

GRAIN SPOILAGE DETECTION

CO₂ BININSPECTOR

EARLIEST SPOILAGE DETECTION AVAILABLE!

The earliest possible spoilage detection enables early decision-making when the least amount of inventory is affected. This is a huge economic advantage over the current status quo where spoilage is all too often detected late in its development, requiring expensive mitigation action that

involves a large fraction, or all, of the bin inventory. With early warning from Binspector-CO₂, you will trim spoilage losses from many thousands of bushels per incident down to just a few hundred or even zero bushels, saving thousands of dollars with each detection.

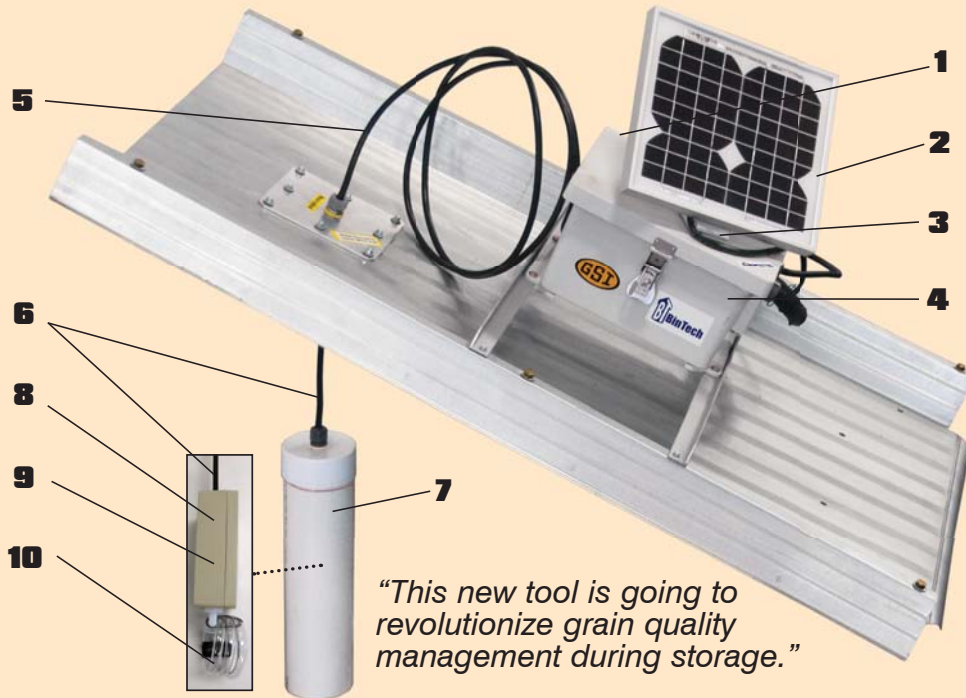


Patent Pending
www.gsiag.com



WHY MONITOR CARBON DIOXIDE (CO₂)?

All condition loss processes in grain (mold or insects) generate heat and carbon dioxide. Grain's thermal insulation properties are excellent and keep heat from a spoilage site from moving very far into the surrounding unspoiled grain mass. The slowness of this heat transfer makes spoilage detection via heat measurements a difficult task. At the same time, while heat is generated and essentially trapped at the spoilage location, carbon dioxide gas, CO₂, is generated in large amounts and is free to move or diffuse throughout the stored grain. Inside a bin or tank, much of this CO₂ reaches the headspace and mixes with the free air between the grain surface and the roof. Unlike heat, CO₂ from a spoilage site gets to the headspace air almost instantly where it is available for detection by a gas sensor. In this way, CO₂ provides the earliest possible warning of undesirable biological activity in a grain storage bin.



"This new tool is going to revolutionize grain quality management during storage."

Dr. Dirk E. Maier, Professor
Department of Grain Science & Industry
Kansas State University

1 Control Electronics Box

2 Solar Panel recharging eliminates external power cord requirements allowing quick installation.

3 A Panel Rotation Bracket facilitates easy setting of the solar panel pointing direction for the best sun exposure angle.

4 Weather-tight, UV and impact protected plastic enclosure protects the Binspector's brain from the elements.

5 Sensor shroud roof flange cover seals the installation hole and serves as a cable clamp for adjusting the height of the sensor shroud above or below the bin eave level, as stored grain height dictates.

