

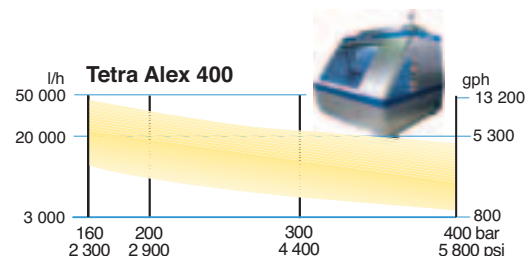
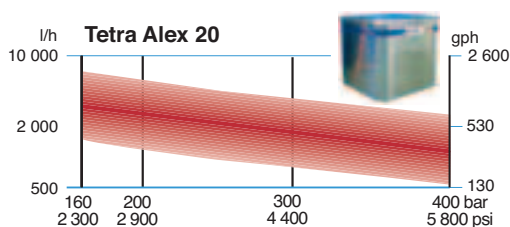
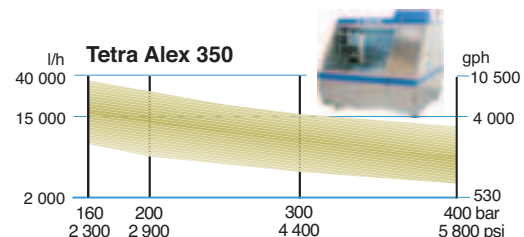
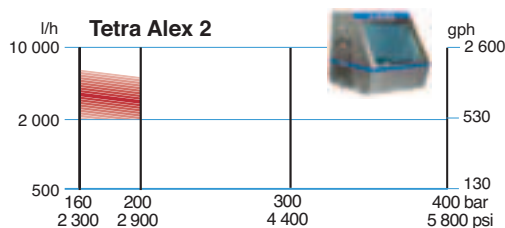
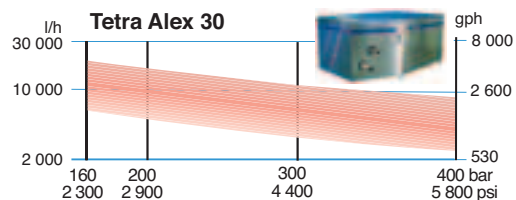
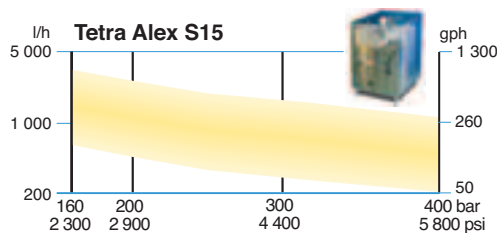
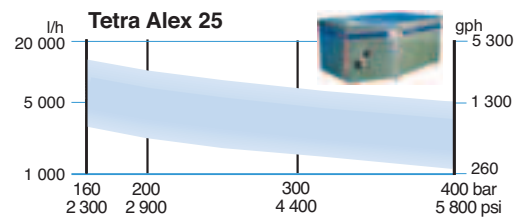
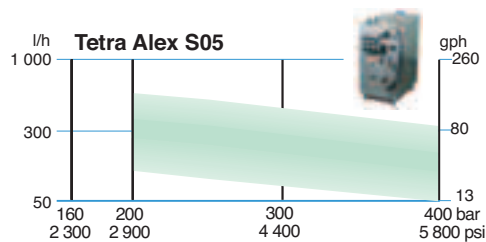
# Tetra Alex<sup>®</sup>

Homogenizers and high-pressure pumps



# Homogenization and pumping from 55 to 45 800 l/h

The comprehensive Tetra Alex range of homogenizers and high-pressure pumps offers capacities from laboratory pilot-scale to the largest food industrial applications. The working pressure of each machine size can be varied up to 400 bar. All machines are available as homogenizers in both non-aseptic and aseptic versions, and as high-pressure pumps for liquid and viscous food products.



## Knowledge of milk...

Traditionally, pasteurised consumption milk is homogenized to obtain better product stability and avoid the formation of a cream line in the package. Homogenization also improves the mouth-feel and appearance of the product.

The improved stability is even more important for ESL (Extended Shelf Life) and UHT-treated products, with their longer shelf life. Recombined milk is always homogenized to avoid free fat in the final product.

