

Processes

The Kelstream Scraped Surface Heat Exchanger can handle

Basically all thermal processes are based on cooling or heating. By using different models and sizes of Kelstream's Scraped Surface Heat Exchanger, the effect on the product is different. Kelstream makes a heat transfer calculation based on the properties of your specific product, its initial temperature and the desired final temperature.



Cooling

Bringing down the temperature of your product as much as your process is asking for. Cooling can be done with several cooling mediums, like glycol and (ice)water.

Heating

Heating your product can be done by using steam to heat the surfaces. We can calculate how much steam you need to achieve the desired temperature.

Tempering

Tempering is a method of increasing the shine and durability of chocolate couverture by melting it and cool it down. With the Kelstream Scraped Surface Heat Exchanger you can temper chocolate in a very controlled way.





Jellification

Jellification is defined as the process of turning a substance into a gelatinous form. With this process, liquid substances are converted into solids with the help of a gelling agent.

Crystallisation

Crystallisation is the formation of solid crystals from a solution. Crystallisation is applied in the sugar and dairy industry, but also for crystallise Sodium Kelstream is applied.

Pasteurisation

Pasteurisation is a temperature treatment of food whereby microbiological organisms are destroyed in order to make the product safe for human consumption and to provide biological stability of the food product to improve its shelf life.



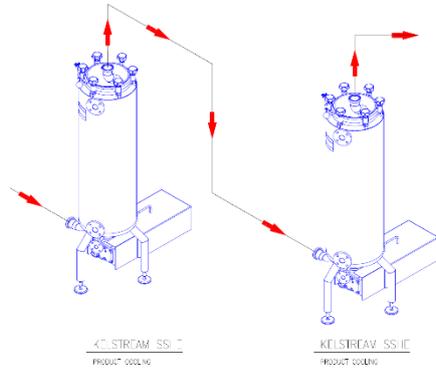
Sterilisation

Sterilisation is the removal of living micro-organisms, and can be achieved by using steam to heat the product. Sterilisation is a heat treatment of over 100°C for a period long enough to lead to a stable product shelf-life.

Boiling

Boiling is heating the product till it reaches boiling temperature. Kelstream is able to calculate the amount of heat is needed to reach boiling temperature.

Cooling



Get your product nice and cool with Kelstream

Thermal processing remains one of the most important processes in the food industry. Cooling is one of the thermal processing techniques and can be defined as a processing technique that is used to reduce the temperature of a product from a processing temperature to the desired temperature.

Cooling is used to reduce the rate of biochemical and microbiological changes in the product, like aerobes and anaerobes bacteria, to extend the shelf-life or for example to crystallize.



Cooling Product Applications

Cooling is one of the most used steps in food, feed, pharma and non-food processing.

- Soups
- Salsa
- Hummus
- Milk Concentrate
- Curd
- Yogurt and Milk
- Mashed Potato
- Mechanically Deboned Meat
- Sausage Pasteurization

· Fruit(puree)	· Vegetable puree	· Pie Filling
· Fat crème	· Bon-bon filling	· Fruit filling
· Chocolate	· Caramel/Fondant	· Jam/Marmalade
· Lotion	· Cream	· Candle Wax



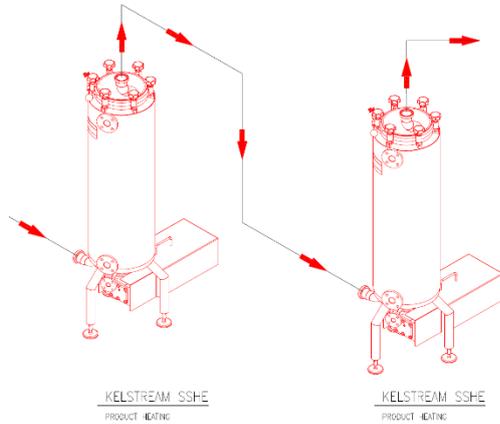
Why using a Kelstream Scraped Surface Heat Exchanger?

