Confectionery Process Systems

BCH

Welcome to BCH Limited

Established in 1835, BCH has developed a world-wide reputation as a manufacturer of high quality process systems for the food and confectionery industries.

By investing in engineering technology and process knowledge, our skilled engineers together with food technologists, have created a technical centre of confectioner expertise at BCH.

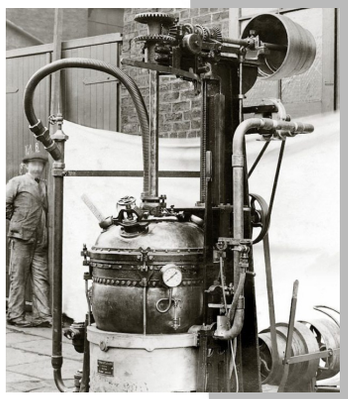
Complete turnkey solutions backed by over 180 years of experience

BCH specialise in turnkey systems for the manufacture of a large range of food and confectionery products. Our process equipment is ideal for the production of liquorice, 100% fruit products, caramel, syrups, jams and preserves.

We also provide advanced cook/cool technology for the production of chilled and frozen meals, sauces, fillings and fruit toppings. Our extensive range of skills, machinery and workshops enable us to undetake bespoke and tailor made equipment to be built within strict completion deadlines.

We offer a total 'in house' service for the design, manufacture, installation and commissioning of complete process systems, incorporating the most up-to-date modern process and control technology available.

Full turnkey or stand-alone equipment is available from laboratory size to full scale production.



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Investing In The Future

To assist our worldwide customers with meeting the many challenges faced in today's fast changing food industry, our unique Innovation Centre is available for assistance with new product and process development, as well as equipment evaluation before initial investment.

The Centre houses a wide range of equipment, services and facilities, all of which are supported by in-house personnel with a wealth of knowledge to provide support in process design, food science, engineering and software.

BCH know-how enables all of our clients to develop new and exciting products, to test feasibility, then up-scale production – ultimately enabling the end product to reach the wider marketplace at a much faster pace.

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Liquorice & Starch Gel Process Systems

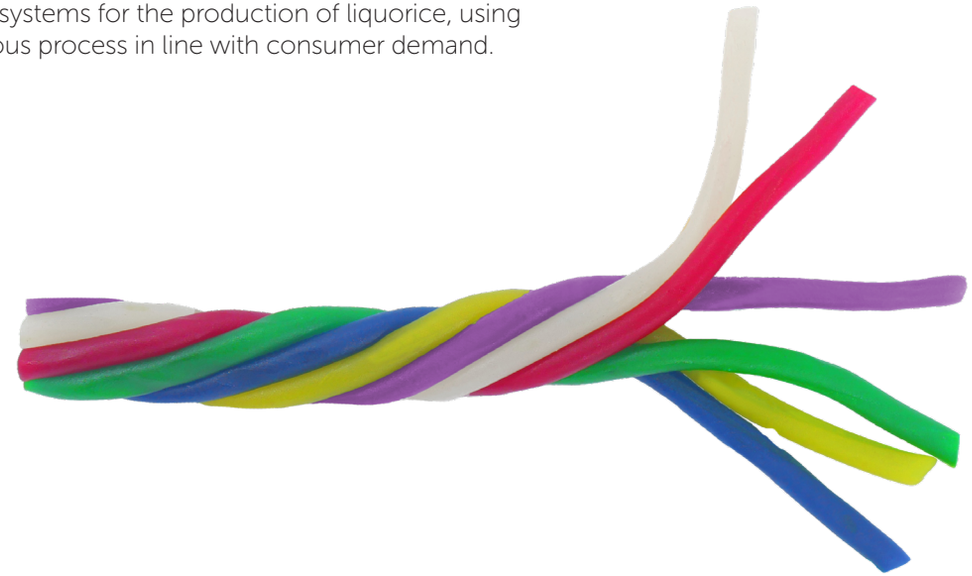
BCH produced their first liquorice press in 1835 and have been manufacturing equipment for liquorice and starch gel applications ever since.

