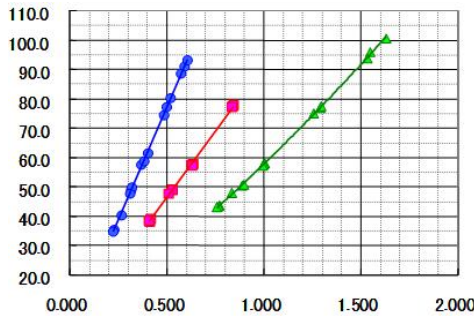
Mount IRMA at the 90° angle to direct the light beam onto the target. To prevent the lens surface from dust or fine particle, apply air purging with filtered instrument air if needed. Use leveling plow (leveler) to level uneven flour powder. Leveled surface can lead to a stable measurement. To keep accurate measurements, we highly recommend cleaning lens AND conducting Zero-Calibration over IR-WEB(calibration mirror) once every three months.

Absorption characteristic



Moisture(water) has a unique infrared absorption spectrum regions. Water absorbs at wavelength of 1.43, 1.94, and 3 micrometers.

Calibration curve



Calibration curve is a correlation between moisture determined by customer's reference instrument and IR absorption measured by IRMA.

[Basic sample test for moisture]

1. Prepare samples with various moisture content
 2. Show each sample to IRMA and record absorption level
 3. As conducting step-2, determine moisture level with your reference instrument
 4. Put all data points on a X/Y graph and see if there's a correlation
- Note: Reference instrument may vary depending on the method (by volume or weight).



Mirror type



Fiber type



Liquid cell type



Setting & Display unit



Contact

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