6 Armored high tensile strength Sensor Power/Data Cable can be used to extract a buried sensor shroud and housing.

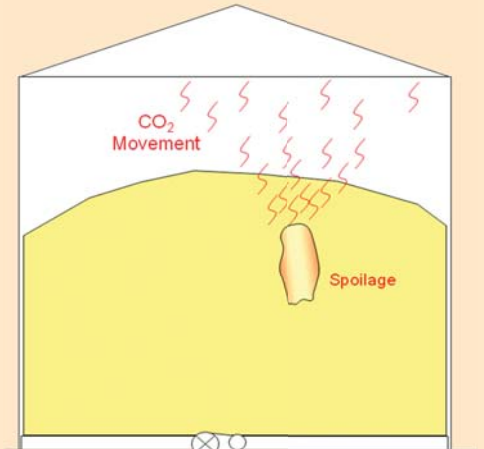
7 Sensor Shroud protects the sensor housing and dust filter from direct grain contact; provides an anchor point for extracting the sensor housing should the unit be buried in grain.

8 Sensor Housing protects the CO₂, temperature, and relative humidity sensors from physical damage, and serves as a closed air sampling cavity for the system.

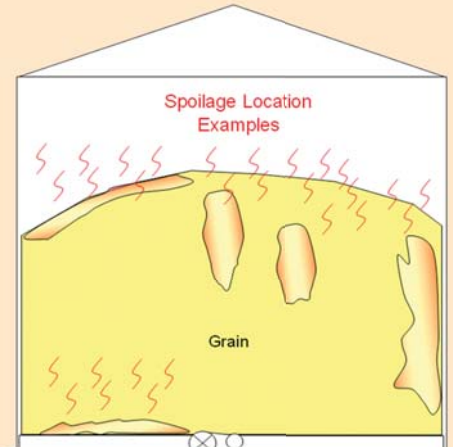
9 CO₂, temp., and humidity sensors. Abnormal concentrations of headspace CO₂ indicate grain quality problems long before significant heat is generated by spoilage; temp. and relative humidity readings refine the diagnostics for spoilage at depth, surface fungus and insects.

10 A sensor Dust Filter passively excludes dust from sampled headspace air without the use of barrier filters, leading to low power, clog-free and maintenance-free sensor operations.

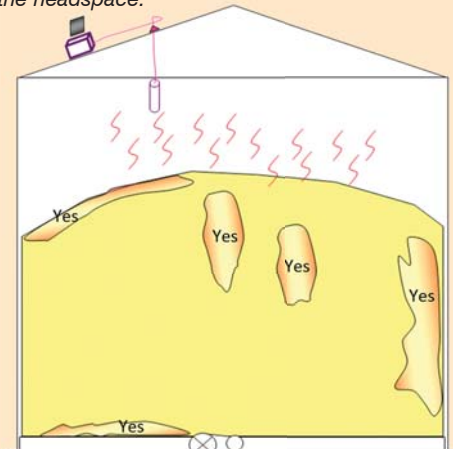
BINSPECTOR-CO₂: HOW IT WORKS



When biological activity is present in the form of mold or insects, you always get: CO₂+water+some heat



Regardless of where the spoilage starts, the CO₂ it generates quickly diffuses through the grain mass to the headspace.

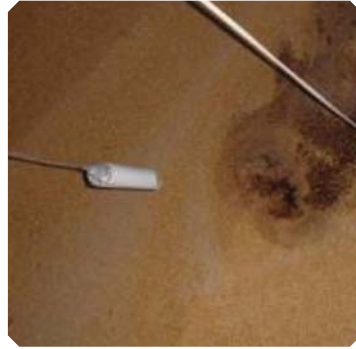


Because the CO₂ generated by spoilage migrates quickly and easily to the headspace air, Binspector-CO₂ can detect it, providing the earliest possible warning of spoilage in progress.

BINSPECTOR KEY FEATURES



PASSIVE DUST FILTER



SPOILAGE DETECTION



CENTRAL DATA STORAGE & ANALYSIS



SOLAR-RECHARGED BATTERY POWER



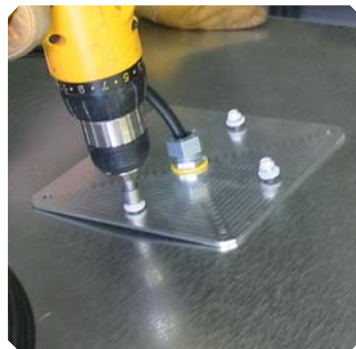
ALARMS VIA TEXT, VOICEMAIL, OR EMAIL



WEB-BASED DATA ACCESS



WIRELESS COMMUNICATION



SIMPLE, ANYTIME INSTALLATION

SPOILAGE DETECTION

Earliest available spoilage detection allows earliest, lowest cost mitigation to preserve highest grain quality and value.