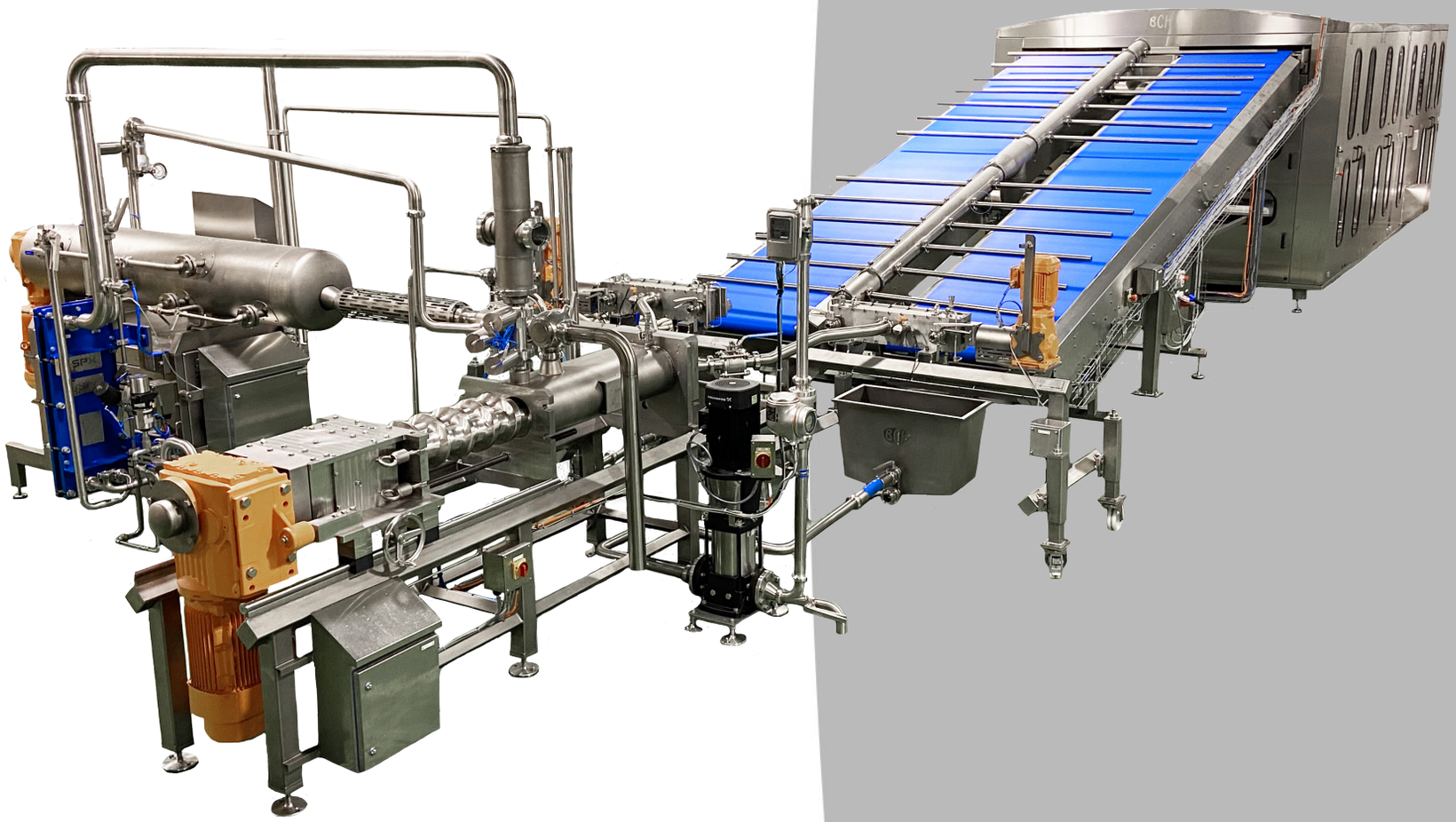
In 1968, a breakthrough in the design of equipment for the production of liquorice products resulted in the BCH final moisture liquorice system. This original design was for batch processing which was later developed into a continuous production system, thus reducing labour and handling requirements.

Further expansion to the range incorporated co-extrusion technology which allows the combination of liquorice and sugar paste products. By modifying the recipe and process further, it is possible to incorporate fruit juices or purées to allow for the production of a more natural product.

Today's production lines incorporate the latest developments in efficiency, hygiene, electronics control and modern design. Liquorice is manufactured from wheat flour, starch, sugar, molasses, glucose syrups, fruit purées and flavourings that are blended together to make a slurry. The resultant slurry is cooked, thus allowing the starch particles to expand and turn into a paste. The liquorice can then be extruded into various shapes through a wide range of die profiles.

BCH continue to provide systems for the production of liquorice, using either a batch or continuous process in line with consumer demand.





Kitchens

Slurry Mixing Vessel

Features

- Stainless steel mixing vessel
- Mounted on load cells for automatic weight control of ingredients
- Steam jacketed for automatic temperature control
- Contra-rotating agitator
- Automatic discharge valve
- Valve and pipe arrangements (to accommodate all liquid and dry ingredients)

Slurry Holding Vessel

Features

- Stainless steel holding vessel
- Steam or hot water jacket (for automatic temperature and level control)
- Agitator
- Automatic discharge valve (with product screening facility)

Rework Processing System

Features

- Stainless steel mixing vessel for the processing of start-up and shut-down waste, and manually added minor ingredients
- Mounted on load cells for automatic weight control
- Steam or hot water jacket (for automatic temperature and level control)
- Agitator
- Automatic discharge valve

Cooking

Continuous Liquorice Production System

A batch of continuous slurry is automatically weighed and mixed in the slurry mixer at temperatures of between 50-60°C, with a moisture content of 20%. It is then transferred to the holding vessel by pump. The slurry is held at temperature in the holding vessel and agitated, prior to being pumped on demand into the continuous cooker.

The Viscotator Scraped Surface Cooker raises the temperature of the slurry to achieve gelatinisation, the consistency being controlled by auto steam pressure control and product back pressure valve.

