

## **Salting and Roasting Pistachios In Iran**

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### **Summary**

For many years pistachios were roasting in Iranian families, specially by ladies at homes. During so many years of experiences, they really become experts. Different methods and much different tastes are experienced. Some of them adding additives like, lemon juice or saffron and make them really very tasty.

Later on some small traditional batch type roasters is developed and used in nut preparation stores. The taste of each batch was different from others.

For many years only raw pistachios were exported. Therefore, even if there was demand for roasted pistachios, a practical roaster with high quality high capacity was not available.

Momtazan the biggest pistachio machinery manufacturer in Iran started from 1996 to design and manufacturing a big continues roaster to fulfill the demand of roasting pistachios. From 1997 a full automatic roaster installed. The quality of the roasted pistachios was accepted by Europe countries and exporting roasting pistachios started. Today 5 roasted plants are in operation and exporting of such product is increasing. Over past few years with increased pistachio crop in Iran, estimated over 250,000 tons, we believe the demand for roasting pistachio nuts will increased.

Momtazan roaster is good not only for pistachios, but it will roast peanut, hazelnuts, almond, cashew nuts, etc.....

### **Introduction**

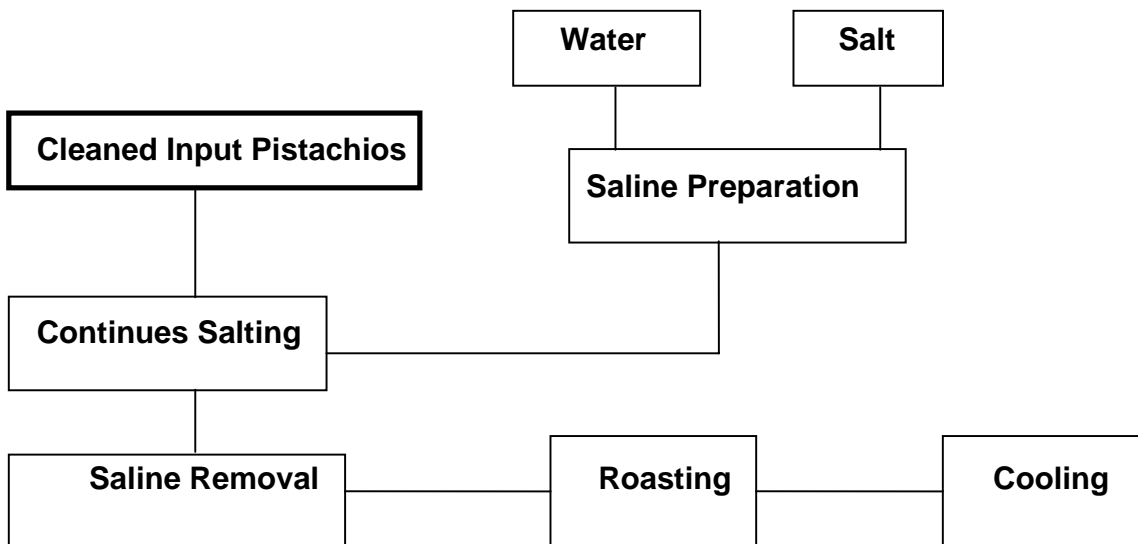
Momtazan roasting line consists of several machineries in daisy chain sequences. The most important fact about Momtazan roaster is as follow:

- I- Pistachios roasted in a very uniform quality
- II- Taste and flavor of final products is select able among all other roasters output.
- III- Energy consumption is minimum
- IV- Prices is not compatible, that is guaranteed

### **Introduction**

Usually cleaned pistachios transferred to the roasting plant as finish product for roasting. If pistachios are not prepared for roasting, Momtazan suggest a cleaning line (such as Momtazan Ph4000)to clean the pistachios up to a certain level of customer request, such as dust and shell removal, non-split separation, sizing, color sorting, manual control picking table and etc..

Cleaned pistachios is then fed to the plant and as it can be seen at figure 1 passed trough the continues saline machine. Saline is prepared former and supplied to the salting machine. Extra saline will be removed and charged into the main machine roaster. After pistachios are roasted promptly, they will be cooled down immediately. Then roasted pistachios are ready either to be sent to silo or transferred to packing machine.



