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# Frozen French Fries Making Machine

## Frozen Fries Market



Fast food sector is growing at 25-30 % annually due to rapid growth of fast food chain in the world. Virtually all of the restaurants' French Fries we love use frozen product. There is substantial and growing market for fresh French fries which are made in the eating joints from fresh potatoes. **Fresh French Fries** are also made in middle income group households quite frequently. A part of this market can also be captured in view of using ready to cook food products from frozen French fries directly.

## Process Description for Frozen French Fries

### **1<sup>st</sup> Washing and Peeling**



Potatoes are feed into a hopper with an elevator behind. A de-stoning takes place in a flume for settling the sand and gravel into the collecting chamber while potatoes soaking. Drum washer makes a preliminary washing and then potatoes are collected in a screw conveyor to bring the **potato peeler**.

Potato peeling is most important step, brush roll potato peeling machine is recommended.

The peel loses is less than with abrasive peeling, the higher yield will be achieved.

Extra washing by means of separate shower for washing while screw blade carries potatoes forward will be done, small damage and more cleaning.

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### **Special case**

If the final frozen fries of a large capacity, steam peeling process is necessary in advance. Potatoes are by means of steam heat and then the pressure is released rapidly, so the potato cell moisture starts boiling and rubs the cell wall. The skin will hang loose. In the second brush peeler, this loose skin is brushed away completely and easily.

### **2<sup>nd</sup> Slicing and Blanching**



After potato peeling process, hand picking will be done on a sorting table to select the defective potatoes. And then up-to-standard potatoes will be collected in receiving hopper which has a buffer for at least 10 minutes to cope with fluctuations in the feed.

### **How to cut potatoes for French fries? How to cut curly Fries? How to make potato crisps, wedges, cutlets, chips?**

In this process, *Potato chips slicing machine* will cut the peeled potatoes into slices, chips, sticks, strips and shredded potatoes easily with knives to cut square or rectangular product or wedges be placed.

A spray bar for fresh water is offered to remove free starch from the slice fries, which has come free by cutting through the potato cells.

A belt elevator brings the slices to the *blancher*. The most common actual blanching process is to blanch short in hot water, followed by long time in less hot water. The first blancher has a retention time up to 2 minutes on approx. 90°C and the second blancher has a retention time of 40 minutes on a temperature of approx. 70°C.

### **3<sup>rd</sup> Cooling and Frying**



The high quality demands equal color of the stick and prevention of after cooking darkening. Before the chips or fries are fried, it should be properly dried. **Potato chips air drying machine** conveyer chips or fries with air blowing while chips turnover, the surface water will be removed completely and quickly, the dryer has to remove a certain amount of the water from the product to improve crispiness of the stick and shorter frying times.

Nest step, **How to make French fries?**

In this process, fresh potato chips and fries will be fried with a **continuously chips fries fryer**.

Continuously working, full automatic control, there is no any worry.

The product of the dryer is collected on a collecting belt or converging in-feed vibrator to bring the product directly into the fryer. The fryer is a pan filled with oil, on the bottom a wire link conveyor is present is present to transport the product. The oil is injected in the bottom over the width of fryer.

The fryer assembly includes an oil circulation system with belt filter for the course of dirt remover, a thermal oil heat exchanger and a circulation pump. To complete the system a prime oil day tank in included. The frying tank is set on 45-90 seconds, in oil of 180 °C the moisture content of the end product is fixed on 64%. The fat take up will be approx. 5-6%.

Directly behind the fryer a de-fatting vibrator is placed to remove as much as possible surface fat from the product.

#### **4<sup>th</sup> Quick-Freezing**



After **de-fatting vibrator**, frying fries are going cooling again. It is the same process like before frying cooling.

Fries **air drying machine** is by means of fans and blown through the fries to achieve an easy temperature drop from 90°C incoming till 5°C for the exacting French fries.

After cooling, fries are directly dropped over to the freezer belt. This drop over point corresponds with the solidification point of the fat. So, if product has stick together, the relatively weak bonds are easily broken apart.

In the **quickly freezer** the product is individually quick-frozen. This means that a high capacity cold airflow is blowing upward through the product, fluidizing the product bed. The first belt part brings the product on the general solidification point of water (-1°C). The second belt of the freezer has a thicker layer of product and the product layer is cooled down further till -18°C in average a retention time in a freezer is minimum 9 minutes.

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