



Chocolate Masses.  
**Partnering with  
the leader for any  
kind of chocolate  
making.**

# Trendsetting partner for any chocolate mass. Benefit from Bühler's competencies in chocolate, coating and filling mass making.

"Engineering our customers' success" is a promise we will always do our best to honor. With your success in mind, we will ensure that you get the best value for the money you spend on your investment in Bühler's solutions throughout the lifecycle of your equipment, contributing to your success in your markets with your products.

Bühler's undisputed technological leadership has made us the Number One supplier of solutions and machinery to the worldwide chocolate and confectionery industry over the last decades. Be it for single machines or entire plants, for entry-level capacity or complete industrial processing solutions – Bühler is your partner anywhere in the world, and has been so for more than 150 years.

**Raw materials handling and dosing.** Reliable equipment for dry and liquid materials handling and dosing as a prerequisite for achieving a high-quality manufacturing process.

**DoMiReCo and DoMiReLi process.** Proven hundreds of times to be by far the best-in-class dosing, mixing, two-stage refining and conching or liquification processes.

**Ball mill grinding.** Highly efficient and simple NOVA and SmartChoc ball mill grinding applications for a uniquely consistent and reproducible end product quality.

**Automation system.** From simple to high-end machine and line control systems and interfaces with ERP systems, for leveraging Bühler's chocolate making process know-how.

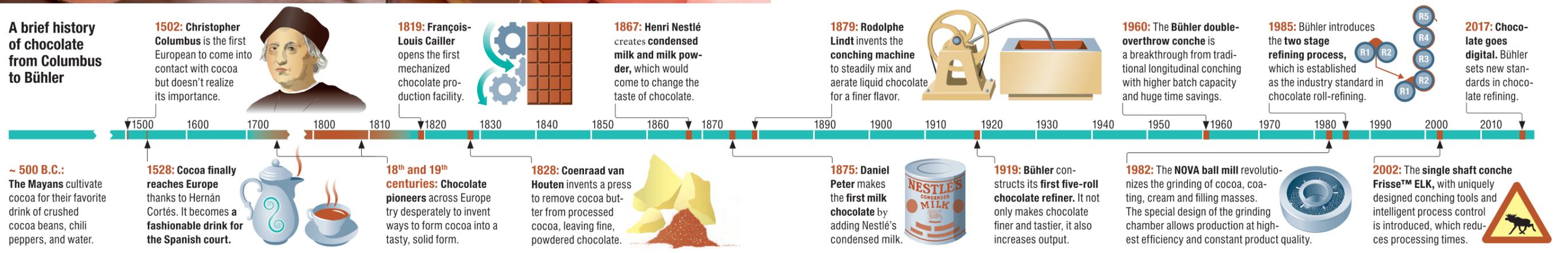
**Customer service.** Not only for supplying spare and wear parts, but also for maintaining highest availability and productivity of your investment with machine overhauls, retrofits, training, maintenance, in-plant technical services, safety and OEE consulting.

**Application Center.** Develop, optimize and analyze your products and recipes using our most advanced technologies on small- or large-scale production equipment.

**Food safety.** Chocolate as a ready-to-eat product requires outstanding hygienic machine design, proper operation, regular cleaning and maintenance as well as adequate zoning of the production and material flows.

... and all this can be applied to processing lines with throughputs ranging from 400 kg/day up to high-efficiency lines with an output of 6,000 kg/h.

## A brief history of chocolate from Columbus to Bühler





## Four different process concepts. Choose the solution tailored to your specific application.

New recipes and new creations appear almost daily in the worldwide chocolate market. With Bühler's highly flexible production systems, there is practically no limit to the variety of forms and flavors possible. Our innovative solutions guarantee manufacturers of chocolate products maximum yield and top product quality.



### Mind and manage your operating costs.

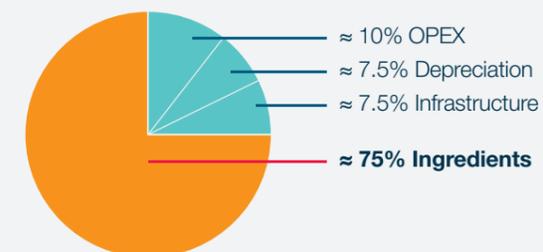
Capital expenses (CAPEX) as well as operating expenses (OPEX) form the total cost of ownership (TCO) of your production facility. In chocolate production, your OPEX is mainly driven by the cost of the ingredients, which exceeds all your other expenses. Ingredients are your Number One TCO-driver and

deserve your utmost attention in running your production system as efficiently as possible.

### Bühler's contribution to minimizing your TCO.

- Widest process portfolio from which you can choose the concept tailored to your specific application.
- Very gentle and accurately controlled processes to avoid rework and waste.
- Best-in-class production systems to minimize the cost of ingredients (e.g. through fat savings).
- Professional consulting to optimize your recipes without compromising on product end quality.
- Unique programs to continuously modernize your equipment and systems and to train your operators.

### Breakdown of costs in mass production:



Which is the most precious ingredient in your end product?

# Our process concept portfolio. Benefit from Bühler's unique process portfolio and choose the most suitable process concept.

What is important to you and what aspects should you focus on? Is your top priority a superior and unique end-product quality, high downstream processing efficiency, or rather a purely CAPEX-optimized process solution? Benefit from Bühler's vast experience to make your investment decision based on proven 360° facts and figures while also giving consideration to important soft factors.