Continuous Cooker (Viscotator)

The Viscotator is designed to continuously cook or cool a wide range of food and confectionery products using a scraped surface heat exchanger design. It offers maximum process versatility with the ability to continuously cook or cool both viscous and particulate food products.

Due to its superior heat transfer performance, the Viscotator can be employed in the continuous processing of many pumpable fluids or slurries.

With a spiral flow water jacket or a direct expansion refrigerant jacket, the Viscotator is also suited to the cooling of a range of food and confectionery products.

- Soups
- Sauces
- Caramel
- Liquorice
- Custard
- Pet Food
- Spreads

Features

- All stainless steel construction
- Self-draining vertical or horizontal heat exchange tube mounting
- Rotor directly driven by geared motor (power and speed selected to match product and process)
- Simple and safe rotor extraction with protected cartridge type mechanical seal
- High thermal efficiency
- Good product movement in the heat exchange area and minimal build up on the scraper blades
- Maximise cooling/ heating medium flow efficiency with different jacket options
- Rotor options allow for minimum shear to foods containing particulates

Batch Cooking (FM Cooking)

Liquorice slurry with a water content of around 30-35% is supplied from the BCH liquorice slurry mixing vessel, prior to transfer to the Final Moisture (FM) Cooker.

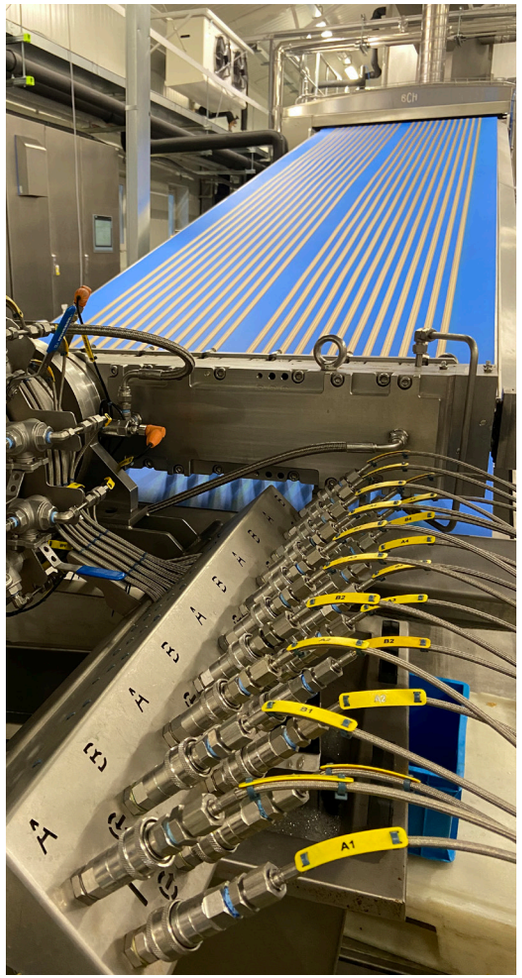
The FM Cooker is a stainless-steel mixing vessel mounted on load cells to determine the input and output weight, thereby giving the final moisture content of the cooked paste.

Features

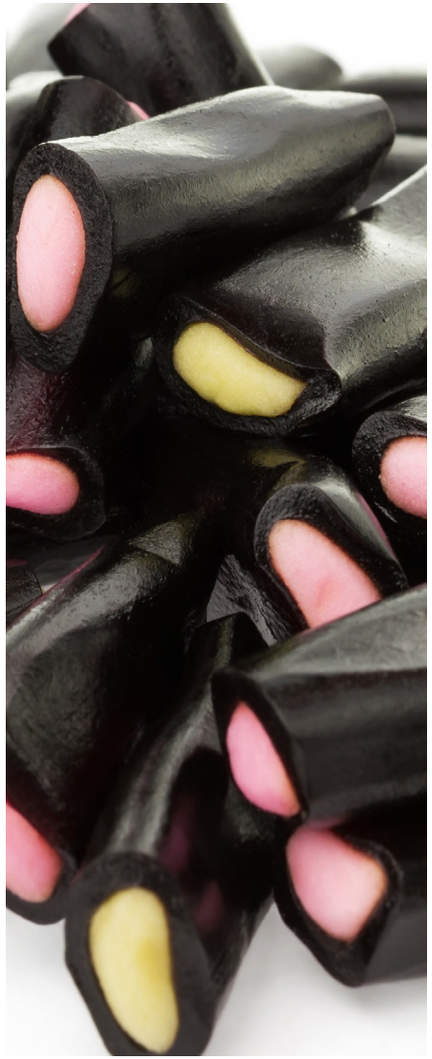
- Steam jacket for automatic temperature control
- Contra-rotating agitator with efficient cooker scraper design (ensuring that the paste has fully gelatinised and has reduced the final moisture content to 18% prior to transfer to the extruder)
- Discharge via large automatic valve for transfer to the BCH extruder
- Valve and pipe arrangements to accommodate all liquid and dry ingredients

Colour & Flavour Addition

BCH provide colour and flavour dosing stations which can supply up to six independent colours and flavours to the line. Mixing is achieved through the DMS range of dynamic mixing systems to provide a homogeneous mass of colour and flavour. Control and monitoring of dosing is achieved through the line control system.



