

PRESS RELEASE

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Editorial contact:
THIEME GmbH & Co. KG
Lena Thoma
Robert-Bosch-Str. 1
D-79331 Teningen
Phone: +49(0) 7641 583 142
Fax: +49(0) 7641 583 110
lena.thoma@thieme.eu
www.thieme.eu

No chance of random error

Fewer errors, more customer satisfaction: the following report by the polyurethane specialist Thieme will show how this works

With polyurethane (PUR), it is possible to produce complex casings and housings with greater precision and quality. In order to ensure that the perfection produced in the manufacturing process is not compromised at the last minute during packing or while on the way to your customers, Thieme has developed a "zero-error strategy" - one that aims especially at the process steps of finishing, pre-assembly, packing and shipment of ready-for-assembly parts. This approach, which is especially good at eliminating errors caused by carelessness, has for the first time successfully proven itself in the complex PUR housings of mammography units.

Two right or two left parts, instead of one right and one left - a little carelessness in packing the housing parts is enough to considerably annoy customers. In the complex case of the housing of a mammography unit (fig. 1), consisting of 15 PUR parts in all, such mistakes as missing parts and damages in transport happen constantly: in the roughly 300 kits delivered to customers in 2007, an above-average number of complaints were recorded.

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Fig. 1: The housing of mammography equipment consists of 15 PUR molded components. Its Baydur® 110 FR PUR material construction enables a creatively ambitious design.

At Thieme, we place great importance on smoothly and flawlessly completing the entire PUR construction process chain, up to delivery. So, at the beginning of 2008, a working group was established under the direction of Yves Munsch, head of quality assurance at the south Baden molded parts manufacturer. Its goal was to analyze errors that had occurred and, in the second stage, to eliminate them. The agreement of objectives with the customer was simple: "Zero errors in all processes".

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In order to put this objective into practice, first the errors that occurred were classified as part of a Pareto analysis, then sorted according to frequency. In addition to the investigation of the customer complaints, the entire production process underwent an assessment and was optimized. It was found that errors most often occurred during packing and shipping. As a result, a package of measures was adopted and implemented as follows:

1. Assembly of a separate area for the projects of the involved customer and providing this area with a permanent staff that will be specifically trained for each step. With these measures, it is possible to eliminate the errors of frequently changing, inexperienced personnel.
2. The development of new transport packaging following the principle of "poka-yoke" (Japanese for "error-proofing"), which allows both housing parts and assembly elements to be sorted exclusively in the predetermined manner. Up to that point, the molded parts were individually packed in cushioned foil and stacked in a shipping carton, making it difficult to get a clear view of the parts that were already packed; despite the protection of the cushioned foil, damages in transport to the sometimes very delicate parts occurred constantly.

The newly developed packaging is divided into segments in the manner of a cabinet, in which each part has its own established place; no part fits in another segment, so that right/left confusions are impossible (fig. 2). Moreover, the "cabinet" is arranged in such a way that missing parts would be noticed immediately. Since the parts in the new packaging no longer have freedom of movement, the cushioned foil is no longer needed, thus cutting out the corresponding step of the procedure.

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Fig. 2: The new transport packaging, designed according to the poka-yoke principle, prevents random errors, missing parts and transport damages. Every part has its own established place.

3. Optimization of supplied parts: Acoustic mat sheets are affixed on the inside of the PUR molded parts as an EMC measure. In collaboration with the suppliers, the sheets can be optimized so that they continue to be pasted only on the intended parts before packing, but now no longer need to be reworked. To prevent errors in pasting, a video was created to document the procedure exactly. This measure not only produced the desired results with respect to the prevention of errors, but also led to significant time savings.

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4. For the purpose of checking that all integrated assembly elements are installed, there was previously a checklist that had to be checked off; errors constantly occurred due to inattentiveness. This procedure was changed: now the respective assembly elements must be checked directly in the corresponding molded part. This intuitive method functions so well that the written checklist has become unnecessary.
5. The introduction of weekly zero-error discussions between the quality working group and the employees involved in assembly. That way the newly adopted measures can be reviewed and, when necessary, optimized. At the same time, exchanges with the customers were intensified in order to keep them up-to-date regarding the ongoing optimization process. "Active communication with the customer was very important," Yves Munsch points out. "We want to make it clear that we have not been idle, and that we were meeting the challenge."

