



APV Cavitor Technology for Egg Processing

A NEXT GENERATION EGG HOMOGENISATION AND PASTEURISATION PROCESS IN ONE STEP

The powerful forces of cavitation produce results that far exceed those of conventional technology

Controlled cavitation is a new breakthrough technology for microscopic mixing, dispersion/homogenisation and scale-free heating based on hydrodynamic cavitation.

The key challenges in egg processing are shelf life and protection of the functional properties of the egg products as well as extended run time of the pasteuriser and lower overall production cost. The APV Cavitor offers a wide range of benefits that meet the needs of our customers



The principle of the APV Cavitor

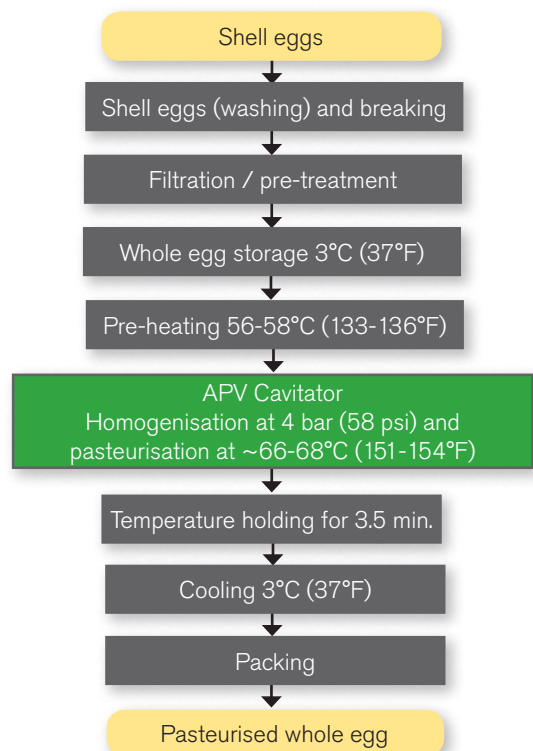
The heart of the technology is a rotor spinning in a liquid chamber. The rotor has a number of radial holes. The spinning action generates internal liquid frictions (disk friction) and the holes generate hydrodynamic cavitation. The cavitation creates high shear ensuring a very efficient homogenisation effect and friction which generates heating away from the metal surface and thereby avoid fouling.



The homogenisation and pasteurisation process for whole egg

The liquid egg product is pre-processed after breaking and pumped from the storage tank at about 3°C (37°F) to the pasteuriser. A preheating takes place at 56 – 58°C (133-136°F) in the Plate Heat Exchanger (PHE).

Processing example for whole egg



The Cavitor is coupled to the PHE in a hybrid solution, so the Cavitor is homogenising and pasteurising the liquid egg in one step, increasing the temperature by 10°C (18°F) to 66-68°C (151-154°F) without fouling of the pasteuriser.

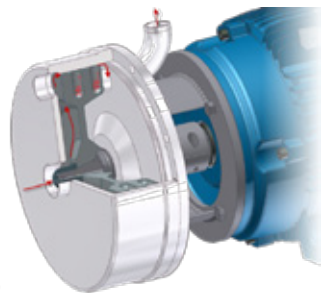
The product enters the holding tube in a homogeneous form ensuring an even pasteurisation/ holding resulting in protection of the functional properties of the egg product.

The holding time may vary, but will typically be 3.5 minutes. After the holding time the product is cooled in the PHE to about 3°C (37°F) prior to storage.

Features and benefits of using the APV Cavitor for egg processing

The Cavitor combines highly efficient low pressure homogenisation and pasteurisation in one step.

The Cavitor is coupled to the pasteuriser in a hybrid process solution and replace the high pressure homogeniser. The new technology has several attractive features and benefits for the egg producers:



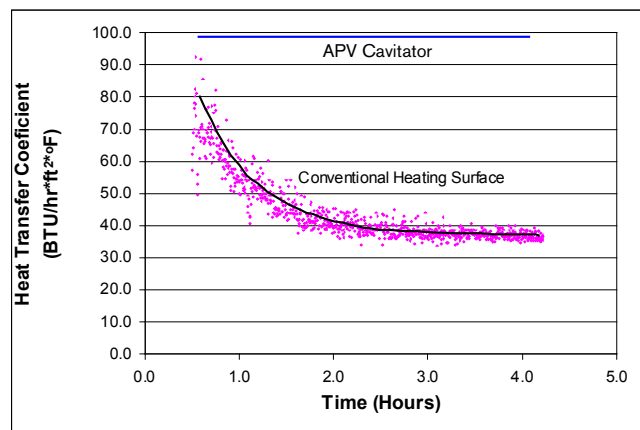
- The excellent homogenisation by the Cavitor ensures a homogenous mix of the whole egg components which means an even pasteurisation and holding
- The Cavitor has no heat transfer surface and so no hot or cold spots exist, consequently no scaling or fouling takes place in the pasteuriser
- Thanks to the scale-free heating the run time is significantly extended -typically by 4 hours compared to the conventional process, i.e. typically up to 8-12 hours run time between CIP
- The scale free heating and the efficient homogenisation ensure protection of the functional properties of the egg product
- The increased pasteurisation temperature and the cavitation shock wave effect result in an extended shelf life (ESL)

- Lower operational cost due to longer run times and fewer CIP processes and low pressure homogenisation
- Lower investment cost when replacing a high pressure homogeniser with the Cavitor.
- Lower maintenance time and cost
- Highly reliable and sanitary design meeting 3A and EHEDG standards
- The APV Cavitor can be delivered as a single unit or as a plug & play skid mounted system.

Egg yolk and egg white and other applications

The APV Cavitor can also be used for processing of egg yolk and egg white. For egg white however, at the same or 1-2°C (1.8-3.6°F) elevated temperature compared to the conventional process. The increased kill rate will primarily result from the cavitation effect.

Furthermore, the Cavitor can be used for mixing and fast hydration of powder ingredients as well as dispersion and emulsification in addition to scale-free heating of other heat sensitive products.



The cavitor has no heat transfer surface and consequently no scaling or fouling



SPX Flow Technology, Pasteursvej, DK-8600 Silkeborg,
P: +45 70 278 278 F: +45 70 278 330

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