The Kelstream Scraped Surface Heat Exchanger is extremely usable to cool your product inline in your process. Provided with the specific characteristics of your product and indication of the starting temperature (product temperature of the product that you are supplying) and the desired product end temperature, Kelstream is able to perform a correct determination of the required heat transfer. The result of this calculation is used to select the appropriate Kelstream for you, which may be a single unit or multiple Kelstreams, possibly connected in series. The cooling medium which can best be used will also be identified.

Using Kelstream for cooling your product, has loads of benefits:

- Efficient heat transfer due to two heated surfaces
- High product flow up to a capacity of 10.000Ltr/h per unit
- Mixing with preservation of homogeneity
- Constant capacity and temperature
- [more benefits](#)

Heating



Heat your product inline with Kelstream

Thermal processing remains one of the most important processes in the food industry. Heating is one of the thermal processing techniques and can be defined as a processing technique that is used to increase the temperature of a product from a processing temperature to the desired temperature.



Heating is used to pasteurize or sterilize the product, melt the product for fat recovering, or change the product phase from solid to liquids.

Heating Product Applications

Heating is one of the most used steps in food, feed, pharma and non-food processing.

- Soups
- Salsa
- Hummus
- Milk Concentrate
- Curd
- Yogurt and Milk

· Mashed Potato	· Mechanically Deboned Meat	· Sausage Pasteurization
· Fruit(puree)	· Vegetable puree	· Pie Filling
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Why using a Kelstream Scraped Surface Heat Exchanger?

The Kelstream Scraped Surface Heat Exchanger is extremely usable to heat your product inline in your process. Provided with the specific characteristics of your product and indication of the starting temperature (product temperature of the product that you are supplying) and the desired product end temperature, Kelstream is able to perform a correct determination of the required heat transfer. The result of this calculation is used to select the appropriate Kelstream for you, which may be a single unit or multiple Kelstreams, possibly connected in series. The heating medium (steam or hot water) which can best be used will also be identified.

Using Kelstream for heating your product, has loads of benefits:

- Efficient heat transfer due to two heated surfaces
- High product flow up to a capacity of 10.000Ltr/h per unit
- Mixing with preservation of homogeneity
- Constant capacity and temperature
- [more benefits](#)

Tempering

Give your chocolate that nice shine and snappy bite

Tempering is applied in the manufacture of chocolates. The three main reasons to temper are:

1. Ensure product quality
2. Give the nice and shiny gloss and snappy bite to the product
3. Enable handling of liquid chocolate



Why tempering your chocolate?

Cocoa butter can exist in various crystalline forms, which if left untempered transform into unstable forms that impact severely on production capability and product quality. The tempering process ensures that the crystallisation of the fat occurs into stable forms which enable products to be manufactured with good gloss, hardness or snap and delays the formation of grey-white spots on the surface known as fat bloom.

Why using a Kelstream Scraped Surface Heat Exchanger?

Tempering has two stages: 1. Melting of the fat crystals by heating it above 40°C and then cool it down to below 30°C.

KELSTREAM

When you use a Kelstream Scraped Surface Heat Exchanger, the product will be heated and cooled very efficient and homogeneous way, due to the continuous scraping and mixing principle. The chocolate cannot crystallize onto the surfaces, because of the same scraping principle. Also the cover is scraped, so no product can accumulate there. Because of the two stages of tempering, you'll need a Kelstream for heating your chocolate and one for cooling it down. The Kelstream can be linked together for maximum convenience.

Jellification

Make it jelly

Jellification is defined as the process of turning a substance into a gelatinous form. With this process, liquid substances are converted into solids with the help of a gelling agent. Common gelling agents come from natural sources and include agar-agar, gelatin, Carrageenan, gellan gum, pectin and methylcellulose. More often than not, these gelling agents are presented in a dry, solid form which needs to be hydrated.



All of these are hydrocolloids and react when dispersed in liquids. Gels resulting from this process may range from tough and hard to weak and soft. Gels are characterized by having a viscous property when heated and becoming solid or jelly like once cooled. Melting and cooling points for gelling agents may differ according to type.

Jellification Applications

The food industry uses the jellification process the most, but they are not the only one. Also in feed, pharma and non-food industries it is used.

