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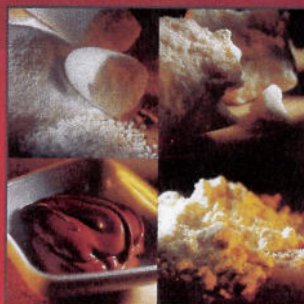
# Kennedy's

THE WORLD'S  
NUMBER ONE  
CONFECTIONERY  
MAGAZINE

# Confection

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## THE EASY WAY TO CHOCOLATE...



## ...WITH NETZSCH CHOCO EASY® PLANTS



### EQUIPMENT FOR CHOCOLATE PRODUCTION

We look at technology advances, from all the vital stages of chocolate processing, which are helping to produce great tasting chocolate products



### INGREDIENTS FOR CHOCOLATE PRODUCTS

Suzanne Callander reports on some of the latest developments which can help make chocolate products more appealing to consumers, and better for them too!



### FLOW-WRAPPING

Flow-wrapping can offer a cost-effective packaging solution across a wide range of confectionery products. We look at the machines and materials available

[www.chocoeasy.com](http://www.chocoeasy.com)

[www.netzsch-grinding.com](http://www.netzsch-grinding.com)

# NETZSCH

# A special process for special chocolate *dark, milk or white!*

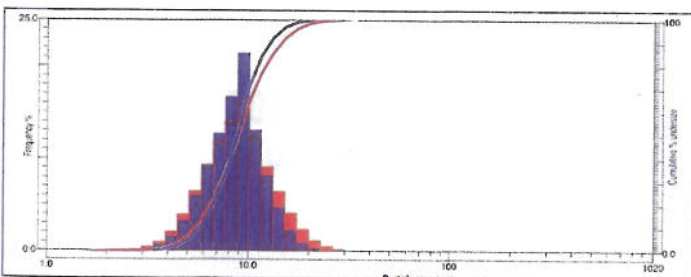
Suzanne Callander finds out more about an innovative chocolate production process which allows users to create their own unique chocolate brands – be it dark, milk, white, or speciality chocolate – using the same plant

Chocolate itself, in bar and candy form was, allegedly, invented in 1847 by the Fry Brothers in England. Prior to this chocolate was generally drunk as a beverage. Milk chocolate was first made successfully in 1897, after Daniel Peter, a Swiss chocolate manufacturer started adding powdered milk to his recipe.

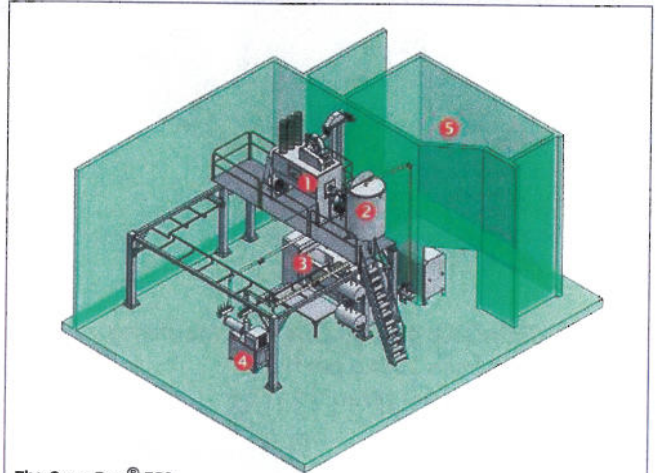
White chocolate was first created by Nestle, reportedly to make use of excess cocoa butter. However, before 2002, the FDA did not allow white chocolate to be called chocolate, instead it was labelled as 'confectionery coating.' In 2002, the FDA amended its standards of identity, enabling white chocolate to be called chocolate providing that, among other requirements, it is made from a minimum of 20% cocoa butter (by weight), a minimum of 15% milk powder and a maximum of 55% sweetener (generally sugar or maltitol for high-quality sugar-free chocolate). Any other formulation must still be called 'confectionery' or 'summer coating'.

