

# FOOD PROCESSING

FOOD & BEVERAGE • CONCEPT TO DELIVERY • PRESENT TO FUTURE • [FOODPROCESSING.COM](http://FOODPROCESSING.COM)



## Manufacturing Equipment's Role in Food Safety



# TABLE OF CONTENTS

|  |           |
|--|-----------|
| <b>2018 Manufacturing Outlook Survey Results: Sunny Expectations</b>   | <b>5</b>  |
| From food safety to plant modernization, food & beverage professionals share their strategies for success in the new year. |           |
| <b>Understanding Food Regulations</b>  | <b>14</b> |
| An overview of regulations in the United States, EU, and China   |           |
| <b>Special Report: Food Safety Meets Practicality</b>  | <b>17</b> |
| Selecting the Right Motor & Mechanical Products for Each Area of Your Plant  |           |
| <b>When Quality Needs Clean Temperature Data</b>   | <b>20</b> |
| Can a Thermometer and a Software Development Kit Enable Integrated Quality Measurement and Real-Time Alerts?               |           |
| <b>The Price of Safety in Plant Sanitation</b>   | <b>23</b> |
| Learn how direct steam injection can affect maintenance costs while keeping plant personnel safe.                          |           |
| <b>Your Food Is Only As Healthy As Your Storage Vessel</b>   | <b>26</b> |
| Mole•Master Services Corporation talks about the importance of silo and bin cleaning for food safety.                      |           |
| <b>Improve Safety &amp; Sustainability in Food &amp; Beverage Plants with Mix Proof Valves</b>                             | <b>29</b> |
| Increase capacity, simplify operations, and prepare for the future   |           |
| <b>FSMA Compliance</b>   | <b>32</b> |
| How Separation Technology Gets — And Keeps — You There   |           |
| <b>Product Focus: Control Pests and Bugs Around Your Loading Dock Doors</b>  | <b>35</b> |
| <b>Product Focus: Rosedale Products' FSOT300 and FSOT150 Filter Bag Housings</b>   | <b>37</b> |

## AD INDEX

|                      |    |
|----------------------|----|
| Anritsu              | 2  |
| Tuthill              | 6  |
| Mettler-Toledo       | 13 |
| Baldor               | 16 |
| Tegam                | 19 |
| Pick Heaters         | 22 |
| Mole Master          | 25 |
| Pentair              | 28 |
| Bunting              | 31 |
| Goff's Curtain Walls | 34 |
| Rosedale             | 36 |

# 2018 Manufacturing Outlook Survey Results: Sunny Expectations

From food safety to plant modernization, food & beverage professionals share their strategies for success in the new year.

By Kevin T. Higgins, Managing Editor

**C**all them cockeyed optimists if you will, but food industry professionals are riding into 2018 with great expectations, based on findings in Food Processing's 17<sup>th</sup> annual Manufacturing Outlook Survey.

Four out of five survey respondents say they either are very optimistic or somewhat optimistic about the prospects for the New Year, the most upbeat attitude in at least five years. At the other extreme, barely 1 percent indicate they are very pessimistic, one-third the ratio of a year ago.

Optimism increases with headcount, with respondents from the largest organizations most confident riding into 2018. Those at companies with 50 or fewer employees were relatively downbeat, although the

## OPTIMISM HEADING INTO 2018

|                             | 2018 | 2017 | 2016 |
|-----------------------------|------|------|------|
| <b>Very optimistic</b>      | 29%  | 27%  | 28%  |
| <b>Somewhat optimistic</b>  | 52%  | 38%  | 39%  |
| <b>Neutral/ambivalent</b>   | 11%  | 26%  | 22%  |
| <b>Somewhat pessimistic</b> | 6.8% | 6.0% | 8.3% |
| <b>Very pessimistic</b>     | 1.0% | 3.0% | 2.2% |

## ANTICIPATED CHANGE IN PRODUCTION

|                        | 2018 | 2017 |
|------------------------|------|------|
| <b>Increase 20%+</b>   | 21%  | 18%  |
| <b>Increase 10-19%</b> | 23%  | 22%  |
| <b>Increase 2-9%</b>   | 40%  | 30%  |
| <b>About the same</b>  | 13%  | 24%  |
| <b>Decline</b>         | 2.1% | 6.7% |

## CLEAN LABEL'S IMPACT ON MANUFACTURING

|   |     |
|---|-----|
| <b>Processes adjusted to accommodate</b>    | 55% |
| <b>Purchase orders negatively impacted</b>  | 12% |
| <b>Adding new technology to compete</b>     | 26% |
| <b>New lines for minimal processing</b>     | 19% |
| <b>Positive impact on throughput demand</b> | 21% |
| <b>Holding our own against clean label</b>  | 27% |

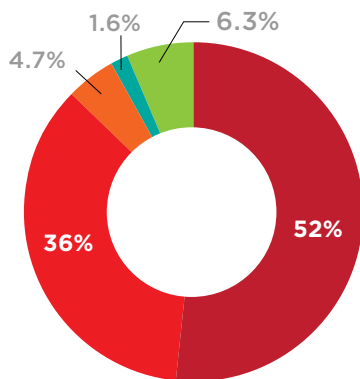


outlook at firms with 51-100 workers topped all demographic categories.

The protein sector – meat, poultry & sea-food – topped all product categories in terms of positive outlook, closely followed by confections and sauces & condiments.

Anticipated increases in plant production help explain survey participants' expectations. Only 15 percent think throughput will

### FACILITY STAFFING PLANS



|  | 2018 | 2017 |
|--|------|------|
| <span style="color: red;">■</span> Add to workforce                  | 52%  | 39%  |
| <span style="color: red;">■</span> Maintain existing staffing levels | 36%  | 37%  |
| <span style="color: orange;">■</span> Reduce workforce via attrition | 4.7% | 11%  |
| <span style="color: teal;">■</span> Actively reduce staffing levels  | 1.6% | 4.5% |
| <span style="color: green;">■</span> Don't know                      | 6.3% | 8.2% |

be flat or down somewhat, about half the proportion in the past three years. More expect their facility to rack up double-digit throughput increases than single digits.

Expectations for corporate performance are more mixed, with almost half indicating overall production will be roughly the same.

