NETZSCH

Proven Excellence.

NETZSCH *MasterConch*

The greatest flexibility and product safety for your chocolate production

FOOD & CONFECTIONERY | a Business Field of NETZSCH Grinding & Dispersing

NETZSCH Food & Confectionery – Your Global Partner

Across the globe, NETZSCH provides support for your confectionery mass production projects, from the raw materials all the way through to the finished product. To ensure the success of your investment from the very beginning, we take on the planning and implementation of your new production lines and train your personnel.

NETZSCH Food & Confectionery offers

- Applications support
- Service
- Modern solutions
- Supervision of tests and demonstrations
- Product development and control
- Quality

Your Advantage is Our Focus

- High level of product safety
- Completely closed system
- CIP capable
- High level of flexibility
- Space-saving
- Short processing times
- Low energy requirement
- Highest quality

NETZSCH *MasterConch*

Chocolate. The distinct flavor of cocoa has long been known to mankind. Even the processing methods have been around for centuries, a little bit like a sacred ritual with secrets of each product that creates this marvelous Feast of the Gods. NETZSCH has established itself as an innovative supplier of plant machinery and is now taking another step forward with special news about innovative technology that breaks the paradigms. The new NETZSCH Conch is not only efficient and quick for the production of high quality chocolate; it is extremely flexible and reliable as well.

Product Development

Our modern applications laboratory is always state-of-the-art, fulfills your wishes and gives your ideas free rein. Here you can test new recipes or optimize production of your existing products. Visit us and experience our know-how for yourself.

Flexibility

With the ease of cleaning, the product can be changed at any time with minimal effort. Use the *MasterConch* as a component in a *Rumba*® system, for the production of chocolate mass or even as a stand-alone machine for finishing pre-rolled mass with existing production lines. Another advantage: NETZSCH *MasterConch* is the optimum solution for rework processing of products with a high moisture content, such as marzipan or caramel fillings.

Hygienic Design

The hygienic design is convincing, with its finely-polished stainless steel surfaces with no sharp edges, corners, bore holes, screw fittings or gaps. A continuous inner wall can also be found in the product loading area or cover with no static parts and with a self-cleaning air inlet. Use „Smart Feeding“ of fats or other liquids for frequent removal of residual products. Due to the optimized geometry, you will achieve effective and maximum emptying. It is possible to clean with water and to dry with heat and vacuum.

Savings

The successfully-established dry-conching process, with lower fat content, enables a large savings of energy with reduced process times. The combination of the NETZSCH *MasterConch* and our highly efficient *MasterRefiner* agitator bead mill creates an extremely space-saving, compact system, which includes all of the process steps required for the best chocolate production. Our completely closed and automated systems offer you the maximum product safety.

Economic Efficiency

The fast and easy cleaning makes it possible to use the various sizes of *Rumba*® system and the *MasterConch* with great flexibility, for multiple products, quickly and with little effort. This enables manufacturers to plan higher utilization of the system, which greatly optimizes the return on investment.

Quality

With the NETZSCH *MasterConch*, you will achieve the best reproducibility in an established, automatic process. Both production and cleaning follow optimum sequences in a closed system under precise temperature and energy control. The closed, hygienic design ensures the safety of the product against cross contamination or external factors and allows precise adjustment of your desired quality.

