

# ERASMUS MC CENTRAL BIOBANK RELIES ON XILTRIX FOR RISK MITIGATION



**Customer:** Dr. Brouwers – da Silva  
**Company:** Erasmus MC Central Biobank  
**Industry:** Biobank / Cryobank  
**Suppliers:** XiltriX International  
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In February 2020 the construction of a central freezer facility started in the Erasmus Medical Center in Rotterdam. Moving away from individual ultralow freezers into a cutting-edge facility with (to start) 56 Nordic Freezers. These freezers, cooled by centrally provided cooling compressors, each provide room for up to 164.640 samples. XiltriX was tasked with providing the centralized monitoring and alarm solutions for this new Central Biobank Facility.

## The Story of the Erasmus MC Central Biobank Facility

In recent years the need for securely storing samples at -196°C and -80°C conditions have exponentially risen. With hundreds of freezers scattered across multiple buildings and floors, management of samples, and the risk of losing them was of great

concern to the Erasmus MC organization. As the leading teaching hospital in the Netherlands, Erasmus MC set out to build a facility that drastically lowered fire hazard, costs and energy consumption.

The result is a fast-growing facility in which, not only a large number of samples are being securely stored, but is also taking over the whole management and sample tracking and tracing away from the individual departments and researchers. At the end of 2023 more than 5.8 million samples were stored in more than 77,000 storage boxes. Replacing conventional freezers with the novel Nordic freezers resulted in a total annual cost saving of almost €1.000.000.

\*Sources: <https://www.erasmusmc.nl/en/research/facilities/centralbiobank#68ebd776-ab4e-40b5-8789-2394fdd68c17>



**Dr. Hilde Brouwers – da Silva** Head of the Central Biobank

**Dr. Hilde Brouwers – da Silva** has obtained her Master of Science degree in Biomedical Sciences from the Vrije Universiteit of Amsterdam (VU Amsterdam). After doing her PhD research at the Leiden University Medical Center (LUMC), she transferred to the Erasmus MC Biobank. She was promoted to Head of the Central Biobank in June 2022 and has been building out the facility ever since.

### Stages of the Implementation Process

Before building the Biobank facility a pilot installation was performed together with the supplier of the Nordic freezers Carnot. During the process several optimizations and upgrades to the design of the freezers were performed. This resulted in a freezer that was fit-for-purpose for the specific long-term storage Biobank task. Importantly Operational Qualification (OQ) and Performance Qualification (PQ) studies, using XiltriX independent temperature sensors, were performed making sure the Biobank knew exactly how long it would take for a freezer to heat up at fixed conditions and specific loads.

**Dr. Brouwers – da Silva commented:** *“With the temperature studies performed we have the peace of mind that even with big calamities we have up to 24 hours until the temperature inside our freezers reaches -60°C.”*

The Nordic Freezer concept uses externally placed redundantly cooling compressors that provide the cooling fluids via super insulated pipes to a large number of highly insulated uprights cabinets fitted with freezers racks. The redundant systems allow the biobank to remain able to cool the freezers even during maintenance or failures. The benefits to users are numerous, for example the biobank has no need for any air conditioning in the room in which the freezers are placed, but still maintains a temperature of  $\pm 20^{\circ}\text{C}$ . The complete cold chain is monitored by

the manufacturer (on a technical level), but it also has XiltriX temperature and door sensors in every freezer. XiltriX is also linked to the compressors to be able to gauge if the compressors are functional 24/7. The Nordic systems allow customers to reduce their power consumption up to 78%. **Mr. Han Weerdesteyn CCO for XiltriX International** said: *“We extremely proud to be part of the Erasmus MC Biobank using these cutting-edge technologies. Safeguarding more than 5 million samples equates to a sample value of more than 500 million Euros. At XiltriX we are very aware there simply is no room for error.”*



After commissioning the first part of the Central Biobank, the departments needed to start moving the samples into the new freezers. This process brought to light the lack of standardization between research departments at the time. Given the chance to do things right, an overarching Biobank Information Management System (BIMS) was put in place for tracking and tracing of all managed samples. This was important since the Central Biobank is in essence a managed service that Erasmus MC departments can trust their samples to for secure storage.

**Dr. Brouwers – da Silva recalled:** *“Working with multiple suppliers, it was very important to us they provided us with their knowledge and experience. We have been very happy working with the XiltriX team and their support. The system has been very reliable.”*

The Biobank is not only a number of freezers storing biological samples in a secure facility but is also dependent on a number of technical services. These services comprise of the large power demand, critical support from the freezer manufacturer in case of technical issues, and network and telephone services for XiltriX monitoring provided by the Erasmus MC



Mr. Pascal van Elzakker Leading the support team

facilities and IT organization. The XiltriX technical & Functional Management has been assigned to a team of 6 people in the Erasmus MC. This unique concept has resulted in a high level of quality and incidents being picked up more quickly preventing damage in the process. Leading the team **Mr. Pascal van Elzakker** commented: ***"I have been working with XiltriX for more than 15 years. Having worked in the laboratory I am intimately aware of what can go wrong. Working closely together with departments like the Central Biobank as part of the multi-tiered safetynet, we are crucial in preventing damage in case of big calamities."***