### CAPITAL SPENDING PRIORITIES

|   | AVG. SCORE ON 9-POINT SCALE |
|---|-----------------------------|
| Packaging equipment                                     | 4.8                         |
| Replace older equipment w/ sanitarly-designed equipment | 4.7                         |
| Plant and worker safety                                 | 4.6                         |
| Control systems   | 4.1                         |
| Electronic records system                               | 4.1                         |
| Software  | 3.7                         |
| Digital field devices                                   | 3.4                         |
| Robotics automation                                     | 3.4                         |
| Laboratory equipment                                    | 3.2                         |

One-third believe their facility's production boost will come at the expense of other plants in the company's network.

Slightly more than half believe facility staffing will increase, the highest proportion in at least five years. Only 6.3 percent foresee staff reductions, another recent-history low.

Food safety continues to rank as the top food manufacturing priority, both in terms of overall importance and in the number of food professionals who rank it No 1. Cost control had the second highest average ranking, but worker safety was rated first

### STEPS IN THE DIGITAL FACTORY TRANSFORMATION

|  |     |
|--|-----|
| Shifting from local servers to cloud computing           | 32% |
| Providing more remote access to machine controls         | 34% |
| Replacing analog devices with digital sensors and meters | 39% |
| Replacing paper records with electronic records          | 56% |
| Granting OEMs access to machine controls                 | 12% |
| No action/taking a wait-and-see approach                 | 17% |



by a higher proportion, with 17 percent of respondents saying it is the most important issue. More professionals rated automation and capacity expansion as more important than cost control. Almost one-quarter reserve the top spot for food safety.

Food safety failures are costly, both in financial terms and in lost public and customer confidence. Almost one in eight survey participants said their companies experienced a product recall in the past 12 months.

### MOST FREQUENTLY OUTSOURCED PLANT SERVICES

|                                      | 2017 |     |
|--------------------------------------|------|-----|
| <b>Pest control</b>                  | 71%  | 68% |
| <b>Microbiological testing</b>       | 51%  | 52% |
| <b>Some/all engineering services</b> | 34%  | 36% |
| <b>Staff training</b>                | 16%  | 17% |
| <b>Sanitation</b>                    | 16%  | 17% |
| <b>Maintenance</b>                   | 19%  | 22% |
| <b>Logistics management</b>          | 16%  | 24% |

Mislabeling accounted for more than two in five of those recalls, and one-quarter involved biological, chemical or foreign-material contamination. Another quarter said their firms simply erred on the side of caution and the recalls did not involve a public health danger. Ten percent said suspected product was headed off before reaching distribution.

Most food & beverage companies regulated by the FDA now are subject to the preventive controls rules of the Food Safety

### HOW COMPANIES ARE FILLING NEED FOR HIGH-SKILL WORKERS

|  |     |
|--|-----|
| <b>Recruiting maintenance technicians</b>                | 34% |
| <b>Adding in-house engineering capabilities</b>          | 23% |
| <b>Expanding in-house technical training</b>             | 43% |
| <b>Working with schools on electromechanical courses</b> | 15% |
| <b>More outsourcing</b>                                  | 14% |
| <b>Hiring line operators for semi-automation</b>         | 21% |
| <b>Not addressing the issue</b>                          | 26% |

Modernization Act, though only a small fraction have undergone a FSMA inspection. Most are confident they will survive an FDA inspection, with FSMA readiness ranking as one of the lowest concerns going into 2018. Of even less concern is FSMA compliance by suppliers, although the regulations require verification of supplier compliance.

In the run-up to FSMA, North American retailers and major food companies advocated third-party audits and certifications under the Global Food Safety Initiative. Most processors have accepted the idea, with three in five respondents saying they are GFSI certified and one in 10 considering undergoing an independent audit. One in six is certified under a proprietary food-safety standard.

Almost one in six reject the idea of any independent certification. The majority of those companies have 50 or fewer employees.

SQF remains the most common GFSI-sanctioned safety standard, with 40 percent



certified under either level 2 or 3. BRC Global auditors visited 16 percent of respondents' plants, with one in five undergoing either an IFS or FSSC 22000 audit (combined).

Employee training in food safety will be done in 2018 or was instituted last year at 73 percent of respondents' facilities. Almost half are investing in more equipment for cleaning and sanitation. Other popular actions are the purchase of equipment with improved sanitary design and development or refinement of a hazard analysis, critical control points (HACCP) plan.

### MOST POPULAR GFSI CERTIFICATION PROGRAMS

|   |      |
|---|------|
| <b>SQF 2</b>  | 22%  |
| <b>SQF 3</b>  | 19%  |
| <b>BRC Global</b>   | 18%  |
| <b>FSSC 22000</b>   | 11%  |
| <b>IFS</b>  | 9.7% |
| <b>all others</b>   | 16%  |
| <b>Note: Some multi-plant manufacturers have more than one certification standard</b> |      |

"We implemented all these (8) items prior to 2017," wrote one dairy professional, echoing a comment registered by several participants. Cloud-based tracking of quality practices, improved sanitation tracking systems and beefed-up corporate standards for food safety and quality were other practices flagged by respondents.

### NEW AND IMPROVED PLANTS

Eight times as many polled readers' companies will increase capital spending this year

### HOW FOOD COMPANIES ARE UPGRADING SANITATION AND FOOD SAFETY PRACTICES

|                                      |     |
|--------------------------------------|-----|
| <b>Employee training</b>             | 73% |
| <b>New/improved HACCP plans</b>      | 43% |
| <b>Upgraded sanitation equipment</b> | 44% |
| <b>Third-party audits</b>            | 40% |
| <b>Equipment w/sanitary design</b>   | 39% |
| <b>Rapid microbial testing</b>       | 29% |
| <b>Outside consulting services</b>   | 24% |
| <b>Improved pest control</b>         | 34% |

than reduce it; half as many will deal with flat budgets. On average, respondents say their firms plan to increase capital expenditures 5.1 percent.

Spending plans are as varied as the products produced. New and expanded facilities, equipment replacements and upgrades, more automation and new lines for production and packaging are among the major projects cited.

