How a major European Grocer implemented freezer warehouse automation to gain operation & financial benefits

Presented by:
Andrew R Lockhart
Vice President Sales Integrated Systems

Domenico Repetto
Logistics Manager Northwestern Switzerland, Central Switzerland, Zurich
About coop

• Founded in 1864
• Not just Swiss supermarket chain
  – Wholesale
  – Manufacturing
• Employs 85,000 people
• Total revenue of $29.15b
• 2,200 retail outlets
Coop Group

Switzerland (retail)
- coop
- coop city
- coop bau-hobby
- coop @home
- coop mineraloel
- coop pronto
- coop restaurant
- Inter Discount
- Fust
- microspot.ch
- nettoSHOP.ch
- sirop
- top tip
- Lumimart
- Betty Bossi
- CHRIST Uhren & Schmuck
- The Body Shop
- Marché

Europe (wholesale)

Production
- Bell
- CH CHOCOLATS HALBA
- swissmill
- peariwater
- REIS MONS
- nutrex
- Steinfels SWISS
COOP LOGISTICS STRATEGY
Targets for the new strategy

Reducing CO$_2$ emissions was the key element:

- Reduce number of sites (DCs, bakeries/confectioneries)

- Optimize transport between DCs and Stores
  - Distances
  - Mode of transport (combined)
  - Electric powered trucks
The results

Closing of 3 regional distribution centers
Closing of the 3 deep-freeze distribution centers
Closing of 3 large bakeries
Closing of 3 large confectioneries

Extension reg. Distribution centers Schafisheim and Aclens
New national freezing distribution center Schafisheim
New large bakery & pastry shop Schafisheim
Expansion of the Grossbäckerei Bern
ECOLOGY AND EFFICIENCY
How we work today in freezers
How to improve the overall process

Past
- Manual Picking
- Truck Transport

Future
- Automated Picking
- Combined Transport (Train/Truck)
Capex

Opex

Total Cost of Ownership
Reduction of operational cost

- Energy-saving improvements
  - Control the loss of cold air
  - Eliminate heat load factors such as operators, forklifts, and lighting
- Elimination of product and warehouse damage
- Labor cost and availability improvements
Reduction of investment cost

• Improved space utilization

• Direct load handling

• Flexibility

• Replacement of sprinkler system
THE SOLUTION
A FULLY AUTOMATED FREEZER
Deep Freeze DC – Fully Automated

Requirements
Supply of 850 supermarkets and 300 gas station shops with frozen food

- **Goods Receipt**
  - 400 pallets per day from external
  - 800 pallets per day from in-house bakery

- **Volume Ordering**
  - Normal day: 55,000 cases and 3,500 rolled containers
  - Peak day: 100,000 cases and 6,000 rolled containers

- **Transport**
  - Less than 55 miles - trucks (55%)
  - More than 55 miles - combination train / truck (45%)
Schafisheim Site Overview

- Building A
  - Chilled Products
- Building B
  - Frozen Products
  - Empty tote center and Bakery & pastry shop
  - General Goods

Building the Facility
Solution Design Parameters

- 4,500 double cycles/hour
- 38,008 storage locations
- 33/49 clear building height
- >1,000 SKUs
The Process

- Receiving
- Storage
- De-palletizing
- Storage (engine)
- Order Picking & Pall.
- Consolidation (buffer)
- Shipping

Cross docking
Order picking
Frozen Distribution Center

• Customer specific design with high bay on top of shuttle

Pallet Storage
(- 13 °F)

(De-)Palletizing
(Cartons; -23 °F)

(De-)Palletizing
(pallets, roll cages; -23 °F)

Shipping Buffer
(- 13 °F)

Stingray® Shuttle Buffer
(- 13 °F)
THE TECHNOLOGY
Fully Automated (De-)Palletizing

Splitex

Autostax
Shuttle technology for the freezer

• Shuttle technology
  – 4 wheel drive
  – Design for freezer from the beginning

• Designed for freezer from the start
  – Cables
  – Seals
  – Lubricates

• Fully tested in test environment
CHALLENGES IN DESIGN AND OPERATION
Design
Installation and Commissioning

• New freezer versus retrofit

• Reduced footprint and higher building
  – Reduces heat loss
  – Improves shuttle performance

• Implementation is a longer process

• Commissioning is a 2 stage process
  – Commission in ambient
  – Re-commission at freezer temperature
Operation
Operational Challenges

• Vendor carton quality

• Barcode labels require special glue

• Special operator training for low oxygen environment
Operational Challenges

• Replacing a component in a freezer is a longer process.
  – Shuttle needs to be bought out of the freezer for maintenance
  – Needs to be placed back in the freezer and bought down to temperature before operation
Performance optimization

Performance
• Up to 1,000 double cycles per hour / per aisle

• Improved order fulfillment accuracy (target 99%+)

• High availability thanks to redundant system design
Safety optimization

Safety

• Shipping and other work to be conducted outside of deep freeze

• Advanced system access and service concepts
Green Logistics

• All essential components have an energy recovery system
  – STINGRAY - innovative PowerCap
  – Shuttle Lift - energy recovery module
  – KingDrive® - energy recovery module

• Acceleration and speed of STINGRAY and/or lift are adjustable
footprint reduction by \(~\frac{2}{3}\)  
energy reduction by \(~\frac{2}{3}\)  
workforce productivity \(x2\)
FREEZER AUTOMATION FOR THE US MARKET
Frozen food market growth

- Frozen fruits & vegetables
- Frozen Potatoes
- Frozen meat
- Frozen fish/seafood
- Frozen ready meals
- Frozen soups & appetizers

$\text{b}$
Energy Prices continue to increase

Energy Prices

Case: Reference case | Region: United States
Indexed to 2015 as percent

Electricity ~ +10%

Diesel Fuel ~ +35%

Source: U.S. Energy Information Administration
MAKE YOUR BUSINESS FUTUREPROOF.

- Health
- Rights
- Labor
- Safety
- Standards
- Minimum wage
- Social development
- Act
- Employment
- Wage
- Organization
- Jobs
- Contract
- Disadvantaged
- Organizing
- Tradeg
- Advice
- Consultant
- Categories
- Floor disadvantage
- Common
- Restrict
- May
- Different
- Employees
- Problems
- Obligations
- Conditions
- Acceptability
- Terminate
- Re-mediated
- Technical
- Force
- Limits
- Transcend
- Industry
- Organizing
- Precedents
- Including
- Limited
- Protecting
- Legislative
KEY TAKEAWAYS
Reduction of investment cost

• Improvement of space utilization
  – Maximize cube, minimize footprint based on tall, high-density, rack-supported storage

• Flexibility

• Replacement of sprinkler system in storage/pick engine area by oxygen reduction system
Reduction of operational cost

• Reduction in energy usage
  – Any segment of the solution only is as cold as it needs to be to reduce energy usage

• Control the loss of cold air
  – By minimizing footprint and roof size
  – By controlling entrance size, minimal contact with the outside air is controlled
Reduction of operational cost

- Ensure circulation of cold air in freezer storage and minimize temperature difference

- Eliminate heat load factors such as operators, forklifts, and lighting
Performance and safety improvements

• Operational speed is improved by automation

• By allowing shipping, picking and other work to be conducted outside of the freezer warehouse, the work environment is drastically improved

• Safety is improved by eliminating human contact within the inside of the freezer warehouse
Implementing shuttle-based automation for the freezer is the key to maximize your flexibility and minimizing investment and operational costs!

Thank you!
Booth #B1227
For More Information:

Speaker email: andy.lockhart@tgw-group.com
Website: www.tgw-group.com

Or visit MODEX Booth B1227