

# Ensuring a Good Night's Sleep

## Production line quality testing of foam material for bed mattresses

### The Challenge

The Customer, a manufacturer of bed mattresses for the consumer marketplace, incorporates a layer of flexible foam into their mattress design to provide enhanced comfort. The foam layer is at the top of the mattress structure, where the consumer will lie to sleep. Quality control issues with the foam layer included variations in both the density and height leading to discomfort and potential consumer dissatisfaction. The Customer needed to ensure that the foam layer was uniform and consistent throughout, supporting a high product price point based on its brand reputation for top quality mattresses.

**With this system, the Customer is able to assess the height and homogeneity of the flexible foam material to ensure uniformity throughout.**

### The Adaptive Energy Solution

In the production process, the flexible foam is manufactured as a mat using a double-wall conveyor belt system. Adaptive Energy deployed an X-ray solution incorporating PolyScan technology

that can simultaneously assess both the vertical density and the horizontal surface profile of the foam mattress material.

PolyScan is an X-ray scanner designed for on-line inspection of materials. To inspect the large mats of flexible foam, a vertical frame was installed on the production line at a suitable position to hold the scanner unit. The conveyor belt has existing side walls around key production areas, so the vertical frame was placed just



High-quality bed mattresses for the consumer marketplace

**Industry:** Materials / Manufacturing / Consumer Products

**Technology:** Digital Radiography

**Products & Services:** PolyScan / X-ray material evaluation at production line speed

**Customer Profile:** A premier European mattress manufacturer

**Business Challenge:** Testing for density, height and uniformity in the production of flexible foam used for consumer mattresses

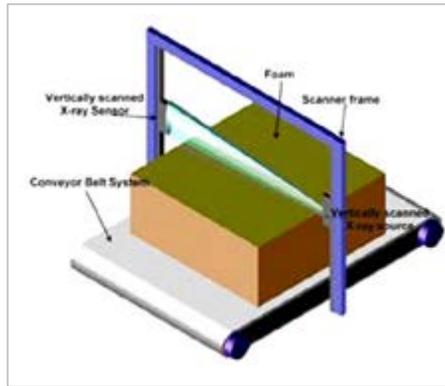
**Solution:** X-ray scanning system with a vertical frame assembly that is able to scan large foam mats on the production line

#### Benefits:

- Real-time monitoring during production means problems can be corrected immediately, reducing raw material waste and increasing efficiency
- Consistent product quality ensures customer comfort and satisfaction, and maintains the brand's high-end reputation

after the termination of the conveyor side walls.

The vertical frame holds an X-ray scanner for horizontal line measurement in a direction perpendicular to the length axis of the conveyor. As the foam mats pass along the belt underneath the frame, the scanner captures images across the full width of the mat. The instrument measures the foam density and detects the mat height dimension.



Schematic image of foam mattress material on a conveyor belt, passing under the X-ray scanner assembly

The scanner has both an X-ray source and an X-ray sensor. Using an automated motor drive it can move vertically up and down in the frame to do quick horizontal measurements at short intervals ranging from the bottom of the foam mat to slightly above the top, performing a complete assessment of the entire mat.

## Results

With this system, the Customer is able to assess the height and homogeneity of the flexible foam material to ensure uniformity throughout. Consistency in the end product means good customer ratings and user satisfaction in the marketplace, maintaining the Customer's high-end brand position.

By conducting on-line measurement with immediate results, data from the system can be used in real time for production adjustment and quality control. Being able to fine-tune during the manufacturing process ensures efficient use of raw materials. Any issues can be corrected quickly, bringing production back to up to standard, preventing material waste and keeping costs in line.

## About Adaptive Energy

Adaptive Energy creates customized, non-destructive material evaluation solutions to address mission-critical, time-sensitive testing needs. By combining the latest digital radiography, computed tomography, and ultrasonic imaging technologies with innovative mechanical and robotic assemblies, Adaptive Energy's integrated systems offer rapid deployment, are easy to learn and maintain, and perform reliably under pressure.

Working collaboratively with organizations in the aerospace, automotive, energy, petro-chemical, defense, infrastructure, and materials industries, our experts develop optimized solutions for flaw and crack detection, composite delamination, weld inspection, hardness testing, custom radiation enclosures and overhead gantry systems, and more.

Adaptive Energy is also the exclusive distributor in the U.S. and Canada of FORCE Technology's P-Scan ultrasonic scanners, including the P-Scan Stack with Phased Array, a next generation automated inspection system.



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