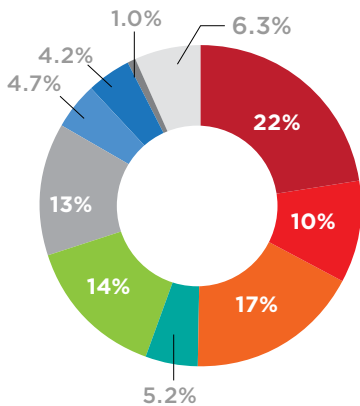
Cheap energy puts a damper on renewable fuels, but sustainability remains a priority for some. "Enlarge the wastewater plant to produce more biogas" is in the works at a major meat processor. "Cogeneration unit installation" wrote a manager at one of the industry's largest corporations, along with "line consolidation and controls upgrade."

The most intriguing project is at a small beverage processor, who wrote that his firm will be "using biologic-based inert medium combined with certified organic ingredients (to produce) healthy food products."

Survey participants were asked to prioritize nine types of capital outlays. Packaging equipment ranked first, followed by replacement of end-of-useful-life equipment with machinery designed with sanitation in mind. Spending on plant and worker safety was next, followed by control systems and electronic records for track & trace and quality management. Laboratory equipment ranked last.

Automation vendors tout the digital factory as the new model for manufacturing. The necessary infrastructure includes

### MANUFACTURING PRIORITIES



|                             | Percent ranking first | Avg. rating* |
|-----------------------------|-----------------------|--------------|
| Food safety                 | 22%                   | 5.7          |
| Cost control                | 10%                   | 5.2          |
| Worker safety               | 17%                   | 4.7          |
| Skilled worker recruitment  | 5.2%                  | 4.6          |
| Automation                  | 14%                   | 4.5          |
| Capacity expansion          | 13%                   | 4.4          |
| FSMA readiness              | 4.7%                  | 4.2          |
| Sanitary designed equipment | 4.2%                  | 4.1          |
| FSMA compliant suppliers    | 1.0%                  | 4            |
| Sustainability issues       | 6.3%                  | 3.6          |

\*Based on 10-point scale, 10 being the highest

### STRATEGIES TO KEEP THE MACHINES RUNNING

|                                    |      |
|------------------------------------|------|
| Hiring more maintenance personnel  | 29%  |
| Condition monitoring being used    | 29%  |
| Recruiting electromechanical techs | 21%  |
| On-the-job training programs       | 14%  |
| Shifting tasks to operators        | 40%  |
| Third-party maintenance services   | 21%  |
| Computerized asset management      | 12%  |
| Outsourcing parts management       | 6.2% |

digital sensors and meters to replace analog devices. While capital expenditures for those field devices ranked as the second lowest priority, two in five respondents say their companies are moving ahead with purchases.

The majority indicate their employers are converting to electronic records from paper-based systems. One-third are shifting from local servers to cloud computing and providing more remote access to machine controls. Access usually doesn't extend to OEMs, however: In seven out of eight cases, OEM access is denied.

### CLEAN MACHINES AND LABELS

Getting maximum value from those investments requires maintenance. Presented with eight strategies to optimize asset utilization, 40 percent indicated routine maintenance tasks are being assigned to machine operators. Condition monitoring tools (29 percent) and the hiring of additional maintenance technicians (21 percent) are other popular tactics, with many firms doing both.

Growing demand for products with clean labels, non-GMO ingredients and other “free-from” claims impact production as much as it does R&D teams. A majority of participants indicate processes are being adjusted to accommodate these types of formulations, and one-quarter say new equipment and technology is being integrated to manufacture them.

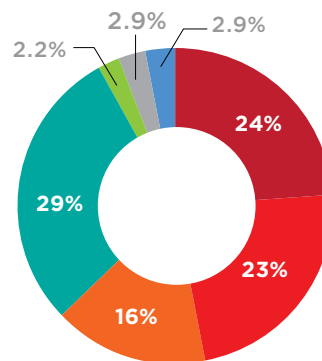
Twelve percent report that competition from clean label products is reducing demand for their products, but a higher proportion – 21 percent – say throughput at their facilities has increased as a result of the trend. Almost one in five are adding lines or new plants to produce minimally processed products.

How is your company meeting the growing demand for skilled workers? 43 percent are expanding in-house technical training, and a third are recruiting maintenance technicians. 23 percent are beefing up in-house engineering capabilities, but 26 percent are doing nothing.

Reverting to manual processes is the workforce solution at some firms. One grain-based food processor is “recruiting unskilled labor and placing them in risky situations they cannot begin to fully appreciate,” a manager ruefully noted.

Increased outsourcing is the solution of choice at 14 percent of readers’ companies.

## CAPITAL SPENDING BUDGET



|                             |      |
|-----------------------------|------|
| Will increase more than 10% | 24%  |
| Will increase 5-10%         | 23%  |
| Will increase less than 5%  | 16%  |
| Will be about the same      | 29%  |
| Will decrease less than 5%  | 2.2% |
| Will decrease 5-10%         | 2.9% |
| Will decrease more than 10% | 2.9% |

Pest control is the most frequently outsourced plant service, and the proportion of food companies that have turned this responsibility over to service specialists is growing. This year’s survey found 71 percent of respondents’ companies are outsourcing pest control, up 10 points in two years.

Plant engineers are an endangered species, although the frequency of outsourced engineering services has been steady in recent years, with about a third of surveyed companies subcontracting engineering support. Maintenance, logistics management and staff training registered minor dips, but less than one in five plants outsource any of those duties.

Companies are trying to get in front of the FSMA “swab-athons” for environmental

and product testing. Some or all microbial testing is outsourced at slightly more than half of respondents' facilities. Sanitation, on the other hand, saw a slight decrease in outsourcing, perhaps an indication that food processors now view this as a critical competency.

Meat, poultry and other protein processors were among the first food companies to outsource sanitation, and uncooked protein foods are prime candidates for microbial

testing. Half of respondents at protein processors indicated their firms are outsourcing microbial testing. Two-thirds of bakeries also outsource testing, and one in five outsources sanitation.

Customer demands, regulatory requirements and rapidly evolving technology are putting more stress on manufacturers. Despite those pressures, food professionals are approaching 2018 with quiet confidence. 