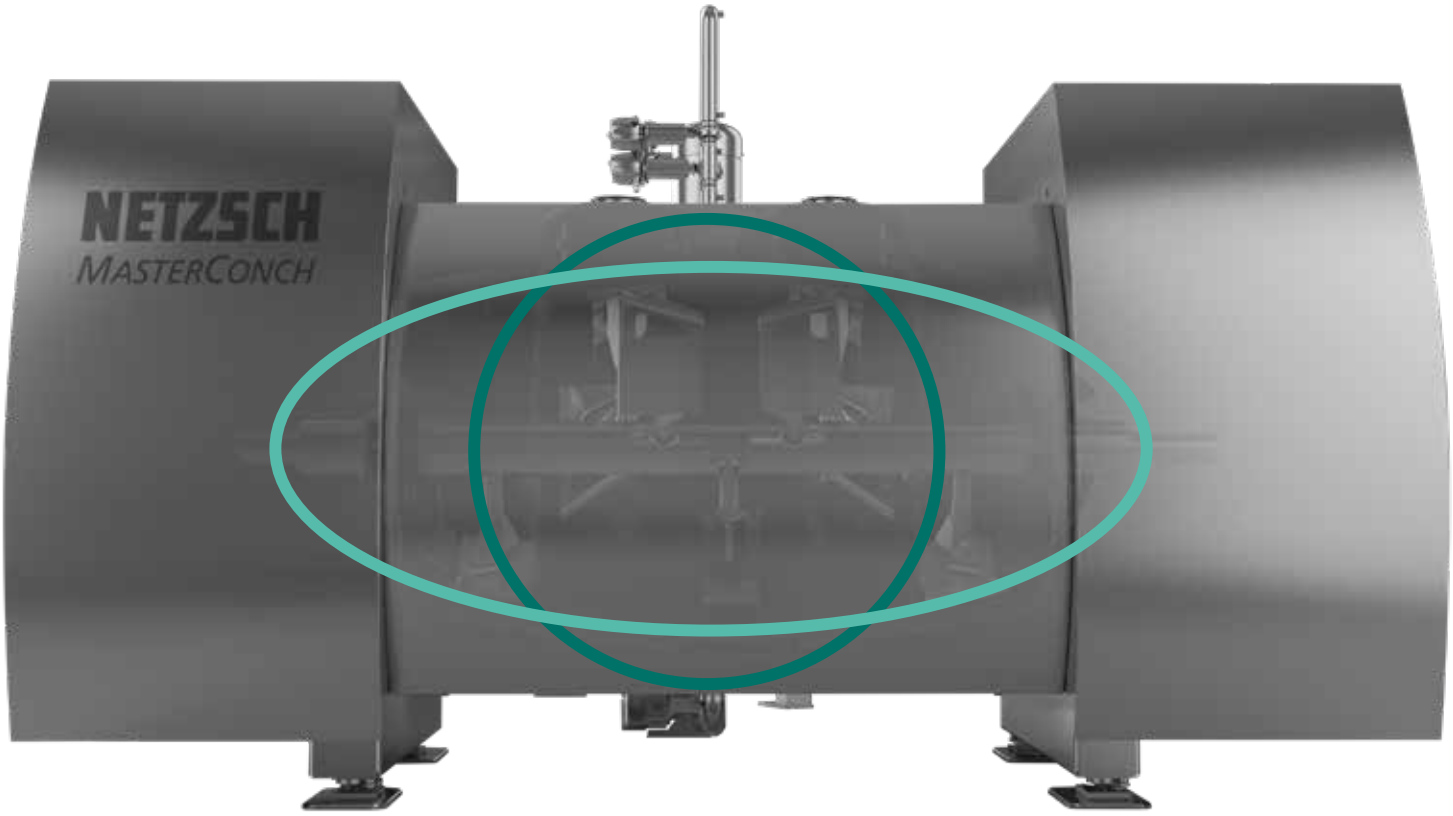
NETZSCH *MasterConch*

Design & Functionality

NETZSCH has developed a new concept for the conching machine that will replace the successful U-Conch. It is to be integrated with the *Rumba*® chocolate production lines. Ease of cleaning was a high priority for the new conching machine in order to help producers meet the highest hygienic standards. Product safety and repeatability were the basis of the design concept from the very first sketch. Hygienic design with, for example, a smooth inner surface, without screws, sharp corners or edges, holes, surface depressions or static parts inside the tank which are potential residual contaminants and generate "product shadows" during cleaning procedure.

The very innovative geometry of the Conch provides for internal circulation and optimum emptying with unprecedented low residual levels. The conching shaft is responsible for the fast mixing and, more importantly, the shear and kneading forces over the mass to develop the chocolate flavor and affect the rheology.