- Puddings
- Desserts
- Dog and cat food in Jelly
- Pharmaceutical gels
- Hair gel

Why using a Kelstream Scraped Surface Heat Exchanger?

The Kelstream is ideal when, as part of a continuous process, you wish to jellify/stiffen your





product.

If, for example, we assume that gelatine is the basis of the jelling agent, then this gelatine must be mixed in a fluid. For this reason, it is important that the mixture begins to jellify/stiffen by means of controlled mixing and cooling. The mixture will then be further processed by, for example, using whipped egg whites to make it fluffy.



The product is pumped through the Kelstream at constant pump capacity (your existing pump can be used for this). The Kelstream is equipped with a double shell, one wall of which is in direct contact with the product. A cooling medium is pumped through the double shell at a constant volume and temperature, while remaining fully segregated from the product. It is impossible for the cooling medium to come into contact with the product. The cold transfer occurs due to the cooling fluid being colder than the product, therefore cooling the product as a result of which it jellifies/stiffens. This cold exchange is very effective because the double wall is continuously and completely scraped. The scrapers prevent the product from accumulating on the double wall, as a result of which the cold exchange is maximized throughout the entire production process.

Crystallisation

Get the crystals you'd wanted

The crystallisation of your product means your product will form solid crystals from a liquid. Crystallisation takes place when you're cooling the product. Every product has its own characteristics and starting temperature where crystallisation starts.

Crystallisation Applications

- Fat crème
- Chocolate
- Spinach crystallisation
- Caramel
- Sodium
- Synthetic waxes

Why using a Kelstream Scraped Surface Heat Exchanger?

The Kelstream is ideal when, as part of a continuous process, you wish to crystallize your product.

When you use a Kelstream Scraped Surface Heat Exchanger, the product will be heated and cooled very efficient and homogeneous way, due to the continuous scraping and mixing principle. The product cannot crystallize onto the surfaces, because of the same scraping principle. Also the cover is scraped, so no product can accumulate there.



The product is pumped through the Kelstream at constant pump capacity (your existing pump can be used for this). The Kelstream is equipped with a double shell, one wall of which is in direct contact with the product. A cooling medium is pumped through the double shell at a constant volume and temperature, while remaining fully segregated from the product. It is impossible for the cooling medium to come into contact with the product.

The cold transfer occurs due to the cooling fluid being colder than the product, therefore cooling the product as a result of which it crystallizes. This cold exchange is very effective because the double wall is continuously and completely scraped. The scrapers prevent the product from accumulating on the double wall, as a result of which the cold exchange is maximized throughout the entire production process.



Pasteurisation

Conserve your product with Kelstream

Pasteurisation is the process of controlled heating used to eliminate dangerous pathogens that may be present in milk, fruit-based beverages and juices, some meat products and other foods which are commonly subjected to this treatment.



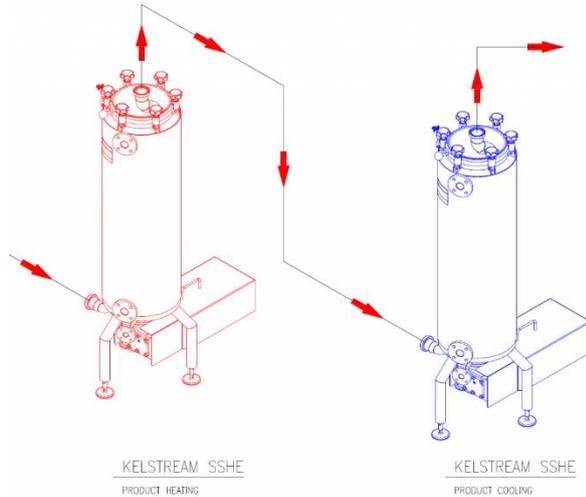
Pasteurisation temperatures range from 62°C to 90°C, depending on pasteurisation time. For continuous pasteurisation, scraped surface heat exchangers are applied, with heating, holding (tubes) and cooling sections.

Pasteurisation applications

- Dairy
- Fruit juices
- Beer
- Starch
- Sauces
- Meat products

Why using a Kelstream Scraped Surface Heat Exchanger?