Sugar Paste Production



BCH's sugar paste production system typically comprises of a syrup/mucilage cooker (if required) and a Z-blade duplex trough mixer. The resultant sugar paste is fed to a side flow extruder to produce the combination extrusion of sugar paste and liquorice.

The mucilage cooker is a steam jacketed vessel with an anchor type stirrer together with steam heating, resulting in a fully homogenous syrup mix.

The vessel is load cell mounted with recipe controls. The syrup is transferred to the Z-blade duplex trough mixer by a positive displacement pump and jacketed pipework. Icing sugar is fed into the mixer, together with the sugar syrup, colour, flavour and other inclusions to form a sugar paste mass. The Z-blade duplex trough mixer is robustly designed to give a thorough mixing action, prior to discharging into empty mobile bins.

The mobile bins are transferred to the extruder and mechanically tipped into the feed hopper of the sugar paste extruder.

The liquorice and sugar paste extruders would require the addition of a specially designed manifold and die configuration to produce a co-extrusion of liquorice and sugar paste in a number of combinations.

A second sugar paste extruder can be introduced to allow for two colours of sugar paste to be formed on the line.

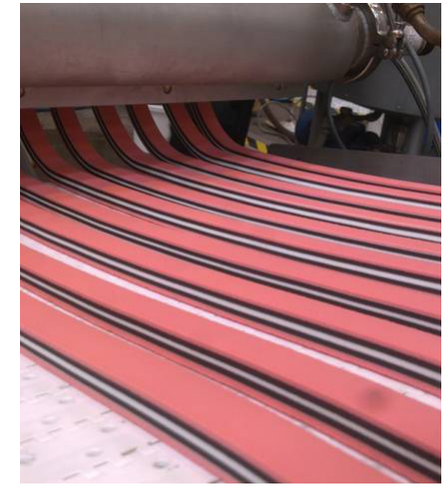
Z-Blade Mixer

BCH manufacture a range of stainless steel Z-blade mixers from 75kg to 500kg capacity. The mixers are equipped with direct driven inverter speed control.

- Sugar Paste
- Gums
- Spreads
- Chemical Process

Options

- Vacuum or positive pressure process
- Water or steam jackets
- Insulation
- Load cell operation
- Screw discharge

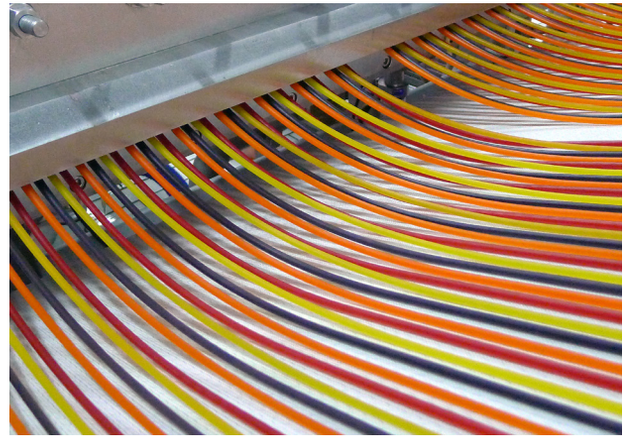


Extrusion

BCH'S food and confectionery extruders are manufactured in stainless steel to a hygienic and robust design.

Primarily designed to handle liquorice, starch gels, fruit twists and sugar pastes, these extruders can also handle viscous food pastes and gels.

- Caramels
- Liquorice
- Fudges
- Nougat / Praline Gels
- Fat-based products



Side Flow Extruders

The extruders are manufactured with 75, 130, or 200mm diameter screws to achieve throughputs of between 50-1,000 kg/hr. via a side flow die configuration. The side flow dies will extrude over widths from 300-1200mm at right angles to the screw axis. Side flow dies can be designed to extrude sheets, ropes and twisted ropes in solid, hollow or co-extruded form.

The side flow design provides a cost-effective, high-output system with good uniformity of product weight across the die width. This uniformity is achieved by careful design of the screw across the die mouth: regulating /throttling plates/ screws on the dies.

The extruders are usually mounted on rails to position the dies over a retracting nose piece on the BCH high performance cooling tunnels. For die changing and cleaning, the extruders can be wheeled off line.

The main barrel of the extruder is water jacketed to minimise start up times, maximise extrusion efficiency and in the case of the twin screw mixer extruder, provide heat transfer.

For liquorice applications, the extruder can be fitted with a small vacuum inlet hopper or standard hopper to receive liquorice directly from the continuous cooker (Viscotator). The vacuum hopper enables the extrusion of a cooler, drier and firmer liquorice product. When fitted with a larger feed hopper, batch-fed product is possible.

Twin Screw Extruder

This type of extruder enables the mixing of colours, flavours and acid into a base cooked liquorice mass between the extruder, manifolds and dies. Using this type of extruder, colour and flavour contamination of the premix and cooking equipment is eliminated, thus enabling rapid colour changes, minimal loss of flavour, minimal sugar inversion and starch gel breakdown. The extruder is fitted with a screw extraction system for rapid and easy inspection.

