

Equilibrium Moisture Content Accuracy

1 INTRODUCTION

Grain Equilibrium Moisture Content (EMC) is a vital property that indicates grain health and sellable value. Each BinManager® moisture sensor cable calculates EMC by measuring the actual temperature and relative humidity inside the grain mass. Next, it applies these readings to the American Society of Agricultural and Biological Engineers (ASABE) standard commodities EMC curves or an EMC curve developed specifically for your hybrid using the industry standard moisture tester GAC 2500 as the reference.

2 EXPECTATIONS

Grain bins can experience a wide range of conditions throughout the bin based on several factors: number and placement of fans and heaters, unlevel or peaked grain, exhaust ventilation, and more. When testing the grain, it is best to conduct these tests with your AGI Customer Service Representative for comparison to the direct sensor reading within BinManager® when possible.

2.1 STARTING COMMODITIES

These are the standard American Society of Agricultural and Biological Engineers (ASABE) commodity EMC curves and will get you a close EMC reading. These readings will get the bin towards a drying process, but we recommend sending in your hybrid to develop a specific curve to get a more accurate finishing EMC reading if desired.

2.2 SURETRACK LAB TEST

We test several commonly used hybrids and yours may have already been tested and have a suggested EMC curve available to use. If you farm with a different hybrid, you can put in a request for a test bucket. Fill the bucket with your grain and send it to AGI. Once AGI receives your sample, the grain will be tested and a specific EMC curve for that hybrid will be created. This will increase the accuracy of the EMC calculation for the bin.

2.3 ACCURACY

The BinManager® 3G Moisture Cable will operate in temperatures of -40°C to +85°C. Relative humidity (RH) ranges from 0% to 100%. The most accurate EMC calculations will occur within temperatures of 0°C to 60°C and RH of 20% to 80%. For EMC conversion, please refer to the specific commodity safe storage chart at a given temperature and relative humidity for comparison or contact our Customer Support Representatives for assistance.

Provided good care and maintenance of the cables and their sensors, we expect to be able to provide readings within +/- 1% EMC. The following environmental conditions must be considered to keep the sensor accuracy within the expected tolerance:

- 1) Long-term (>4 days with no fan aeration) exposure to extreme high relative humidity (>80%) may temporarily offset the RH readings. Once readings are below 80%, the sensors will return to calibration. In some instances, this may not occur until the bin is emptied.
- 2) Prolonged exposure to extreme conditions may accelerate the aging factor for accuracy. Extreme conditions include, but are not limited to:
 - a. Exposure to solvent vapors
 - b. Exposure to fumigation, such as methyl bromide, phosphine, sulfuryl fluoride, etc.
 - c. Exposure to ethanol off-gassing, such as popcorn
- 3) Mixing of hybrids stored in the bin. Any mixing of hybrids in one bin will result in readings that may not be as accurate as expected due to the same relative humidity potentially equal to a different EMC of the commodity.
- 4) Undersized fans for drying or aeration. Ensure the bin has enough cubic feet of air per minute (CFM) to dry or aerate the grain as required.
- 5) Other actions that could potentially damage electronic devices.

BinManager® cables and sensors have been functioning accurately and as expected in grain bins for over 10 years when used and maintained correctly. As grain bins are present in a variety of environmental conditions, there are some applications of BinManager 3G cables that impact the longevity and accuracy of the temperature and moisture sensors. We have mitigated environmental factors as much as possible through improvements to operational modes, design changes for improved readings, and creating custom EMC curves for our customers.

We strive to continue to provide the best customer experience throughout each stage of BinManager® ownership.