In cream, homogenization increases the number

of fat globules, which also raises viscosity and gives the cream a more full-bodied taste.

In the case of yoghurt and other fermented products, milk is homogenized to avoid separation of whey in the final product. When producing drinking yoghurt, a subsequent homogenization is performed in order to break up the texture after finished coagulation.

To obtain high quality ice cream, the ice cream mix must be homogenized, a treatment that makes the emulsion of fat more stable and uniform.



## *... and other foodstuffs*

Tetra Pak also has broad knowledge of products other than milk, such as soy-based beverages, tomato products, juice and egg. For soy products with high protein contents, homogenization breaks up the protein particles and prevents sedimentation in the packages.

Cloudy juices and nectars of apricot, peach and mango are homogenized to reduce sedimentation of the pulp. Mouth-feel, colour and flavour are all enhanced by the treatment.

Homogenization of tomato products, such as juice, purée and ketchup, raises viscosity, improves appearance and prevents separation in the final product.

Pasteurised liquid whole egg is a raw material for the food industry. Homogenization prolongs the stability of the product as well as the running time in the pasteuriser.



## *Research in practise*

At Tetra Pak Process Development Centres, homogenization tests can be performed in combination with, for instance, heat treatment. The experience gained in Tetra Pak Process Development Centres and in field tests around the world provides the knowledge base for solving homogenization problems in new and old applications.

As an example, tests have shown that homogenization can offer raw material savings by making the product more viscous. In many cases, homogenization can reduce the amount of stabilisers and other ingredients that need to be added.

## *High-pressure pumping*

In applications involving viscous products, the pressure drop in the pipeline requires powerful pumping. Tetra Alex machines work highly efficiently as pumps for pressure requirements up to 400 bar. Tetra Alex high-pressure pumps can be used in the food industry as well as in other industrial sectors where sanitary high-pressure pumping is essential.

The pumps are equipped with necessary safety features in case of blockage in the line downstream of the pump.

Tetra Alex high-pressure pumps have the same flow/pressure specifications as the homogenizers.



# Developed to enhance your

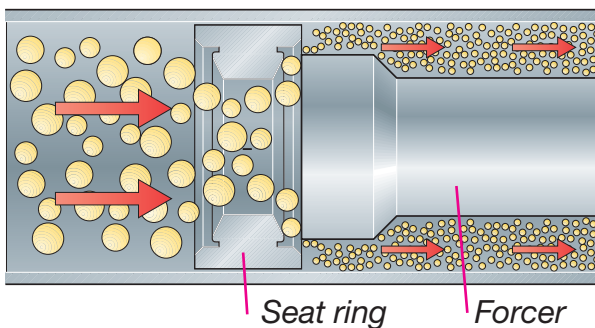
Tetra Pak's development work on the Tetra Alex machines has focused on providing high profitability and first-class product quality for users. The machines are continuously being developed, not only to reduce maintenance costs and energy consumption, but also to improve working environment-related aspects such as safe design and noise levels, as well as access for service and daily maintenance.

The philosophy of Tetra Pak is to continuously improve the performance of each machine. Many of the new development achievements can therefore be retrofitted into older machines, by means of upgrading kits.



## Essence of homogenization

**Definition:** A process to reduce the size of fat globules or particles in liquid and viscous products and disperse them evenly.



### How is it performed?

The product enters the pump block and is pressurised by the piston pump. High pressure forces the product through the narrow gap between the forcer and the seat ring. The product passes the gap at high velocity, creating turbulence and cavitation, which breaks up the fat globules or fibres.

### Energy savings with HD 100

HD 100 is a homogenization device design that reduces energy consumption by up to 30 % at pressures below 200 bar, in comparison with conventional designs. The HD 100 device is very efficient for pasteurised milk applications. The high level of efficiency is achieved in both full-stream and partial homogenization.

### Low noise

Homogenizers are traditionally regarded as noisy machines. Today, Tetra Alex machines generate a lower noise level than ever before – maximum 80 dB(A) when running at 85 % capacity.

Extra noise insulation is available as an option.

