



Efficient planning and reliable operation

Introduction

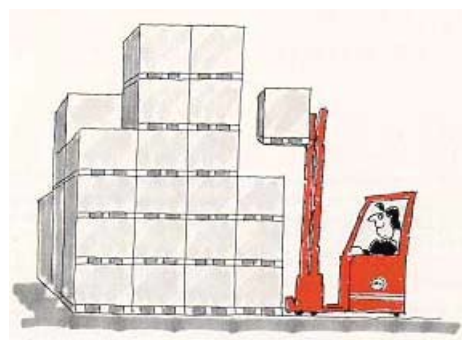
Cold stores are amongst the most demanding of material handling applications. All of the normal efficiency factors apply, with the need to move and store goods accurately and safely, as well as the need to order pick in some applications, but there are important additional issues to deal with.

Firstly, the cost of maintaining the low temperature environment. In the same way it costs electricity to keep your domestic refrigerator or freezer, cold stores consume energy to maintain temperatures that can be as low as -35°C . One of the most important considerations here is density of storage. An empty cold store is much more expensive to run than one that is full of stock. TMHE offers a range of solutions that can maximise density of storage in order to reduce cost.

Secondly the way that trucks have to be adapted for cold store use. All TMHE trucks can operate in chilled environments down to -10°C without technical modification. But for lower temperature cold stores most trucks need technical changes to be made. The Toyota and BT ranges offer a complete choice of models that are suitable.

Efficient planning

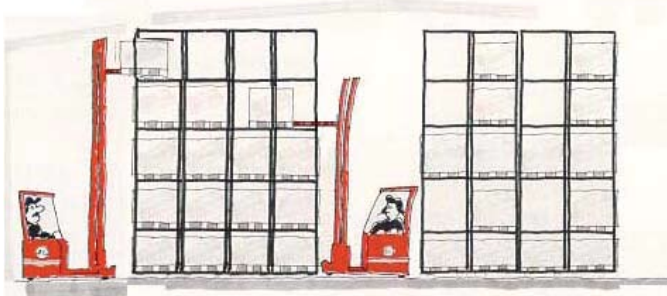
Achieving maximum density of storage is key to cost-efficient operation, and density of storage will be determined by the type of storage system. However this has to be balanced by the type of goods stored, number of product lines and frequency of transits. The simplest and best example is block-stacking which provides maximum density of storage.



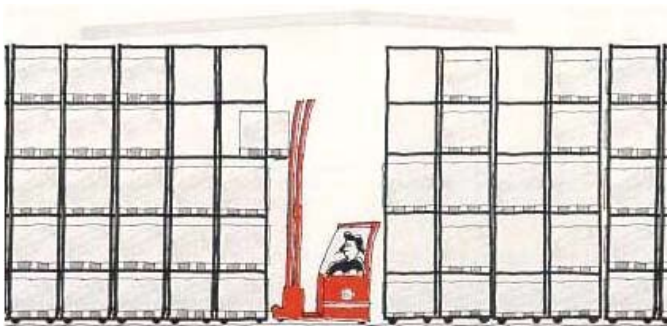
However the ability to block stack depends on a number of factors including weight, shape and strength of the loads being stored and most importantly the number of different stock lines, as accessibility is significantly restricted.

Facts about

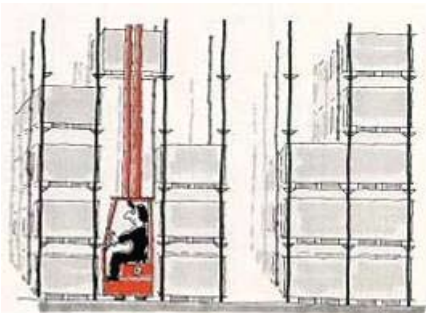
There are several types of racking system designed to provide high-density storage, all of which can improve cost efficiencies in cold stores. Here are some examples:



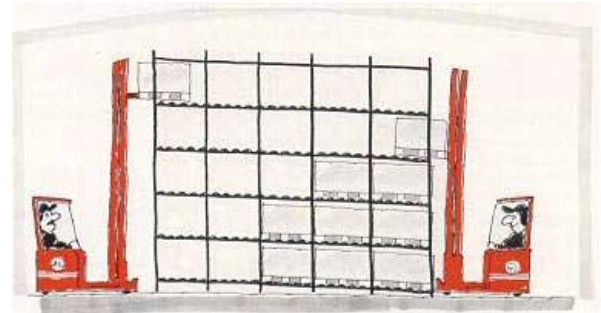
Double-deep racking systems allow for high-density storage, with the deeper pallet positions being reached with telescopic forks units, usually attached to a reach truck. BT offers this type of solution. Double deep racking allows relatively flexible storage for many different stock lines, but with up to 50% of loads not instantly accessible at any time.



