

Cold Room Installation

Project Readiness, Installation Essentials & Decision Checklist

WHAT THIS GUIDE DELIVERS

- 01 A direct go/no-go answer before installation
- 02 Ten engineering requirement groups
- 03 Installation types and equipment architecture
- 04 A 15-point pre-installation checklist

PREPARED BY AFZALI TECHNICAL SERVICES

Industrial Refrigeration & HVAC Engineering

Technical summary based on the supplied Afzali installation guide

THE DIRECT ANSWER

Is the project ready for installation?

Only when the operating duty, site interfaces, engineered system and acceptance criteria are documented - room dimensions alone are not a design basis.

GO / NO-GO RULE

Proceed only after the product duty, refrigeration load, site condition, floor and vapour strategy, insulated envelope, power, drainage, ventilation, controls, safety and commissioning plan have all been confirmed.

1 Storage duty

Product, temperature band, entering temperature, throughput, humidity and door activity.

2 Site readiness

Verified dimensions, slab condition, access, heat exposure, clearances and service routes.

3 Envelope & floor

Insulation, vapour continuity, door details, thermal bridges, drainage and frost control.

4 Calculated load

Transmission, infiltration, product, people, fans, lighting, defrost and design conditions.

5 System compatibility

Capacity, refrigerant, compressor, evaporator, condenser, valve, piping and defrost.

6 Utilities

Voltage, phase, protection, backup power, condenser ventilation and drain routing.

7 Controls & safety

Sensors, alarms, logging, emergency release, relief and leak detection where required.

8 Acceptance plan

Approved drawings, testing, commissioning, training, handover and maintenance records.

WHAT AN UNRESOLVED START USUALLY CREATES

- Unstable temperature
- Excess energy use
- Condensation / icing
- Short cycling / wear

The cheapest place to resolve uncertainty is before equipment selection - not during commissioning.

DEFINE BEFORE PROCUREMENT

Cold room installation requirements

These five requirement groups establish the room duty, physical boundary and refrigeration capacity before any major equipment is ordered.

1 Operating conditions

Confirm: product type; target range; entering product temperature; daily throughput; maximum inventory; humidity; door frequency; traffic method; operating schedule.

Why: holding pre-chilled goods is not the same duty as cooling warm product or blast freezing.

2 Site & structural assessment

Verify: internal/external dimensions; ceiling and service clearances; slab strength, level and moisture; delivery access; lifting space; heat sources; weather exposure; condenser clearance; drains, power and expansion space.

Critical detail: check the complete footprint - an uneven floor causes panel, door and gasket problems.

3 Floor & vapour strategy

Select the floor for temperature, ground condition, cleaning and static/rolling loads.

- Insulation type and thickness
- Continuous vapour barrier
- Hygienic, slip-resistant finish
- Thermal-bridge-free wall junction
- Drainage and freezer frost protection

Risk: unsealed penetrations can drive moisture into insulation and reduce performance.

4 Insulated envelope & door

Panels: core, thickness, declared thermal performance, surface finish, fire class, joints, vapour sealing, ceiling support and impact protection.

Interfaces: corners and every pipe, cable, drain or bracket penetration require a defined sealed detail.

Door: size, swing, gasket, threshold, frame heater, emergency release, window and closer must match the duty. High-traffic rooms may need strip curtains, rapid doors, air curtains or an anteroom.

5 Project-specific refrigeration load

Calculate capacity at the actual evaporating and condensing conditions. Include:

- Heat transmission through walls, ceiling and floor
- Door infiltration and panel leakage
- Product pull-down or freezing load
- Packaging, pallets, people and lighting
- Fan motors and electrical equipment
- Defrost heaters, operating time and safety allowance

Do not substitute oversizing for calculation.

Excess capacity can cause short cycling, poor humidity control and inefficient part-load operation; insufficient capacity may never recover after loading.

