

Stainless steel in food processing Industry



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Why Stainless Steel?

Stainless steel is a globally accepted superior material for food processing equipment around the world. This includes equipment for processing and storage, and also transportation. As a corrosion-resistant, 100% recyclable, and inert metal, stainless steel complies with stringent hygiene and safety requirements in the food processing industry. Several reasons make stainless steel the ideal choice for this industry as hygiene and easy cleaning is of paramount importance.

Stainless steel is easy to wipe and clean, hence eliminates any bacterial and microorganism breeding on surfaces. This makes it easy to upkeep the stainless steel equipment. The durability of stainless steel minimizes any physical damage and reduces the wear and tear related to aging. This makes stainless steel almost maintenance-free as compared to other metals. Typically, industrial cleaning requires water, steam, mechanical scrubbing, use of abrasive materials, and abrasive agents. Ideally, food contact material surfaces must be tough to withstand any deformation and must retain their surface quality. Stainless steel easily meets this condition. Stainless steel surfaces remain uncontaminated even after being rinsed with cleaning solutions, ensuring no contact with food items. The most essential trait that sets stainless steel apart is its inert nature. Stainless steel is non-reactive metal and is resistant to caustic acidic erosion as it does not react with any form of food acid or solutions, and maintains the purity of food items intact. Stainless steel maintains its characteristics as it is much more resistant to mechanical abrasion and chemicals and retains its surface quality. Stainless steel surface also doesn't pick up or transfer any food smells. Stainless steel doesn't impart any colour or flavour to food, making it ideal for the food processing industry.

Stainless steel grade 304: It is the most commonly used food-grade stainless steel and is often used in dairy and beer processing facilities.

Stainless steel grade 316: This is another popular food-grade stainless steel and has a better pitting corrosion resistance capacity than grade 304 due to added molybdenum content. This grade is more often used in commercial food production centres.

Food Processing Industry In India

Nearly ~ 10,000 MT of stainless steel is consumed every year in India for the production of new food equipment and upkeep of the processing chain. Considering a global concern for preserving hygiene and quality standards, the World Health Organization (WHO) associated CODEX and Food Safety and Standards Authority of India (FSSAI) have recommended stainless steel as a preferred material for all food storage and transportation. During various stages of processing food comes in contact with metals. Therefore it becomes imperative to understand the type of interaction between the two and also select the suitable metal for handling depending on the food process. This is important to understand any transfer of harmful elements from metals to food. Several global studies have shown the impact of various metals and alloys used in different stages of food processing. It has been seen that measurable amounts of metallic elements in the alloy could be released into foodstuffs from food preparation and cooking, leading to human ingestion, which sometimes being critical to life.

Therefore, to curb the impact of these elements, the selection of food-grade material is indispensable for the food processing industry. Food processing covers a spectrum of sectors, comprising agriculture, horticulture, plantations, animal husbandry, fisheries, etc. Few types of equipment that are usually made of stainless steel in the food processing industry include Evaporator tubes, Flour silos, Syrup tanks, Beer kegs, Ice cream molds, Conveyor systems, Double wall food transport containers, Tanks holding dairy, Food mixers, Peeling machines, Food pulverizers,



Confectionery equipment, and Industrial oven, etc.

Diverse climatic conditions and a long coastline have contributed to India's position as one of the leading food producers in the world. Consequently, India has an abundance of a wide variety of crops, fruits, vegetables, flowers, live stock, and seafood. Over the years, demand for processed food has risen exponentially owing to growing urbanization and disposable income among the young population. It is expected that increasing household consumption in the country will lead to an increase in the variety of food that is consumed by the population.

Moreover, India's strategic geographic location, which offers proximity to food-importing nations, allows easy export of processed foods. As per the latest industry data, the size of the food processing industry is INR Rs 85,000 crore. Estimates show that the industry could grow to INR 36.6 lakh crore by 2025.

Scope of Stainless Steel Applications in the Indian Food Industry