

# Metal Detection



## **Pipeline Systems**

High Performance Metal Detection  
for Enhanced Brand Protection

Tailored Solutions for  
Easier Integration

Electronic Data Collection For  
Easier Compliance

## **Metal Detection Solutions** For Pipeline Applications

**METTLER TOLEDO**

# Maximum Protection

## Optimized Product Quality

**Designed to deliver ultimate product quality and total peace of mind for you and your customers, METTLER TOLEDO Safeline's Pipeline metal detection systems inspect pumped liquids, pastes, slurries and vacuum-filled products for metal contamination. The combination of maximum detection capability, efficient rejection systems and new technology to enhance quality processes increases operational efficiency, maximizes profitability, and makes compliance with both industry standards and regulations easier.**

High frequency operation and sophisticated electronic filtering techniques combine to deliver the ultimate in metal detection sensitivity within the product flow. On detection of metal, a fully automatic, high-speed reject device operates, diverting the contaminated product and isolating it from the main product flow.

### Enhanced brand protection

The combination of very high sensitivity and superior reliability provide protection for your brand and your reputation.

Choosing the latest Safeline Pipeline metal detection systems can help you achieve:

- Compliance with regulatory and industry standards
- Improved hygiene standards
- Maximized product quality

### Increased productivity

Pipeline metal detection systems enable productivity to be increased. Pipeline metal detection systems enable productivity to be increased through:

- Simple set-up and operation
- Seamless process line integration
- Reliable, consistent performance
- Reduced false rejects
- Low maintenance requirements
- Easy-to-clean system designs

### Consistent product quality

Increased length of product flow pipelines can give rise to degradation in some products, but the use of METTLER TOLEDO Safeline's innovative Zero Metal Free Zone (ZMFZ) technology allows the metal fittings of the throughout pipe and other process equipment to be positioned closer to the metal detector without affecting performance.

- Shorter throughput pipes
- Engineered solutions to address production requirements
- Hygienic, easy-to-clean reject valves to reduce risk of biological or cross-contamination



All METTLER TOLEDO Safeline metal detectors support compliance with the GFSI standards and external codes of practice including: BRC (British Retail Consortium), IFS (International Featured Standard for Food), SQF (Safe Quality Food), FSSC 22000/PAS 220, major retailer codes of practice and key legislation including the Food Safety Modernization Act (FSMA).

## Choosing the right solution for your product application

Pipeline applications are wide and varied - choosing the right metal detection solution will ensure maximum performance and brand protection. A variety of integrated reject devices are available to efficiently remove metal contaminated product from the production flow, while minimizing waste of good product. We can supply any fittings required to connect the non-metallic throughput pipe with the input and output pipes.



**Pipeline** systems offer versatility for inspecting a wide range of liquids, pastes and slurries. The Human Machine Interface (HMI) can be installed remotely from the metal detector enabling the point of inspection to be located in inaccessible locations for easier integration.

**Best for:** homogenous products including liquids; viscous fluids such as molten chocolate; pastes; meat slurries; soups and sauces.

Find out more on [pages 6-7](#).



**Profile Advantage** technology delivers the highest sensitivity performance in challenging applications subject to product effect (due to bubbles or voids in the product flow), and virtually eliminates false rejects.

**Best for:** pumped products with the potential to have bubbles or voids in the product flow; when highest level of brand protection is desired.

Find out more on [pages 8-9](#).



**HDS Pipeline** systems are designed specifically for vacuum filler applications. The space-saving design can be configured through the use of a range of accessories for easy integration with leading processing equipment including vacuum fillers, linking machines and clipper systems.

**Best for:** sausage meat and other vacuum-pumped foods.

Find out more on [pages 10-11](#).

## Engineered for easier process line integration

Our Pipeline metal detection systems can be tailored to suit specific applications, including:

- Special support brackets and frames for suspended systems
- Mobile stand-mounted designs on castors
- Water-heated throughput pipes for applications where a constant temperature must be maintained
- High-temperature, high-pressure throughput tubes

# Maximizing Product Quality

## Meeting Compliance Requirements

**Pipeline systems offer advanced metal detection solutions for liquid, paste, slurry and vacuum-packed product inspection applications to provide product quality assurance. When installed at Critical Control Points (CCPs), these metal detection systems support HACCP and HARPC requirements, and the broader requirements of food safety regulations and standards.**

### **Profile Advantage - innovative metal detection**

The newest addition to our Pipeline systems portfolio is our Profile Advantage Pipeline system which uses proprietary Multi-Simultaneous Frequency and Product Signal Suppression technology. This unique combination delivers superior metal detection sensitivity to all metal types in challenging applications to detect smaller metal contaminants and virtually eliminate false rejects.