The latest generation of BCH extrusion systems allow the user to clean in place at high velocity and temperature ensuring rapid, hygienic product change overs.

Multi-Colour Multi-Flavour Extrusion

The process begins with a neutral cooked product being fed into the BCH Twin Screw Extruder. The product can be split up into 6 individual channels, each of which can be coloured and flavoured.

The flow control of each colour channel to each rope is automatic, and no manual regulation of the machine is required, leading to quick start-up and guaranteed rope weight control, as well as equal and uniform colour and flavour streams.

Ropes can be extruded in a huge variety of shapes and designs including twisted, straight, flat strap, squares and stars. They can also have hollow or filled centres.

- Labour saving with quick start-up
- Unique CIP System reducing energy costs
- Flexible and fast colour change

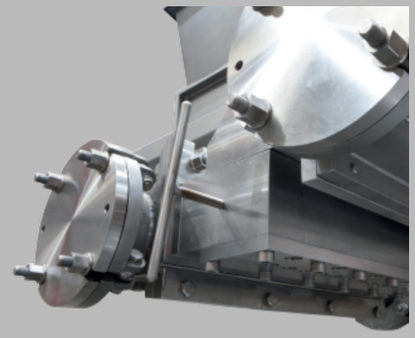
Co-Extrusion

To complement the range of extrusion solutions, the addition of further equipment gives the flexibility of manufacturing co-extruded products.

There are a large range of combinations such as liquorice/sugar paste and liquorice/pectin gel and liquorice/compound chocolate.

Co-Extrusion - Liquorice / Sugar Paste

Liquorice/sugar paste combinations require sugar paste extruders and the addition of a specially designed manifold and die configuration to produce articles in a number of combinations.



A second sugar paste extruder can be introduced to allow for two colours of sugar paste to be formed on the line.

Co-Extrusion Liquorice / Pectin Gel

The liquorice/ pectin gel application is achieved through the addition of mixing and holding vessels, combined with a local colour and flavour dosing station. A feed pump to the extrusion assembly delivers the gel mass continuously to the line.

Co-Extrusion Liquorice / Compound Chocolate

The liquorice/compound chocolate product is manufactured by continually feeding melted chocolate to a specially designed co-extrusion manifold, after which the product is cooled to solidify prior to cutting to the desired length.

Continuous Fruit Cooking & Extrusion Systems

BCH has developed a 100% fruit cooking and extrusion system for the manufacture of healthy snack products. This is in response to the latest customer trends for natural, organic and clean ingredient labels.

The system is a combination of BCH's MaxiVap Evaporator technology (used for long running caramel plants) and liquorice extrusion technology.

The fruit cooling and extrusion system enables the evaporation of high moisture fruit mixes to typically 85% solids, at which point they have the consistency of soft dough which can then be extruded. This then enables the production of a healthy snack bar using 100% fruit ingredients which can be co-extruded in a variety of different colours, shapes and flavours.

Micro Extrusion Lines

The BCH micro confectionery extrusion line is a user-friendly and cost-effective solution, ideal for start-up companies or mature companies who wish to gain a foothold in this sector without committing to a large financial outlay. For larger manufacturers, it is also suitable for recipe development and marketing sample production.

In addition to its ability to extrude traditional confectionery products, the Micro Extrusion Line has been designed to accommodate the continued move towards more responsible healthy eating attitudes.

The Micro Extrusion line can be configured for output capacities of up to 150kg/hr of liquorice product and up to 300kg/hr of liquorice and sugar paste co-extrusion.

Cooling Tunnels & Process Conveyors

Originally designed for the specialist high temperature and rapid cooling requirements of extruded liquorice confections, BCH has launched a modular range of conveyors and tunnels for the efficient transport, cooling and conditioning of food products.

A BCH cooling tunnel or process conveyor can be incorporated into a full process line using a fast and simple installation.

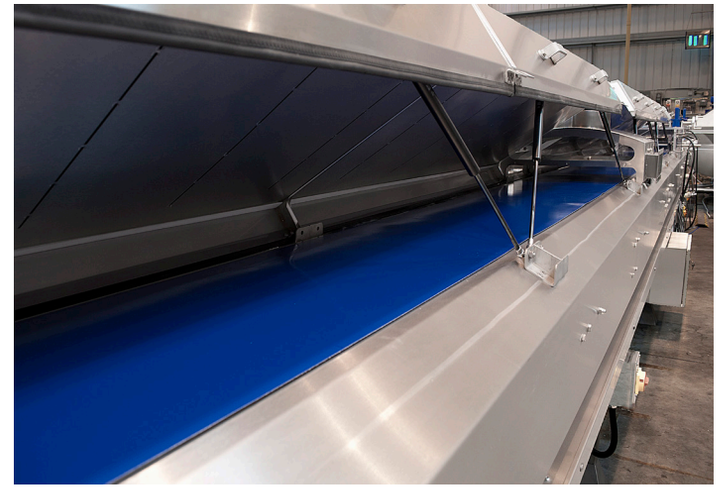
The conveyor widths are available from 300-2000mm in modular stainless steel sections and apply a hygienic design for easy access and cleaning.