# FOOD PROCESSING

## 2018 Food Processing Event Guide

Download the **2018 Guide** for a list of the top food and beverage shows happening this year.

If you'd like to be considered for an upcoming edition, check out the second page of the guide for information on how to submit your event.

[info.foodprocessing.com/fp-events-1800](http://info.foodprocessing.com/fp-events-1800)





# Understanding Food Regulations

An overview of regulations in the United States, EU, and China

By Mettler-Toledo

## INTRODUCTION

The past decade has seen an enormous increase in concerns over food safety. While many efforts have been made to mitigate contamination and improper handling of food products, it is only recently that similar concerns about consumer education have become part of the larger conversation. This is not to say that product labels have lacked for regulation—there are laws on the books going back decades dictating the sort of information that product labels require—but apart from a basic set of guidelines, labels could take on nearly any sort of appearance, so long as a few particular pieces of information were present in some form or another.

These simple pieces of information included the name of the product, a list of ingredients, the name of the manufacturer and the address of whichever company owned the brand name. Perishable foods required an expiration date, and other foods required lot codes for recall purposes, but even these were not particularly a priority. There were, until recently, no requirements for legibility, location, or size. More importantly, there

were also no particular regulations governing the placement of allergen warnings beyond a requirement that product ingredients be present on the package.

Consumers, however, have long been growing more aware of what goes into the products they consume—and as consumers begin to demand more easily-accessible information about the food they eat,

government and industry regulators have slowly but surely began to focus even more on product labeling. The release of the British Retail Consortium (BRC) Food Safety Issue 7, which added a new section to their regulations specifically dealing with print and label quality, is one such indicator of this trend, as is the EU's Food Information Law (or Regulation (EU) No 1169/2011), which is still taking full effect. Similarly, the FDA updated their Food Label Guide in 2013 and is considering further improvements to the nutrition information requirements for food product labels.

As governments and regulators move to respond to consumer pressures, food product manufacturers are left to comply with the new regulations in order to avoid recalls, decertification or fines. For manufacturers selling products globally, this means keeping track of the mounting labeling regulations for each country, as well as ensuring that every product label is up to specifications. There are an increasing number of ways in which a label might now fail to meet one of those specifications, making a strict label quality control process more necessary than ever.

Part of a strict label quality control program is the use of a vision inspection system to both prevent mislabeling and ensure the print quality of the label meets industry regulations. Exploring the labeling guidelines for some of the larger world markets

shows shared traits among each, but also highlights differences which need to be kept in mind when designing product labeling. Industry regulations, such as the BRC's Issue 7, deal less with the content of the labels themselves and focus more on preventing labeling errors. This paper gives an overview of labeling regulations and requirements for the US, EU, and Chinese markets.

## THE BASICS

Before going into what precisely the basic label regulations across all countries are, it is useful to define what we mean by the word 'label.' The definition of label which this paper uses is taken from the EU Food Information Law: "any tag, brand, mark, pictorial or other descriptive matter or symbol relating to a food and placed on any packaging, document, notice label, ring or collar accompanying or referring to such food" (Regulation (EU) 1169/2011, p. 16). In other words, 'label' can refer to any printed material on a package surface.

While there are indeed different regulations depending on what country or industry body is doing the regulating, there are a few constants when it comes to labeling requirements:





# Special Report: Food Safety Meets Practicality

Selecting the Right Motor & Mechanical Products for Each Area of Your Plant

By Baldor

**W**hat's driving food safety? The Food Safety Modernization Act (FSMA) signed into law in 2011 was the first major food safety overhaul in 70-plus years. The primary goal of FSMA is to shift the emphasis for food safety from being reactive - recalls and finding the source of infection - to being proactive, making prevention the foundation for food safety.

FSMA gives the FDA the authority to detain foods, order a recall instead of just recommending one, and even shut down a facility. The ultimate goal is for organizations to take preventive actions at every conceivable step of the process, so there is no food contamination in the first place.

## **FOOD SANITATION ZONE ADOPTION**

The industry is slowly adopting to three distinct food sanitation zones that affect food safety. In a food processing facility, sanitation zones are classified as Zone 1, Zone 2

or Zone 3 based on the environment and cleaning regimen in that specific zone.

Zone 3 is primarily a dry environment or no food contact zone. The equipment in this zone may not need protection from high-pressure washdowns, but are still subject to dirt and dust, which can contaminate equipment seals on motors, gearboxes and bearings. Contamination on seals can break the lubrication film, which is important for seals to work properly. Compromised lubrication film can lead to seal damage and beyond that, ingress coming into the

gearbox or motor. Consider equipment with features that provide dust ingress protection—such as shaft seal breathers—in Zone 3.

Zone 2 is a splash zone. It is a medium-hygiene zone where areas need at least some kind of washdown, but not necessarily high-pressure or aggressive cleaning, and probably not in the entire area.

In Zone 2, any standard seal is adequate to prevent moisture from coming into the gearbox, and it is always good to use covers in these areas to protect the gearbox. Pay attention to breathers because if there is splashing, there could be humidity, which could affect the internals of the gearbox.

Painted washdown motors work well in Zone 2 environments. In this zone, some splatter, particles or liquid can come off the food, however these motors are not located over the food source. Here, motors typically have neoprene gaskets, epoxy paints, lip seals, and a neoprene shaft slinger on the shaft. The motors must be clean but does not necessarily require higher-cost stainless steel. Even a paint-free design can work quite well in these types of applications.

Zone 1 is a high-hygiene or food zone area. These are the areas where the food product is at its most vulnerable and equipment has direct contact with food. Zone 1 areas also create the best opportunity for

## HOW WELL DO YOU KNOW IP69K?

Many food and beverage applications demand this highest level of washdown protection.

The IP69K rating is for applications where high-pressure and high-temperature washdowns are used to sanitize equipment. The IP69K test specification was initially developed for road vehicles, especially those that need regular intensive cleaning (dump trucks, cement mixers, etc), but has been widely adopted in the food and beverage industries as a test of products to withstand sanitary washdown.