Profile Advantage systems overcome the issue of bubbles and voids in the product flow to virtually eliminate false rejects.

### **PowerPhasePRO technology - advanced metal detection**

Pipeline metal detection systems are available with METTLER TOLEDO Safeline's proprietary PowerPhasePRO software technology to provide advanced metal detection. The intuitive, easy-to-use interface simplifies procedures and places valuable process information at the fingertips of the whole manufacturing team.



PowerPhasePRO and Profile Advantage systems feature a large, full color touch screen interface with an icon-driven menu.

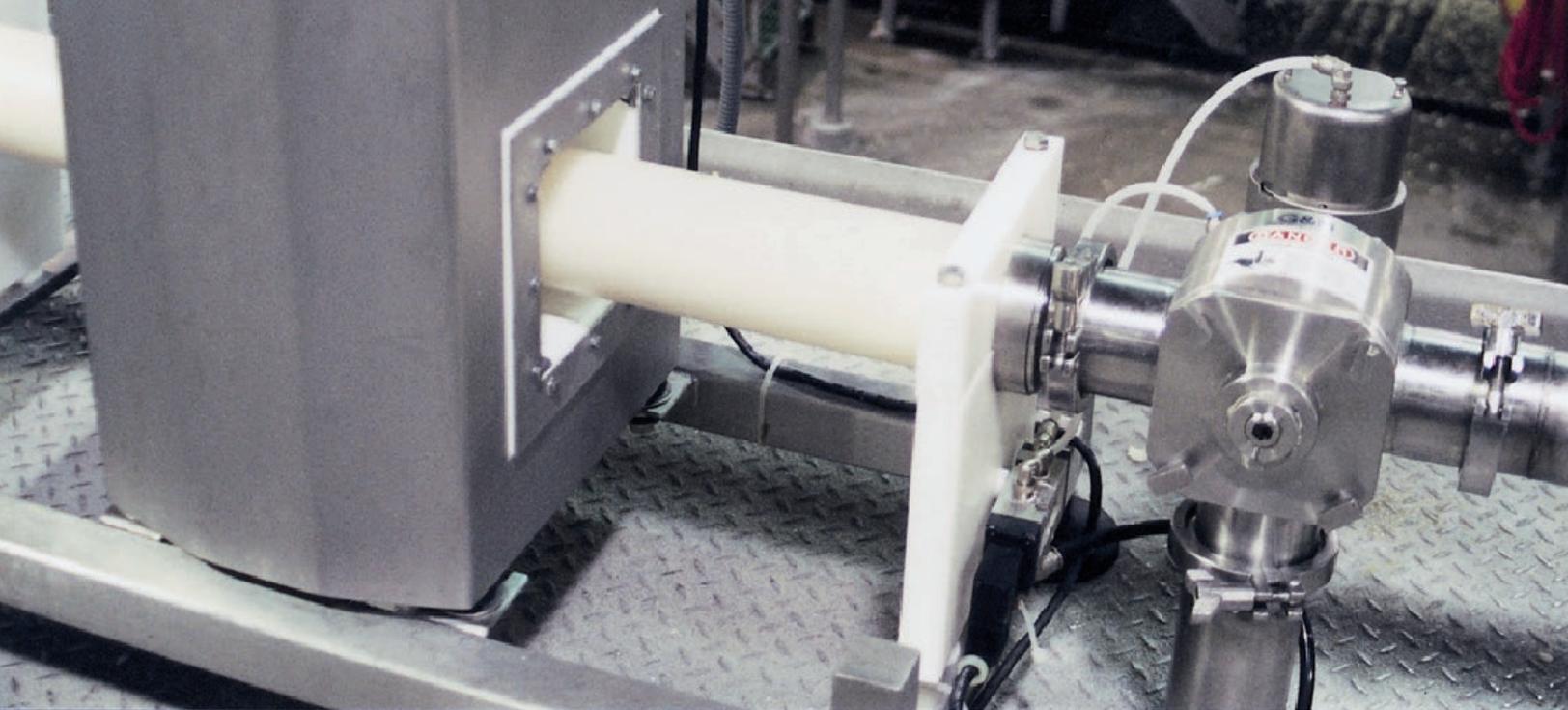
Auto-Balance Control and Enhanced Noise and Vibration Immunity features deliver long-term in-process performance and stability, reducing the risk of false rejects, minimizing product waste and increasing operational efficiency.

