

The Thermo Scientific PROx X-ray inspection system offers unparalleled protection from metal, glass, stone, and bone contaminants in food products and detects many common production assembly errors in a wide variety of manufacturing processes. The PROx protects your brand by 100% inspecting packaged, bulk or piped products and reducing waste while providing valuable process improvement information.

Thermo Scientific PROx™ X-ray Inspection System



Features and Benefits

- Multiple conveyor and pipeline models available to inspect many different types of packaged or bulk products
- Field-proven contaminant detection filters and product inspection tools
- Large, 15-inch touch-screen interface is exceptionally easy to learn and use
- IP65 wash-down capable. Air-conditioner option available for harsh environments.
- New USB interface for quick and easy import and export of data
- Multilingual software interface available

The Thermo Scientific PROx X-ray inspection system is the next generation in a long line of systems providing industry-leading protection against a wide range of product defects, including contaminants and product assembly errors. The system utilizes a field-proven, X-ray sensing system and sophisticated, yet easy to use, software refined over many years while working closely with major food producers around the world. The result is unmatched brand protection and intuitive access to actionable information to track and improve your manufacturing process.

Available in several system configurations, the PROx can inspect small-to-large packaged products, products conveyed in bulk form as well as pumped products. All these systems can be quickly linked to various types of internal or external reject mechanisms. The system operates over a wide temperature range, is IP65 wash-down compliant and meets the toughest X-ray safety standards around the world. Statistics and images can be saved locally and exported quickly via a unique USB interface to other systems for archive and review.



Intuitive touchscreen interface with real-time image display

Powerful Detection and Inspection Capability

Unlike other X-ray systems, the Thermo Scientific PROx was designed based on 20 years of experience working on the toughest contaminant detection and package inspection problems around the world. This experience has resulted in a cost-effective, exceptionally easy-to-use food protection system capable of finding metal, glass, stone, bone, plastic, wire, and other dense contaminants in any packaged or bulk food products. The PROx utilizes a high power, high resolution, thermally stable

X-ray system capable of penetrating through most common food products produced today. Numerous field-proven detection filters can be utilized to optimize sensitivity and reduce annoying false rejects. These powerful detection capabilities are augmented with innovative 2-D image analysis functions enabling full product inspection. With a modern Pentium® computing system and throughput optimized software, the PROx can easily do all this at the fastest line rates employed today.

PROx Software Overview

Image Filters and Analysis Tools	Application Capability
<ul style="list-style-type: none"> • Simple thresholding • Gradient image processing • Contaminant area measure • Dot morphology 	General contaminant detection based on density, edge strength, size and shape
<ul style="list-style-type: none"> • Product area measure • Grid pixel totalization 	Reverse detection and presence/absence in uniform product patterns
<ul style="list-style-type: none"> • Contrast stretch • Pack edge mask 	Image enhancement and masking of dense product package outlines

An Exceptionally Flexible and Simple to Use Interface

Full acceptance and utilization of any inspection system is dependent on how easy it is to learn and use. In this area the PROx is unequalled in the market today. Its large, color touch-screen employs an intuitive icon-based graphical interface that makes product setup and selection/run a simple task. New products can be taught by a technician in a matter of minutes with clear graphical feedback along the way. Multiple image processing and analysis functions can be quickly experimented with on frozen images to determine the optimum

inspection strategy. The selected tools can be prioritized to display and record results in the way you want them. Once created, product programs can be selected and started by operators in seconds. High-resolution, real-time or frozen images with graphical overlays can be displayed, providing immediate feedback and insight into the inspection process. Summary statistics are clearly displayed on screen, and stored on the system's rugged HD to meet traceability requirements. Rejected product images can be saved on the system for problem determination and corrective action.

Designed to be Safe, Easy to Clean and Reliable

The PROx employs multiple safety techniques to ensure the system meets the most stringent requirements around the world. They include a multi-level password system, an emergency X-ray and conveyor stop, a fail-safe X-ray indication light tower, coded safety interlocks, an X-ray power key switch, multiple lead curtains and robust system shielding. All this assures safe daily use by all factory personnel. In addition to being safe, the PROx is also hygienic and easy to clean. Made of stainless steel the PROx is IP65 wash-down rated and includes watertight seals on all cabinet

openings. Full access to the conveyor and pipeline transport areas make periodic cleaning simple and fast. Forced air cooling is standard and a sealed air conditioned system is available for harsh environments. Because equipment uptime is critical in all production environments, the PROx has been designed to be extremely reliable and modular in design. The key system components have undergone rigorous accelerated life testing and the system is designed so all major components can be quickly replaced when needed.



Easy access to the conveyor enables quick cleaning and belt replacement

Three Flexible Models Available for Any Application

To meet a wide range of inspection applications, the PROx is available in multiple, system-length packaged product and bulk conveyor models as well as

different pipe diameter models. To minimize footprint a new 1 m wide conveyor system (model C1) is available for inspection of smaller packaged products.

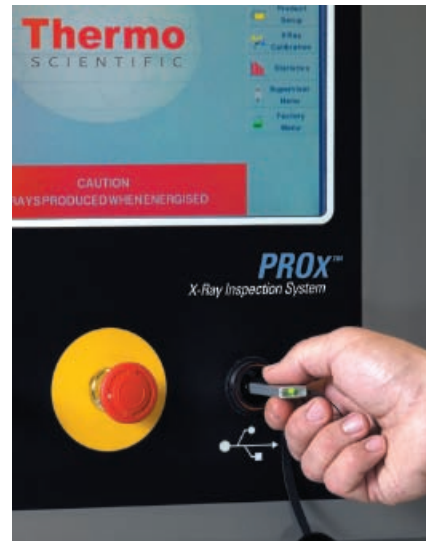
Thermo Scientific PROx Models

Conveyed Products	Bulk Products	Pipelines
C Model	B Model	P Model
For discrete products; packaged or unpackaged. Models available with optional built-in rejecter(s) and bin(s).	For bulk flow products. Multi-lane operation including drop gate rejecters, and hopper in-feed.	For piped products. Three diameters available. Optional reject valves available.

