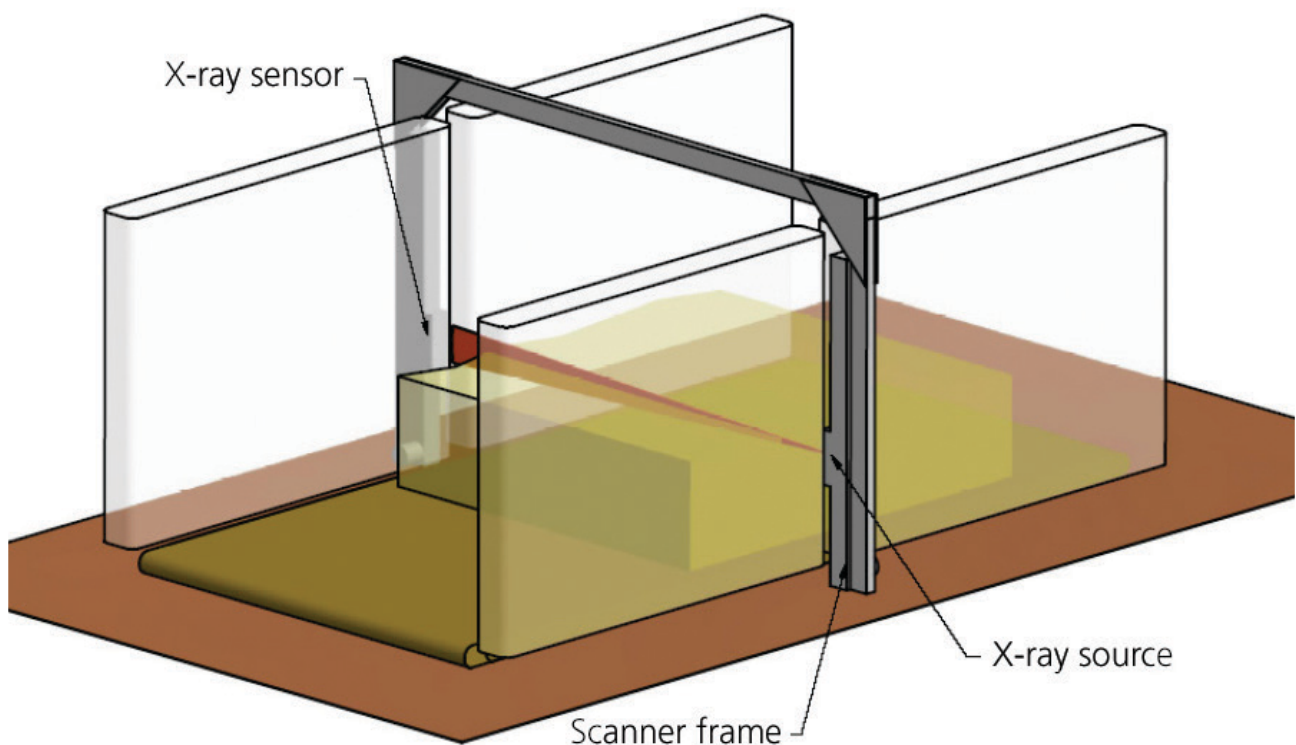


# PolyScan in-line inspection system

– Optimisation of flexible plastic foam production



The PolyScan in-line inspection system measures foam density and detects the vertical dimension of the foam mat. Providing you with valuable information regarding product quality and production optimisation.

## Optimise production and product quality

PolyScan is an advanced inspection system for in-line measurement of plastic foam parameters on the production lines for flexible foam. The instrumentation provides you with new possibilities for optimisation of production and product quality.

## Benefits of using the PolyScan inspection system

- uniform foam density
- no waste of raw materials
- correct height of products for further processing
- online measurement system with short response time

- production adjustment/control based on data from the system

## Description

PolyScan is designed for in-line inspection of flexible foam manufactured as a mat using double wall conveyor belt system. The instrumentation measures foam density and detects the usable vertical dimension of the foam mat.

The measuring system is housed in a vertical frame that is installed on the production line at a suitable position located after termination of the conveyor sidewalls.

The vertical frame holds an X-ray scanner for horizontal line-measurement in a direction perpendicular to the length axis of the conveyor. The X-ray scanner has an X-ray source and an X-ray sensor.

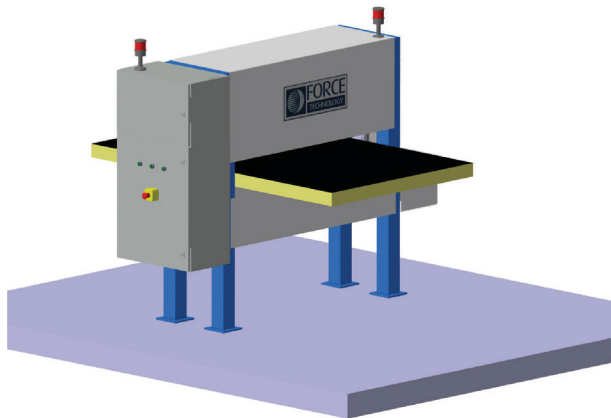
The X-ray scanner can by an automated motor drive move vertically up and down in the frame and do quick horizontal measurements in tight level intervals ranging from bottom of the foam mat to slightly above top of the foam mat.

The PolyScan instrumentation includes:

- a frame with an X-ray scanner and motor drive
- a PC with monitor
- a scanner operation software
- an X-ray security system
- a power supply unit.

### Measuring principle

The PolyScan instrumentation uses radiation transmission to measure foam density and the vertical dimension of the foam mat. The scanner has an X-ray source in one side of the scanner frame. The X-ray source is collimated to transmit horizontal line radiation to the opposite side of the frame where the intensity of radiation is detected by a sensor.



Sketch of a PolyScan for rigid foam.

The sensor signal is processed to find the average density along the line from source to sensor point. A vertical serie of horizontal measurements through the foam mat determines the vertical density distribution and top level of the mat as well.

### Calibration

Calibration of the sensor signal is done automatically by the system software.

### Scan modes

PolyScan is in the standard version designed to operate in two modes; top level and density.

*Top level mode* measures top level position of the foam mat with quick up and down measurements in a narrow interval around the top level. This mode does a very close monitoring of the usable top level. This mode provides feedback signals for production adjustment in order to reduce the quantity of nonusable material.

*Density mode* measures foam density in a profile. The scanner measures while moving from top level to bottom and back to top level. This mode provides data for a statistical determination of the foam density. Optimisation based on data from this mode will save raw materials.

### Performance

Top level mode

Time interval between measurements: from 1sec.  
Accuracy: +/- 2 mm

Density mode

Profile detection time: 15 sec.  
Accuracy with 1400 mm high foam mat: +/- 1 Kg/m<sup>3</sup>

### Optional addition

PolyScan can be delivered with software for automatic on-line regulation of the production line.

### Further information

Lars Holmberg: Tel. +45 42 62 72 38 / E-mail: lkh@force.dk