The Ingress Protection (IP) rating system is an internationally recognized scale that relates to proven protection against environmental factors such as liquids and solids. It's a part of the IEC 60529 rating system. Products rated to IP69K first must be impervious to dust, but also must be able to withstand high-pressure and steam cleaning. To be specific:

- A spray nozzle is fed with 80°C water at 80–100 bar (~1160-1450) at a flow rate of 14–16 L/min.
- The nozzle is held 10–15cm from the tested device at angles of 0°, 30°, 60° and 90° for 30 seconds each.
- The device being tested sits on a turntable that rotates once every 12 seconds.

The IP69K rating is the highest protection available.

bacterial contamination and need to be sanitized thoroughly with regularly scheduled cleanings. At the very least, cleanings are completed at every shift change or quite possibly several times each shift.



Learn more about this Special Report **here**.



# When Quality Needs Clean Temperature Data

Can a Thermometer and a Software Development Kit Enable Integrated Quality Measurement and Real-Time Alerts?

By TEGAM, Inc.

## INTRODUCTION:

Integrating an automated temperature measurement solution into a processing facility and/or supply chain is required or at least optimal in multiple industries. In some regulated lines of business, such as the food industry, temperature measurement provides one of the few clear quality inputs. Processors must maintain food at temperatures that inhibit the growth of pathogens which cause consumer foodborne illnesses. Failure to do so can result in recalls, lost revenue, increased expenses, and damage to the brand. As a result, food processing and downstream supply chain operations must monitor their products to assure that temperatures have not risen above widely accepted levels where pathogens multiply.

For fifty years or more, quality measurements across many industries were conducted with paper and pencil on a clipboard, then manually filed.

As technology advanced, quality technicians entered the data collected from the processing floor or the loading docks at change-of-possession into a local computer.



However, both of these methods proved to be fraught with errors, even by the most careful quality technicians and managers. Whether transcription errors in recording, data entry errors into the computer, or misfiled reports,

errors in quality data recording are the rule, not the rare exception.

As a next step, automated data collection and storage solutions emerged that digitally stored the data directly at the time of measurement. Unfortunately, most vendors offering such a solution tacked on proprietary software solutions that required multiple steps to actually enter the data in their customers' databases. In a typical "How Not to Do It" scenario, the vendor provides a proprietary software that requires connection to the digital thermometer. When connected to the local QA computer, the temperature data uploads only to the vendor's proprietary software. To integrate the data into the company's database, the QA technician must then download a comma-separated (.csv) data file and upload it to the company's database. This is a cumbersome task that may or may not occur promptly



and may also be subject to errors. This approach does not allow direct two-way communication with the thermometer to change or update settings and defaults.

Why does this matter? you might ask. The three-fold answer is auditability, traceability and cost. All of the previously described temperature measurement processes have multiple inherent disadvantages for each of these characteristics. In a commercial



temperature measurement environment, auditability and traceability translate to no human interaction between thermometer and server.

5-star traceability also means that the data exhibits a clear chain of custody, which is not possible if there's human intervention between measurement and the server. Of course, the data is meaningless unless the thermometer is accurate. In that vein, any integrated solution needs to document that the instrument has been regularly tested for accuracy.

Perhaps most importantly, delays in generating out-of-range temperature alerts at any stage of the value chain multiply the produc-



tion cost. A fully integrated, Bluetooth-enabled automated temperature measurement platform enables nearly instantaneous alerts. Whenever temperature measurements generate an alert, that product can be quickly identified and diverted out of the value chain. For the food industry, this translates to preventing, or in the worst case, limiting the scope of a recall due to product that may contain unacceptable levels of foodborne pathogens.





# The Price of Safety in Plant Sanitation

Learn how direct steam injection can affect maintenance costs while keeping plant personnel safe.

By Mark Brueggemann, Pick Heaters

**P**ick Heaters has been providing liquid process heating solutions that use direct steam injection for more than 70 years. Direct steam injection offers unique benefits for heating water or water miscible liquids for numerous food plant applications. It is used wherever an immediate supply of precisely controlled hot water is required, such as sanitation, batch filling, blanchers, clean-in-place, and freezer defrost. Pick also has a sanitary design that can be used for in-line product cooking, the first direct steam injection sanitary heater to earn 3-A Sanitary Standards certification.

Our customers face challenges from many angles. There are ongoing food safety issues, as well as concerns over food borne illnesses. Energy savings and efficiencies directly affect profitability. Maintenance costs have always been important. Recently there has been a heightened concern for the safety of plant personnel. While the application of the Pick Heater can offer benefits in all of these areas, satisfying the concern for operator safety in plant sanitation is prominent.

The biggest concern in regard to plant sanitation is that customers need a reliable yet safe supply of hot water. They need water at a precise temperature to satisfy sanitation standards. At the same time, they cannot afford water temperature to exceed set point, resulting in a concern for their operator's safety. They want confidence that their hot water system will provide a safe, reliable source of precisely controlled hot water, regardless of demand.

Safety has become a problem, or risk, at the hose point of use. One of the more common methods for supplying hot water for sanitation has been the use of individual steam/water mixing stations, or tees, located at each hose station. While these units offer the responsiveness of steam injection heating, they can pose a serious



**Pick Variable Flow Heater**

safety risk. Mixing tees require a minimum water supply pressure to operate properly. An internal valve serves to prevent live steam, or overheated water, to exit the hose station should there be a loss in water pressure. This mechanism often sticks due to hard water scaling, which creates a situation where operators have been scalded or injured. It's not a question of whether or not this happens, but when it happens.

In addition, water temperature is controlled individually at each hose station. This makes it susceptible to operators unnecessarily tampering with the temperature set point. There is a common misconception that the higher the temperature, the better — this isn't the case. Rather it is inefficient and a

serious potential safety concern. Water that is too hot is a waste of energy, but water that is not hot enough won't get the job done or meet sanitation standards.

Pick Heaters developed the Variable Flow Heater with plant washdown in mind. It is designed to serve as a single, central water heating system that can be isolated from operators and use points. The heater can handle the wide range of water flow rates required throughout the facility. It features a low-head pump that maintains proper water velocity during low loads, while maintaining tight temperature control regardless of demand. It can respond to frequent start-stop situations and still deliver accurately controlled hot water, on demand. Temperature overrides can be put in place preventing any possibility of overheated water from reaching any of the points of use.

