



神舟制冷  
SHENZHOU REFRIGERATION

# ARKREF CO2 PROJECT CASES INTRODUCTION

神舟行 一起赢

Web/[www.sz1989.com](http://www.sz1989.com)

## Company Profiles

Shandong Shenzhou Refrigeration Equipment Co., Ltd. was founded in 1989. It is a professional company focusing on environmental protection cold chain equipment under Moon-Tech (stock code 000811). It is a system solution integrating R&D, design, production, sales and commissioning services of refrigeration equipment. Solution service providers, while providing customers with a variety of environmentally friendly and energy-saving refrigeration system solutions that meet the needs of users.



## Characteristics CO<sub>2</sub> system

- ◆ CO<sub>2</sub> is a natural working fluid (ODP=0, GWP=1) with good safety, non-toxic and non-flammable
- ◆ Large latent heat of evaporation, high cooling capacity per unit volume
- ◆ Excellent flow and heat transfer characteristics
- ◆ Low filling volume and low shaft power consumption
- ◆ Good chemical stability, less chemical reaction of related materials
- ◆ Higher operating pressure
- ◆ The critical point is at a lower temperature: 31.1°C (88.0°F)
- ◆ CO<sub>2</sub> is heavier than air, and the mixed gas produced in a closed space is enough to suffocate.
- ◆ Safety limit: NH<sub>3</sub> is 25ppm and CO<sub>2</sub> is 5000ppm (0.5%)

## 1、2022 Winter Olympics-National Speed Skating Stadium

Adopting an all-ice design with an ice surface area of 12,000 square meters, it is the world's first speed skating venue with direct CO<sub>2</sub> transcritical evaporation and cooling, and the ice surface is the largest in Asia; full consideration of comprehensive energy utilization, the system can save electricity throughout the year 2 million degrees.



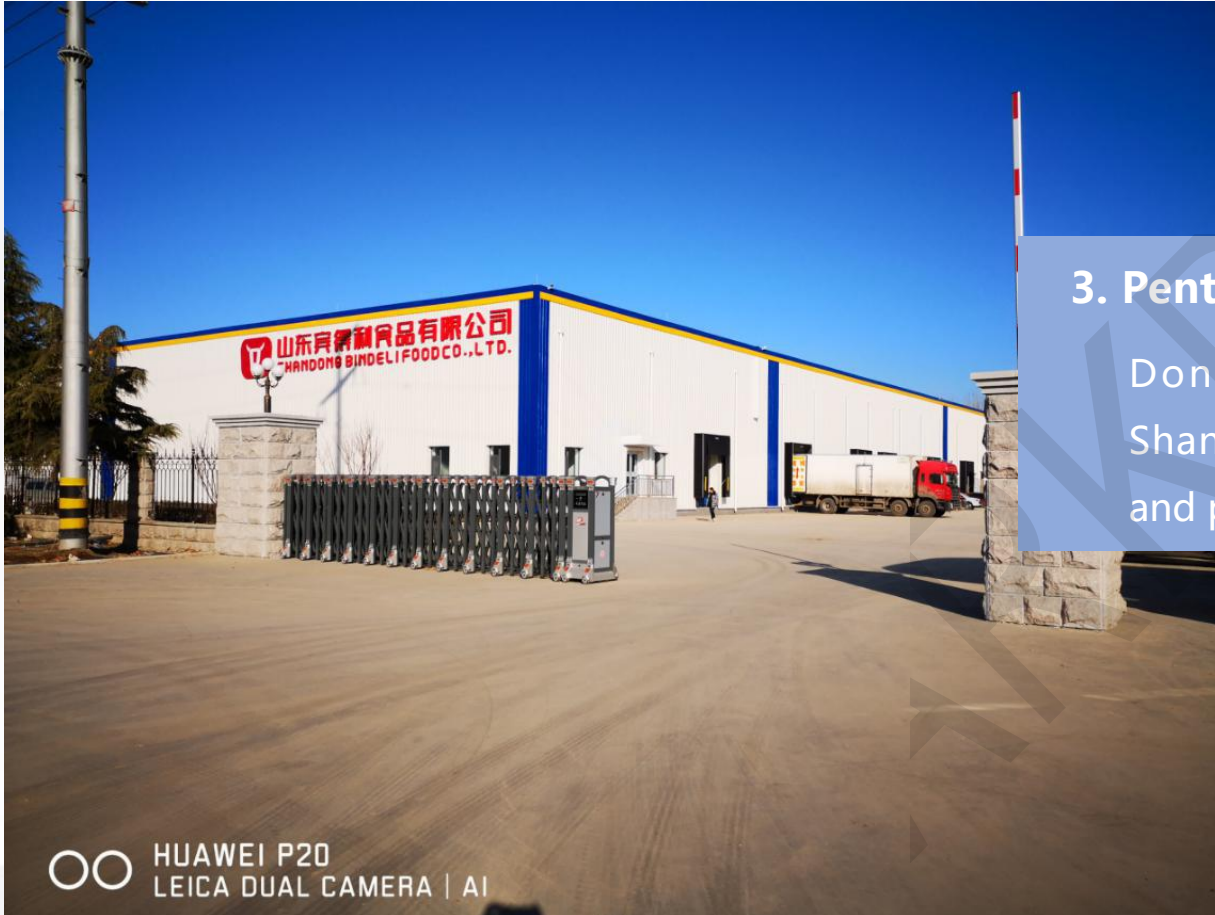
1. The design and application of 14 cubic CO<sub>2</sub> drum pump unit is the first in the world;
2. The application of centralized medium pressure oil return in CO<sub>2</sub> ice making system is the first in the world;
3. The application of ultra-long stainless steel cold row pipes in artificial ice rinks is the first in the world;
4. Using environmentally friendly CO<sub>2</sub> refrigerant, ODP is zero, no pollution to the environment;
5. Fully consider the comprehensive utilization of energy, the system can save about 2 million kWh of electricity throughout the year;



