

Industry brief – Steam & Food processing

STEAM

The Preferred Energy Medium in Australia's Food Processing Industry

Efficient, Safe, and Sustainable

The food processing industry in Australia is an important sector that ensures the supply of safe and nutritious food to both domestic and international markets. Among the various energy mediums available, steam has emerged as the preferred choice for many food processing operations. This preference is driven by steam's efficiency, safety, and sustainability, making it an indispensable component in the industry's operations.

In food processing, steam is utilised for various purposes, including cooking, sterilisation, pasteurisation, dehydration, and cleaning. These processes are essential for ensuring the safety and quality of food products. Steam's ability to transfer heat efficiently and uniformly makes it an ideal medium for these applications.

- **Cooking and Blanching**

Steam is widely used in cooking and blanching processes. It provides consistent and controlled heat, which is crucial for maintaining the texture, flavour, and nutritional value of food. For instance, vegetables are often blanched with steam to preserve their color and nutrients before freezing or further processing.

- **Sterilisation and Pasteurisation**

Sterilisation and pasteurisation are critical processes in the food industry to eliminate harmful microorganisms. Steam is employed to achieve the high temperatures needed for these processes. It ensures that food products are safe for consumption and have an extended shelf life. Dairy products, canned foods, and beverages commonly undergo steam pasteurisation.

- **Dehydration**

Steam is also used in dehydration processes to remove moisture from food products. This is essential for producing items like dried fruits, vegetables, and powdered ingredients. The controlled application of steam helps achieve the desired moisture content without compromising the quality of the product.

- **Cleaning and Sanitation**

In addition to its role in food processing, steam is an effective medium for cleaning and sanitising equipment and surfaces. The high temperatures of steam can kill bacteria and other pathogens, ensuring a hygienic environment in food processing facilities. This is particularly important in preventing contamination and ensuring food safety.

Advantages of Steam

The preference for steam in Australia's food processing industry is attributed to several advantages it offers over other energy mediums.

- **Efficiency**

Steam is highly efficient in transferring heat due to its high latent heat of vaporisation. This means that a small amount of steam can carry a significant amount of energy, making it an efficient medium for heating processes. Moreover, steam systems can be easily regulated to provide precise temperature control, which is essential for maintaining the quality and consistency of food products.

- **Safety**

Steam is a safe energy medium when handled properly. Unlike open flames or hot oils, steam does not pose a risk of fire or explosion. Additionally, steam systems are designed with safety features such as pressure relief valves and automated controls to prevent accidents. This makes steam a reliable and safe choice for food processing operations.

- **Sustainability**

Sustainability is a growing concern in the food processing industry, and steam offers several environmental benefits. Steam can be generated from renewable sources such as biomass, reducing the industry's reliance on fossil fuels. Furthermore, steam systems can be designed to recover and reuse waste heat, improving energy efficiency and reducing greenhouse gas emissions. This aligns with the industry's commitment to sustainable practices and reducing its environmental footprint.

Challenges and Solutions

While steam is the preferred energy medium, it is not without challenges. However, these challenges can be addressed with appropriate solutions.

- **Energy Consumption**

Generating steam requires energy, and the efficiency of steam systems can vary. To mitigate this, food processing facilities can implement energy-efficient technologies such as Flue Gas Economiser, Accumulators high-efficiency boiler burners, insulation for steam pipes, and hot clean condensate and waste steam recovery systems. Regular maintenance and monitoring of steam systems can also help optimise energy use and reduce consumption.

- **Water Quality**

The quality of water used to generate steam is crucial for the efficiency and longevity of steam systems. Impurities in water can lead to scale buildup and corrosion, reducing the efficiency of heat transfer and increasing maintenance costs. Implementing water treatment processes, such as filtration and chemical conditioning, ensures the production of high-quality steam and prolongs the life of steam equipment.

- **System Maintenance**

Steam systems require regular maintenance to ensure their reliability and efficiency. This includes inspecting and servicing boilers, steam traps, and distribution lines. Establishing a proactive maintenance schedule and training personnel on best practices can prevent unexpected failures and extend the lifespan of steam systems.

Conclusion

Steam has proven to be the preferred energy medium employed by the food processing industry in Australia due to its efficiency, safety, and sustainability. Its versatility in various food processing applications, coupled with the ability to generate steam from renewable sources, makes it an ideal choice for the industry. By addressing challenges such as energy consumption, water quality, and system maintenance, food processing facilities can maximize the benefits of steam and continue to deliver safe, high-quality products to consumers.

As the food processing industry evolves, the role of steam will remain central to its operations. Embracing innovative technologies and sustainable practices will further enhance the efficiency and environmental performance of steam systems, ensuring a resilient and prosperous future for the industry.

Contact

for more information, how we can assist you maximising the return of your investment.

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