



## Cryotank Load and Unload Lock System

### Access Tower for Cryotanks

- Mobile and adaptable to different cryotanks
- Secure handling under a dry low temperature nitrogen atmosphere
- Reliable and automated cooling
- Contamination protected
- No time pressure



Fig. 1: Access tower on Cryotank.

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»Classic« sample extraction through the normal air causes ice formation on surfaces (substrate, container, tank interior) and an interruption of the cooling chain. The IBMT solution is a tower for manual access. During access the frozen substrate containers will thus not come into contact with humid atmosphere or be warmed in an uncontrolled manner. For long-term samples a warming over  $-80\text{ °C}$  will lead to cell damaging recrystallisation; that means even a short-term warming in the frozen area can change the sample quality.

### Technology

One liter of liquid nitrogen creates several hundred liters nitrogen gas vapors through evaporation. This effect is used to create a nitrogen atmosphere, in which a liquid reservoir of LN2 provides permanent cooling and gas production.

A PID controller monitors all important parameters during operation. So the user can concentrate on the access to his valuable cryosample without worrying about a coincidentally warming. The clear and dry nitrogen atmosphere provides the handling of samples without ice formation on the surfaces.

This new technology in cryobanks results in longer operating lives for the storage tanks. The combination of the cryotank load and unload lock system with the IBMT cover technology of the adjacent stations such as freezing and thawing secures the cooling chain for cryosamples and is a major improvement for the cryobanking process quality.

### Cryobank equipment

The IBMT offers its scientific and industrial partners experiences and competence in the fields of cryoprocess technology and cryoequipment (of course, even beyond the implementation in the cryobank).



Fig. 2: »Classic« sample extraction with months of ice formation on the surfaces (substrate, container, tank interior) and interruption of the cooling chain.

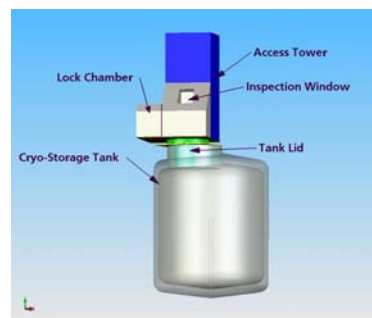


Fig. 3: CAD-development of an access tower (cooled with »dry« nitrogen atmosphere) with lock function to prevent ice formation during the extraction of the frozen sample.



Fig. 4: Cover technology for contamination-free handling. The cover-cooler systems can be cooled either manually or automatically by liquid nitrogen in an absorbent matrix for hours. From bottom to cover a stable temperature gradient develops from  $-196\text{ °C}$  below to  $+20\text{ °C}$  at the top. Cell samples can such be handled and stored on shelves in different heights at any given temperature. The system is inexpensive and can be extended to a parallel freeze/thaw automat. It is a basic device for future cryolaboratories.