The Kelstream Scraped Surface Heat Exchanger is extremely usable to pasteurize your product inline in your process.



Provided with the specific characteristics of your product and indication of the starting temperature (product temperature of the product that you are supplying) and the desired product end temperature, Kelstream is able to perform a correct determination of the required heat transfer. The heating medium (steam or hot water) which can best be used will also be identified.

As stated above, Kelstream is also used to cool your product down after pasteurisation.

Using Kelstream for pasteurizing your product, has loads of benefits:

- Efficient heat transfer due to two heated surfaces
- High product flow up to a capacity of 10.000Ltr/h per unit
- Mixing with preservation of homogeneity
- Constant capacity and temperature
- [more benefits](#)

Sterilisation

Kill the bacteria in your product

Sterilisation is like pasteurisation a method of thermal processing to remove living micro-organisms. Compared to pasteurisation, a heat treatment of over 100°C is applied for a period long enough to lead to a stable product shelf-life.

Ultra-high temperature sterilisation (UHT) has a heat treatment of over 100°C during very short times, it is especially applicable to low viscous liquid products.



In a sterilisation procedure, a product is briefly heated for only a few seconds. Heating the product kills bacteria and the spores that produce them. Sterilisation is a process in the food industry that kills harmful bacteria in food products susceptible to spoiling by briefly heating the food without harming it. The chemical composition of the product is changed as a result of the sterilisation process, and this may affect the taste of the product.

Sterilisation applications

- Seafood
- Dairy
- Meat
- Fruits and vegetables
- Baby-food
- Pet food
- Ready Meals

Why using a Kelstream Scraped Surface Heat Exchanger?

The Kelstream Scraped Surface Heat Exchanger is extremely usable to sterilize your product inline in your process. Provided with the specific characteristics of your product and indication of the starting temperature (product temperature of the product that you are supplying) and the desired product end temperature, Kelstream is able to perform a correct determination of the required heat transfer. The heating medium (steam or hot water) which can best be used will



also be identified.

Using Kelstream for pasteurizing your product, has loads of benefits:

- Efficient heat transfer due to two heated surfaces
- High product flow up to a capacity of 10.000Ltr/h per unit
- Mixing with preservation of homogeneity
- Constant capacity and temperature
- [more benefits](#)

Boiling

Bring your product to boiling point



vecci



Dairy Industry
Association
of Australia



Every product has its own characteristics and boiling temperatures. By heating your product indirectly with steam (or hot water), you are able to process your product inline.



Provided with the specific characteristics of the product and indication of the starting temperature (product temperature of the product that you are supplying) and the desired product boiling temperature, Kelstream is able to perform a correct determination of the required heat exchange. In many cases, the desired product boiling temperature is 100°C.

Boiling applications

Boiling is part of processes in the food, feed, pharma and non-food industry and is used for:

- Soups
- Milk Concentrate
- Mashed Potato
- Fruit(puree)
- Fat crème
- Chocolate
- Lotion
- Salsa
- Curd
- Mechanically Deboned Meat
- Vegetable puree
- Bon-bon filling
- Caramel/Fondant
- Cream
- Hummus
- Yogurt and Milk
- Sausage Pasteurization
- Pie Filling
- Fruit filling
- Jam/Marmalade
- Candle Wax



Why using a Kelstream Scraped Surface Heat Exchanger?



Food Processing Equipment
and System Specialists
to Mix-Cook-Fill-Cool

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page 16 of 16

Sometimes for boiling the product, steam is directly pumped into the product. The disadvantage of this method is you basically add water into your product, so the product characteristics, taste and colour might change.

With Kelstream, the medium is fully segregated from the product. It is impossible for the medium to come into contact with the product. The heat transfer occurs because the medium is warmer than the product and therefore the product heats up to the desired boiling temperature. The heat exchange is very effective because the double wall is continuously and completely scraped. The scrapers prevent the product from accumulating on the double wall, as a result of which the heat exchange is maximized throughout the entire production process.

Also, products with particles are no problem for Kelstream. Particles up to 25mm can be processed without damaging it.