### **Signature technology - for consistent, reliable detection**

Pipeline and HDS systems are available with METTLER TOLEDO Safeline's Signature operating platform and robust, push button membrane key panel operating system. The operator interface offers simple set-up routines and maximum inspection process control. Auto-Balance Control and on-board fault reporting combine to deliver a stable operating platform to reduce potential downtime.



Signature platforms offer a simple user interface with push button key panel.



### Advanced technology makes compliance easier

Built-in software routines and data displays can be used to support quality management processes to meet compliance requirements. Integration with **ProdX** software allows users to monitor and manage data collected from METTLER TOLEDO product inspection devices, making it easier to comply with food safety standards and retailer audit requirements. Outlined below are three ways PowerPhasePRO and Profile Advantage technology make compliance easier.

#### Meeting compliance requirements



Missed performance monitoring tests can compromise quality standards and lead to non-compliance issues.

Pipeline metal detection systems with **PowerPhasePRO** or **Profile Advantage** technology advise when test routines need to be performed and when testing is overdue via highly visible screen messages.

#### Greater process control



The control of manufacturing processes is supported through an automated user access log facility. This feature enables data to be reviewed to establish when the system was accessed and by whom. This helps with the management of line personnel and ensures enhanced levels of due diligence can be exercised.

#### Ensuring uptime



PowerPhasePRO and Profile Advantage metal detection systems incorporate advanced Condition Monitoring technology which constantly analyzes and tracks the performance of major system components. Adverse trends are highlighted as an early warning in advance of potential failure enabling the issue to be addressed when the machine is off-line, avoiding lost production time.

# Pipeline System Solutions

## For Liquids, Pastes and Slurries

**METTLER TOLEDO Safeline Pipeline metal detectors can be used to inspect a wide variety of pumped food products. Available in either suspended or floor mounted format, Pipeline systems can be easily integrated into production lines, delivering reliable metal detection inspection and rejection.**

### Easy operation for optimum efficiency

The operator interface uses Safeline's PowerPhasePRO software platform with full-color touchscreen technology.

Pipeline systems are also available with Safeline's Signature software operating platform.

Heavy duty, stainless steel pneumatic reject valves with quick release couplings automatically remove metal contaminated product from the process flow.

### High sensitivity for maximum security

Advanced software provides exceptional levels of in-process stability resulting in reliable, on-line performance.

All metal types including ferrous, non-ferrous (including aluminum) and normally difficult to identify non-magnetic stainless steel contaminants are easily detected and removed from process lines.

The use of METTLER TOLEDO Safeline's advanced detection coil technology combined with enhanced filtering techniques deliver ultra-reliable and stable in-line sensitivity to all metal types.

### Flexibility to integrate with production lines

Systems can be designed to suit your exact needs depending on the product being inspected and can include:

- Solutions for direct integration with other equipment
- Special support brackets and frames for suspended systems
- Mobile stand mounted designs on easy-move castors
- High-temperature, high-pressure throughput tube
- Water jacket to maintain consistent product temperature (hot/cold)
- Choice of application-specific, integrated automatic reject devices
- Emulation feature enables remote access and control of PowerPhasePRO Pipeline metal detection systems

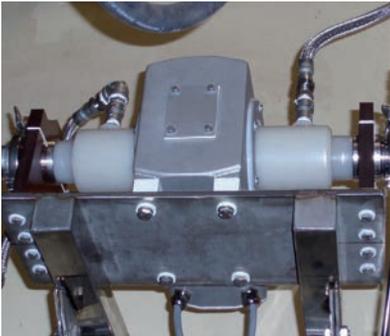




## Engineered solutions to address production challenges

Pipeline applications can range from the inspection of homogenous liquids at room temperature, to more complex applications involving non-homogenous slurries or viscous products at high temperatures. METTLER TOLEDO has decades of experience in designing pipeline metal detection solutions tailored to individual customer requirements.