Today, many types, qualities, shapes and flavours of chocolate are available – dark, milk and white chocolate.

A comparison of the particle size distribution of chocolate from a traditional production method to that produced with the *CHOCO EASY*<sup>®</sup> demonstrates that, qualitatively equal, or more significantly, better chocolate can be produced with the *CHOCO EASY*<sup>®</sup>. The high flow circulation operation produces a finer top-size without producing more fines, providing the potential for use of less fat for viscosity control with a smoother taste.



Particle size distribution (red: standard, blue: produced with *CHOCO EASY*<sup>®</sup>)



The *CHOCO EASY*<sup>®</sup> 750

1. Feeding, pre-dispersing unit and intermediate storage for sugar and other drying materials
2. Melting unit and storage tanks for cocoa liquor and cocoa butter
3. Conch for dry and wet conching
4. Agitator bead mill for fine grinding of the chocolate
5. Complete control system for the plant, including temperature control

Many processes used today for making chocolate, however, negatively affect its flavour development and texture. With up to 6% moisture, dry milk powder and cocoa liquor can cause the fine sugar that is added to the ingredient mix to stick together and form hard-to-break clusters. To counteract this, many manufacturers add more fat, which only serves to mask, not cure, the sugar problem.

Sugar is also the cause of problems during the traditional conching stage of the chocolate making process. Because it is ground so finely in the pre-conch grinding step, the available surface area of the sugar increases, enabling it to absorb and retain cocoa acids that can result in unwanted flavours and can lead to additional difficulty in removing acids from the chocolate.

## Redefining chocolate production

A new plant concept for the production of all types of chocolate has been developed by NETZSCH for those wanted to produce high quality chocolate, achieving taste comparable or exceeding commercially available products using traditional methods. Importantly, this process eliminates the pre-conch mass grinding step.

Using standard raw materials readily available on the market, dark, milk and even white chocolate can be quickly and cost-effectively, and consistently produced on the *CHOCO EASY*<sup>®</sup> plant.

With the compact module *CHOCO EASY*<sup>®</sup> 50, batches from

25 to 50 kg can be made in one shift. Between 3 and up to 80 tonnes per shift are, however, possible with the largest plant currently available. The flexible *CHOCO EASY*<sup>®</sup> process also allows for the production of speciality products such as dietary chocolate, or chocolate using other sugar types or sweeteners and additives, allowing users to create a truly unique and individual finished product.

## Benefits for white chocolate

The *CHOCO EASY*<sup>®</sup> plant is said to be particularly effective at producing high-quality white chocolate, which will maintain a good colour throughout the process. The dry conching process enables an excellent development of taste and the reduction of moisture of the milk powder. The system is so quick and easy to clean between recipe changes, all kinds of chocolate can be produced using one *CHOCO EASY*<sup>®</sup> plant – be it dark, milk or white chocolate, organic, or speciality chocolate.

The simple operation of the compact plant allows formulations to be tailored to individual requirements, allowing users to have a direct influence on the type, flavour and quality of the chocolate. Reproducibility of a recipe is also guaranteed as the semi-automated process includes a simple menu-controlled operation panel including temperature control, which allows for exact and consistent adjustment for a particular recipe.

The *CHOCO EASY*<sup>®</sup> compact plant integrates all the conventional chocolate making process steps. The process uses horizontal agitator bead mills instead of five roller mills for fine grinding of the chocolate. Further, the refining and liquid conching stages of the processes run at the same time so process times are shorter while producing the same, or better quality, compared with chocolate produced using conventional plant.