The cooling tunnels use high velocity air cooling with water cooled tables or parallel air flow cooling above and below the belt.

Features

- Modular construction
- Hygienic design
- Ease of installation
- Specialist conveyor design
- Process cooling design
- Various air conditioning modules can accommodate up to 100kW of cooling capacity
- Optional de-humidification
- High performance cooling via carefully positioned manifolds Gentle cooling velocities achieved by flow and counter flow air directions
- Under belt cooling available by means of pressurised water cooling coils in copper

Optional customised features are available.



Multi-Tier Cooling and/or Drying Tunnel

The cooling/drying tunnel has been designed with efficiency and hygiene in mind. It is fabricated throughout in stainless steel with an open grid plastic modular belt. The tunnel is fitted with stainless steel, with easily removed covers giving access to product areas and ductwork.

The 3 or 5 tier construction has a structure of stainless steel pipework, which not only acts as the frame for the tunnel, but also the process air delivery system onto the product.

Tiers are fitted with an open structure plastic modular belt running on plastic chevron strips. Each tier has individual speed settings for optimum process control. Any product dust/debris is allowed to fall through the open structure and collect on the open stainless steel floor where it can be easily cleaned.

Hot and moist air rises and the tunnel is designed to use natural convection currents to achieve maximum cooling and drying efficiency. The cooled and/or dried air enters at the base of the tunnel, and is blown up through the product and removed for re-conditioning from the top of the tunnel.

Benefits

- Reduces floor space
- Easy access to product and to clean
- Achieves maximum cooling and drying efficiency

Glazing & Sanding

BCH offer equipment for the glazing/oiling of traditional liquorice products, and the sugar/sour (Pica Pica) coating of fruit flavoured liquorice products.

Glazing Unit

Glazing units are installed within the cooling section of the line for liquorice ropes to pass through an alcohol wax batch at 45-60°C.

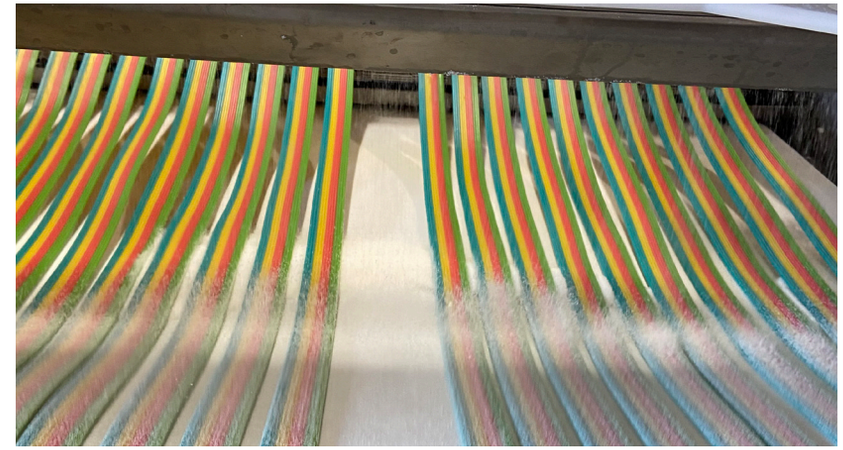
Downstream cooling allows the excess alcohol to evaporate off leaving only the wax coating behind.

Sanding Unit

The Sanding Unit is located between the cooling tunnel and guillotine and consists of a steam chamber and sugar/sour application system.

Features

- Enclosed infeed section to moisten the product surface
- Secondary section belt with base layer coating
- Feed hopper for curtain application with thickness control



Caramel

BCH is at the forefront of caramel production technology and is a specialist provider of both batch and continuous production methods which minimise 'burn on'.

Our continuous system can run non-stop for 14 days without cleaning. This new system has split the Maillard reaction into two sections, allowing independent control of moisture content and colour/flavour development.

Our famous "Low Type" cookers have long been regarded as the industry standard for batch production, many of our customers citing that truly high-quality products can only be made on this machine.

Another exciting BCH development is the extrusion of caramel for continuous biscuit lines; this highly accurate depositing method can be linked to our continuous caramel production system for a complete process solution. BCH also offer a caramel enrober, cooling tunnels and guillotines as part of our complete caramel portfolio.

Confectionery Guillotines

Products

- Chocolate / Caramel
- Sausage Rolls
- Sponge
- Straps
- Liquorice
- Marshmallow

BCH offer Standard, Automatic, High Speed and Ultrasonic Cut Guillotines to maximise the flexibility of any production line. Manufactured with the latest stainless steel hygienic design, they are user-friendly, easy to clean and maintain and are competitively priced.

The range is specially designed to cut both soft and sticky products without adhering to the blade and with minimal crumbling of the product.

Guillotines can be modified to suit specific customer requirements.