### Pressure and temperature considerations

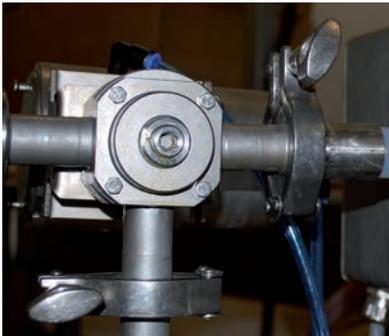


The maximum pressure in the system must be known to ensure the throughput pipe can handle the expected system pressure.

Heated products will require a throughput pipe that can handle extremely high temperatures.

Molten chocolate will require a heated water jacket around the throughput tube to maintain the product's temperature during the inspection process.

### Effective rejection to minimize product waste

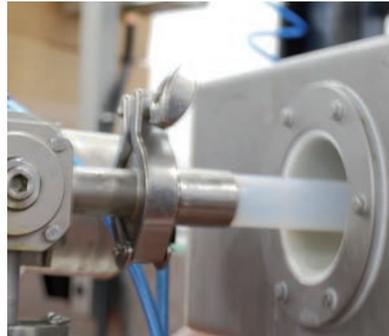


Choosing the right reject mechanism will minimize unnecessary product waste.

METTLER TOLEDO can supply three-way diverter valves, suitable for most liquid or soft slurry applications.

Specialized reject devices, including piggable options and cutting valves, are available for products containing solid elements.

### System integration made easier



System integration is made easier through the provision of specialized brackets and support frames.

A variety of pipe fittings can be supplied to ensure the throughput pipe can be securely connected to input and output pipes.

ZMFZ technology enables the use of a short throughput pipe for maximized product quality in restricted installation spaces.

# Superior Performance In Challenging Applications

**The quality of your products and the safety of your customers is critical to your business. Breakthrough Profile Advantage technology enables the detection of irregular-shaped metal contaminants that are up to 50 percent smaller than those found using traditional methods. Profile Advantage Pipeline systems provide a vital building block to establish improved processes and manufacturing efficiency.**

## **Brand protection made easier**

Natural products such as liquids, pastes and slurries often have a high degree of moisture content and may also be subject to voids or bubbles in the product flow due to the pumping process.

Both of these contribute to a phenomenon known as "product effect" where the product's own characteristics inhibit a detector's ability to distinguish the product from foreign body contaminants.

Conventional metal detector technology often struggles to cope with this variation with the risk

of a high false-reject rate or an unacceptable reduction in on-line sensitivity.

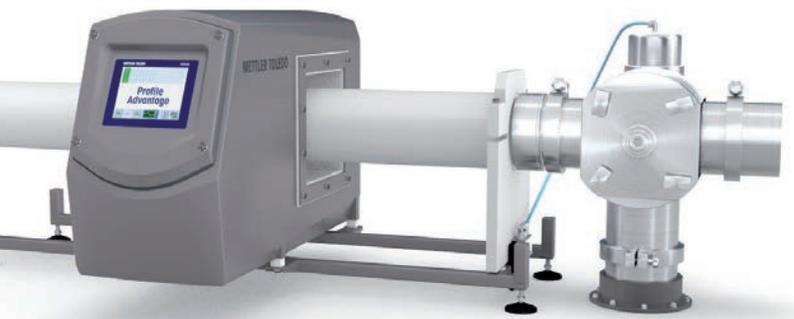
**However, Profile Advantage systems are able to overcome product effect by using a unique combination of breakthrough Multi-Simultaneous Frequency (MSF) and Product Signal Suppression technology.**

Profile Advantage metal detectors are able to detect smaller irregular shaped metal contaminants for enhanced product quality and virtually eliminate false rejects to minimize unnecessary product waste.

## **Robust mechanical construction**

Profile Advantage Pipeline metal detectors are designed and constructed for operation in harsh environments. Profile Advantage Pipeline metal detectors include as standard:

- Stainless steel with a bead blast or brushed finish to meet a variety of hygiene standards
- IP69K construction
- A 5-way sealed, single piece heavy duty liner system
- Enhanced Vibration Immunity (EVI) and Enhanced Noise Immunity (ENI)





### Compliance made easier

Using Profile Advantage Pipeline systems makes it easier to comply with food safety standards and retailer codes of practice.

- Meet or exceed sensitivity standards and detect smaller contaminants
- Due diligence system options including reject confirmation system and air pressure monitoring enable manufacturers to meet the strictest requirements for failsafe features
- Built-in step-by-step guidance makes it easier to complete routine performance monitoring tests without errors
- USB ports make it easy to extract stored data
- Integration with **ProdX** software enables all test records to be captured and stored electronically for audit purposes



### Productivity made easier

**Intuitive Clustering** technology enables multiple products to be grouped under the same setting. This allows seamless product changeovers without any impact on the capabilities of the metal detector.

