

Nut material shelling technology application (2)

1.1 Shelling method



(1) [Microwave drying mechanical](#) method: The principle is mainly to form high-pressure water gas inside the grain by microwave heating. When the pressure of the high-pressure water gas is greater than the tensile limit stress of the peel, the peel breaks and the shell is broken. In the process of breaking the shell by microwave method, the dense structure of the nut peel is an important guarantee for the formation of high pressure inside the nut; the moisture contained in the nut is the material foundation for generating high-pressure water gas inside; the heating temperature of the microwave is the external power that causes high-pressure water vapor. However, rapid heating can cause the product to expand and even explode.

(2) High pressure expansion method: The principle is to make the fruit in a high pressure chamber, let the fruit stay in it for a long time, so that the pressure balance is reached inside and outside the grain, then the pressure is instantaneously relieved, the internal and external pressure balance is broken, and the gas in the shell is Under the action of high pressure, a large bursting force is generated to break through the shell, thereby achieving the purpose of shelling. [Nut sheller](#).

(3) Energy method: The principle is to let the nut enter a high-pressure and high-temperature environment and to withstand high pressure and high temperature for a certain period of time, so that a large amount of heat is concentrated in the nut shell, and then the grain is instantly separated from the high temperature and high pressure environment. At this time, the nut shell and the kernel are gathered. The pressure between the two is instantaneously blasted to achieve

the purpose of shelling. This method is suitable for processing cooked food.

(4) High vacuum method: Put the nuts in a vacuum sheller, and heat the nuts with certain moisture to a certain temperature under vacuum conditions. Under the suction of the vacuum pump, the nuts absorb heat and keep the moisture of the shell constantly. It is removed by evaporation, its toughness and strength are reduced, and brittleness is greatly increased. Vacuum also reduces the pressure outside the shell, and the inside of the shell is at a higher pressure. Under the action of the internal and external pressure difference, when the pressure in the shell reaches a certain value, the outer casing will burst and the outer casing will be removed.

(5) Laser method: Cut the nut shell one by one with a laser. Tests have shown that this method can almost reach 100% of the whole kernel rate, but it is difficult to promote because of its high cost and low efficiency.

(6) Ultrasonic method: Ultrasonic generator is used to generate ultrasonic waves of more than 20 kHz on the outer surface of the nut seed, and the shell is broken by various forces such as impact, collision and friction. Can be applied to nuts whose skin structure is not too hard.

(7) Combustion method: The method uses a liquefied gas flame to burn off the nut material shell at a high temperature, and then extrudes the unburned material to separate the kernel and the garment, and enters the kernel and the garment into the separator together. The kernel is separated here, and the kernel can be washed. This method has high shelling rate, but the burning temperature is difficult to control, and it is easy to make the material mature or even coking. This kind of shelling process is unique and is a foreign technology patent, so the whole set of equipment is expensive.

(8) Chemical corrosion method: Chemical shelling mainly involves immersing the nut to be shelled into the shelling solution. The solution is used to soften the outer shell of the material and dissolve a portion of the outer shell, then remove the fruit and mechanically remove the outer shell. This method requires the addition of other chemical components such as alkalis, enzymes, etc. These additives may cause the product to have an odor and affect the quality of the finished product, but this method has a higher rate of whole kernel.

Composite type: When using a method to achieve good shell-breaking effect on some nuts, several shell-breaking principles can be used to reasonably combine them to overcome and compensate for the deficiency of single shelling method. Efficient shelling.