## 2. Yanshan Sports Ice Rink

The Yanshan Skating Hall will become the promotion base for Beijing youth ice sports education and popularization, and the competition base for professional ice hockey team and club training.

Equipped with Shenzhou's self-developed transcritical CO<sub>2</sub> main engine, air cooler, and barrel pump unit to achieve a zero breakthrough in the localization of transcritical refrigeration systems in stadiums.



### 3. Pentax 300,000 heads/year beef cattle processing

Dong Bin Deli Food Co., Ltd. is a subsidiary of Shandong Delis, whose main business is the cutting and processing of imported beef.

The planned output value is 1 million heads/year, and the processing volume of the first phase of the project is 300,000 heads/year.



○ ○ HUAWEI P20  
LEICA DUAL CAMERA | AI



#### 4. Jinan Dongjing Refrigeration Co., Ltd.

The project covers an area of 10,000 square meters logistics warehouse, using the most advanced CO2 system in the world, the evaporator uses Shenzhou patented aluminum tube, and automatic hot gas defrosting.

The project includes B1 level library board and refrigeration system, the overall design and construction of Shenzhou refrigeration.



## 5. Yuanlong Beef

The project is a black cattle processing and slaughter project, including a low-temperature cold storage of 1,600 square meters, five quick-freezing storages, five acid discharge rooms, and workshop air-conditioning and tempering rooms.

The low-temperature cold storage uses ceiling aluminum pipes, and the rest uses ceiling air coolers, which are now operating well.





## 6. Beijing Tongzhou Port Project

Tongzhou Port is the largest inland port in the north, and domestic large-scale warehousing and logistics companies such as Best, SF Express, and Suning have settled in one after another.

The project also includes ultra-low temperature cold storage. According to the load, the cascade unit of model SABL223Y+244Y produced by Shenzhou is adopted.



## 7. Derun Health Food

The project is constructed by Leling Derun Health Food Co., Ltd. The project focuses on processing and storing golden jujube, adopts Bitzer carbon dioxide refrigeration system at low temperature, and adopts Bitzer dual-stage refrigeration system for quick freezing.

Construction adopts 1:1 three-dimensional design drawings to avoid cross-construction pipeline fights



## 8. East Food Security Commune Food Cold Storage Project

The project has a construction area of 10,000 square meters, and the low-temperature cold storage adopts the most advanced CO2 carrier cooling system in the world.

The main engine adopts the carbon dioxide carrying cold barrel pump skid independently developed and produced by Shenzhou, the evaporator adopts Shenzhou carbon dioxide patented aluminum pipe, automatic hot gas defrosting; the high temperature cold storage adopts R507 direct expansion system, the main engine adopts Shenzhou high temperature screw parallel unit, and the end is equipped with Italy Luwei high-efficiency air cooler.

