A surprise for chocaholics
From cocoa to a magic egg

White, milk or plain chocolate, chocolate bar or assorted chocolates - chocaholics are spoilt for choice. A toy and confectionery all in one, that's the Magic Eggs from Rübezahl Koch: Beneath their delicious shell hides a plastic capsule which is full of delicious surprises for the avid consumer. Just how pneumatics hatch these eggs for your consumption is revealed by a glance at the 'laying battery' of the Swabien chocolate manufacturer.

Cocoa in whatever form hasn't just enjoyed enormous popularity in recent times. Even the Olmeke and Maya tribes appreciated this tropical fruit more than 2,000 years as a food and luxury. The Aztecs too, sometimes had a craving for chocolate: They planted cocoa trees and mixed the ground beans with water, chilli, vanilla and aniseed to make an aromatic drink called "xocolatl". The cocoa bean did not reach Europe until the mid 16th century through the Spanish conquerer Hernan Cortez. However, this exotic drink of the Aztecs was appreciated by only a small number of enthusiasts. Only with the addition of sugar or honey, did more and more people develop a taste for it and did popularity of chocolate grow throughout the world.

Up until 150 years ago, chocolate was only available in the form of a drink until, in 1847, an English inventor discovered that chocolate solidifies if cocoa powder is mixed with sugar and cocoa butter and the chocolate bar was born. Following its market launch by

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Messrs. Fry & Sons in Bristol, it became an immediate best seller. And this has not changed much since then: The Germans alone consume 800,000 tonnes per annum of this delicious confectionery; this represents 10 kilos of chocolate products per person.

Fun and games, excitement, chocolate

High up on the list of favourite things for young and old chocaholics alike – apart from biscuits and chocolates – are mainly any chocolate snacks which conceal a toy. But how does this surprise get into a chocolate figure? A question, which has probably bothered few enthusiasts – quite in contrast with the engineers at Rübezahl Koch. Together with Bühler Bindler GmbH – specialists in all areas of chocolate machinery – they have developed a system to produce Magic Eggs! This introduces the brightly coloured plastic capsules fully automatically into the hollow figures. And that's not all: The Magic Eggs pass through twenty stations before finally ending up in their colour-printed aluminium foil. Sometimes, small teddies tumble from the conveyor instead of chocolate eggs. These "Wonder Teddies" also contain a surprise and are intended for chocolate shelves on the home market, whereas the Magic Eggs, for reasons of competition law, end up on the export market. A constant companion of both on their journey through production are pneumatics, with Festo having been selected as supplier of all components. As far as control technology is concerned, Rübezahl Koch opted for a Siemens S7 PLC.

From a single mould

Without chocolate, there is no Magic Egg: The chocolate, with which the magic eggs are made, is produced according to a recipe by Rübezahl Koch, which consists of cocoa, milk, sugar and a number of other ingredients. In order for the liquid mass to take shape, it is first of all poured into egg halves. The moulds – white for the front and blue for the rear side – are placed alternatively on to a workpiece carrier system via a stacking magazine and conveyed to a pouring unit, where exactly 11 g of milk chocolate is poured into each of the 44 cavities of a mould. The precise dosing is assisted by a standard cylinder with quick exhaust valves. During the next step, the chocolate mass is evenly distributed in the cavities by stamps pressed in from above which have been cooled down to 23 degrees. In order to maintain a constant air humidty of 2 % and to prevent sticking of the ice-cold stamps and hot chocolate due to condensed water, an air supply pipe continually blows dried air into the station. The next step is to "debur" the moulded edges: Two heated rollers remove the surplus chocolate from the moulds and convey this to a container.

To ensure the smooth further processing throughout the subsequent production steps, the egg halves must be neither too soft nor too hard. A Paternoster cooler ensures the correct

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1_ It's a wrap!
Chocolate eggs galore

2_ 25 meters long and 6 meters wide is the size of the fully automated system which transforms the liquid cocoa mass into surprise shapes

3_ 44 jets meter the liquid chocolate to within an accuracy of 1 gram

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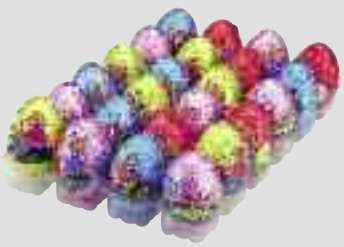
In excellent shape...

... that's chocolate from Rübezahl Koch in Dettingen/Teck. This confectionery manufacturer has specialised in the moulding of hollow figures and apart from Magic Eggs and Wonder Teddies also produces Santa Clauses, Easter Rabbits and Christmas Tree decorations. Since 1994, puffed rice chocolate has become another staple part of the their confectionery range. The main buyer of cocoa-based confectionery is the German confectionery and food industry; 30 % of chocolate produced is exported to EC countries, Canada, USA and Australia. In Europe, Rübezahl Koch ranks amongst the manufacturers using the most advanced production systems.



ambient temperature of 16 degrees and transport to the cool section is assumed by a pneumatically equipped feed mechanism: Two guide units with attached slides and a space-saving integrated rodless drive convey 16 moulds a minute into the giant refrigerator at full capacity. The chocolate is moved through the Paternoster level for level, until it has hardened to the right consistency so that the surprise capsules can be inserted in the next station.

A good egg indeed!

Formula 1 racing cars, aeroplanes and collectable items – 150 different toys are contained in the brightly coloured sleeves, which Rübezahl Koch purchase previously prepared. These are thoroughly mixed in a drum before landing in a storage device above the conveyor. Following a separating out process, a device made up of standard cylinders simultaneously drops 44 capsules into the

passing forms from above. Before the surprise completely disappears inside the egg, the halves are slightly melted and a pneumatic gripping device then fits the top and bottom halves together and two short-stroke cylinders ensure that the two halves of chocolate egg are correctly joined. This is followed by final cooling cycle before the figures are loosened from the mould cavities. Here too, pneumatics play a part, whereby a round cylinder operates the “rapper”, which administers a sound ‚rap‘ to all the passing moulds. The degree to which this is effected can be adjusted via a pressure regulator. Finally, the top and bottom moulds are separated again and the naked eggs removed by means of vacuum suction cups and wrapped into brightly coloured aluminium foil at the packaging station. 350 magic eggs per minute drop ready-made and wrapped from the conveyor and soon afterwards await eager chocaholics on the shelves. n

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4_ A space saving integrated linear drive ensures controlled mould feed

5_ An open and shut case: A pneumatically controlled gripper unit joins the moulds together

6_ A “rapper” separates the chocolate from the mould – a clean solution blow by blow

7_ Picked up and released: Vacuum suction cups remove the chocolate eggs