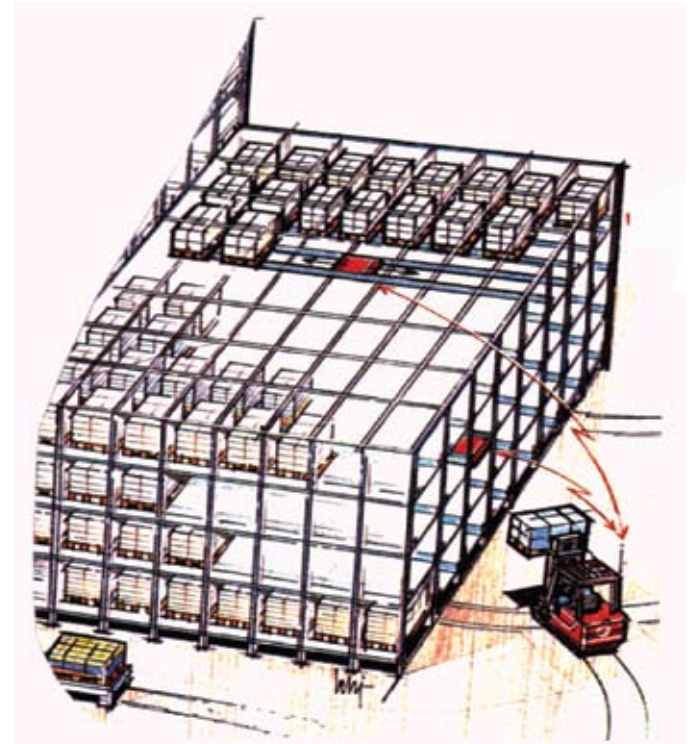
Mobile racking systems also provide for very high-density storage, and have the benefit of working with standard trucks, and the ability to access all pallet positions. However throughput rates are slower and cost and complexity of installation has to be taken into account.



Drive-in racking is another way to achieve high-density storage with a limited number of product lines. This type of system requires adapted trucks – available from Toyota and BT – but also reduces flexibility due to slower speed of operation and reduced accessibility to pallet positions.



Flow-through racking (often referred to as gravity flow racking) provides very high-density storage and can be accessed by standard trucks. Pallets are deposited at one face and then gravity-fed on rollers, built into the racking, through to the opposite face. However here are limitations in terms of the number of different stock lines that can be accommodated, and investment/maintenance costs are high.

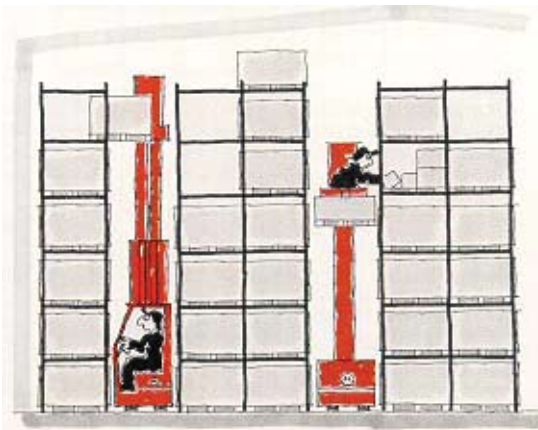


BT Radioshuttle is particularly suited to cold stores. It gives very high-density storage without compromising throughput. Even allowing for installation costs the end result is a low cost-per-pallet-moved thanks to its semi-automatic operation. Loads are carried inside the racking on radio-controlled shuttles that are moved between slots with conventional trucks. Several shuttles can be operated by **one driver and truck** at any time. Racking can be configured for both FiFo and FiLo. The goods are well protected and the racking can be located in conventionally 'wasted' space such as above loading bays or on mezzanines.

