



Your application, our system

Refrigeration Systems in Cold Storage

COOL-FIT® PE Plus Piping System: 3 in 1

- + Low-temperature HDPE carrier piping system
- + Pre-installed PUR insulation
- + Pre-installed outer HDPE jacket

Less installation time and cost

Pre-insulated pipes and fittings, delivered ready to install

No condensation, Mold-free, & Energy efficient

High density PUR closed cell insulation

Corrosion-free – Maintenance-free

Carrier pipe in PE, low temperature and high impact resistant

UV and Weather resistant

Outer jacket in high density black polyethylene is vapor-tight and 100% water-tight

Reduced weight

65% lighter than metal systems

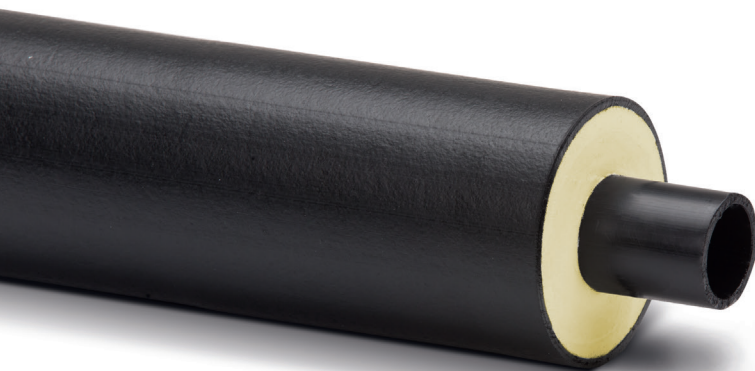
Long lasting

25-year-plus life span

Fits your cooling application

32–450 mm (1"–18") 150 psi from -58°F to 140°F

Suitable for water, brine, glycol solutions, and ice slurry



Pre-insulated simplicity

A cold storage refrigeration plant needs to be long-lasting, reliable, and ideally consume a low amount of energy. In these facilities, secondary cooling systems play an important role and performance can vary based on the type of piping system and insulation used.

The COOL-FIT® PE Plus pre-insulated system from GF Piping Systems (GF) is the best piping solution to achieve excellent cooling performance.

GF has a long history of successful projects in the cold store and distribution business. Usually, COOL-FIT and all associated components are installed on the Medium-Temperature cooling loop, which is used for storing fruits, vegetables, dairy products, meat, fish, etc.

Installations with COOL-FIT benefit from simple and cost-effective installation, minimal maintenance, reduced weight, top quality insulation properties, and long service life.

Low temperature cooling loops can also use secondary fluids such as glycol or brine (-13F to -28F). These applications have also benefited from choosing COOL-FIT as the cooling piping system.

Cold storage facilities that use secondary cooling profit from a lower insurance policy and a more simplified risk management program compared to those that use a direct expansion solution.

COOL-FIT PE Plus

Pre insulated HDPE pipes and fittings with high density, closed cell PUR insulation and a hard UV resistant jacket.

Transition fittings

Complete range of threaded or flanged connections that make COOL-FIT PE Plus easily compatible with existing metal loops.

Extended valve range

A wide range of either manual or actuated (electric and pneumatic), plastic valves allow the perfect flow control.

Joining technique

The electrofusion process for joining COOL-FIT features simple, reliable and fast installation. This machine-assisted process minimizes human error and has been used for more than 30 years.



COOL-FIT® PE Plus for Glycol, Chilled Water and Brine

Secondary Piping System Specification

When selecting a piping system for the secondary cooling lines, several criteria need to be considered; but the most important are life-span, efficiency, weight and ease of installation.

Lifetime and Efficiency

Metal piping systems that are post-insulated on-site have traditionally been the choice for secondary cooling. However, metal systems bring daily challenges and a busy maintenance schedule for facility and maintenance managers.