**Condition Monitoring** features provide advance warning of any adverse trends that could potentially impact the performance of the metal detector, enabling preventive maintenance to be conducted during a period of scheduled downtime.

Innovative **Emulation** technology enables remote access and control of Profile Advantage Pipeline metal detectors, ideal when they are installed in difficult-to-access locations. This can remove the need to work at height to change settings for enhanced operator safety.



# Metal Detection Systems For Vacuum Filler Applications

**METTLER TOLEDO Safeline HDS Pipeline metal detection systems are at home in the most demanding food processing environments. Designed for easy integration with other process equipment, the space-saving design can be configured through the use of a range of accessories to suit continuous, linked or clipped sausages and other food products in natural or collagen cases.**

### Simple operation for optimum efficiency

The operator interface is provided via a robust, intuitive menu-driven membrane key panel. This offers simple set-up routines and inspection process control through METTLER TOLEDO Safeline's proven Signature software platform.

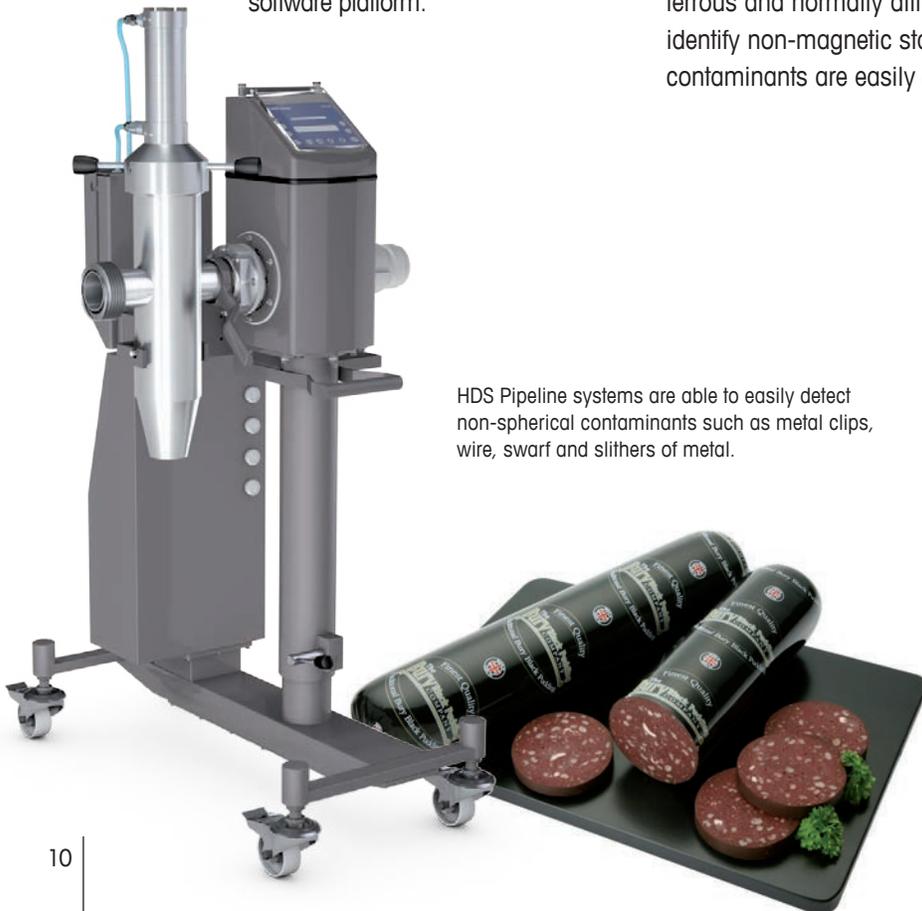
### High-sensitivity for maximum security

The use of METTLER TOLEDO Safeline's advanced detection coil technology combined with enhanced filtering techniques deliver ultra-reliable and stable in-line sensitivity to all metal types. Ferrous, non-ferrous and normally difficult to identify non-magnetic stainless steel contaminants are easily detected.