Flexibility vs space efficiency

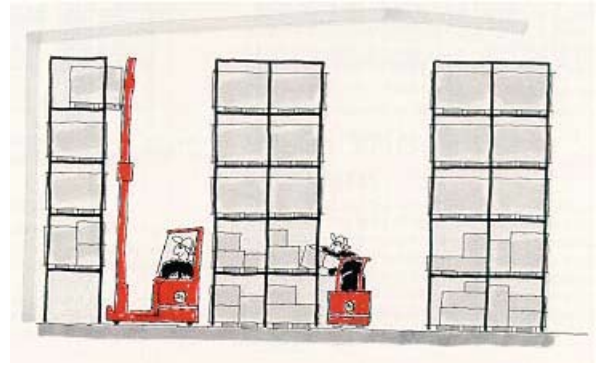
Whilst all of the specialist high-density storage systems described give clear benefits in terms of efficiency in refrigeration costs, this has to be balanced with flexibility. The very nature of cold storage is all about increasing the storage life of produce – which allows some flexibility when it comes to storage methods and demands for stock rotation. Nevertheless stock will invariably be managed broadly on FIFO (first in, first out) principles, which most high-density storage systems can constrain. Likewise if many different stock lines are to be stored, high-density systems can create operational problems.

For these reasons many users still require the flexibility of selective racking systems with all pallet positions fully accessible at all times. This leads to two further options:



Very Narrow Aisle

storage increases use of space by around 30% compared to traditional racking, which makes it a good option for cold stores. VNA systems can provide effective full pallet cold storage and also order assembly, picking from all levels. TMHE offers a range of equipment suited to VNA pallet storage and low and high level order picking, including the advanced Vector man-up machine, which can be equipped with a heated cab.



Conventional pallet storage is often the preferred solution as it provides complete flexibility using conventional equipment such as reach trucks, often combined with order picking at lower levels. It does not provide the most efficient solution in terms of use of refrigerated space and associated running costs, but it allows for conventional, straightforward handling methods to be employed.

Reliable Operation

The extreme temperatures in cold stores demand equipment that is engineered for the job. All TMHE trucks are able to be used in chilled environments down to -10°C . but for frozen environments, with temperatures down to -35°C most equipment needs to be adapted.

TMHE offers a complete range of BT warehouse trucks including hand pallet trucks, support arm stackers, order picking trucks, reach and VNA trucks, a well as Toyota counterbalanced trucks. Many trucks can be offered with heated cabins for operator comfort. The BT Reflex reach truck is a class-leading example.

Some trucks in the range require little modification. For example BT Levio and BT Staxio pallet trucks and stackers simply require low temperature hydraulic oil – in all other respects they are pre-engineered for cold stores with fully sealed components.

Condensation is the enemy in cold store environments. Once operating in a cold store a suitably engineered truck can work without significant implications, other than some deterioration in battery performance. It is when transporting in and out of the cold store that problems can arise. Moving from a cold to an ambient atmosphere will cause condensation, which is the biggest challenge to reliability. The greater the extremes of temperature the greater the risk, with cold stores in warm humid climates giving the biggest problems.

For this reason many operations work with clear operating zones for equipment, therefore reducing the need for trucks to travel constantly between extreme temperatures. Needless to say, it is essential that only cold store specified trucks should ever be used in cold storage areas.

Cold store durability from TMHE

The aggressive nature of cold store environments

means that service intervals are usually more frequent, depending on the demands of the application. However the level of service required will reflect the degree to which the trucks are adapted to suit the application. TMHE trucks that are engineered for cold store environments invariably require a lower degree of service compared to other manufacturers, further reducing cost and reflecting the durability of equipment.

The TMHE range available for cold stores to -35°C

Warehouse trucks:

hand pallet truck

- BT Stainless Lifter LHM200ST

low-lifters

- BT Levio LWE140-250
- BT Orion LPE200, 240

stackers

- BT Staxio SWE080L, 100-140, 200D
- BT Ixion SPE125-200

reach trucks

- BT Reflex M RRE120M-160M
- BT Reflex RRE140-250

order pickers

- BT Opus OSE100/W, 120/P, 120CB, 180X/XP, 250/P, OME100N/NW
- BT Opal OME100/W/M/MW
- BT OP-series OP1000SE/HSE, OPW1200SE/HSE

VNA

- BT Veflex VRE150, VRE125SF
- BT Vector VCE150A, VCE125ASF

aisle-free storage

- BT Radioshuttle

Electric counterbalanced trucks:

- Toyota Traigo 24*
- Toyota Traigo 48*
- Toyota 7FBMF*

* -30°C minimum temperature and maximum exposure of 30 minutes, with 30 minutes at ambient temperature before returning to cold store.

Consult your local TMHE representative for further information.

