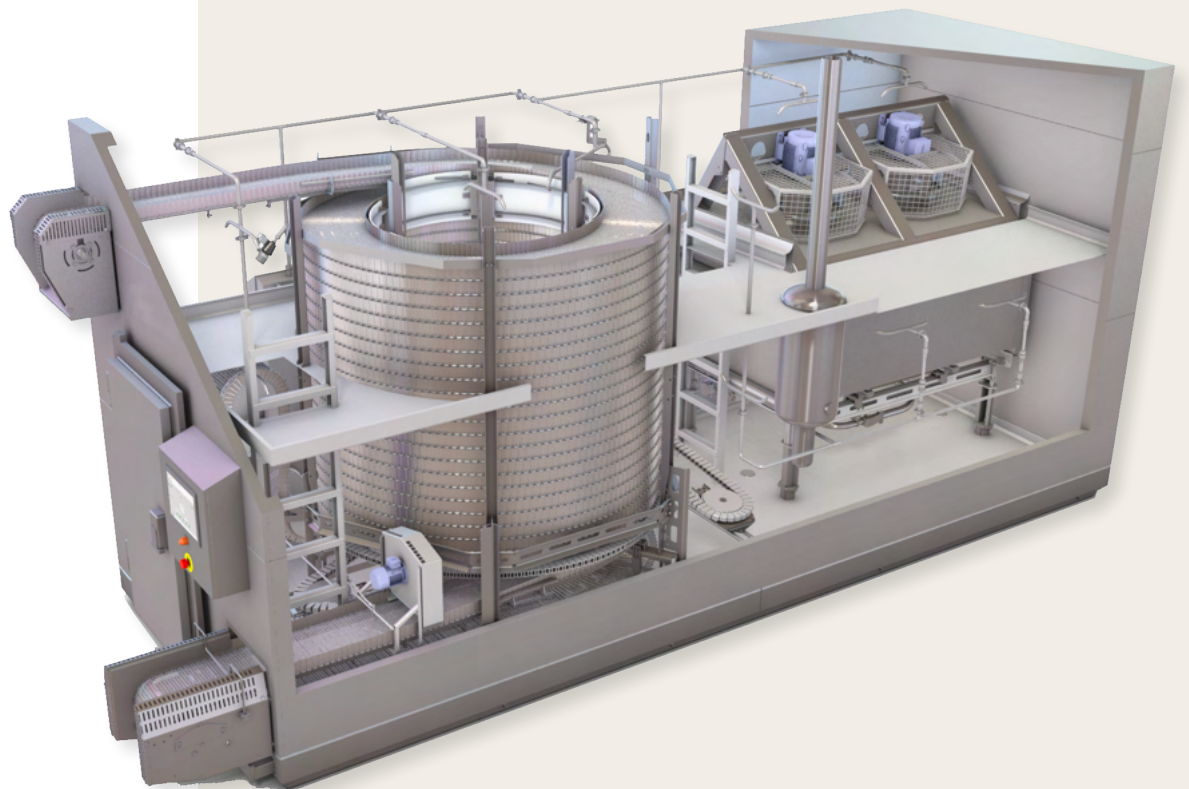




The power behind freezing and chilling

# Frigoscandia LVS Refrigeration™ System

Optimising refrigeration systems



# Optimising refrigeration system

Engineered for low energy consumption and optimum freezer performance

Frigoscandia LVS (Low Volume System) Refrigeration™ is up to 20% more efficient than traditional pumped refrigerant systems, as it provides a dry return from the compressor eliminating the need for a refrigerant pump. The dry return also means that a Frigoscandia LVS system typically has pressure drops between **0.5 and 1°C**, where traditional systems often have pressure drops of 3 – 5°C.

## Requires 15% less energy than traditional systems

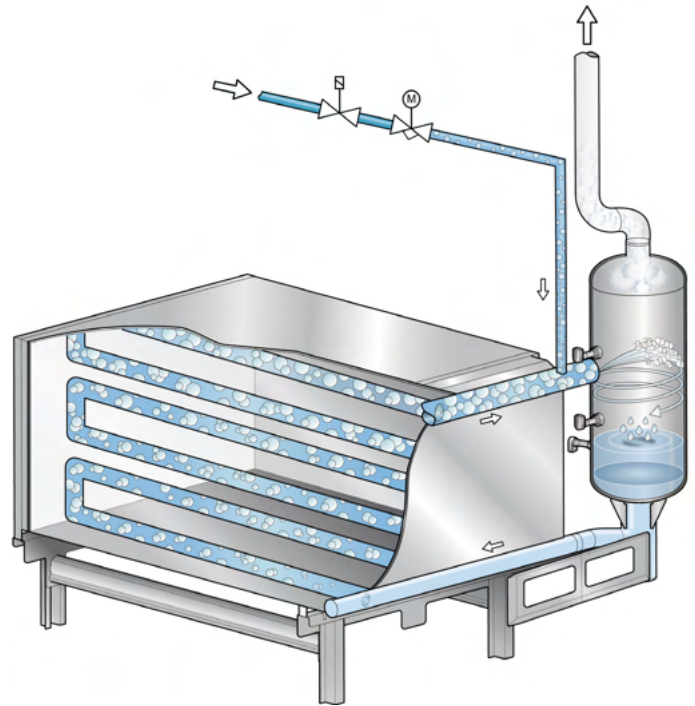
Due to the lower pressure drop LVS Refrigeration can operate at lower temperatures than other systems. The freezer usually **reaches operating temperature in only 20 – 30 minutes**. Low pressure drops at lower temperatures generate additional savings.