### Flexibility to integrate with production lines

- Robust, mobile stainless steel stand integrates easily with production line equipment
- Large, fully rotating castors facilitate easy withdrawal from the process for cleaning and relocation
- Flexible height adjustment allows the detection head to be raised or lowered via a gas-strut to link up with the vacuum filler outlet
- Fine adjustment to take account of uneven floors is provided via a hygienically designed screw feature on each individual castor
- Optional HDS linker extension kits provide effortless installation of the detector between the vacuum filler and linking machine

HDS Pipeline systems are able to easily detect non-spherical contaminants such as metal clips, wire, swarf and slithers of metal.





### Reliable in the harshest environments

Sealed to IP69K standard, the rugged heavy duty washdown construction is designed to withstand the rigors of the hostile environments found in meat and food processing plants. Dirt traps have been minimized and easy-to-clean stainless steel surfaces throughout make the HDS pipeline system suitable for use in the harshest conditions. Reject devices can be fully dismantled for thorough cleaning to minimize the risk of biological contamination.



The robust, mobile stainless steel stand is designed to fit around key elements of process equipment allowing closer coupling into the process line.

### Heightened product quality through reduced product creaming

Increased length of product flow gives rise to the fats in some food products being unevenly distributed towards the outside of the sausage or tube pack - an effect known as "creaming."

- Patented ZMFZ technology allows the metal fittings of the throughput pipe and other process equipment to be positioned closer to the detection head without affecting the detector performance
- The short throughput pipe is essential to avoid product creaming and gives the added benefit of a compact system size to reduce space requirements

### Reliable contaminant removal and easy process line integration

METTLER TOLEDO Safeline provides a range of system options for effective removal of metal contamination, suitable for integration with all leading vacuum fillers and processing equipment including **Handtmann, Vemag, Risco**, etc.

- Stop-on-detect functionality generates a signal to control vacuum filler operation enabling contaminated product to be purged from the pipeline
- A selection of heavy-duty, stainless steel, pneumatic reject valves with quick release couplings are available to automatically redirect process flow when metal contamination is identified
- Hygienic, easy-to-clean designs with food industry-approved contact parts, using either a ball valve or plug valve
- Reject valves can be specified to suit specific product characteristics



HDS with integrated ball valve reject mechanism

HDS with stop-on-detect

# Meet Compliance Requirements Enhance Levels of Automation

To comply with the latest regulations and quality standards, it is no longer sufficient to rely on paper-based record keeping processes. Many major retailers now insist that records are stored electronically. **ProdX** is a PC-based client server solution which monitors and manages data collected from METTLER TOLEDO product inspection devices. It supports and maximizes rigorous quality control regimes, production optimization drives and simplifies production line operation.



#### Helping you manage quality and compliance

**ProdX** empowers Quality Managers to meet critical quality requirements enabling them to comply with global and local standards and legislations. It significantly cuts the resource burden for food safety standard and retailer audit requirements.



#### Helping you manage production and efficiency

**ProdX** enables Production Managers to maximize process efficiency and increase productivity. It visualizes the machine data in real-time to reduce downtime and optimize the production parameters.



#### Helping you manage data communication

**ProdX** provides IT Managers with a data network connectivity solution for seamless integration with MES/ERP systems. It uses the latest communication protocols and fully supports Industry 4.0 and smart factory initiatives.

**ProdX** is scalable to meet your needs whether monitoring a single packaging line or monitoring numerous lines from multiple production sites, and is supported by the largest team of product inspection sales and service professionals in the world.



# Data Collection Options

## Supporting Due Diligence Records

**Pipeline metal detection systems can be configured to incorporate a wide range of data collection options. These can be used to support requirements for electronic record keeping as well as enabling integration with factory management systems, making processes more streamlined, more accessible, and more efficient.**

### USB Port

#### **PowerPhasePRO** and **Profile**

**Advantage** metal detectors incorporate a USB port to enable information captured by the detector to be transferred simply and effectively to data storage devices such as a computer.

The USB port facilitates access to a range of standard and configurable reports, available in CSV, TSV and TXT formats for analysis or electronic data storage.

