

How Can I Reduce My Process Cooling Costs?



Process cooling plays a crucial role in many industries, but it may contribute significant cost to the operational overheads of a business. However, there are several factors contributing to high process cooling costs that can be addressed.

We explore the use of free cooling; preventative maintenance; and proper integration and installation processes as ways of reducing the costs of your process cooling systems.

Reapproaching your process cooling systems in consideration of these factors will help your business to save money, improve the efficiency and longevity of your systems, and lower your carbon footprint.

Understanding Process Cooling Costs

The first step in lowering the costs of your process cooling systems is to understand what is causing the high costs...

Definition of Process Cooling

Process cooling, especially at temperatures below 25°C, typically involves the use of refrigeration technology and the transfer of excess heat to a heat exchanger or cooling tower. This plays a vital role in controlling temperatures for a wide range of industries, such as plastics, food and beverage, pharmaceuticals, data centres, and chemical processing.

Factors Contributing to High Process Cooling Costs

When it comes to process cooling, there are several factors that can significantly increase your expenses.

The high energy consumption of refrigeration based systems without energy saving features and often an unnecessarily low temperature setpoint which is often to compensate for heat gains through poor pipework or vessel lagging, or poorly maintained heat transfer equipment, scaling and bio-fouling.

The location and integration of the cooling system also plays a role; many systems do not take advantage of cooler and drier ambient air for heat transfer or consider a 'whole-system' approach.

The incorrect sizing of pipework and use of old and inefficiently designed fixed speed pumps is also a commonplace finding.

Lastly, infrequent maintenance can cause high process cooling costs, as clogged filters and dirty towers can reduce cooling system efficiency.

Exploring Free Cooling

Introducing free cooling into cooling processes is one way in which manufacturers can reduce their process cooling costs without reducing the output of their systems.

Definition and Concept of Free Cooling

Free cooling is the economical and eco-friendly method of providing process cooling; this can be achieved with either an integral free cooling chiller or a standalone free cooler alongside a chiller.

Utilising cooler external temperatures, process heat can be removed by ambient air, which is blown over process fluid in an air to fluid heat exchanger by electronic fans.

In the UK, partial or full free cooling can be achieved during colder months to reduce the load on chillers and extend their operational life.

Free cooling systems can be added to existing plant systems or incorporated into new builds. It is a long-term solution with fixed installation options that deliver quick payback.

Benefits of Utilising Free Cooling

Free cooling offers significant benefits that can help reduce your process cooling costs.

By utilising the ambient air temperature to cool your systems, you can achieve substantial energy savings and lower your carbon footprint. The cost associated with running free cooling systems is limited to powering the fans, rather than powering the mechanical refrigeration components as in traditional systems.

Implementing Free Cooling Strategies Effectively

Free cooling systems should be designed and integrated into existing and new systems in a way which optimises impact within your facility.

There are several strategies you can employ to make the most of free cooling, including:

- Defining the correct setpoint temperature for the process – how cold do you need to go to achieve optimum production OR conversely how warm can I run this process before I affect production and will the energy savings I make offset the losses if it does affect it.
- Consider the layout and placement of the cooling system, which works more effectively when airflow is increased.
- Examine how cooling systems support processes across the whole facility to increase efficiency and reduce cooling expenses across the complete system.
- Establish a maintenance contract to ensure the cooling system remains in good working condition and free from debris.

Preventative Maintenance Contracts

Preventative maintenance contracts are a great way to maximise the efficiency of your cooling systems by keeping the equipment in optimum condition.

Importance of Regular Maintenance for Process Cooling Systems

Prioritising the maintenance of your process cooling equipment will extend its lifespan and prevent unexpected breakdowns, as well as reduce the need for expensive parts replacement.

A comprehensive preventative maintenance package should be tailored to your specific needs and process cooling products, taking into account your requirements and providing the correct service.

Benefits of Preventative Maintenance Contracts

Preventative maintenance services can significantly reduce your process cooling costs.

Regular maintenance visits ensure that any potential issues with your cooling equipment are identified and resolved before they turn into breakdowns. This proactive approach extends the lifespan of your equipment, as well as minimises unexpected downtime.

Maintenance contracts also make certain your cooling systems are kept clean, which can increase their efficiency and reduce operating costs.

Key Components of a Comprehensive Maintenance Plan

Ensure that your maintenance plan includes regular inspections and cleaning of all components to maximise the efficiency and longevity of your process cooling system. This includes water quality checks, which are crucial to prevent freezing, corrosion and bacteria build-up, as well as checks of key system components.

Your maintenance plan may also involve the performance of your systems being digitally recorded in order to streamline understanding of your system and its trends, fault finding, energy logs and more.

Proper Integration and Installation of Process Cooling Solutions

Finally, investing in the proper integration and installation of your process cooling systems will mean your systems are designed for cost efficiency from the start.

Importance of Proper Integration and Installation

Whether installing new systems or integrating new equipment into existing systems, it is important to consult with process cooling experts to ensure the most suitable system is incorporated into your environment.

Process cooling experts like Summit Process Cooling have access to a range of process cooling solutions and can design bespoke systems to help you achieve a highly efficient cooling system. Ensuring these systems are further correctly integrated and installed into your facilities is key to maximising its performance.

Factors to Consider During Installation

Utilising professional installation services for the incorporation of new process cooling systems into your facility ensures systems work to their full capacity, complete with final commissioning.

This will ensure cost efficiency by eliminating faulty equipment and incorrect installation procedures.

Factors to consider for correct installation include:

- Location and positioning of equipment
- Number of chillers required for processes
- Control panels, monitoring systems and remote control
- Electrical work, which must be undertaken by a qualified electrician

Potential Cost-Saving Opportunities Through Efficient Integration

Integration of new equipment into existing systems opens the door to cost saving opportunities. The use of up-to-date equipment, such as the integration of free cooling systems, increases the efficiency of the process cooling system as well as your control of energy consumption – leading to lower process cooling costs.

Whilst process cooling systems can be expensive, there are ways to reduce expenditure whilst increasing efficiency. Correct design and installation procedures, utilising the latest

equipment and concepts, and establishing a maintenance contract, are some of the most crucial ways in which you can effectively lower your cooling expenses.