Communications Enabled With USB and Network Interfaces

To facilitate data storage, analysis and real-time remote monitoring, the PROx X-ray inspection system comes with a standard water-tight USB port built-in.

A memory stick can be employed to remove data/images for archiving as well as to import and export product setups.



Transfer data to any PC via the built-in, watertight USB port



Thermo Scientific PROx Pipeline Model



Thermo Scientific PROx Bulk Model

Applications Analysis and Aftermarket Services

Prior to purchasing a PROx system our applications engineers will evaluate your application. During this process your product samples are run on an actual system to determine what types of defects can be detected; what the typical sensitivity is; and what product line rate can be achieved. In addition, machine specific characteristics are reviewed prior to order, assuring the system delivered meets your exacting requirements. After purchase, a full range of services is available to support the PROx system throughout its lifetime, including radiation testing, commissioning and validation at the time of installation. To ensure maximum operational efficiency, we offer on-site maintenance contracts and a full, spare-parts service.

Available Accessories/Options

- Sealed air conditioning system for harsh environments
- Networking webserver
- Many built-in and external reject mechanisms
- Audible alarm and light beacons
- Product alignment rails
- Certified metal and glass test spheres
- Stainless steel casters
- Recommended spare parts kit
- Spare belts
- Radiation survey meter
- Additional regional radiation testing and certification

Thermo Scientific PROx

Application and X-Ray Specifications

X-Ray Power	320 watts, 80 KV/4 mA maximum
Scan Rate	Up to 1000 lines per second
A/D Converter	12 bit, 4096 gray scale images
Warm-up Time	Less than 30 minutes
Detection Sensitivity	Contaminants as small as 0.5 mm can be detected depending on product type. Typically sensitivities are ≥ 1.5 mm diameter for metal, ≥ 3 mm for other dense foreign objects
Detection and Inspection	Simple threshold, gradient image processing, contaminant area measure, product area measure, grid pixel totalization, dot morphology
Filters Available	
Other Image Processing Functions	Edge masking, contrast stretch
Image Processor	2.8 GHz Pentium® 4
Aperture Width and Height	350 mm (13.8 in) by 200 mm (7.9 in)
Maximum Product Width and Height (Conveyor and Bulk Models)	320 mm (12.6 in) by 50 mm (2 in); 290 mm (11.5 in) by 100 mm (4 in); 261 mm (10.3 in) by 150 mm (6 in); 231 mm (9.1 in) by 200 mm (8 in)
Maximum Product Weight	45 kg (100 lbs)
Maximum Belt Speed ¹	10 m per min (32.8 ft per min) to 40 m per min (130 ft per min)
Pipeline Diameters	63.5 mm (2.5 in), 76.2 mm (3 in), 101.6 mm (4 in)
Maximum Pipeline Capacity	11000 liters/hour (2.5-in or 3-in diameter), 19000 liters/hour (4-in diameter)
Conveyor Heights	850 mm (33.5 in), 950 mm (37.4 in), 1050 mm (41.3 in). Field adjustable ± 50 mm (± 2 in)
Pipeline Length	1280 mm (50.4 in), standard in-feed and out-feed pipes at 45 degree angle
Belt Material	USDA/FDA approved urethane
Inspection Trigger	Photo eye, radiographic or digital input from external source
Security/Safety Features	X-ray power key, four level password system, emergency X-ray/conveyor stop button, lead curtains, failsafe X-ray imminent and on indication light. Coded magnetic safety interlocks on doors.
Human Machine Interface (HMI)	381 mm (15 in) diagonal resistive touch-screen
Language Interfaces Available	English, Italian, Spanish, French, Dutch, German, Polish and Norwegian
Optional Built-in Rejecters,	Pusher, air blast with reject bin or drop gate.
Multilane Operation	Multi-lane options allow two or four lanes to be independently inspected and rejected.
Data Export	Product set-up (Import also), statistical information, bit map images and event log via USB interface

Environmental, Electrical and Operational Specifications

Operating Temperature	0°C to +30°C (+32°F to +86°F), X-ray oil cooling and cabinet forced air systems. Air-conditioner option available for ambient temperatures up to +50°C (+122°F)
Relative Humidity	20-80% non-condensing
Electrical Supply	110 VAC/20 amps/60 Hz or 230 VAC/10 amps/50 Hz, single phase
Digital Outputs	8, normally open/closed contacts, 48 VDC, 1 A maximum load
Digital Inputs	8, opto isolated
Network Port	RJ45 Ethernet. Networking software options required; Watertight USB 2.0 standard. One 128 MB memory stick included
Machine Weight	450 kg (992 lb) depending on configuration

Conformance Tests and Certifications

Radiation Safety Conformance	FDA CFR 21 part 1020.40, UK IRR 1999. Others are available, contact the factory for details.
Export/Safety Certifications	CE, cCSAus
IP Wash-down Conformance	IP 65 (NEMA 4), stainless steel type 304 straight line finish
Manufacturing Quality	ISO9001 certified

¹ In some applications PROx can run faster with little or no impact on sensitivity. Contact Thermo Fisher Scientific for details.

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