A highly efficient process, which requires up to 30-35% less energy than conventional "heavy" machines, provides the best flowability of the final mass, since it is under strict temperature control. The famous low-fat dry conching is successfully combined with sublevel volumetric aeration with self-cleaning inlets.



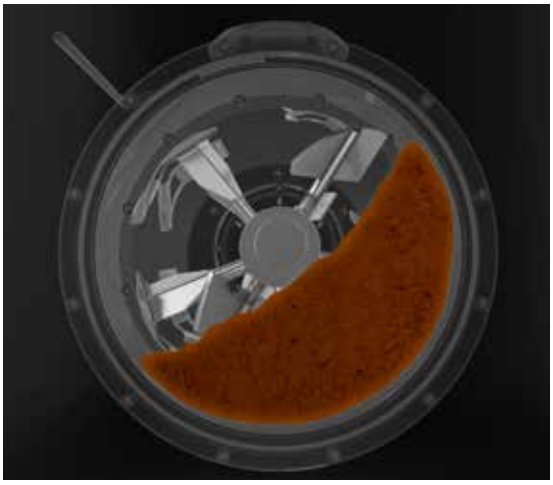
Your Advantages

- Round transverse section allows a larger working area with less total volume
- Elliptical tank geometry improves mixing and aids complete discharge
- Rounded corners, no screws, holes, sharp edges or inner surface depressions
- Single shaft, without static parts inside the conch, prevention of “shadows” and hard to clean spots
- Covers follow the inner surface of tank with a smooth transition and without gaps
- Peripheral self-cleaning air inlet

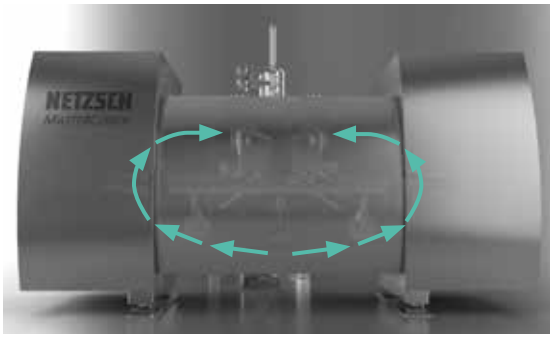
Principle of Operation

- Shear forces and compression, in order to gain more free fat from milk and cocoa, as well as intensification of the chemical reactions under heat

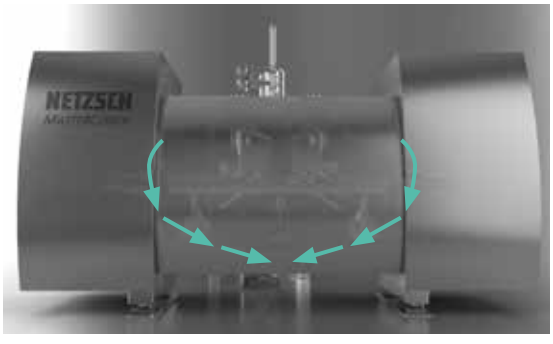
- Circulation of the product in the tank by means of the shaft tools in accordance with rotational direction and process stage



- Peripheral hot air supply, which creates an air bubble directly in the product bed



- Scrapers move the product across the inner walls to the centric outlet



NETZSCH *MasterConch*

CIP – The cleaning process

A highlight to be mentioned is the fully enclosed design with integrated high-pressure Cleaning in Place (CIP) devices, which work with fats, water or rinsing liquid. Sterilizing in Place (SIP) with steam is also possible, as well as operation under vacuum, e.g. for drying purposes.

The basic cleaning cycle at the end of each conching process requires just 1% of the Conch's volume. This is achieved with the residual fat from the recipe itself, and takes only 5 to 10 minutes. After this automatic step, all that remains is an incredibly low residual value of less than 0.2% of the conch volume.

