

## Top Lifting Tunnel

by DOHMEYER

In partnership with Dohmeyer, leading global manufacturer of cryogenic refrigeration systems for the food processing, pharmaceutical, aeronautic, plastics and steel industries, TOMCO<sub>2</sub> Systems offers a complete line of innovative Cryogenic Food Freezers and Chilling Solutions. Each freezer system is custom-designed to its customer's specific requirements

Dohmeyer's in-line cryogenic freezing Tunnels are commonly used to freeze all kinds of foods ranging from small diced products to larger whole muscle meat or packaged products. The Dohmeyer Top Lifting Tunnel combines inline freezing power together with good ergonomics and easy cleanability



# The Process

Top Lifting Tunnels are opened by raising the top section of the freezer using screw jacks in the support legs. A clearance of ca. 700m is available when the tunnel is in the open position which provides an excellent access for clearing and maintenance operations inside the tunnel. Every Dohmeyer Tunnel is equipped with either liquid nitrogen or liquid carbon dioxide (CO<sub>2</sub>) injection, depending upon the product and process requirements. The freezing action happens right inside the tunnel where the cryogenic gases are injected into an insulated cold zone as the food product passes through it.

Dohmeyer can recommend the best cryogen and injection set-up for various types of food products or processing constraints. There are two injection set-ups to choose from depending upon the temperature profile that is needed to freeze the food product:

## Features & Benefits

All Dohmeyer Tunnels are equipped with a standard, operator-friendly HMI touch screen and Siemens PLC software with recipe storage capabilities to ensure a consistent freezing result every time. In addition, Dohmeyer is able to provide specially-designed fan blades, based on its on-going research efforts, for different convection set-ups in order to increase the freezing rate of many types of food products while optimizing the operational efficiency of the cryogenic gases.

Liquid nitrogen and CO<sub>2</sub> deliver the ultimate cryogenic freezing power by minimizing any aroma, flavor, and dehydration losses to the food product. Because these cryogenic gases are inert, they also provide a protective atmosphere inside the freezing zone which prevents any oxidation of the food. As a result, the quality attributes of cryogenically-frozen food products are far superior to those same products frozen in a mechanical system.





# General Specifications

- Standard, operator friendly, HMI control with recipe storage capabilities
- Achieves very low temperatures, down to -70°F (with LCO<sub>2</sub>) and down to -160°F and lower (with LIN)
- Easily adapted for every kind of inline freezing
- Easy access for cleaning and maintenance with an opening clearance of ca. 700 mm.
- No loss of food flavor, aroma, or weight
- Several customizable options

Usable Belt Width		28"	38"	50"	60"
Overall Tunnel Width (mm)		1570	1822	2130	2383
Name	Freezing Length	Belt Freezing Surface (m <sup>2</sup> )			
DOH-TLT-5000	4000	2,84	3,86	5,08	6,10
DOH-TLT-6000	5000	3,56	4,83	6,36	7,63
DOH-TLT-8000	7000	4,98	6,76	8,90	10,68
DOH-TLT-9000	8000	5,68	7,73	10,17	12,20
DOH-TLT-10000	9000	6,40	8,69	11,44	13,73
DOH-TLT-11000	10000	7,11	9,66	12,71	15,25
DOH-TLT-13000	12000	8,53	11,59	15,25	18,30
DOH-TLT-14000	13000	9,25	12,56	16,52	19,83
DOH-TLT-16000	15000	10,67	14,49	19,07	22,88
DOH-TLT-17000	16000	11,38	15,46	20,34	24,40
DOH-TLT-18000	17000	12,09	16,42	21,61	25,93
DOH-TLT-21000	20000	14,22	19,32	25,42	30,50



# Technical Specifications

## MATERIAL

Tunnel: Stainless steel AISI 304 and/or AISI 304L  
Body Panels: Fully welded  
Frame, Axes & Belt System, Fan Motors: AISI 304

## THERMAL INSULATION:

Insulation thickness: 5.5 inch  
Fully welded stainless steel AISI 304 sheet metal panels  
Insulated with hard foam polyurethane HD-PUR average density 3.12 – 3.15 lb/ft<sup>3</sup>

## OPENING:

The tunnel is a top lifting construction with an opening of 2.5 feet.  
The tunnel opens by means of electrical servo IE3 motors which are connected to the spindles hided in legs of the tunnel. The electrical servo IE3 motors are installed on top and integrated in feet/legs of the tunnel. There are no mechanical parts underneath the bottom of the tunnel with cardan joints or hydraulic oil leaks of a hydraulic system.  
Material: stainless steel

## PNEUMATIC UTILITIES:

Compressed air must be supplied  
Pressure 90 – 120 psi  
A manual water drain is foreseen. Must be periodically cleaned manually.

## BELT:

Material: Stainless steel wire belt  
Wire thickness: 3/32 inch  
Mesh opening : ca 1/3 inch x 3/4 inch

## SEALING:

Ultra low temperature Knit-Mesh™ seal covered with polyethylene-foil.