After a customer has experienced problems with point-of-use mixing tees, going with another steam injection heating method can be a hard sell. Both mixing tees and the Pick Variable Flow Heater are considered steam injection water heaters, but that is where the similarity ends. Once the customer understands that the Pick heater is being applied as a utility, they see the difference. The Pick heating system can be located well away from worker locations.



# Your Food Is Only As Healthy As Your Storage Vessel

Mole•Master Services Corporation talks about the importance of silo and bin cleaning for food safety.

By Dave Laing, Mole•Master Services Corporation

**T**he Daily Mail published an article towards the end of 2017 that reported that food contamination cases were on the rise worldwide. Contaminants that impacted major brands in 2017 included pieces of plastic and glass in food as well as salmonella and other bacterial and micro-organisms. The article suggests that the reason for these increases in food recalls is pressure on manufacturers to lower prices. Lowering prices means needing to invest less in order to keep a healthy bottom line. That means that corners get cut, even when it comes to high-priority issues like food safety.

When a story about food contamination or a food recall breaks, the focus usually is on the plant where the actual manufacturing takes place. The storage vessels where raw materials are kept seldom get the focus they should, but the reality is that a storage vessel that is not cared for properly can be the start of a long chain that leads to a costly and dangerous food contamination issue. A lack of sanitation in a storage vessel is as much a factor as a lack of sanitation in the actual plant, but this facet of a food

processing facility does not get as much attention as it should.

Keeping a storage vessel sanitary is not only beneficial for health reasons, maintaining a good material flow can help production levels remain consistent, it can keep the plant's employees safer, and it can keep insurance and other liability expenses down. Health and Safety plans for sanitization differ from plant to plant and company to company but can include wipe testing after,

fumigation , dry ice blasting, soda blasting and solution wash downs.

How can a food processing facility maintain a healthy storage system? The first and most important step is to schedule regular inspections, especially if the silos are a few decades old. Silo inspections can be easy to put off. A lot of problems that arise in storage vessels can be worked around for a short time at least, and an inspection can reveal more serious issues that will require a large investment to fix. Given the pressure on manufacturers mentioned above, “leave well enough alone” is likely a common cliché in food processing facilities.

## THE SILO INSPECTION PROCESS

A silo inspection should not be implemented in a half-hearted manner. Once the decision is made to inspect the status of storage vessels, a professional structural engineer should be contacted to conduct the evaluation. Sometimes companies will hire a construction engineer who may not be as familiar with things like flow channels and other particular issues that storage silos can suffer. Once the engineer and other certified professionals are contracted, the following process usually ensues:

- The engineer visually observes the exterior silo walls using binoculars to see if there are any areas of deterioration that should be looked at more closely. These visual cues include cracking, bulging, or material leakages.

- A three-pound hammer is utilized to test the wall of the silo in multiple locations. This sounding process can help determine if there is a potential for delamination. If issues are suspected, the engineer may drill and remove a small core from the wall for further inspection.
- Visual inspection of the silo’s interior occurs next. If there are areas where build-up has accumulated, the engineer may request it be removed so the walls can be evaluated more effectively. A professional silo cleaning contractor should be on site to be able to take care of issues like this safely and efficiently.

Results of a silo inspection can vary wildly. The news may be great, or the news may be that the silo has such severe structural issues that it needs to be taken down for the safety of employees. Obviously the latter is a significant issue for facilities, but nothing seems significant when compared to severe injuries or even deaths that can and do occur on unstable, unsafe structures.

## SILO CLEANING

Hand-in-hand with regular silo inspections is silo maintenance. The necessity to make sure that all contaminants are removed from a silo before new material is placed for storage does not need to be explained here. Types of stored material can also cause



# Improve Safety & Sustainability in Food and Beverage Plants with Mix Proof Valves

Increase capacity, simplify operations, and prepare for the future

By Pentair

**T**he variety and complexity of products that food and beverage manufacturers produce to stay competitive challenges them to combine consistent safety, high quality, cost control, and sustainability in their operations. These important initiatives result in the need for continuous and fully-automated production facilities with cost-efficient and environmentally-friendly systems.

As part of these complex systems, mix proof and related valves and components play a crucial role in taking a process plant to the next level of efficiency, safety and automation. This is why food and beverage manufacturers should take a closer look at the latest valve technology, system design

and total cost of ownership (TCO) when constructing a new plant, upgrading an existing facility, or changing the production process.

## **UNDERSTANDING VALVES AND DESIGN STANDARDS FOR MIX PROOF PROTECTION**

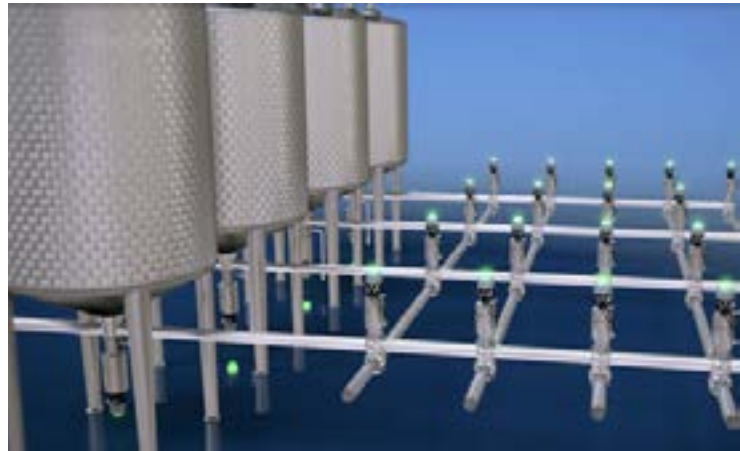
Food and beverage process plants have options when it comes to system design for fluid flow control. While some options may seem more attractive from a CAPAX standpoint, investment dollars should not be the only consideration.





Swing bend panels are commonly used to route product and cleaning solution through piping systems and can be attractive because of the low installation cost. The manual connections in swing bend panels make this system labor intensive, expensive to operate and difficult to expand. More importantly, from a food safety standpoint, this leaves the system open to the atmosphere thus increasing the risk of product contamination.

Mix proof protection can also be achieved with an automated system using a traditional three valve block and bleed arrangement. This configuration provides a two seal blocking design with a full port leak detect. The drawbacks to this approach include more valves, expensive piping, dead-legs, plus large product losses and space requirements.