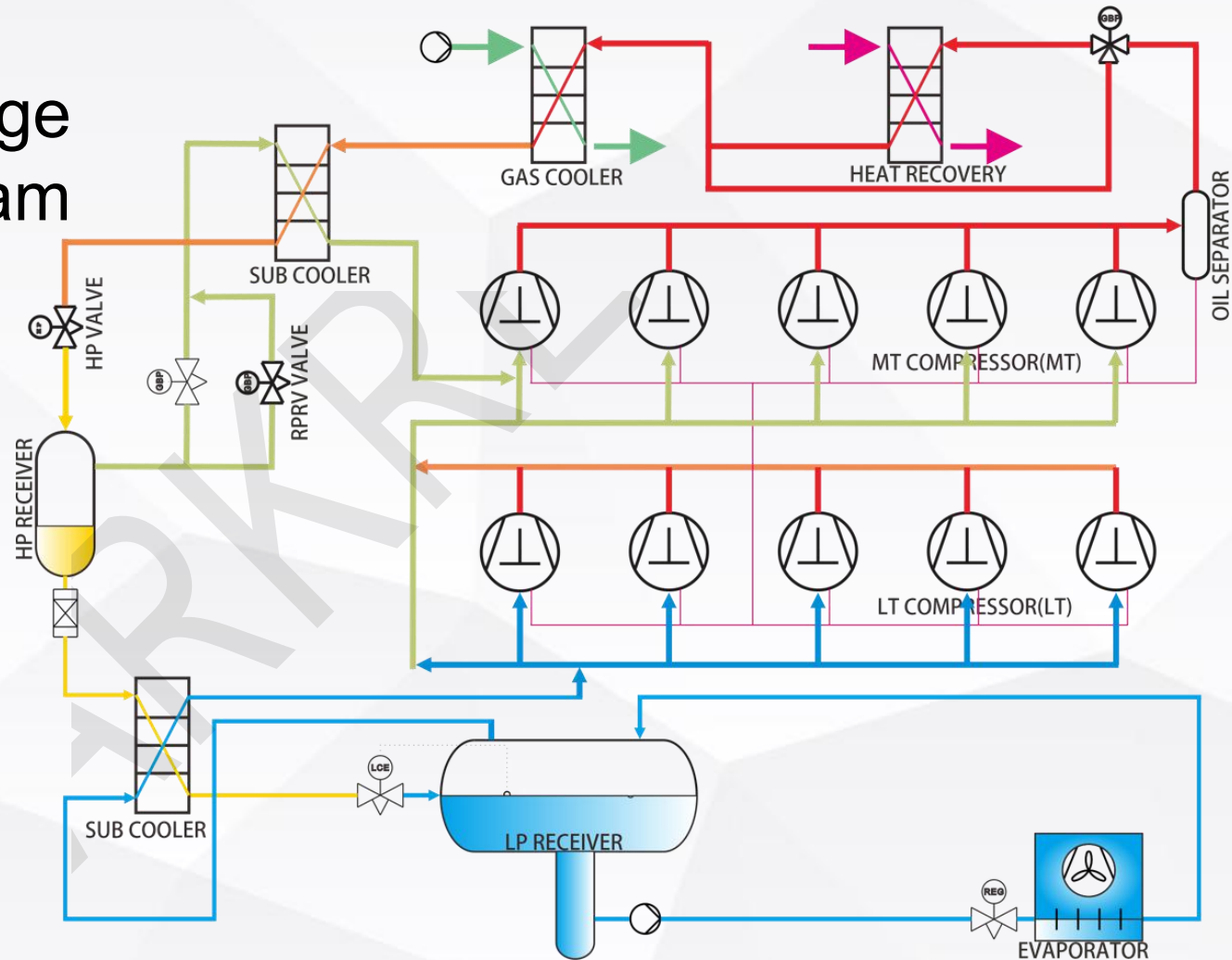


### 9、 South American Large Commercial Supermarket

The project is a carbon dioxide overlay unit, exported to South America and used in large commercial supermarkets. The dual temperature conditions can realize food storage in sub-temperature zones. It can be combined with display cabinets to achieve high-efficiency refrigeration. At present, more than 70 units have been exported, serving more than 30 locals in South America. Supermarket.

# CO2 transcritical two-stage System schematic diagram

Parallel compressor  
 Gas ejector  
 Air cooling system



Project Name	Quick Freezing Vegetables and Fruits
Nation	Bulgarian
Power Supply	3*380V-50HZ
Refrigerant	CO2
Main unit: condensing unit/liquid storage unit/chiller	<p>1. When the evaporating temperature is <math>-35^{\circ}\text{C}</math> to <math>-40^{\circ}\text{C}</math>, the cooling capacity is 300KW, and heat recovery is required; the heat recovery inlet temperature is <math>40^{\circ}\text{C}</math>, and the outlet water temperature is above <math>60^{\circ}\text{C}</math>. 2. Hot water is used for milk and cheese processing 3. Hot water is circulated in a closed system 4. Pure carbon dioxide system</p>
Evaporator	<p>1. Fluidized flat-plate quick-freezing machine, with a quick-freezing capacity of 1800KG/hour, the incoming temperature is <math>6^{\circ}\text{C}</math> to <math>8^{\circ}\text{C}</math>; the shipping temperature is <math>-18^{\circ}\text{C}</math>; the moisture content of the cargo is 84%</p>

## Bulgarian freezer tunnel