# production efficiency



## **Low water consumption**

Another economical – and environmental – advantage of Tetra Alex machines is low water consumption. Furthermore, an automatic thermostat system can control the temperature of the lubrication oil and keep the cooling water consumption at a minimum. In the two largest models, a system based on built-in plate coolers ensures that the circulating lubrication oil is always maintained at the correct lubrication temperature.

## **Pressure control**

Homogenization pressure is easily set using the manual hydraulic valves built into the machine front. Pressure can also be controlled remotely via a control panel or central automation system.



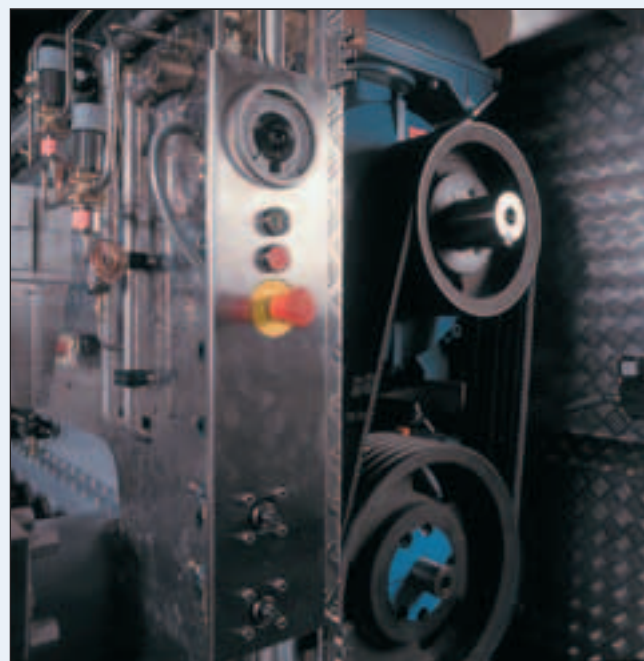
## **New design concept**

Tetra Alex 350 and Tetra Alex 400 homogenizers are high-capacity machines, with five pump pistons, operating at a low speed.

The machines are divided by an internal wall into two sections – a hygienic wet end and a drive end. The electric motor is placed above the self-supporting crankcase – a design which ensures a small footprint, minimal vibration and a low noise level.

Pressure lubrication assures efficient lubrication of all parts even at the lowest speed. The temperature of the lubrication oil is controlled by its own cooling system. Efficient coolers assure very low water consumption.

The large safety glass window allows the operator to monitor piston function easily during running. Convenient service access via front and side doors.



# Your product vision is our guide

You are the specialist in your product. We are specialists in Tetra Alex homogenizers.

You have visions about product quality. We try to fulfil them by advising you on the optimum homogenizing or high-pressure pumping technique.

Tetra Pak has extensive knowledge of

applications from dairy and food installations worldwide.

Further application knowledge is available at Tetra Pak Process Development Centres, where customers can confidentially test processing equipment set-ups using their own raw material.

## Alternatives for product quality

### *Partial or full-stream*

Partial homogenization is an economical alternative to full-stream homogenization, and can reduce investment costs and cut energy consumption by 75 %. This system is used for pasteurised consumption milk in many countries.

Homogenization of the cream phase, and only a minor skim-milk stream, gives the final consumption milk the same mouth-feel, taste and storage characteristics as if the whole stream had been homogenized. Energy costs are drastically reduced and the investment is lower, as a smaller Tetra Alex machine can be used.