While these two options will get the job done, they may not be the ideal option for food and beverage manufacturers. Findings in the Food Processing 2018 Manufacturing survey indicate that process plants anticipate increased production levels, continued focus on food safety and investment in new or expanded facilities, equipment replacements and upgrades, and automation.

## INVESTING FOR THE FUTURE

Today's production processes demand parallel operation of product and cleaning cycles in order to maximize plant utilization and optimize the economy of operation in complex plants. Mix proof technology allows for independent cleaning without interruption of production. The double seat arrangement of mix proof valves promotes safety because all process and cleaning fluids remain separated without danger of cross-contamination.



# FSMA Compliance

How Separation Technology Gets — And Keeps — You There

By Brock Herrmann, Bunting Magnetics Co.

**A**re you confused about how to apply new FSMA regulations in your food processing plant? If so, you are not alone. While the vague regulations allow you to make the best decisions on product purity and equipment protection for your business, the downside is the uncertainty about exactly how to do that. Are you making the right decisions? Are you using the tools correctly? Will the FDA agree with your decisions?

Separation technology is one class of tools commonly used in the food industry to remove metal contaminants. What follows is a simple plan to help keep you compliant with FSMA regulations, including best practices, common

mistakes, and recommendations for how to implement magnetic separation equipment properly.

## **PERFORM A PULL-TEST AUDIT ONCE PER YEAR**

An effective separation technology program requires periodic verification of magnet performance. Don't make the mistake of placing your magnets and forgetting about them. The industry's best practice is to perform a pull-test audit of all magnets in your plant at least once per year. This will



help guard against a lapse in protection and keep you compliant with FSMA regulations.

The pull test measures how many pounds of force it takes to remove a half-inch ferrous ball from the magnet being tested. The strength of a magnet varies based on the type of magnet, as shown in the graph below. If a magnet is not working or has lost strength from cracking, impact, extreme heat, or even improper installation, the pull test will detect the lack of strength. Your test should show similar strength as when the magnet was installed. When magnets show signs of losing strength, replacement may be necessary.



## **BUNTING MAGNETICS CO. MAGNETIC LIQUID TRAP**

To perform the pull test, you can either hire an independent magnet auditor or perform the test in-house using a purchased test kit.

From our experiences performing pull test audits, Bunting Magnetics Co. has observed several common mistakes with the implementation and use of separation technology. These mistakes can leave your food supply and equipment vulnerable to metal contamination, causing damage to your product, reputation, and processing equipment. Four recommendations to keep your magnets working effectively are:

1. Don't ignore the importance of routine magnet cleaning and inspection.
2. Magnets covered with too much ferrous material lose effectiveness. A recommended best practice is to specify cleaning procedures in either your quality assurance or maintenance procedures for all magnetic equipment. Procedures should specify the cleaning frequency as well as a reporting mechanism for the cleaning person to report magnet damage or suspected loss of magnet strength. Two signs of a damaged or ineffective magnet are an inability to attract metal or a rattling sound inside the magnet. Finally, cleaning procedures should also include a supervisory check to ensure the magnet cleaning procedures are being followed.
3. The recommended method for cleaning a magnet is to slide the ferrous material off using a heavy-duty leather glove. Common mistakes in cleaning include banging the magnet against the wall, which can destroy the magnet and diminish its effectiveness; using high-pressure water or air, which pose health and safety risks and do not clean effectively; or using unprotected hands, which can



# Control Pests and Bugs Around Your Loading Dock Doors

By Goff's Curtain Walls

**F**ood safety has always begun with cleanliness and a clean facility simply isn't attainable if food crazed, pests are able to migrate through open dock doors. When unwanted pests invade your facility, whether it be of the ground moving or airborne variety, not much else can be focused on! To solve this specific issue, while helping to meet A.I.B. facility standards, Goff's Enterprises has brought to market the G-2 Lite Door.

Goff's Enterprises' G-2 Lite Door is a fully customizable high speed mesh dock door designed to keep unwanted bugs, birds, and other pests out of the loading dock area. Not only does it keep out pests, the G2 Lite Door helps to reduce heat from the sun while allowing light into work areas and improving ventilation. The Door is constructed with 11 oz vinyl woven Mesh panels that provide a 65% shade factor to lower temperature and save energy. The 17x11 scrim provides small openings which make it difficult for insects, birds, and pests to penetrate, leaving your facility pest free and compliant with food facility sanctioning organizations.

G2 Lite Doors feature easily replaceable, exchangeable panels. Uniquely created fiberglass extrusions slide securely in custom extruded aluminum side beams in a variety of manual and motorized operations including:

Spring Assist, manual chain hoist, 18" per second in tube motor, and 30" per second external jackshaft. Other standard features include: a reverse safety feature and standard rubber side seals & baffle.

Goff's G-2 Door line was adapted from tremendous research and communication with users and distributors. "Like in any business, the customers know what works best for them," states Tony Goff, President of Goff's Enterprises, Inc. "Using their feedback and requests we have developed a door that is not only functional and low maintenance but also affordable."

Another great option available from Goff's, is the Bug Blocking Side Seal Door. The Bug Blocking Side Seal Doors have all the same great benefits that the G-2 Lite offers in a side-sliding manual option. The Bug Blocking Side Seal Door is a "Best in Class" economical solution that offers increased productivity by providing additional employee comfort. The Bug Blocking Side Seal Doors include a wall bracket to secure the door when in use and a tie back strap to keep it out of the way when not in use. All of Goff's Bug Blocking Doors and G-2 Lite Doors aid in the compliance of: FDA, AIB, IPM, ASI & HACCP Food Safety Programs.



Finish reading more about the G-2 Lite Door [here](#)





# Rosedale Products' FSOT300 and FSOT150 Filter Bag Housings

By Dan Morosky, Rosedale Products, Inc.

Rosedale Products, Inc. is a leading technology developer in the field of liquid filtration systems and waste minimization products for customers around the globe. With more than 50 years of experience, Rosedale offers an exceptional product line that includes high-performance filtration solutions for multiple industries. Rosedale technicians help customers find the best, most cost-effective approaches to their filtration needs.