Specially developed cleaning heads work together with the shaft's inner wall "washing" tools to facilitate complete cleaning of the Conch. Using cleaning liquid, which makes up approx. 3% of the Conch volume, and including the finishing operation, the complete cleaning process takes less than 30 minutes!

In other words, this is a conching machine that allows fast and safe cleaning without manual intervention in just minutes when changing products.

Compared to conventional cleaning systems that are used twice a week, this could mean a savings of more than 600 working hours per year. Therefore, more valuable production hours are available.

On the same basis, thousands of liters of cleaning liquids could be saved. On average, a conventional system requires 20 to 30 times more than the CIP system of the new NETZSCH Conch.

Only under such favorable conditions would the manufacturer process a wider variety of products on the same line. The potential exists to strengthen market presence and improve the return on investment.

There are advantages even if no product exchange is needed. One example is the shorter residence time of any residual product remaining in the Conch, considering the related health risks of uncontrolled exposure to the environment for long periods of time.

Principle of Operation

- Dosing of fats by means of NETZSCH cleaning heads and spray nozzles
- Conveyance of the product across the inner walls to the centric outlet by means of scrapers
- Small quantities of cleaning liquid allow fast and economical cleaning
- Central emptying through valve at the lowest point of the entire tank

MasterConch after emptying

View of the Conch after normal emptying.

MasterConch after basic cleaning

View of the Conch after 5 - 10 minutes of simple cleaning without circulation.
Fat 2 - 5% of the net volume of the Conch.

MasterConch after intensive cleaning

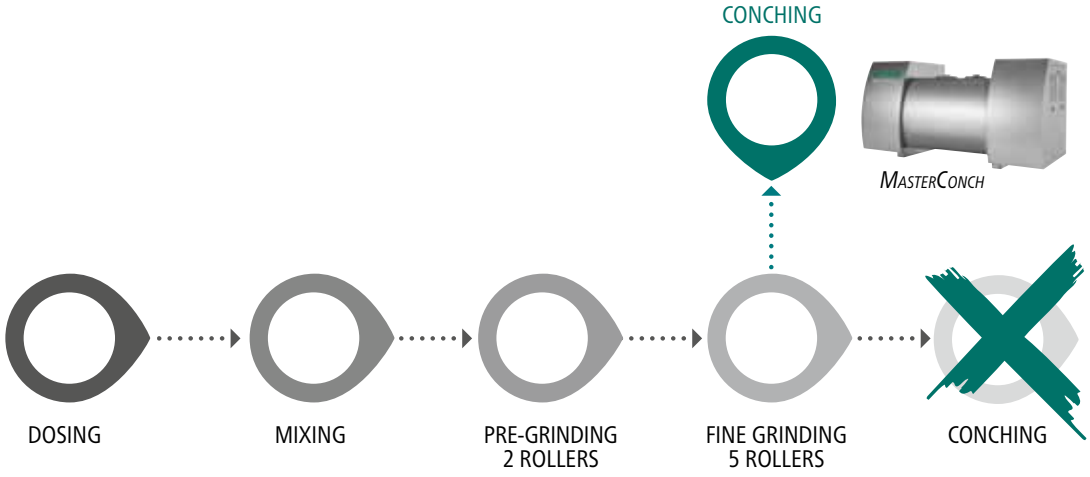
View of the Conch after 15 minutes of intensive cleaning in circulation. Fat 5 - 8% of the net volume of the Conch.