Features

- Cuts speed of 0-500 cuts/min
- Automatic cut length control from 5mm to 10m via HMI on control panel
- Automatic belt tracking
- Belt speed and cut length adjustable directly from HMI while guillotine is in production
- All stainless steel and aluminium construction
- Guillotine blade of hard, mirror polished stainless steel running between spring steel scrapers or PTFE coated with Nylon scrapers
- Adjustable height product hold down bars for product up to 25mm high

Optional Features

- Two axis servo motion control to suit process requirements
- Ultrasonic knife for sticky/fragile products for cut speeds up to 100 cuts/min
- All installations are PLC controlled

Drop Rollers

- Lab & production model hand driven
- Motorised
- Water cooled

BCH produces a comprehensive range of drop rolling machines for hard candy, toffee and gum manufacturers. They have been sold around the world since they were first manufactured in 1835.

There are a large variety of sizes available from a 1kg sample product machine to a 600kg/hr machine.

Rollers are manufactured from phosphor bronze or stainless steel as standard. Additional rollers can be purchased with any pattern and are interchangeable.

Benefits

- Hand operated or motor driven
- Hygienic design for easy access and cleaning
- Versatile – rollers are easy to replace
- Custom built rollers to your specification
- Water cooled rolls when motor driven

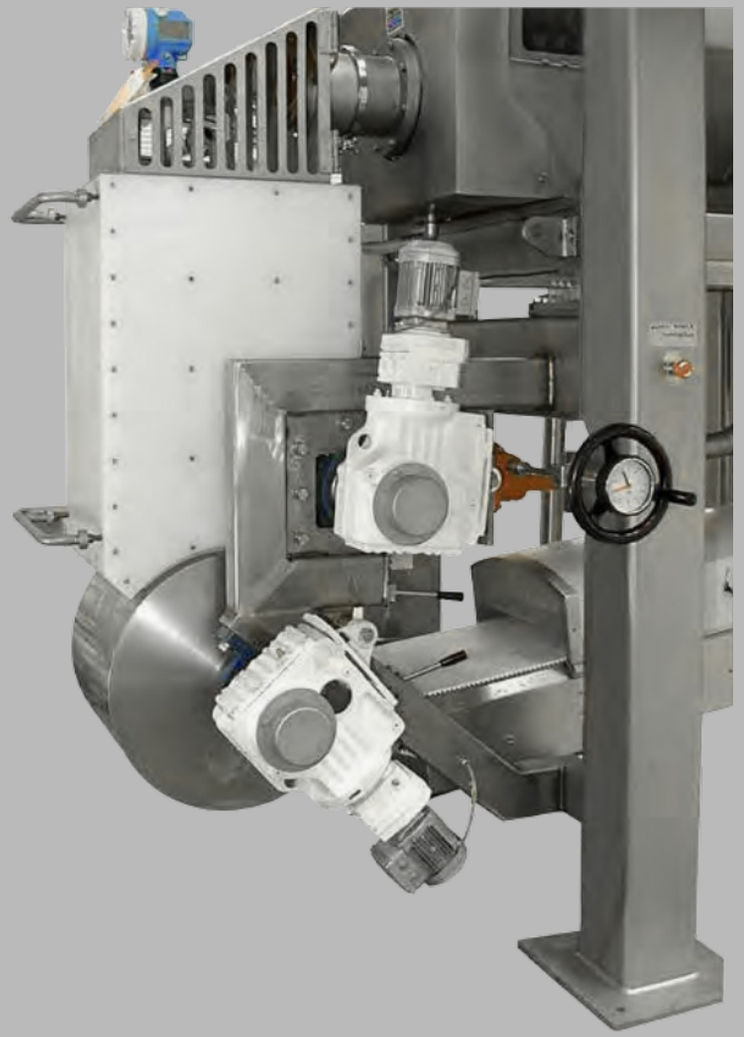
Slab Formers

BCH slab formers are manufactured using stainless steel and are ideal for products such as caramel, fudge, nougat and pastes.

They can be created with different widths and thicknesses to suit the customers needs, depending on the desired outcome.

Features

- High efficiency water cooling channels
- Jacketed feed hopper
- Variable roller gap adjustment for precise slab thickness control
- Easily adjustable/removable scraper blades
- Suitable for a wide range of confectionery products - toffees, fudges
- Hygienic stainless-steel construction
- Available in a range of widths/capacities
- Individual roller temperature control
- Roller internal channelling designed to provide uniform surface temperatures across the width
- Temperature controlled product inlet hopper
- Suitable for feeding via batch or continuous processes
- Option for product roller lubrication



Coating Pans

BCH manufacture traditional style pans for the coating of hard candy with either chocolate or sugar or for candies requiring a high acidity coating. They are a tilting design with a motorised rotating mechanism.

The pans can be manufactured in capacities up to 500kg, and come in either a standard or tulip shape. BCH has seen many improvements to the design of this type of pan over the years making it more adaptable, efficient and easier to use than ever.

