First –80 °C biobank
Pfizer success story

This new automated storage and retrieval system from REMP is a key component of Pfizer's biobank and is a result of customer-focused collaboration leading to state-of-the-art storage solutions.

Pfizer's big chill

Pfizer is the world's largest pharmaceutical company with the largest privately financed research organization. Over 115,000 employees in more than 150 countries work towards improving health. Its business activities encompass the fields of prescription medicines, over-the-counter medicines and veterinary medicines. Thanks to continuous research and development as well as long-term planning, Pfizer is repeatedly successful in being able to offer effective medicines in the fight against and alleviation of diseases.

Pfizer also makes an important contribution to the provision of Switzerland's healthcare with over 150 medicines.

Utilizing the enormous potential of biological samples

Thanks to the sequencing of the human genome and the continually improving analytical methods in the field of molecular biology, biological samples have acquired a new significance and value. Where samples were once gathered for specifically stated purposes, had limited use, and were stored for archival purposes, they can now be stored under the best possible conditions for multiple uses in further studies.

Modern investigative methods in the fields of 'personalized medicine', pharmacogenomics, pharmacometabonomics and proteomics now provide far better insight into the modes of action of different therapeutics, enabling them to be optimized and administered more easily and accurately. Properly stored clinical trial samples have the potential to expedite development of investigational new medicines, thereby accelerating their delivery to patients. The biological samples can help researchers uncover pathways and metabolic processes which may have been previously inaccessible or undiscovered.

The pharmaceutical industry has recognized this enormous research potential and the value to both scientists and patients of making these study samples available worldwide. This requires samples to be stored under precisely defined conditions at extremely low temperatures. They must not be subjected to any freeze-thaw cycles and any temperature fluctuations within the system must be minimized. The multitude of samples and defined storage conditions practically rule out any kind of manual handling of samples. This critical storage process needs to be automated in order to obtain samples of the best possible quality.

Fully automated storage at –80 °C and –20 °C

REMP has had long-standing experience in the design and construction of storage systems for chemical compounds. The objective of the Pfizer biobank project was to ensure the precisely defined, fully automated storage of biological samples at temperatures of –80 °C and –20 °C, and to safeguard the best possible quality of such samples over extended periods of time.

Based on proven storage technology

The first REMP Bio Sample Store™ was developed jointly with Pfizer Global Research and Development, and is able to store millions of samples at –80 °C and –20 °C concurrently, and under controlled dry-air conditions to prevent frost build-up. For the design, the proven concept of REMP's –20 °C storage solution for chemical compounds was modified by fitting additional large, automated freezer compartments that operate at –80 °C. New door mechanisms to ensure the time-critical opening of the compartments were also developed. In order to avoid mechanical problems, due to the low temperature environment, only passive mechanical components were used. Newly developed software algorithms further guarantee optimally selected storage locations and best possible access to samples. The integrated Tube Punching Module™ ensures that cherrypicking or reformatting of samples always occurs at –20 °C, within the Bio Sample Store. The storage unit has fully redundant cooling and robotic systems, which allow service and maintenance to occur without any loss of system use or effect on the controlled storage environment.

The world's first large scale, automated –80 °C storage facility

Pfizer's biobank is the world's first large scale automated store for biological samples in which samples can be stored at both –80 °C and –20 °C. Equipped with REMP's patented Tube Technology™, Pfizer operates a complete system that minimizes the number of freeze-thaw cycles subjected to a sample, thereby maximizing optimal sample quality. All of the basic conditions were developed in cooperation with Pfizer according to their requirements. Thanks to its long-standing experience in building automated storage facilities and managing large scale projects, REMP was the first company to set up an automated –80 °C store, and in record time. The store was installed and commissioned on schedule. Key dates: contract signed – June 2004; FAT (factory acceptance test) – April 2005; SAT (site acceptance test) – March 2006.

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