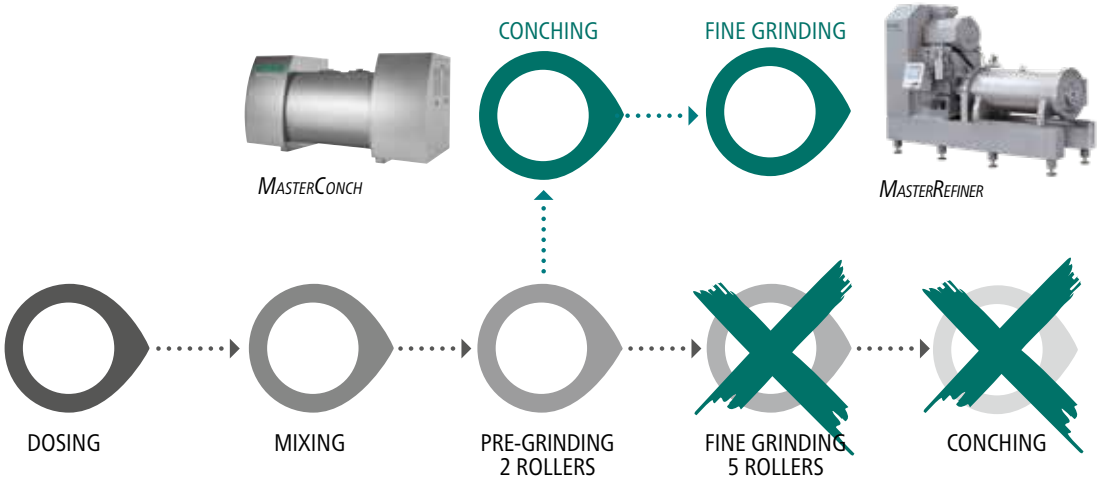
NETZSCH *MasterConch*

Plant Integration & other Applicati

NETZSCH *MasterConch* and the advanced *Rumba*® System offer new possibilities for the production of confectionery masses and are the answer to increasing standards with respect to hygiene as well as a broad range of product requirements. With the new concept for conching, we offer optimal plant integration into the *Rumba*® system, but smooth integration into existing plants is also possible.

As an individual machine in a classic production line





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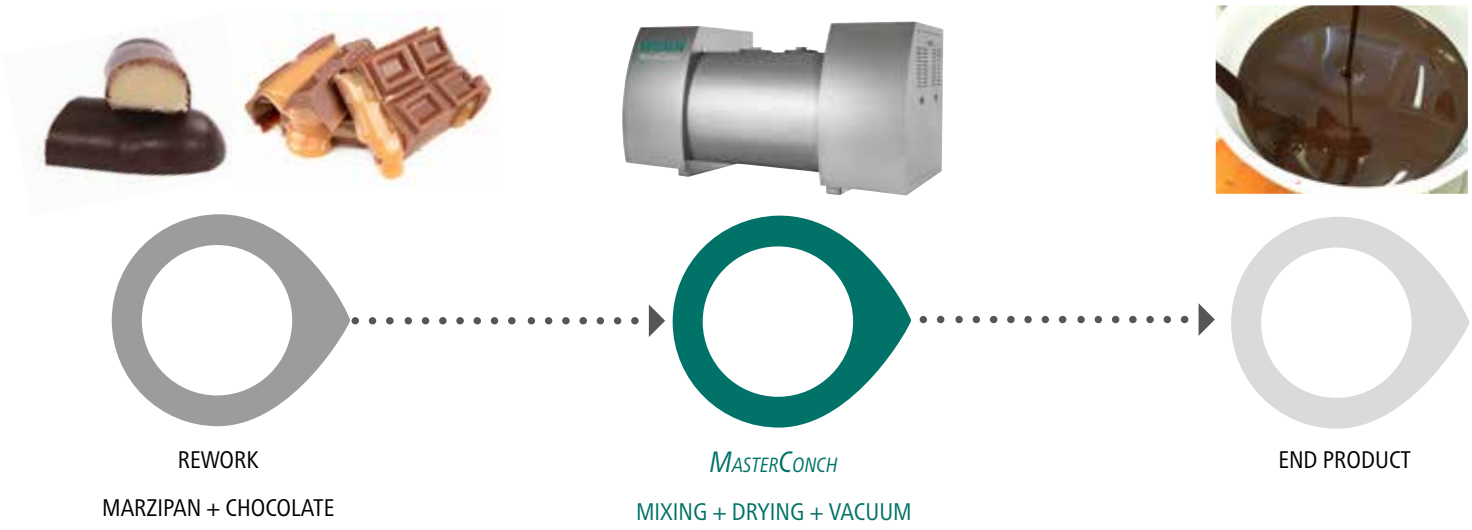
Rework from production with a high moisture content – fillings or caramel