PASSIVE DUST FILTER

Enables low power design and long, maintenance-free sensor life.

SOLAR-RECHARGED BATTERY POWER

Avoids expense of power connections.

CENTRAL DATA STORAGE & ANALYSIS

Securely warehouses all quality measurements, assesses trends in grain condition indicators, and keeps all data handy for later recall.

WEB-BASED DATA ACCESS

24-7 access to graphical history. Permits data viewing on any Internet-connected computer and completely avoids problems with local software compatibility.

ALARMS VIA TEXT, VOICEMAIL, OR EMAIL

Provides worry-free continuous bin monitoring. (First year direct phone also.)

SIMPLE, ANYTIME INSTALLATION

Allows startup during any season with the bin full or empty. No complicated sensor interconnects. Easy scalability from one to all bins. Less than 1 hour per bin installation and startup.

WIRELESS COMMUNICATION

Communication via cell modem. Enables continuous system status and hands-free software upgrades

"No question about it, Binspector-CO2 works."

Tom Ebert
Binspector-CO2 site
Flush, KS

BINSPECTOR-CO2 BENEFITS

The Earliest Grain Spoilage Detection Available

Trim spoilage losses from many thousands of bushels per incident down to just a few hundred or even zero bushels, saving thousands of dollars with each detection.

Remote Monitoring 24/7 Every Day

The quality of your grain inventory is everything. Binspector-CO2 stands guard silently and efficiently over your valuable stocks, watching them so that you can attend to other matters. At the first signs of trouble, BinTech notifies you and provides information you can use to make timely grain management choices before spoilage has a chance to become an emergency.

Enhanced Safety for Farm and Elevator Staff

With Binspector-CO2 on the job monitoring your grain inventory 24/7, there's no need for your workers to repeatedly climb bins to check for condition issues. Eliminating the need to open the hatch for routine grain evaluations directly reduces the exposure of your employees to safety risks associated with confined space entry.

Low Cost, No-Maintenance Design

The smart design of Binspector-CO2 features wireless power and data transmission along with centralized data storage and alarm notification to provide you with a simple, web-based solution for keeping the quality of your inventory at its peak. Binspector-CO2 installs in less than an hour at any time of year, whether the bin is full or empty, and requires no scheduled maintenance, minimizing any impact to your operations.

Full Strength BinTech Customer Service

The basic customer service package, **Advisor-Gold**, covers cellular modem data transmission, 24/7 grain condition monitoring, automatic grain condition alarm notification, in-person telephone follow-up for all grain condition alarms, continuous equipment health and status monitoring, all software and firmware upgrades, plus technical advice telephone calls covering equipment operation, data interpretation and spoilage mitigation options/actions. BinTech's premium customer service package, **Advisor-Platinum**, includes all of these benefits as well as an extended hardware warranty, year-end condition history summary reports and a dedicated advisor who will know your facility/business and will always be your personal point of contact for every technical advice telephone call.

Pay It Forward

PLOWING PROFITS BACK INTO RESEARCH

As a "thank you" to the research community for its part in proving the effectiveness of carbon dioxide as a grain spoilage indicator, a portion of every Binspector-CO2 unit's sales price will go back to universities to give a sustained boost to agricultural technology research and development.



BINSPECTOR-CO2 SPECIFICATIONS

ITEM	DIMENSIONS	WEIGHT
CONTROL ELECTRONICS BOX	12"L X 10"W X 7"H	14.5 LBS
SENSOR ENCLOSURE TUBE	4" DIA. X 16"L	2.0 LBS
SOLAR PANEL, 6 WATTS	10"L X 11.5"W	1.5 LBS
CABLE LENGTH	12' (INSIDE BIN)	2.5 LBS
PERFORMANCE		
TEMPERATURE RANGE (OPERATIONAL)	-20C - +70C	
TEMPERATURE RANGE (SURVIVAL)	< -40C - +85C	
CO2 SENSOR	0 - 5000 PPM	
THERMOMETER	-50C - +150C	
HUMIDITY METER	0% - 100% RH	
BATTERY, SEALED LEAD-ACID	12V, 7.5A-HRS	
CELL MODEM	GSM/GPRS	
ANTENNA	1 DB GAIN	
OPTIONAL ANTENNA	5 DB GAIN	

NOTE: This version is not rated for Class II Div 1 hazardous locations.



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TOTAL VALUE. TOTAL SYSTEMS.™

GS-102 OCT/11

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