### Why the Erasmus MC Central Biobank chose XiltriX

Storing biological samples for Medical Research Involving Human Subjects Act Studies ([WMO](#)) makes laboratories responsible for setting up an appropriate

system for the storage of those samples. Currently it is desired to store samples for up to 15 years for WMO research. Given the great added value that these biobank libraries give researchers terms of 30 years, or more have also been discussed. This means that systems safeguarding these precious samples need to have been designed with long term storage in mind. XiltriX has been providing its monitoring solution to the Erasmus MC for almost 30 years. Data that has been gathered with the XiltriX system since the first day the system was commissioned is still available to the users. **Dr. Brouwers – da Silva** commented: ***"XiltriX is very user friendly and easy to comprehend. We both have a centralized big screen dashboard as well as the opportunity to login on separate screen and receive personalized alarm notifications. We use the system not only as a critical alarm system, but also as a QC tool for checking retrospectively if maintenance was performed correctly."***

XILTRIX		Sensor Data		Status	
Room	Freezer	Temp	Humidity	Alarm	Notes
Freezer 1	Freezer 1	-80.0	45%	OK	
Freezer 2	Freezer 2	-80.0	45%	OK	
Freezer 3	Freezer 3	-80.0	45%	OK	
Freezer 4	Freezer 4	-80.0	45%	OK	
Freezer 5	Freezer 5	-80.0	45%	OK	
Freezer 6	Freezer 6	-80.0	45%	OK	
Freezer 7	Freezer 7	-80.0	45%	OK	
Freezer 8	Freezer 8	-80.0	45%	OK	
Freezer 9	Freezer 9	-80.0	45%	OK	
Freezer 10	Freezer 10	-80.0	45%	OK	
Freezer 11	Freezer 11	-80.0	45%	OK	
Freezer 12	Freezer 12	-80.0	45%	OK	
Freezer 13	Freezer 13	-80.0	45%	OK	
Freezer 14	Freezer 14	-80.0	45%	OK	
Freezer 15	Freezer 15	-80.0	45%	OK	
Freezer 16	Freezer 16	-80.0	45%	OK	
Freezer 17	Freezer 17	-80.0	45%	OK	
Freezer 18	Freezer 18	-80.0	45%	OK	
Freezer 19	Freezer 19	-80.0	45%	OK	
Freezer 20	Freezer 20	-80.0	45%	OK	
Freezer 21	Freezer 21	-80.0	45%	OK	
Freezer 22	Freezer 22	-80.0	45%	OK	
Freezer 23	Freezer 23	-80.0	45%	OK	
Freezer 24	Freezer 24	-80.0	45%	OK	
Freezer 25	Freezer 25	-80.0	45%	OK	
Freezer 26	Freezer 26	-80.0	45%	OK	
Freezer 27	Freezer 27	-80.0	45%	OK	
Freezer 28	Freezer 28	-80.0	45%	OK	
Freezer 29	Freezer 29	-80.0	45%	OK	
Freezer 30	Freezer 30	-80.0	45%	OK	

### How the Erasmus MC Central Biobank uses XiltriX

The XiltriX monitoring platform is used to monitor departments across the Erasmus MC campus with roughly 3000 sensors being monitored to date. All critical parameters in the biobank are being independently monitored by XiltriX. This means all ambient conditions like temperature and relative humidity. Also, all freezer temperatures. On top of that the status of the cooling compressors of the Nordic system is being monitored 24/7.

**Mr. Han Weerdesteyn** commented: ***"The cumulative value of the samples safeguarded by XiltriX in the Erasmus MC is estimated to be greater than 10 billion Euros. It is impossible to get insurance for that. So, mitigating all risks with a real-time monitoring system is imperative. Not only to show compliance, but also allow staff to prevent damage in case something goes wrong."***





### The Results and what's next

The XiltriX support team is working closely together with the Erasmus MC team to monitor and maintain the XiltriX system. New Nordic freezer expansions of the biobank are planned, and construction has already started. Aside from the -80°C storage, a new cryogenic facility (-196°C storage) with more than 50 big liquid Nitrogen storage vessels will be added to provide managed cryogenic storage within the Erasmus MC campus. **Mr. Pascal van Elzakker said:** ***"I am looking forward to expanding the biobank with monitoring of the central cryogenic storage facility. We have already done multiple projects integrating cryo vessels with XiltriX with very good results on campus."***

Currently, the Central Biobank, together with the Tissue bank collection point and two other university medical centers are working together with the Raad voor Accreditatie (RvA, national accreditation body). If all goes according to plan, the Central Biobank will start the accreditation process in 2024. **Dr. Brouwers – da Silva commented:** ***"Proper quality management is crucially important for our biobank. It is a demanding project, but we are confident to be able to obtain the ISO 20387 accreditation in 2025."***



Would you also like to have support in setting up a biobank or other type of laboratory or upgrading your cryogenic repository? Please contact XiltriX at [sales@xiltriX.com](mailto:sales@xiltriX.com), or visit our websites [www.xiltriX.com](http://www.xiltriX.com)