ENGINEER AS ONE SYSTEM

Equipment, services, controls & compliance

The cold room, refrigeration circuit, electrical supply, airflow, drainage and controls must be designed for the same operating conditions.

6 Compatible refrigeration system

Select monoblock, split, multi-evaporator or central architecture after load calculation. Match capacity, refrigerant, compressor envelope, evaporator TD/air throw, defrost, expansion device, condenser at peak ambient, pipe pressure drop, oil return, noise and serviceability.

Special refrigerants: A2L, hydrocarbon, ammonia or CO2 may trigger charge, ventilation, detection, pressure and competency requirements.

7 Electrical capacity & backup

Confirm voltage, frequency, phase, starting current and maximum current before delivery.

- Dedicated protection and isolators
- Cable sizing, voltage drop and earthing
- Phase/voltage and motor protection
- Waterproof fittings in washdown areas
- Emergency light and internal release
- Generator/UPS duty and alarm continuity

Backup must cover real starting and running loads.

8 Airflow, ventilation & drainage

Provide clean condenser intake, hot-air discharge separation and maintenance clearance. Protect evaporator discharge and return paths from racks and product.

Drainage needs correct diameter, continuous fall, traps where required, insulation, freezer heat tracing, cleanouts and a hygienic discharge point.

9 Controls, monitoring & safety

Define the control sequence before wiring.

- Room and evaporator sensors
- High/low temperature and door alarms
- Power-failure notification
- Fan, compressor and defrost logic
- Drain delay and defrost termination
- Data logging and remote escalation
- Humidity monitoring where quality depends on it
- Internal emergency release and personnel alarm
- Pressure relief and leak detection where applicable

Sensor placement matters: measure representative return air - not direct discharge, a doorway or a cold panel surface.

10 Regulation & documentation

Identify applicable building, structural, electrical, fire, refrigerant, pressure, hygiene, worker-safety, escape, environmental, healthcare and drainage rules.

Approve before work: load calculation; general arrangement; panel/door and equipment schedules; refrigerant data; piping; single-line electrical diagram; control/alarm sequence; drainage; method statement; risk assessment; commissioning plan; warranty; maintenance and handover list.

Regulated food, pharma, healthcare and laboratory projects may also need HACCP records, calibration, mapping or validation.

LOAD BASIS → CAPACITY AT DESIGN CONDITIONS → COMPATIBLE COMPONENTS → VERIFIED CONTROLS → COMMISSIONED PERFORMANCE

CHOOSE BY DUTY AND CONTEXT

Cold room installation types

Construction method and operating temperature are separate decisions. The right combination depends on space, capacity, workflow, expansion, mobility and budget.

1 Modular

Prefabricated cam-lock panels. Fast to install, demountable and expandable. Strong fit for restaurants, supermarkets, laboratories and medium storage duties.

FAST / FLEXIBLE

2 Custom-built

Engineered around specific dimensions, product load and workflow. Preferred for industrial plants, processing facilities, warehouses and non-standard layouts.

DUTY-SPECIFIC

3 Containerized / mobile

Built within a transportable enclosure. Useful for temporary storage, farms, remote sites, events and operations that may relocate.

RELOCATABLE

4 Retrofit

Converts or upgrades an existing room. Requires early verification of structure, vapour control, insulation, floor, ventilation, access and electrical capacity.

EXISTING ASSET

Temperature duty changes the installation

DUTY	PRIMARY OBJECTIVE	INSTALLATION IMPLICATIONS
Chiller room	Maintain goods above freezing	Product-specific humidity, air velocity and door infiltration control.
Freezer room	Long-term below-freezing storage	Thicker insulation, floor frost protection, door heat and robust defrost.
Blast-freezing room	Rapidly reduce product temperature	Much higher product load, airflow, capacity and process-control requirements.

Exact setpoints and pull-down times must follow the stored product and process specification.