## CURTAINS:

At inlet and outlet of tunnel: unidirectional PE flaps, HD1000 blue

## COOLING PRINCIPLE:

The injection of the gas is done by an injection system mounted inside (LIN) or outside (LCO2) the tunnel freezer. We offer two different designs, in accordance to the customers specification

## TEMPERATURE:

The tunnel is designed to run at maximum -200°F maximum -85°F for LCO2 (advised -67°F) and maximum -202°F for LIN, (advised -166°F)

#### PRODUCT OUTLET:

Unique high outlet to ensure more efficient use of the gas.  
It is possible to put conveyor belt or obtain under the outlet of the CryoRoll. The funnel is removable.

#### EXHAUST HOODS:

Waste gases must be vented to free atmosphere.  
The tunnel is equipped at both sides (inlet and outlet) with an exhaust hood at the bottom. The exhaust is passive and keeps the tunnel interior under overpressure and inert. As an exhaust collector is located at the bottom of the tunnel no water can drip onto the product.

A condensate collector is integrated, so that condensate water cannot drip onto the product.

Opening diameter: 12 inch, customer needs to install an exhaust fan for the extraction of the waste gases. It is recommended to place the exhaust fans on false ceiling or roof.

In order to insure correct functioning of the tunnel, and in order to insure safety, the exhaust system must be built in accordance to the instructions of Dohmeyer, as mentioned in the user manual.

Exhaust fans, exhaust ducting and frequency inverters for exhaust fans are not included in the offer. Please ask for the pricelist of exhaust fans, inverters and ducts.

#### CLEANING:

The tunnel is a top lifting construction for access and cleaning.

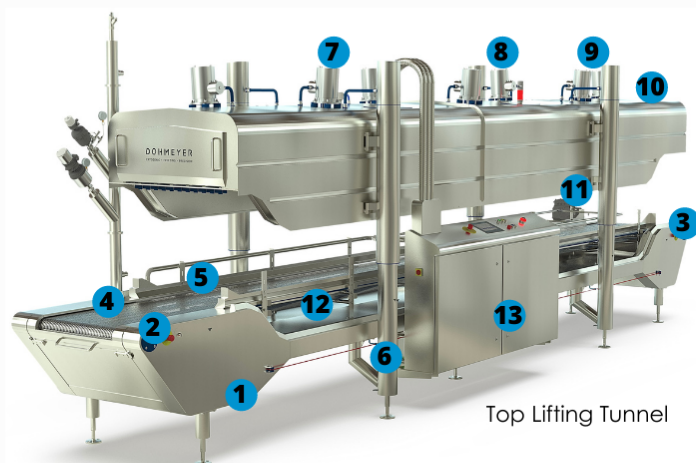
The opening is ca. 2.5 feet.

This gives a sufficient access to all items for cleaning: belt, fans, belt support,...

#### OPTIONS:

Axial fan with 10 blades

# THE DOHMEYER ADVANTAGE



Top Lifting Tunnel

- 1 Auto Belt Washing:** Reduced labor, more efficient and effective cleaning
- 2 Bottom Exhaust:** No drip, concerns or risks of Listeria M (re)infection
- 3 Auto-Tensioning Scraper Blade**
- 4 EyeLink Belt:** Reduced food particle trapping potential & cleaning time
- 5 Blue Plastic Only:** High visibility and rapid in line identification
- 6 Servo Driven Stainless Screw Jacks:** No Hydraulics
- 7 Vacuum Insulated Injection Valves:** Eliminates risk of cold burn and leakage. Higher quality liquid at injection
- 8 Stainless Fan Motors**
- 9 Dual Gas Nozzles:** Available for CO2 & Nitrogen
- 10 Sloped Roof:** Eliminates water retention in cleaning. Food safety & quality
- 11 OS4 Food Grade Servo Gearbox**
- 12 Zero Gaskets:** No gaskets eliminates food particle trapping. Cleanliness, maintenance.
- 13 Ethernet & GPRS Access**

Product Features	Standard Market Freezer	Dohmeyer Base Freezer	Dohmeyer Premium
<b>Exhaust Fans</b>	1	2	2
Turbulence Fans	6	8	12
Adjustable Belt Speed Ratio	1:5	1:5	1:100
Woven Belt Design	•	•	
eyeLink Belt Design			•
Bottom Exhaust		•	•
<b>Redundant Liquid Nitrogen Valves</b>		•	•
No Gaskets Between Tunnel Sections		•	•
<b>Redundant Temperature Monitoring</b>		•	•
<b>Vacuum Insulated Valves</b>		•	•
<b>Metal Detectable Plastic Belts (Blue)</b>		•	•
Dual Gas Capable		•	•
Sloped Surfaces		•	•
Auto Belt Washing System			•
Remote Diagnostic Monitoring			•
Operator ID Logging			•

\*Depicts safety enhancement feature