The patented module consists of the following sub-systems:

- Feeding, pre-dispersing unit and intermediate storage for sugar and other drying materials
- Melting unit and storage tanks for cocoa liquor and cocoa butter
- Conch for dry and wet conching
- Horizontal agitator bead mill for fine grinding of the chocolate
- Complete control system for the plant, including temperature control

## Process description

A special NETZSCH-CONDUX universal mill, type CUM, is used for the pre-grinding of granulated sugar and maybe milk powder. The dry raw materials of the chocolate formulation are manually loaded into a hopper with a safety screen. The dry materials are conveyed by a screw feeder into the dry grinding mill, grinding to a particle size of 300 µm. The transportation system, from feeding station to dry mill, is completely enclosed and all product-contact parts are polished stainless steel. The grinding process uses a special agitator design called a 'Blast Rotor' which provides a combination of impact and shear grinding. The compact

# Advantages of *CHOCO EASY*<sup>®</sup>

- The *CHOCO EASY*<sup>®</sup> module provides current purchasers of chocolate, or those who have the desire to make their own chocolate in large or small batches, a system to achieve their dream of producing their own chocolate.
- The *CHOCO EASY*<sup>®</sup> is an economical, pre-engineered module that is simple to install, simple to start up and requires no special training to operate on a day to day basis.
- Compared with current technology, the *CHOCO EASY*<sup>®</sup> is distinguished by its ability to produce high quality chocolate. Ease of operation, reproducibility, low energy, less man power and space requirements and extremely short process times are just some of its benefits.
- The grinding and conching processes are performed at the same time. This new process enables the exact adjustment of fineness and quality.
- Conching and producing white chocolate.
- Formulations for specific requirements are easily developed and brought to the market with the compact, enclosed *CHOCO EASY*<sup>®</sup> plant. You will have a high degree of flexibility and your own influence on the chocolate formulation and quality, you are ready to meet the demands of your market.

stainless steel rotor is equipped with replaceable impact bars. Cocoa butter and cocoa mass are melted parallel to the feeding of the solids for the dry grinding. The liquid cocoa butter and/or cocoa mass is pumped through a strainer basket and magnetic filter into the storage tanks. These are equipped with an agitator to maintain good homogeneity of the mass.

The horizontally arranged, U-shaped conching tank of the *CHOCO EASY*<sup>®</sup> plant is designed with a double-wall for heating and cooling. After pre-tempering, the conch is fed with the pre-ground solids and a part of the liquid components. A specially formed, horizontal mixing shaft provides ideal mixing of the components.

## Benefits of dry conching

The *CHOCO EASY*<sup>®</sup> employs a dry conching process which is the most important step for the quality development of chocolate. With a lower fat content than the classic conching process, dry conching provides a larger specific surface area, exposing more of the product particles. This results in faster and more effective reduction of moisture. The discharge of undesirable smell and flavour additives, as well as the

development of aroma, is enhanced by an intensive hot air supply.

After the dry conching process, adding cocoa butter, lecithin and other components completes the formulation. The conch is then cooled to the desired temperature. The mass is homogenised and wet conched until full aroma and flavour are developed – this is the same as the classic chocolate production method. However, during the wet conching stage, wet fine grinding by high flow circulation of the mass through a horizontal agitator ball mill, NETZSCH type LME occurs in conjunction with the wet conching. Continuous, trouble free product flow at a high volume rate for fine grinding and dispersing of the cocoa, sugar and milk particles is achieved due to the patented NETZSCH DCC separation system, which allows operation at high throughput rates and a constant temperature without the ball mill blocking or overheating the chocolate. The batch time is normally between 8 and 12 hours, depending on the desired particle size of the chocolate. The modular plant system can easily be enlarged by the addition of one or more conches and/or agitator bead mills. So, production capacity can be increased without significant additional expense.

The easy operation of the *CHOCO EASY*<sup>®</sup> plant has a direct influence on product quality. Using the plant eliminates the need for fine-tuning of a variety of parameters for each batch. The desired chocolate properties are achieved by process time. A longer wet conching and fine grinding leads to a finer product; longer dry conching leads to less moisture, a better flowability and better aroma. [www.netzsch-grinding.com](http://www.netzsch-grinding.com)



Dry and wet conching of white chocolate in the *CHOCO EASY*<sup>®</sup> process