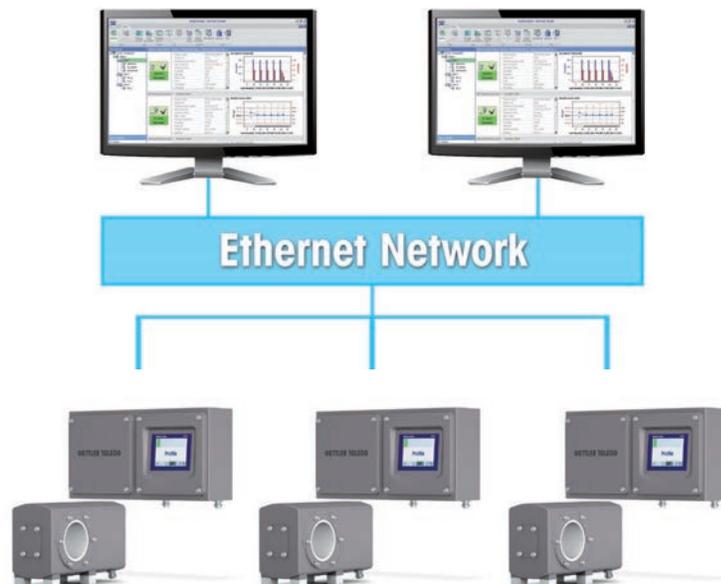
This eliminates the need for paper records and provides comprehensive process data to prove due diligence has been exercised and supports process improvement.

### Ethernet Adapter

An Ethernet adapter provides network connectivity by using a proprietary protocol for real time data transfer, collection and integration into factory management systems. This option is essential for OPC and ProdX integration.

### Fieldbus Interface Module (FIM)

The FIM enables real time communication, data transfer and collection via industry-standard Fieldbus protocols including EtherNet/IP, Modbus TCP and Profinet IO.





	HDS	Pipeline <sup>1</sup>		Profile Advantage
		Signature	PowerPhasePRO	
<b>Typical Applications</b>	Pumped sausage meat and high viscosity pastes	Pumped liquids, pastes and slurries		Overcomes product effect in applications subject to high false reject rates due to bubbles or voids in product flow - for pumped liquids, pastes and slurries
<b>Detection Capabilities</b>	All metal types: Ferrous (Fe) and non-ferrous (NFe) including aluminum (AL) and all grades of stainless steel (SS)			All metal types; delivers superior detection capabilities in challenging applications and virtually eliminates false rejects
<b>Available Technology Platforms</b>	Signature	Signature	PowerPhasePRO	Profile Advantage
<b>Aperture Size Range (mm)</b>	100	50, 75, 100, 125, 150, 175		100 x 100 125 x 125 150 x 150
<b>Software Compatibility</b>	ProdX; FreeWeigh.net			ProdX; FreeWeigh.net (v8 onwards)
<b>Connectivity to Factory Management Systems</b>	Ethernet (optional)	Ethernet	Ethernet/IP, Profinet, Modbus, USB port, printer port, Emulation (option) <sup>2</sup>	
<b>HMI</b>	Membrane key panel		Full-color touchscreen	
	No remote option	Remote option available	Remote option available	Remote access via Emulation (option)
<b>Metal Detector IP Rating</b>	IP69K	IP66		IP65 and IP69K
<b>Finish</b>	Bead blast 304 stainless steel	Bead blast 304 stainless steel		Standard - 304 stainless steel bead blast Options - 304 stainless steel brushed; 316 stainless steel bead blast or brushed
<b>Integrated System Options</b>	Pipeline system with: stand, tube and plug valve  Pipeline system with: stand, tube and ball valve	Custom support frames - floor-mounted or suspended options Reject valve options including piggable reject valve High-temperature/high-pressure, non-metallic throughput tubes Variety of pipe fittings and connection types Water jackets for molten liquids		
<b>System Integration</b>	Leading vacuum fillers and processing equipment	Existing pipeline processing lines and production equipment		

<sup>1</sup> Pipeline metal detection systems are available with Signature or PowerPhasePRO technology; technical specifications will vary according to the platform chosen.

<sup>2</sup> Availability is dependent upon the IP rating of the system.

## Key Considerations

### How to Choose the Right Pipeline Metal Detection System

Pipeline applications are wide and varied - choosing the right metal detection solution will ensure maximum performance and brand protection. Choosing the right pipeline metal detection system involves four simple steps:

#### 1. Determine the size of the metal detector

- The product throughput rate dictates the pipe diameter and the throughput pipe diameter determines the aperture size
- A non-metallic throughput pipe is required to transport pumped product through the metal detector aperture

#### 2. Consider the temperature of the product and the pressure within the system

METTLER TOLEDO typically supplies a high-temperature, high-pressure non-metallic throughput tube. The maximum system pressure must be known to ensure the throughput pipe can handle the expected pressure.

