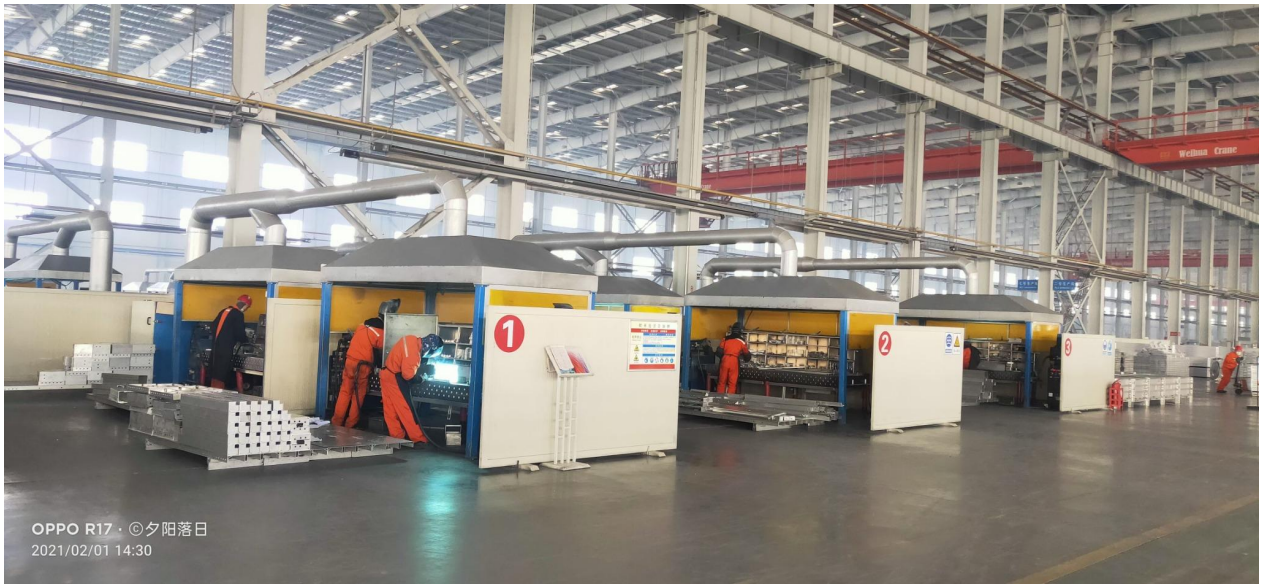
KEYWARM®
We Ignite Success

Zhongwang 103,000 sqm Industrial Heating Case Study

Integrated Heating Strategy for a Super-Large Manufacturing Plant in Liaoyang, China



Keywarm Case Study

Case Snapshot

Project	Zhongwang 103,000 sqm Industrial Heating Project
Location	Liaoyang, Liaoning, China
Building Size	Approx. 715 m × 145 m × 18 m ｜ Floor area approx. 103,000 sqm
Target Temperature	Working temperature: 15–18°C
Operating Conditions	High-bay space, welding stations with heavy ventilation, frequent vehicle movement and distributed ancillary offices
Integrated Scheme	Radiant heating for the main workshop + make-up heat for welding areas + direct-fired air curtains at doors + independent office heating

Project Overview

China Zhongwang operates a super-large industrial fabrication workshop in Liaoyang, Liaoning. The building measures about 715 m in length, 145 m in width and 18 m in height, with a total floor area of approximately 103,000 sqm. The challenge was not only the enormous air volume, but also the process conditions: welding stations required heavy ventilation, major doors opened frequently for vehicle movement, and auxiliary offices were distributed around the perimeter of the plant. The project required a working

temperature of 15–18°C, so a single heating route was not enough. Keywarm therefore adopted an integrated strategy: radiant heating for the main workshop, direct-fired make-up heat for welding zones, direct-fired air curtains for the door areas, and independent heaters for the scattered office rooms. The system was designed around real heat-loss behavior rather than around one product category alone.

Challenges and Responses

Challenges	Responses
The main workshop had a huge air volume and 18 m height, making warm-air-only systems prone to upper-space heat accumulation.	Low-intensity tube radiant heating was used in the main workshop to focus heat on the occupied zone.
Welding operations required heavy ventilation, which continuously introduced cold outdoor air.	Direct-fired warm air heaters preheated incoming make-up air in welding areas.
Major doors opened frequently, causing direct infiltration and strong thermal fluctuation at entrance zones.	Direct-fired air curtains created a hot-air barrier at major entrances.
Ancillary offices were dispersed around the plant, making conventional centralized hydronic heating complex.	Independent room heaters provided a simpler and more responsive solution for scattered office rooms.

System Configuration & Installation

- Main workshop: 415 units of 50 kW low-intensity tube radiant heaters.
- Welding areas: 50 units of 100 kW direct-fired warm air heaters.
- Door zones: 28 units of 100 kW direct-fired air curtains.
- Ancillary rooms: 104 units of 7 kW room heaters for independent heating.

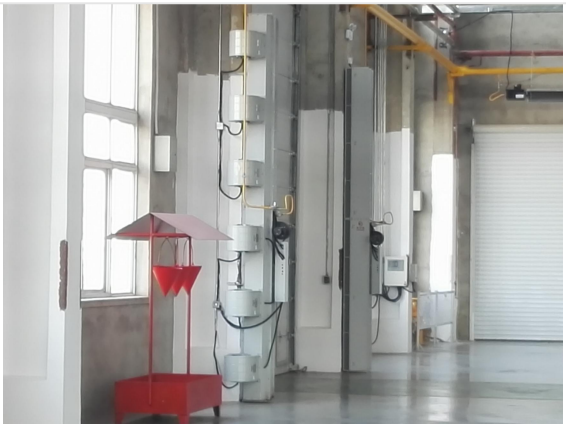
Performance & Customer Value

The case demonstrates a key principle: in very large industrial facilities, the best-performing strategy is often not a single heating route, but a combination system built around different thermal problems. Radiant heating for the main workshop, make-up heat for welding zones, air curtains for door areas and independent office heating together created a practical and robust solution.

Project Photos

Welding workstations in the main workshop

High-bay main workshop space

	
Main workshop processing area	*Direct-fired air curtain at the project doorway*

Recommended Applications

- Factories and workshops
- Large manufacturing plants
- Warehouses and logistics buildings
- Support and auxiliary buildings
- Maintenance facilities
- Other large-volume industrial or commercial spaces