## Requires 50% less refrigerant charge than traditional systems

The evaporators connected to LVS Refrigeration can never be fully flooded with ammonia. There is also a completely dry return to the compressor. This means the refrigerant charge is **minimum 50% less** than in traditional refrigeration systems.

## Dry return eliminates liquid build-up

The dry return on the Frigoscandia LVS System eliminates liquid build-up problems that often cause temperature fluctuations and liquid distribution problems in traditional 'wet' systems.



## Flexibility in positioning and plant layout

Because the pressure drop on the Frigoscandia LVS System is equally low in horizontal and vertical lines, there are more flexible options in plant layout and positioning, for both location and height.

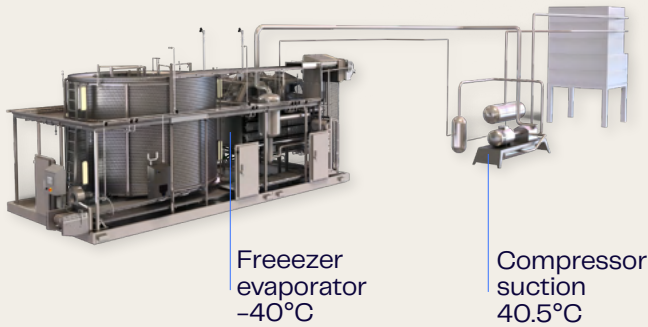
## Small footprint, easy installation

The dry return and the low amount of refrigerant necessary also allows for a much smaller footprint than traditional refrigeration systems, as there are less components, and no need for refrigeration pumps, a large pump separator or a low pressure receiver. This means a more compact refrigeration plant in a much smaller engine room.

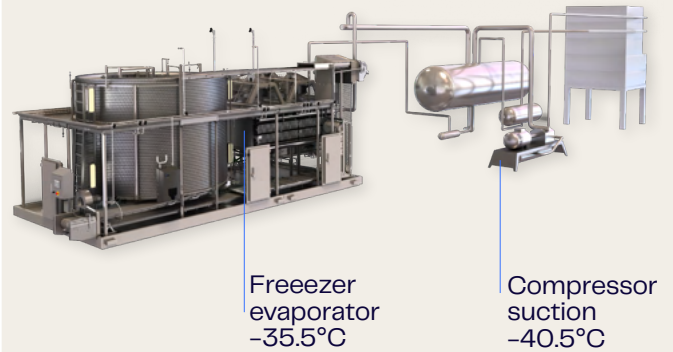
## Environmentally-friendly

The high evaporator performance on the LVS Refrigeration System provides the highest heat transfer efficiency of all liquid feed systems, and its dry vapour return gives the lowest losses. Coupled with the minimised refrigerant charge, the LVS System delivers environmental, as well as economic benefits.

## Typical system characteristics with LVS



## Typical system characteristics without LVS



Well-proven system with over 1,000 installations worldwide

### Frigoscandia LVS Refrigeration™ System (no-pump system with 'dry' return)

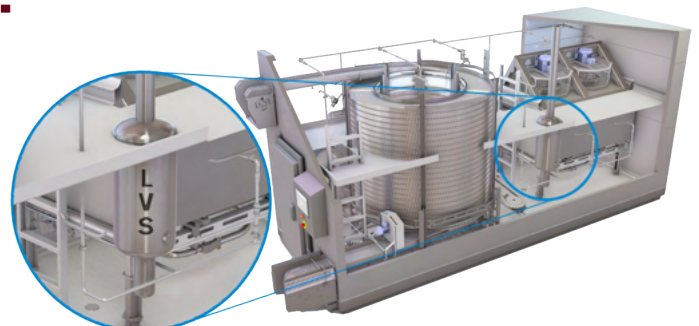
- LVS function fully integrated with freezer controls
- Pressure drop rarely over 1°C
- Free positioning (eg. on roof)
- No refrigeration pumps required = no leaks or maintenance
- All evaporators are fed the required amount of refrigerant
- Freezer evaporator, -40°C
- Compressor suction, -40.5°C
- No need for low pressure receiver due to dry return
- Positive effect on Process Safety Management programmes

### Traditional pumped refrigeration system (pump system with 'wet' return)

- Refrigeration system operated without direct control of freezer requirements
- Pressure drop of 3 – 5°C
- Limited positioning and slope requirements for the wet return
- Refrigeration pumps required = more engine room space required
- Refrigerant goes where it is not needed
- Freezer evaporator, -35.5°C
- Compressor suction, -40.5°C
- Need for low pressure receiver in plant room
- Tough demands on safety

# Want to have up to one hour of extra production?

- LVS QuickDry\* Patent pending
- A unique option to the LVS-system
- Dries your freezer efficiently and quick for smooth and efficient freezer turn-around
- Requires hotgas availability



# LVS QuickDry\* – Reduce your drying time to half

The purpose of LVS QuickDry\* is to make the freezer turnaround as efficient as possible, from it's turned off for defrost until the freezer is back in production. The LVS concept includes many features such as saving energy, increased performance, reduced refrigerant charge and makes the entire freezer turnaround process as efficient as possible.

The LVS QuickDry\* is in line with the LVS concept, saving time and energy!

\* Patent pending