The result of these measures was gratifying in every way: already in the first month after the introduction of the zero-error strategy, from March 2008, it was possible to reduce customer complaints significantly (fig. 3). Even in retrospect at the end of a year, it was apparent that the error rate continued on this much reduced level - in most months, the goal of "zero errors" was actually reached.

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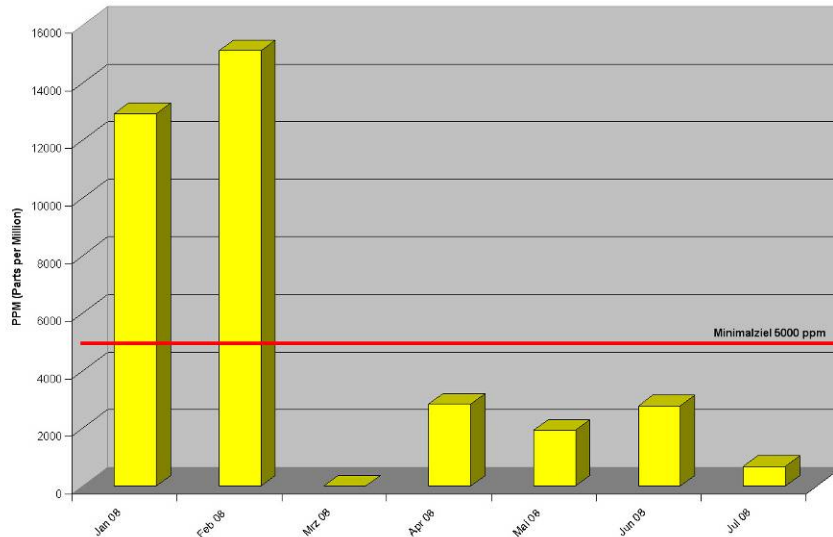


Fig. 3: Significant reduction in the rate of errors in delivered 15-part kits after implementing the "zero-error strategy" in February of 2008.

Yves Munsch, Thieme's head of quality control, has every reason to be satisfied with the result of the project: This is what we have done with our zero-error strategy." Munsch considers the most important result to be high customer satisfaction, which was hereby achieved - Thieme was nominated by the customer for the "Supplier Quality Award of 2009".

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[Box text:]

Sturdy equipment with an ergonomic design and sophisticated composition

Because of its complexity, the PUR housing of the digital mammography unit (equipment used for breast screening), consisting of 15 molded parts, was especially prone to the errors of confusion or incompleteness, as described above. Partially because of the sophisticated construction of the parts with projecting assembly elements, damages during transport are now avoided by means of the new transport packaging (fig. 4).

Once installed, the housing of the mammography unit, made of the Baydur® 110 FR PUR material, provides high autostability along with impact and abrasion resistance. This makes it perfectly suited for the rough handling it will receive in a hospital, where mechanical shocks are absorbed along with aggressive chemicals used for daily cleaning and disinfection.

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Fig. 4: The complex composition of the housing was enabled by means of variable insulation thickness. To immobilize the housing parts and to assemble the electronics, it makes use of domes, snaps, groove/tongue connections, and inserted nuts.

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[Box text 2 (optional):]

Polyurethane - the ideal material for medical technology

Appealing design, ergonomics and user-friendliness play an increasingly important role in medical technology for the market success of a new product. Polyurethane (PUR) not only provides the designer with extensive design flexibility, but is also characterized by advantageous material properties which are very important for medical applications: stability, low weight, good shock absorption, coatability with conductive paint, and chemical resistance. Even in terms of cost, PUR presents an interesting alternative, particularly to other plastic technologies, thanks to its cheap aluminum tools. The typical PUR integral construction, in which functional parts such as sockets and fastening threads are pre-shaped during the molding process or can be foamed in, has a cost-lowering and time-saving effect as well. The costs of final assembly are thereby significantly reduced.

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About THIEME

The THIEME engineering works was founded in 1960 by Werner Thieme who thus laid the foundation for today's company. In its two business divisions, Printing systems and Plastics technology, THIEME GmbH & Co. KG currently employs about 400 people around the world. The headquarters of THIEME is in Teningen, near Freiburg in South-West Germany. The company serves its customers with sales and service subsidiaries in France, Great Britain, and the United States.

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