The heavy weight of metal pipes should be carefully evaluated as it has a strong impact on load calculations of a building's structure, especially since most cooling loops run either up on the roof or hang from the ceiling.

Conveying fluid at a temperature below the ambient without condensation or mold requires adequate thickness, the proper type of insulation and a good, intact vapor barrier. The challenge is keeping the integrity of the insulation, vapor sealing and external jacket to hold up during system life-span. If the insulation becomes damaged, the vapor barrier can become compromised.

This in turn leads to further costs including energy losses, drips, and metal corrosion, thereby reducing the efficiency and operation of the whole plant. Condensation may also drip onto the food stored below causing possible contamination that can lead to scrapping stock or lower food quality.

A pre-insulated HDPE (High Density Polyethylene) piping system with high-quality closed cell polyurethane insulation protected by a robust and UV-resistant HDPE outer jacket is a welcome alternative to problematic metal piping in secondary cooling – this is GF's COOL-FIT PE Plus.

The media pipe is HDPE, which has an operating temperature range from -58°F up to 140°F, making it resilient to the often extreme fluid temperatures of secondary coolants.

Besides HDPE being corrosion free, its smooth inner wall prohibits build-up of deposits from the fluid, preventing reduction of flow in the pipe — scaling.

HDPE has a pipe roughness factor of only $2.33 \cdot 10^{-5}$ ft. compared to steel's $3.10 \cdot 10^{-4}$ ft. — about 12 times smoother. This characteristic improves system efficiency in terms of reduced pressure loss, a performance that remains constant over the years.

The high-quality (0.015 BTU/h ft °F), high density (≥ 4.37 lb./ft.³), closed cell PUR (Polyurethane) insulation is manufactured directly on the pipes and fittings, leaving no room for thermal bridges. This provides temperature stability along the

line and prevents condensation in extreme temperature and humidity conditions.

A stable temperature with lower heat loss along the pipeline allows for a higher cooling temperature that decreases the temperature delta at the chiller and reduces energy consumption.

During the manufacturing process, the insulation is bonded to an HDPE hard jacket that is water and vapor tight and 100% UV resistant – providing a great solution for outdoor applications as well.

This hard jacket ensures insulation integrity and enables easy part manipulation during installation. Additionally, its minimized maintenance and a simple hanging methodology eliminates the need for any special pre-insulated pipe supports and there is no risk of thermal bridges.

COOL-FIT PE Plus is joined using an electrofusion process: a simple, fast and reliable machine-assisted process that minimizes human error and has been used for more than 30 years. The vapor barrier is created by the flexible lip on the fittings together with butyl tape.

Weight Savings

Modern industrial architecture, especially larger industrial buildings, such as cold stores or production facilities, are very sensitive to weight loads that affect the static load of the building.

On average, COOL-FIT PE Plus is up to 65% lighter than post-insulated metal solutions. This may allow for a lighter structure and/or freeing up production or storage floor space, by moving equipment overhead.

Cold stores usually have very high ceilings (up to 23 ft.) and the cooling lines are usually installed as high as possible to avoid any interference with everyday operations. The reduced weight of the piping system also allows for use of simple lift media like cherry-picker lifts that are safe and commonly available.

No dripping and no mold

The top-quality PUR insulation of COOL-FIT PE Plus pipes and fittings prevents condensation, even in extreme ambient conditions.

Over time, post-insulated systems can have the vapor seal compromised, and tend to absorb water from the environment. This negatively affects the thermal conductivity of the insulation by reducing energy efficiency of the system and in turn increasing the operating costs. This trapped water in a closed area can also cause corrosion on metal pipes, as well as ice-build-ups that can lead to cracking.

Reduce your costs

COOL-FIT PE Plus reduces the time on-site to a minimum: easy to handle, simple to hang, pre-insulated and with a robust jacket that allows for a faster installation with less required trades.