- Heated products such as hot jam will require a throughput pipe that can handle extremely high temperatures
- Molten chocolate will require special water jackets around the throughput tube to maintain the product's temperature during the inspection process

#### 3. Confirm what fittings are required to connect the pipes and the connection type

- METTLER TOLEDO can supply any fitting required, including DIN, Tri-clamp, RTJ and many more
- Note that the connection type can impact the aperture size

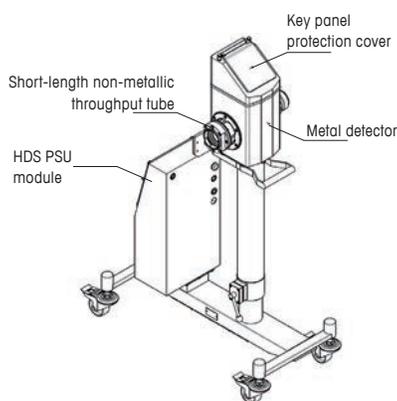
#### 4. Choose the right reject mechanism

The right reject mechanism will depend on the product characteristics.

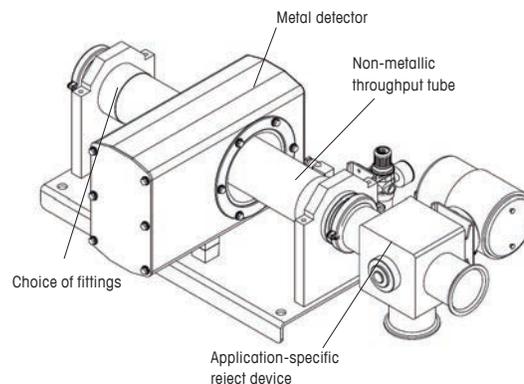
- Three-way diverter valves are available for most liquid or soft slurry applications
- If there are any solid elements within the product flow a specialized reject device may be required

#### Additional considerations:

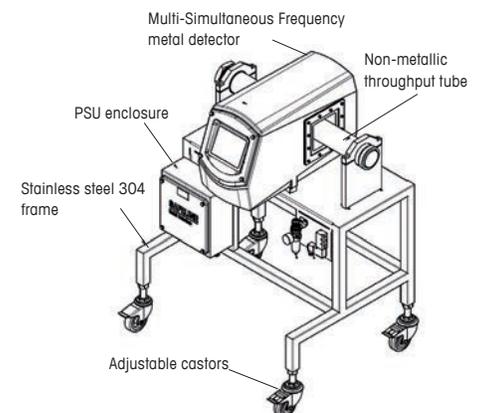
- Ease of integration into existing production lines and extraction of data to meet compliance requirements
- Ease of access to the metal detector HMI for setting changes and to conduct routine performance monitoring tests
- Sensitivity performance, stability and reliability



**HDS Pipeline metal detector**



**Pipeline metal detector**



**Profile Advantage Pipeline metal detector**

# Benefit from Service

## Global Reach and Local Excellence

When bringing a new production line online, full compliance with regulations and the target performance level need to be reached within the first year. From day one, METTLER TOLEDO provides support in the form of a comprehensive service package for your investment. This includes professional start-up of your device, 24 month full coverage of labor and parts, user training and recommended spare part kits.

With 3,600 technicians in 39 countries, METTLER TOLEDO has a global presence which allows us to offer you rapid response times and reliable repair services around the globe.

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**UPTIME** ■ **PERFORMANCE** ■ **COMPLIANCE** ■ **EXPERTISE**

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### IPac™ – Professional Start-up

A professional start-up ensures your standards for performance and productivity are met right from the start. The IPac is designed for regulated industries, providing full documentation to meet GFSI standards.



### Performance Verification - Ensure Compliance

When we verify your equipment performance, we ensure its reliable operation within agreed specifications and in compliance with standards. Performing operational tests annually on your equipment ensures performance levels are maintained.

### Spare Part Kits - Minimize Downtime

Minimize downtime by having critical spare parts on site and handling smaller repairs yourself. All METTLER TOLEDO genuine spare parts meet our highest quality standards and help maintain maximum performance levels.

[www.mt.com/pi](http://www.mt.com/pi)

For more information

#### Mettler-Toledo Product Inspection

1571 Northpointe Parkway, Lutz, FL 33558  
Toll Free: 800-447-4439  
Tel: 813-889-9500  
E-mail: [pi.marketing@mt.com](mailto:pi.marketing@mt.com)

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