

VACUUM COOLING

VACUUM COOLING-COLD CHAIN REVOLUTION



PRINCIPLE OF VACUUM COOLING

The application of vacuum cooling technology has caused a revolution in the green vegetables cold chain distribution system. In summer time, vegetables tend to deteriorate very fast after harvest from the field under high temperature. It is therefore, necessary to cool the vegetables down to about 0°C within a short time to preserve its freshness. The most effective method to cool down vegetables is under vacuum through self-evaporation of water. The main principle is when a vacuum chamber is filled with green vegetables and evacuated, the free water in the cell tissues of the vegetables begins to evaporate at a pressure and the vegetables cool themselves due to the latent heat of the evaporating water. Since 597 Cal is required to vaporize 1 gram of water at 0°C, the vegetables are cooled to 0°C in about 20-30 minutes when the chamber is maintained at a pressure of about 4.6 Torr. The large amount of water vapor generated inside the chamber is condensed on the surface of the cold trap and removed from the chamber. The system uses a refrigerator to keep the cold trap at a low temperature.



ADVANTAGES OF VACUUM COOLING

1. Cooling time is very short, usually only 20-30 minutes. Therefore, it can take away the heat including field heat and respiration heat from the post-harvest vegetables in the first time, this heat is deadly to keeping the freshness.
2. Cooling is very uniform. Vacuum cooling assures uniform cooling. There is no temperature difference between the leaves and the stalk core. Freshness and cleanliness are essential features of vacuum processing.
3. After being vacuum cooled, vegetables have excellent freshness, color, flavor and nutritional components, and can be stored for a long time.
4. The vacuum cooling technique is beneficial for removal of harmful gases and killing pests so as to increase the shelf-life period of vegetables.
5. No restriction to harvest. Green vegetables can be picked at any time, since they can be cooled in only 20-30 minutes.
6. Optimization of yield. Since only about 2-3% of the water is vaporized, there is no danger of the vegetables drying out or their weight being reduced.
7. Harvesting in the rain is possible. The water clinging to the surfaces of the vegetables is moved in a vacuum, and there is no damage during transportation. Even some vegetables washed in water can be processed.
8. Can be cooled in the package. The vegetables are delivered in a clean package, maintaining their original freshness and texture. There is no discoloration or other changes.
9. Can do spray or sterilized treatment inside vacuum chamber.
10. Can deliver/export to distant countries under cooling condition.

VACUUM COOLING PROCESS



FEATURES OF W.B.K-ULVAC BRAND VACUUM COOLING SYSTEM

W.B.K-ULVAC brand vacuum cooling systems are based on our partner's unique technology and are highly acclaimed by many users. up to now, We have delivered more than 300 sets vacuum cooling system to leading agricultural company and farm in china since the development of large-scale experimental system for vegetable cooling in 1992 under the governmental agricultural cold chain promotion policy. In addition, W.B.K-ULVAC Brand vacuum cooling systems have export to many other countries, including The United States of America, Mexico, Japan, Malaysia, Thailand etc. our vacuum cooling systems are highly acclaimed for their outstanding efficiency and reliability. A variety of unique techniques to further improve the performance of vacuum cooling systems has been developed through our corporation and research staffs. We are confident that the outstanding characteristics, superior workmanship and complete after-sales of W.B.K-ULVAC brand vacuum cooling systems will fully satisfy all users.



FEATURES OF W.B.K-ULVAC BRAND VACUUM COOLING SYSTEM

Model	VC-2E	VC-3E	VC-4E	VC-6E
Loading Pallet's number (per batch)	2 Pallets	3 Pallets	4 Pallets	6 Pallets
Chamber's effective dimensions (L×W×H)	2400 mm×1400 mm×2000mm	3600 mm×1400 mm×2000mm	4800 mm×1400 mm×2000mm	7200mm×1400mm×2000mm
Treating Capacity (kg/ cycle)	600-700	900-1,100	1,200-1,400	1,800-2,100
Maximum power required	25 kW	38 kW	48 kW	68 kW
Cooling water required	20 t/h	35 t/h	45 t/h	65 t/h
Weight	5,000 kg	6,500 kg	8,000 kg	10,000 kg
Floor space required (L×W×H)	5200 mm×1900 mm×2300mm	7600 mm×1900mm×2300mm	9200 mm×1900mm×2300mm	11180 mm×1900mm×2300mm

Note: The other non-standard model and vacuum chamber's dimensions, the type of door are also available on request.

As a result of continuing research and design efforts by W.B.K-ULVAC, aimed at offering top quality and innovative products, the information given in this guide may be subject to modification at any time without prior notice, and we reserve the right to make amendments deemed necessary.



VACUUM COOLING FOR COOKED FOOD AND READY MEAL

The vacuum cooling technique is a science of prolongation of shelf life for fresh-cut products, like vegetables, fruits, flowers and mushrooms by eliminating their field heat and softening the respiration intensity as soon as they are harvested. All parts of such fresh-cut products are uniformly cooled in 20 to 30 minutes after harvest so as to restrain the breeding of microorganisms and kill pests, thus significantly cutting down the decay rate. In addition, the adoption of vacuum cooling technology can also considerably facilitate the cooling of cooked food in a short time even after high temperature processing and help goods quickly go through the bacteria breeding temperature zone in order to extend the storage time and retain the goods nutritive, hygiene and fresh as much as possible.

Features of vacuum cooling for cooked food

1. The vacuum cooling machine boasts very fast cooling speed. In the case of cooked foods, it takes only 20 minutes to cool them from 90°C to normal atmospheric temperature, and 30 minutes to below 0-10°C.
2. The whole cooling process is undertaken in the hermetically sealed vacuum, so cooked foods processed by our vacuum cooling equipment is highly sanitary and free from bacteria pollution.
3. The vacuum cooler also features uniform cooling temperature. Temperatures of all parts of the foods in the vacuum chamber descend in a uniform way. According to your specific requirements, the cooling temperature can be conveniently altered by adjustment of the vacuum degree for the cooked foods.
4. Products cooled by our vacuum cooling machine can remain good initial quality and avoid oxidation caused by high temperature and quickly slip the best bacterial breeding period at the temperature of 30 to 70°C and have extended shelf life without the use of any preservatives.
5. The vacuum cooling equipment doesn't results in any pollution during operation, and taking up little space, it can also be placed in the cooked foods production fields.



Specifications of vacuum cooling for cooked food

DK-N Series: Treatment temperature from 90-95°C to normal atmospheric temperature 30-35°C				
Model	Treating Capacity	Cooling Times	Power	Weight
DK-50N	50 kg/cycle	15-20 minutes	4 kW	600 kg
DK-100N	100 kg/cycle	15-20 minutes	6 kW	900 kg
DK-150N	150 kg/cycle	15-20 minutes	8 kW	1200 kg
DK-200N	200 kg/cycle	15-20 minutes	12 kW	1800 kg
DK-400N	400 kg/cycle	15-20 minutes	20 kW	3000 kg

DK-L Series: Treatment temperature from 90-95°C to lower temperature 0-5°C				
Model	Treating Capacity	Cooling Times	Power	Weight
DK-50L	50 kg/ cycle	25-35 minutes	9kW	800 kg
DK-100L	100 kg/ cycle	25-35 minutes	15kW	1200 kg
DK-150L	150 kg/ cycle	25-35 minutes	22kW	1500 kg
DK-200L	200 kg/ cycle	25-35 minutes	30kW	2200 kg
DK-400L	400 kg/ cycle	25-35 minutes	56kW	3600 kg