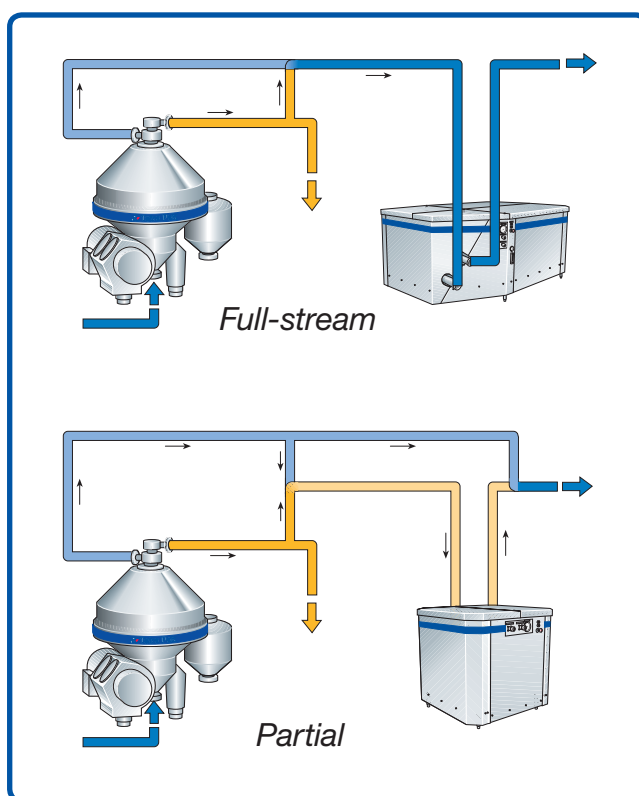
### *Variation in capacity*

All Tetra Alex machines can be equipped with a variable speed drive. An AC drive motor with frequency converter control enables easy adjustment of flow rate to actual production requirements. The system offers optimum processing of the treated product at different filling capacities.

### *Aseptic solutions*

In UHT processes, the homogenizer can either be placed upstream or downstream of the heating section. The ideal location depends on the type of UHT system and the products to be treated. If placed downstream, the Tetra Alex machine is equipped with a steam condensate barrier to prevent reinfection.

A standard non-aseptic Tetra Alex machine is used for upstream installations.



*Full-stream or partial homogenization. The choice has great influence on both investment and energy consumption.*

### *One or two stages?*

Two-stage homogenization is recommended for most applications. In a two-stage process, homogenization takes place in the first stage, which also has the largest pressure drop.

The second stage mainly provides a constant and controlled counter-pressure to the first stage in order to give the best possible conditions for homogenization. The second stage also breaks up clusters that are formed in some products directly after the first stage.

# Fast access to service

Technical service is always available locally thanks to Tetra Pak's worldwide representation.

Daily maintenance is, however, carried out by your own service staff. Instructive manuals are included with every Tetra Alex machine to ensure good installation and a smooth production right from the start.

The units are designed to provide convenient access for checking and service of wear parts. Every part of the machine can be easily accessed thanks to doors and removable sides of the housing.

For preventive maintenance or if more comprehensive service is required, Tetra Pak has skilled Tetra Alex service engineers ready to assist you. Tetra Pak's central spare parts centre offers 24-hour service.

## Long lifetime

High quality materials, proven sealings and a service-friendly design ensure low maintenance costs and good production uptime.

The seat ring in the homogenization device, for example, is symmetrical and can easily be turned around for another period of operation. The same goes for the valve seats in the pumpblock. The forcer in the homogenizing device has a reversible and replaceable front disc. Both the forcer and the seat in the homogenizing device are made of highly wear-resistant material. Other material combinations are available for homogenization of abrasive products.

## Warranties

Tetra Alex machines have a unique five-year warranty against pumpblock cracks.

This warranty is possible thanks to the design of the one-piece pumpblock in extra-durable stainless steel material.

All mechanical parts and functions carry a one-year warranty.



*Easy-to-open doors and removable covers make maintenance easy and accessible in Tetra Alex 400 homogenizers.*

## Environment

In developing Tetra Alex we use a process called Design for Environment, to ensure that the product's environmental impact is minimised. The process aims at reduced energy and water consumption, minimal loss of foodstuff and control of substances in the product.

The manufacturing of our products, in-house and at our suppliers', is also subject to our continuous environment work, in order to minimise environmental impact. The work is performed with the support of our environment management system, certified according to ISO 14001.

# *Tetra Alex – important links in successful processing lines*

Tetra Alex homogenizers and high-pressure pumps play a vital role in processing lines. These machines are suitable for any process where high standards of hygiene and performance are essential.

Homogenizers have for a long time been associated with dairy products, but in recent years the food & beverage sector and many other industries have recognised the value of homogenization for enhanced product quality.

Tetra Pak designs, manufactures and markets more than the Tetra Alex range of machines. We are specialists in a whole range of processing equipment. We have the technological know-how and experience from a broad range of applications to guide you to the best processing solutions.

Your local Tetra Pak company can assist you in supplying individual components as well as the complete processing, packaging and distribution chain – from raw material to the finished product on the retailer's shelf.



 **Tetra Pak**