## INTRODUCING THE FSOT300 AND FSOT150

Our new FSOT300 model is a durable, high-capacity filter with an uncompromising welded construction to meet ASME Section VIII Code requirements. The cover is hinged and fastened with swing bolts for quick access and easy bag change-out. Each unit has a high-quality electropolished finish to resist adhesion of dirt and scale, making routine maintenance fast and simple. Customize with several options, including gauges and switches. A wide range of filter bags or cartridges can be utilized in this housing.

## PERFORMANCE

The FSOT300 model provides optimal filtration performance when combined with our high-capacity filter bags. Our unique design ensures a 360-degree positive

seal and media compression, eliminating the potential for bypass. Unfiltered liquid and debris do not accumulate above the filter bag and contaminate the clean fluid area during change-out. Fluid passes through the bag from inside to outside. The FSOT300 also ensures an even flow into the filter bag, where contaminant is contained for easy disposal.

## FEATURES

- Permanently piped housings are opened without special tools
- Carbon or stainless steel housings
- Covers are O-ring sealed
- All sealing surfaces are blancher ground
- O-ring seals: Buna N, EPDM, Viton® and Teflon®
- 300 psi rated housing (FSOT300)
- ASME Code Stamp available
- Uses standard #1, #2 or 500 series PL cartridges
- 1/4-inch NPT gauge ports and vent connection
- 1/2-inch NPT drain connection
- Adjustable-height tripod leg assembly
- Available with extra length legs and evacuation floats
- NSF 61 Certification available
- Mesh lined and heavy duty rimmed basket available
- Sanitary and Victaulic connections (available)
- Basket-Tool included for easy removal

New Bag-Sized Cartridges Provide Up to 12 Times More Dirt-Holding Capacity. End-users requiring a solution for their frequent filter servicing problems now have an option. The new PL series bag-sized cartridge element from Rosedale Products, Inc. incorporates the advantages of both bag and cartridge type elements into a single, absolute-rated unit capable of handling up to 12 times more dirt over conventional bags before needing to be replaced.



- Three different top-sealing ring designs – one to fit your needs
- Available in standard bag sizes 1 and 2, to fit housings 8-15 and 8-30
- Low pressure drop

\*For size 2 cartridges. Size 1 cartridges have 13 square feet of material.

## MATERIALS

Like our other filter elements, Rosedale's PL series bag-sized pleated

cartridge elements use polyester or polypropylene micro fibers and standard fibers to produce our high-efficiency filter media. This unique construction provides filtration to 1 micron at 95 percent efficiency: a real rating for the real world, consistently giving the same level of performance from batch to batch.

Like bags, Rosedale's bag-sized pleated cartridges are easy to handle and trap contaminants inside, preventing "wash off" during removal of spent or dirty cartridges. Like cartridge elements, they provide larger surface area and greater dirt-holding capacity than standard bags.

## CONSTRUCTION

Rosedale's bag-sized pleated cartridges are uniquely constructed to enhance durability and performance. Twenty-five\* square feet of high-efficiency material is sandwiched between two flow-enhancing, coarse-mesh screens and then pleated in a supported construction. This supported pleat construction ensures flow cannot be pinched off, and it also greatly strengthens the overall integrity of the element. The cartridge end caps, made of solid molded polypropylene, are thermo-bonded to the pleated cylinder.

## FEATURES

- Eleven micron retention ratings, from 1 to 110 at 95 percent efficiency, are available

## GREATER CAPACITY MEANS LONGER LIFE

### Filtration Level

Rosedale's PL series bag-sized pleated cartridge elements have been tested with the Single-Pass Efficiency Test using water and the AC Fine Dust Test. Water is passed through an initial pre-filter (at 0.45  $\mu$ ), after which contaminant is injected into the water line. An automatic particle counter analyzes the number of particles per milliliter greater than a selected size, before the water enters the filter. The water then passes through the test filter, and the effluent is analyzed for the number of those same-size particles. The number of particles removed provides the efficiency rating. For example, if after the single pass, 95 percent of the

particles are removed, then the filter is 95 percent efficient at the specified micron rating.

## FILTRATION EFFICIENCY

Using the Single-Pass Efficiency Test, we've determined the following efficiency ratings for our pleated cartridges. Real ratings are accurate and reliable, time and time again.

Disposable Bag-Sized Pleated Cartridges Provide High Performance at a Low Cost Compatible with Models 8, LCO, NCO, and Multi-Bag Filters

The new PL series bag-sized pleated cartridge elements from Rosedale Products, Inc. are easily installed in our standard housings. The PLRICU cellulose filter provides 10 times the surface area of standard filter

bags, and the PLRIPF polyester felt provides 6 times the area. Also available are a pleated element insert and a self-contained cartridge/basket combination. These low-cost, high-performing dirt gluttons provide superb capacity with filtration efficiency as high as 99 percent.



## FEATURES

- Available with or without metal cage
- Seals in a standard strainer basket
- Over 50 square feet of surface area
- Beta 100 (99 percent) retention levels
- Longer element life provides improved system efficiency

## BENEFITS

- Fewer change-outs required
- Less downtime
- Improved quality due to improved retention ratings
- Lower maintenance and labor costs
- Reduced operator exposure
- Recyclable with no metal (optional)

Rosedale's Absolute-Rated Pleated Cartridges Deliver High Efficiency and Long Service Life. Filter cartridge elements from Rosedale Products, Inc. provide efficient solids removal in liquid systems. Absolute ratings range from 0.5 to 70 microns. Each cartridge has pleated, fixed pore media to maximize surface area and prevent particle unloading and fiber migration. Media selections include cellulose, fiberglass, polyester, and polypropylene. The wide variety of media, filter sizes, and end cap configurations provides customers with an ideal solution no matter their specific application. Superior construction materials and quality control techniques ensure that our filter cartridge elements provide quality filtration, even in the harshest operating conditions.



**Find us online at [RosedaleProducts.com](http://RosedaleProducts.com) or call us at 734-665-8201.**

**Rosedale Products Inc.**

**3730 W. Liberty Rd., Ann Arbor, MI 48103**

**Email: [Filters@RosedaleProducts.com](mailto:Filters@RosedaleProducts.com)**