When compared with traditional post-insulated metal systems, COOL-FIT is not only a cost-effective solution in terms of initial investment, but also significantly decreases the downtime for repairs and therefore of the maintenance costs while increasing the efficiency of the whole facility.

Full support during the complete process

GF will support your project during all phases of your project: from design and specification through bidding and installation, our local teams will answer any questions.

We assist with all relevant engineering calculations, product range information, best design and installation practices, and installer training on-site. Our CAD, Revit and BIM libraries are available on-line to ensure the accuracy of your project.

Maintenance-free

The COOL-FIT PE Plus system consists of corrosion-free pipes and fittings insulated with top quality PUR closed cell insulation that is protected by a UV resistant, robust and corrosion-free jacket. The vapor sealing created for this system, using the lips of the fittings together with the butyl tape, totally encapsulates the insulation and grants a perfect barrier against any water absorption for the designed life-span of more than 25 years.

Reduced Pressure Loss – less energy for the pumps

The smoothness attribute of plastic pipes prohibits build-up of deposits from the fluid, thereby preventing flow reduction in the pipe. The inner bore of COOL-FIT PE Plus experiences no change during the system's entire life-span.

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www.cool-fit.georgfischer.com





Refrigeration and cooling systems in cold storage

Top quality

COOL-FIT PE Plus can improve the efficiency of your secondary system by up to 30%. With insulation thermal conductivity, (λ) of 0.026 W/m.K, due to top-quality high-density PUR insulation combined with PE's low thermal conductivity (0.38 W/m.K, steel 90 W/m.K), COOL-FIT offers exceptionally low energy loss characteristics for your piping system.

Size* (mm)	Insulation Thickness	
	(mm)	(in)
32	26	1.0
63	27.2	1.1
110	31	1.2
160	40	1.6
280	53.7	2.1
315	61.1	2.4
450	82.4	3.2

*Other sizes are also available

No condensation or ice build-up

All COOL-FIT PE Plus pipes have about a 30 mm insulation thickness, which guarantees the end-user, even under the most severe environmental conditions, no condensation or ice build-up on the outside of the insulation.

Medium	Medium Temperature	Ambient	Humidity	COOL-FIT
Propylene Glycol	-8°C (18°F)	+30°C (86°F)	up to 85%	no condensation

Wind velocity 0.5 m/sec, COOL-FIT black.

COOL-FIT PE Plus is supported by the external jacket pipe; there's no need for expensive and inefficient insulated pipe supports. No energy bridges are created when hanging COOL-FIT pipe. The temperature-independent rigid foam also increases the allowable pipe support distances, such as 9.35 ft for d225 (8") pipe.



No corrosion

COOL-FIT’s complete plastic construction is designed and manufactured by GF Piping Systems. The system includes pipes, fittings, transition fittings to metals, manual valves and measurement and control devices. Zero corrosion both externally and internally guarantees an excellent lifespan.

Smooth pipes reduce pressure losses

The smoothness of PE pipes ($\lambda=0.007$) not only prevents encrustation on the internal surface of the pipe, but also reduces pressure losses to a minimum. (Steel surface roughness 0.1 – 0.15)

Pressure Drop	COOL-FIT
1000 m (3281’), -6°C (21°F) Propylene Glycol at 20 m ³ /hr (88 gpm) in 110 mm (4”) pipe	0.8 bar (12 psi)

Simple reliable installation

COOL-FIT PE Plus electrofusion technology is based on the tried and tested ELGEF electrofusion techniques. With our new MSA electrofusion machines we provide safe and easy welds to improve installation experience.

Low weight

Low-density plastic enables speedy, easy handling on-site with a simple, cost-effective hanging structure. The low weight and UV/weather resistant outer jacket makes COOL-FIT PE Plus ideal for roof-top installations.

lbs per 100 m (328 ft) of piping	COOL-FIT PE	COOL-FIT PE Plus	Carbon steel
110 mm (4”)	701	1389	2992
160 mm (6”)	1486	2187	4799

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