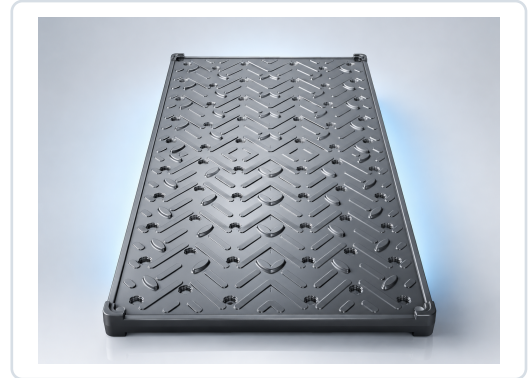




LNG COLD-ENERGY RECOVERY PRODUCT LINE

# -22C PCM Cold-Energy Plate

LNG Cold Recovery standard product manual based on the 5.0 L plate fill rule.



PHASE POINT

**-22C**

NOMINAL FILL

**5.0 L/plate**

LATENT RANGE

**0.361-0.361 kWh**

MATERIAL OPTIONS

**1 variants**

## Core Engineering Data - Plate Template

Parameter	Value	Unit	Source / status
Plate outer dimensions	800 x 400 x 18	mm	Standard plate rule
Nominal PCM fill volume	5.0	L/plate	Standard product rule
Phase point	-22	C	Product library
Material option count	1	-	Active Pure PCM products
HDPE single-side wall	1.5	mm	Current plate template
HDPE density	950	kg/m3	Current plate template
HDPE conductivity	0.45	W/mK	Current plate template

Data status: design-calculated; final deployment requires cycling, leakage, compatibility, thermal-curve, and compliance validation.

## CORE ENGINEERING DATA TABLES

# Material And Performance Data

Material options are active Pure PCM products at -22C, calculated under the 5.0 L fill rule.

## Material Property Table - -22C Pure PCM Options

Source product	Type	Density kg/m3	Latent kJ/kg	k W/mK	Status
PCM-INO-PURE-003	Inorganic	1300	200	0.5	PCM cost library

## Calculated Performance Table - Per 5.0 L Plate

Variant	PCM kg	Plate kg	Latent kJ	Latent kWh	vs water 10K	Context
Inorganic	6.50	7.22	1300	0.361	6.2x	Draft calc.

## Calculation Basis And Boundary Conditions

Item	Basis	Unit	Status
PCM mass	5.0 L x density	kg	Calculated
Latent capacity	PCM mass x latent heat	kJ / kWh	Calculated
Water comparison	5.0 kg water x 4.186 x 10 K	kWh	Reference only
Plate mass	PCM mass + 0.722 kg HDPE estimate	kg	Estimate only

## APPLICATION, SELECTION, VALIDATION

# Material Selection And Quality

Select the -22C plate by operating window, material priority, plate count, and validation evidence.

## Application Fit Matrix

Application	Problem	Engineering objective
LNG cold-source recovery	Cold exergy is usually wasted	Convert cold source into dispatchable storage
Process pre-cooling	Low-temperature load fluctuates	Buffer inlet conditions before process use
Low-temperature storage	Temperature stability is difficult	Hold a phase plateau near the target band

## Selection Workflow

Step	Decision	Required input
01	Temperature window	Confirm charge/discharge temperatures and approach delta
02	Phase point	Select PCM transition point inside usable operating window
03	Material option	Balance kWh/plate, mass, conductivity, safety, and cost
04	Plate count	Convert required kWh into plate quantity and packaging layout

## Qualification Gate Before Customer Release

Item	Evidence required	Status
Cycling stability	Cycle count, method, acceptance threshold	Required
Leakage / containment	Thermal cycling and hold test	Required
Compatibility	Coolant, HDPE, seals, metals, duration	Required
Thermal performance	Flow rate, approach temperature, charge/discharge curve	Required
Safety / compliance	SDS, transport/storage classification, regulatory status	Required