Confectionery manufacturers are confronted with the problem of rework on a daily basis. Rework is a wide variety of products that exhibit irregular specifications such as weight, integrity, shape, breaks, etc. during processing in the production chain. Such „good products" are often reprocessed as a mass for other purposes. The problem usually lies with products that are no longer suitable for standard rework by means of mechanical and thermal processing due to higher moisture content or sticky ingredients, like caramel, since the mixture no longer allows further processing of such ingredients due to the non-fluid consistency. For this purpose, the *MasterConch* uses functions such as shear forces, drying with hot air and, at the end, vacuum in order to again produce from these problematic mixtures a mass with normal flowability. Further grinding of the mass is even possible because moisture values of 1% are achieved.

NETZSCH *MasterConch*
Sizes

Depending on the model, product batches up to 12,000 kg can be processed with the enclosed, space-saving *MasterConch*.

Model	Batch size [kg]	Engine power [kW]	Width [mm]	Length [mm]	Height [mm]	Empty weight [kg]
MasterConch 300	100 - 300	5.5 (7.5)	1,250	2,500	1,400	1,000
MasterConch 1500	800 - 1,500	22 (30)	1,800	4,200	2,200	4,000
MasterConch 3000	1,800 - 3,000	45 (55)	1,900	5,000	2,300	7,000
MasterConch 6000	3,600 - 6,000	75 (92)	2,000	6,000	2,500	12,000
MasterConch 12000	7,500 - 12,000	132 (160)	2,500	7,500	2,800	20,000

NETZSCH Food & Confectionery
Service and Competence

Your Global Partner for the Production of Confectionery Masses

Our Technical Center in Selb/Bavaria is specifically furnished and equipped and hygienically designed for testing food and confectionery applications. After clarification of the technical details, you can unleash your creativity when it comes to the recipe. Our team in the Applications Laboratory is fully committed to ensuring that the tests lead to the anticipated result.

Machines and plants for varied applications and tasks:

- *MasterRefiner* 6 – feasibility tests and recipe development
- *MasterConch* 300 / *MasterRefiner* 30 – scale-up and toll grinding
- *MasterCream* 10 for pre-crushing various products (nuts, etc.) and processing rework
- *MasterNibs* 100 for grinding cocoa nibs to cocoa mass
- *GammaVita* for the preparation of suspensions, solutions and emulsions

On-site quality control with modern analytical instruments:

- Mastersizer 3000 for definition of the particle size distribution using laser diffraction
- Haake Mars II for determination of yield point and viscosity with coaxial cylinder system
- Spectra Star quantitative determination of ingredients such as sugar, fat and protein using near infrared spectroscopy

After every test, a test report is prepared with the machine parameters and analysis results and promptly forwarded to the customer.

NETZSCH Service

- Applications lab
- Product development
- Process-specific support
- Scale-up to your production requirements
- Project planning and management / commissioning / customer service / on-site service
- Training at NETZSCH and on site

The NETZSCH Group is an owner-managed, international technology company with headquarters in Germany. The Business Units Analyzing & Testing, Grinding & Dispersing and Pumps & Systems represent customized solutions at the highest level. More than 3,800 employees in 36 countries and a worldwide sales and service network ensure customer proximity and competent service.

Our performance standards are high. We promise our customers Proven Excellence – exceptional performance in everything we do, proven time and again since 1873.

Proven Excellence.

Business Unit Grinding & Dispersing – The World's Leading Grinding Technology

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NETZSCH Trockenmahltechnik | Germany
NETZSCH Vakumix | Germany
NETZSCH Lohnmahltechnik | Germany
NETZSCH Mastermix | Great Britain
NETZSCH FRÈRES | France
NETZSCH España | Spain
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