**Figure 1 Momtazan Roaster sequence Procedure**

In momtazan's roaster following major steps occurred:

- I- Saline preparation
- II- Continues salting
- III- Extra salt removing
- IV- Roasting
- V- Cooling

### **Saline preparation**

Salt powder is immersed into the water as much as possible. Saturated saline will be prepared. Liquid saturated saline with water will be mixed accordingly. The rate of saline and water could be adjusted. Different amount of salt in pistachios is depended to the rate of mixing saturated saline and normal water. By controlling knobs the rate is adjusted. A small pump will sent the prepared solution to the salting machine.

## Continues Salting

**Momtazan** salting machine is one of the most important well designed machine. Product is immersed emerged into the saline. Salting machine is a rotary type machine with auger mounted inside. In front there is a special system which will emerge pistachios without saline coming out. The length and diameter and speed of the machine will guaranteed of uniformly supplying saline to all pistachios passing through.

## Salt Removal

Removing extra saline is very useful for increasing the capacity. Although there are not much saline with pistachios are emerging from Salting machine, but saline remain between opened mouths of pistachios. By shaking the pistachios, extra saline will be removed. This method will also be controled the uniformity.

## Roaster

The first part of the roaster is pre-heater. Pre-heater is designed to remove surface saline and pre-heating the product. Hot air from cooler is evacuated and fed into the pre-heater by a centrifugal fan. Pre-heater consists of fixed and moving plates. The mechanism is patented. There is no used of any type of chain or curtain. By this type of conveying, product is guaranteed from any damage. The products are turned around and mixed well as they are transported. There are many holes in the fixed and moving plates to introduce heat underneath into the product. This machine could be replaced and assembled on the top of the roaster according to request of the customer. It depends on the dimension of the assigned area.

Main part is a 3 stage roaster. The mechanism of moving the product is the same as in pre-heater. As the product is moving ahead absorbing heat, it is roasted slowly with a very high quality. From the end of the top stage the product is fed to the starting point of middle stage, from end of middle stage, the product is charged to the starting point of the bottom and final stage. Heat is introduced underneath of the bottom stage and passed through middle and top stages.

On top of the upper stage there is a hood which collects exhaust air and through a fan sends out to the atmosphere.

A set of cyclone and bag filters could be ordered as an option.

All materials used inside roaster is stainless steel. The roaster framework is fabricated from square tubing's and angle section. To avoid heat leakage the housing is clad in double skinned panels filled with glass fibbers or mineral wool. On each stages, are doors which are hung on steel hinges to provide easy access to interior for cleaning and maintenance.

Heat generator is generally a gas burner type using natural or liquid gas. Gas burner has an integral combustion air fan, air pressure switch, ignition spark plug, flame sensor and some other protection devices.

A supervision unit has been installed to automatically control the flame. An electrical control unit is installed to control burners. Two burners will almost fix pre-adjusted temperature. The bigger works as gross control and the smaller as the fine controller.

One of the most important advantages of Momtazan roaster is its safety against any kind of explosions. This system works as an open loop system. In Momtazan roaster exhaust air temperature is very low and there is no need to recycle exhaust air.

For more safety an explosion relief door is provided on the burner zone.

All flame tank and ducts supplying heat to the roaster are made from thick stainless steel sheets. The housing is clad in double skinned panels filled with mineral wool. The cover of the heater is made from galvanized steel. It could be made completely from stainless steel as an option.

## Cooler

The mechanism of transporting pistachios in the cooler is the same as roaster and pre-heater. To cool down the product a vacuum fan will insert cool atmosphere air from top of the cooler. The out put warmed air from cooler is fed into the pre-heater to increase efficiency. All cooler surface and product contact is made from stainless steel.

## Technical specification

Technical specification of the roaster line is as follow, but dimension of the roaster is mostly depend to the customer space availability .With assumption of putting all machinery in a straight line, dimension will be as follow. Dimensions are without any cleaning facility or any storage silo.

<b>Capacity:</b>	<b>1000 kg/h</b>
<b>Power consumption</b>	<b>20 kW</b>
<b>Water consumption:</b>	<b>0.7 cum. /hr</b>
<b>Fuel consumption</b>	<b>30 Kg/h</b>
<b>Length</b>	<b>20 m</b>
<b>Width:</b>	<b>3 m at widest</b>
<b>Height</b>	<b>5 m highest</b>

## Conclusion

So much effort has been done during past years to achieving a special roaster to produce uniform delicious pistachios. We hope some more people of the whole world eating pistachios and introducing this lovely taste to the others, and others saying to the others until every body asking about pistachios. This will give more energy to the customer and helping grower to produce more pistachios. We as Momtazan hoping been able of manufacturer roasters.

Be our pistachio growers and machine manufacturer's gust and enjoy pistachios roasted taste.