SELECT AS A COMPLETE SYSTEM

Cold room installation equipment

Equipment is not a shopping list: every component must be compatible with the refrigeration load, temperature, ambient condition, refrigerant and door activity.

01

INSULATED ENCLOSURE

Wall and ceiling panels • insulated floor • continuous vapour layer • sealed penetrations • hygienic finish

02

ACCESS & PROTECTION

Hinged/sliding/rapid door • gaskets and heaters • emergency release • strip curtains • impact barriers

03

REFRIGERATION CIRCUIT

Compressor/condensing unit • evaporator • expansion and solenoid valves • receiver, drier and protection

04

PIPEWORK & DEFROST

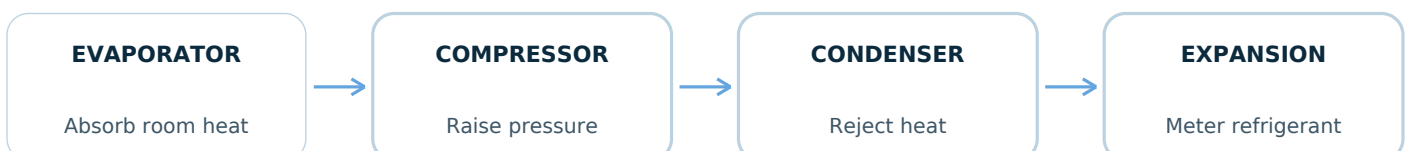
Sized and supported piping • insulation • oil return • pressure-drop control • drains • heaters/heat tracing

05

POWER, CONTROL & SAFETY

Control panel • protection • sensors • alarms • logging • monitoring • relief • leak detection • backup

Refrigeration circuit - simplified



Selection rule: rate components at the actual design conditions and verify the complete circuit, controls and defrost sequence together.

15-POINT CONTROL GATE

Pre-installation checklist

If any answer is no or unknown, record the owner, required evidence and closure date before work begins.

- | | |
|---|---|
| 1 Stored product and allowable temperature range confirmed | 9 Evaporator air paths protected from racks and product |
| 2 Daily throughput and entering product temperature known | 10 Power, protection and backup requirements confirmed |
| 3 Project-specific refrigeration load calculation approved | 11 Condensate and defrost-water routes designed |
| 4 Site measured and structure/slab assessed | 12 Refrigerant and all components verified as compatible |
| 5 Floor level, dry, strong and properly prepared | 13 Controls, sensors, alarms and safety systems defined |
| 6 Insulation, vapour barrier and floor details specified | 14 Local approvals and regulatory requirements identified |
| 7 Door size, direction, heating and traffic controls confirmed | 15 Testing, commissioning, training and handover plan approved |
| 8 Condenser ventilation and service clearances provided | |

RELEASE DECISION

INSTALL only when every requirement has objective evidence. HOLD if a missing input could change capacity, safety, compliance, cost or commissioning acceptance.



NEXT STEP

Build it right before you switch on the cold.

A reliable quotation starts with reliable project data. Send Afzali the following inputs for a technical review before installation begins:

01

Stored product

Commodity and packaging

02

Temperature duty

Setpoint and allowable range

03

Room geometry

Internal dimensions and layout

04

Product load

Entering temperature and throughput

05

Site condition

Indoor/outdoor ambient and access

06

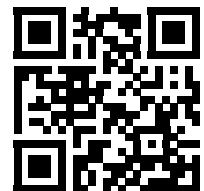
Utilities

Power, drainage and project location

Request a Technical Consultation

Share your project details and receive expert guidance on the installation basis, system selection and next engineering steps.

VISIT AFZALI.AE



SCAN TO OPEN AFZALI.AE

SELECTED TECHNICAL REFERENCES

Danfoss - Cold room system design & component selection • WHO PQS - Cold room and freezer room quality-assurance protocol

Scope note: This is a decision-support summary, not a final engineering design. Verify local authority and project-specific requirements.