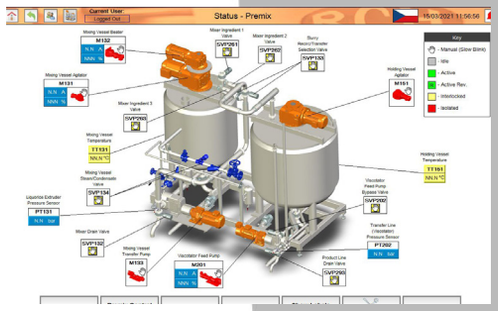
Process Automation

Calling on our vast experience in the industry, our electrical and software engineers develop our control systems using the most up-to-date technology available.

The system will specifically match the process requirements of any individual plant, whether it is a stand-alone basic relay control panel or an intelligent networked plant requiring a turnkey solution.

The software can be developed for use on any of the leading PLC manufacturer's equipment. A full package can be added to include recipe management, real time and historical trending, batch and CIP reports and cloud based monitoring/ data storage if required.

- System design from basic concept
- Control panel design and building
- Software design and development
- In-house testing and pre-commissioning
- On-site installation
- On-site commissioning
- Technical support and training (local or remote)



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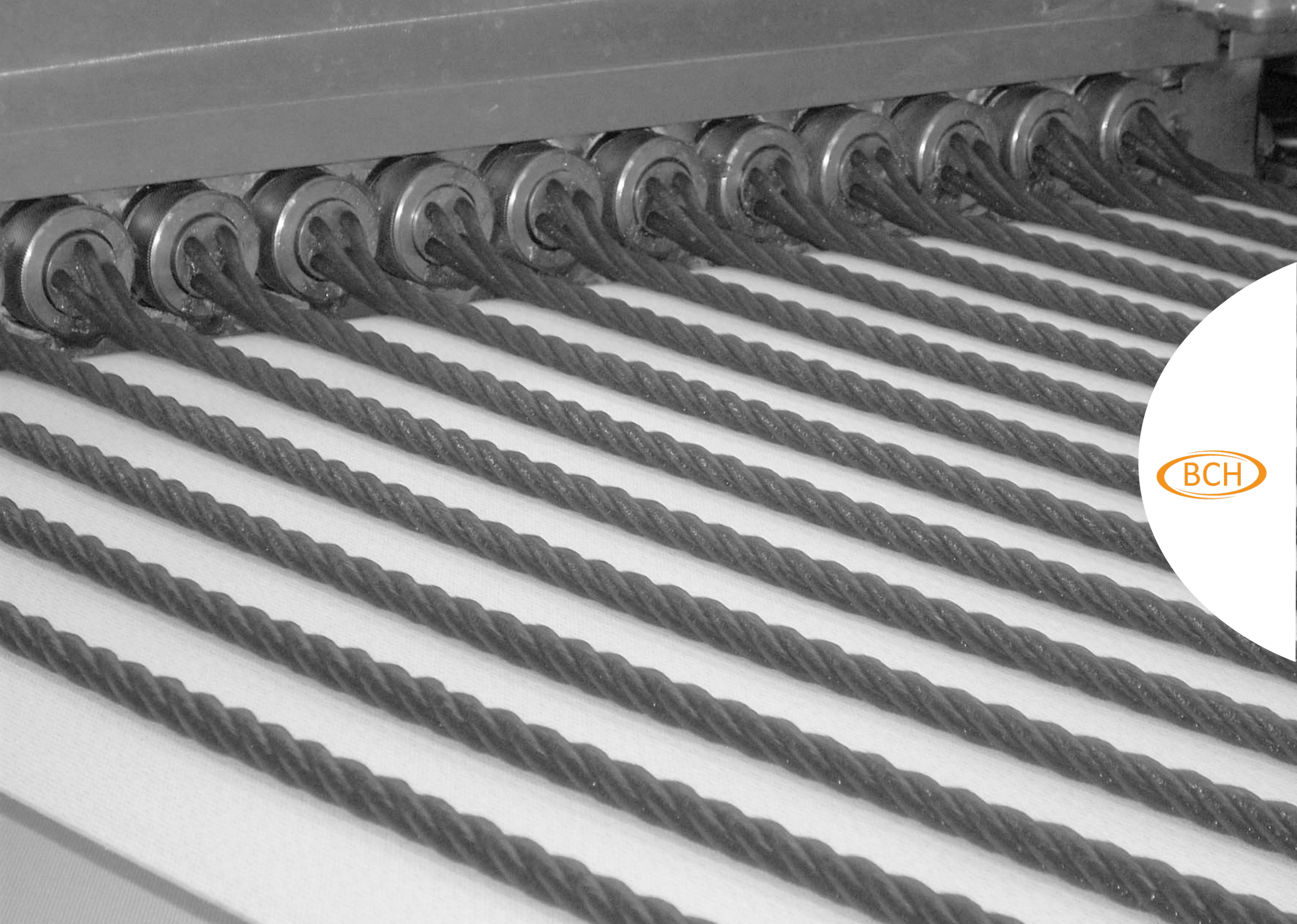

BCH Ltd
Spring Place
Millfold
Whitworth
Lancashire
OL12 8DN
UK

T +44 (0)1706 852122
E info@bchltd.com
W www.bchltd.com