						
	Chocolates	Coatings	Fillings	Creams	Bread spreads	Low fat masses
DoMiReCo Roll refining and conching	Perfect match	Perfect match	Over sophisticated	Over sophisticated	Over sophisticated	Perfect match
DoMiReLi Roll refining and liquification	Not recommended	Match for majority of products	Perfect match	Perfect match	Perfect match	Not recommended
Light Conching & Ball Mill Grinding	Match for majority of products	Perfect match	Over sophisticated	Over sophisticated	Over sophisticated	Not recommended
Ball Mill Grinding	Not recommended	Match for majority of products	Perfect match	Perfect match	Perfect match	Not recommended

# Decision-making criteria. Main technological characteristics of process concept.

- Assumption basis: – Capacity: 2 t/h at 20 microns  
– Scope: From ingredients intake to liquid mass storage tanks  
– Cost of electric power: 0.1 EUR/kWh  
– Costs gap cocoa butter or fat to replacing ingredient: 1.5 EUR/kg

## DoMiReCo. Roll-refining and conching.

Top flexibility in terms of taste development, adjustment of flow properties and achievable particle size.

<b>Line capacity range</b>		100 to 6,000 kg/h
<b>End product quality attributes</b>	Fineness	12 to 60 microns
	Flavor profile	Highest impact and top flexibility
	Flow properties	Adjustable across a very wide range
	Metal contamination (FE) / white masses	< 1 ppm
<b>Flexibility in recipe development</b>	Final fat content	> 24%
	Maximum expected product temperatures	45 °C
	White masses (greyish)	No limitation
<b>Operating expenses</b>	Cost of electric power and cooling energy	≈ 26 EUR per ton produced
	Maintenance costs (incl. parts)	≈ 10...15 EUR per ton produced
	Fat savings to achieve uniform flow properties	≈ 1...4% or 15...60 EUR per ton produced
<b>Operating conditions</b>	Required space	≈ 600 m <sup>2</sup>
	Operator skills	Advanced

**Ball mill grinding.** Straightforward process with very low flexibility in terms of flow properties adjustment and taste development.

<b>Line capacity range</b>		100 to 3,000 kg/h
<b>End product quality attributes</b>	Fineness	18 to 40 microns
	Flavor profile	None
	Flow properties	Not influenced by process
	Metal contamination (FE) / white masses	Approximately 1 ppm
<b>Flexibility in recipe development</b>	Final fat content	> 28...30%
	Maximum expected product temperatures	55 °C
	White masses (greyish)	Greyish possible
<b>Operating expenses</b>	Cost of electric power and cooling energy	≈ 13 EUR per ton produced
	Maintenance costs (incl. parts)	≈ 8...12 EUR per ton produced
	Fat savings to achieve uniform flow properties	Benchmark
<b>Operating conditions</b>	Required space	≈ 350 m <sup>2</sup>
	Operator skills	Basic

## DoMiReLi. Roll-refining and liquification.

Top flexibility in terms of achievable particle size, application of low temperatures, aromatization during roll refining.

<b>Line capacity range</b>		100 to 6,000 kg/h
<b>End product quality attributes</b>	Fineness	12 to 60 microns
	Flavor profile	Aromatization only
	Flow properties	Limited adjustability
	Metal contamination (FE) / white masses	< 1 ppm
<b>Flexibility in recipe development</b>	Final fat content	> 24%
	Maximum expected product temperatures	45 °C
	White masses (greyish)	No limitation
<b>Operating expenses</b>	Cost of electric power and cooling energy	≈ 18 EUR per ton produced
	Maintenance costs (incl. parts)	≈ 10...15 EUR per ton produced
	Fat savings to achieve uniform flow properties	≈ 0.5...1% or 8...23 EUR per ton produced
<b>Operating conditions</b>	Required space	≈ 550 m <sup>2</sup>
	Operator skills	Intermediate

**Light Conching and ball mill grinding.** Reasonable flexibility in terms of taste development and flow properties adjustment, limitations regarding minimum fat content and production capacity.

<b>Line capacity range</b>		100 to 300 kg/h
<b>End product quality attributes</b>	Fineness	18 to 40 microns
	Flavor profile	Reasonable impact and flexible
	Flow properties	Reasonable adjustability
	Metal contamination (FE) / white masses	Approximately < 10 ppm
<b>Flexibility in recipe development</b>	Final fat content	> 30...32%
	Maximum expected product temperatures	55 °C
	White masses (greyish)	Greyish possible
<b>Operating expenses</b>	Cost of electric power and cooling energy	≈ 24 EUR per ton produced
	Maintenance costs (incl. parts)	≈ 7...10 EUR per ton produced
	Fat savings to achieve uniform flow properties	≈ 0...1% or 0...15 EUR per ton produced
<b>Operating conditions</b>	Required space	7 x 50 m <sup>2</sup> ≈ 350 m <sup>2</sup>
	Operator skills	Basic

## From small to big, from single machine to full scope. Partner with Bühler according your needs.

Bühler's production solutions deliver success in the chocolate industry – from single machines right through to entire production lines and fully integrated factory concepts. As the leading technology supplier to chocolate manufacturers, we support you as a partner wherever, whenever and for whatever purpose in your projects and throughout the lifecycle of your production facility. Our decades-long undisputed market leadership sustainably proves us as your most capable and most economical long-term partner.



### Reliability as a fact and shown in figures – our installed base proves a partnership based on best value for money.

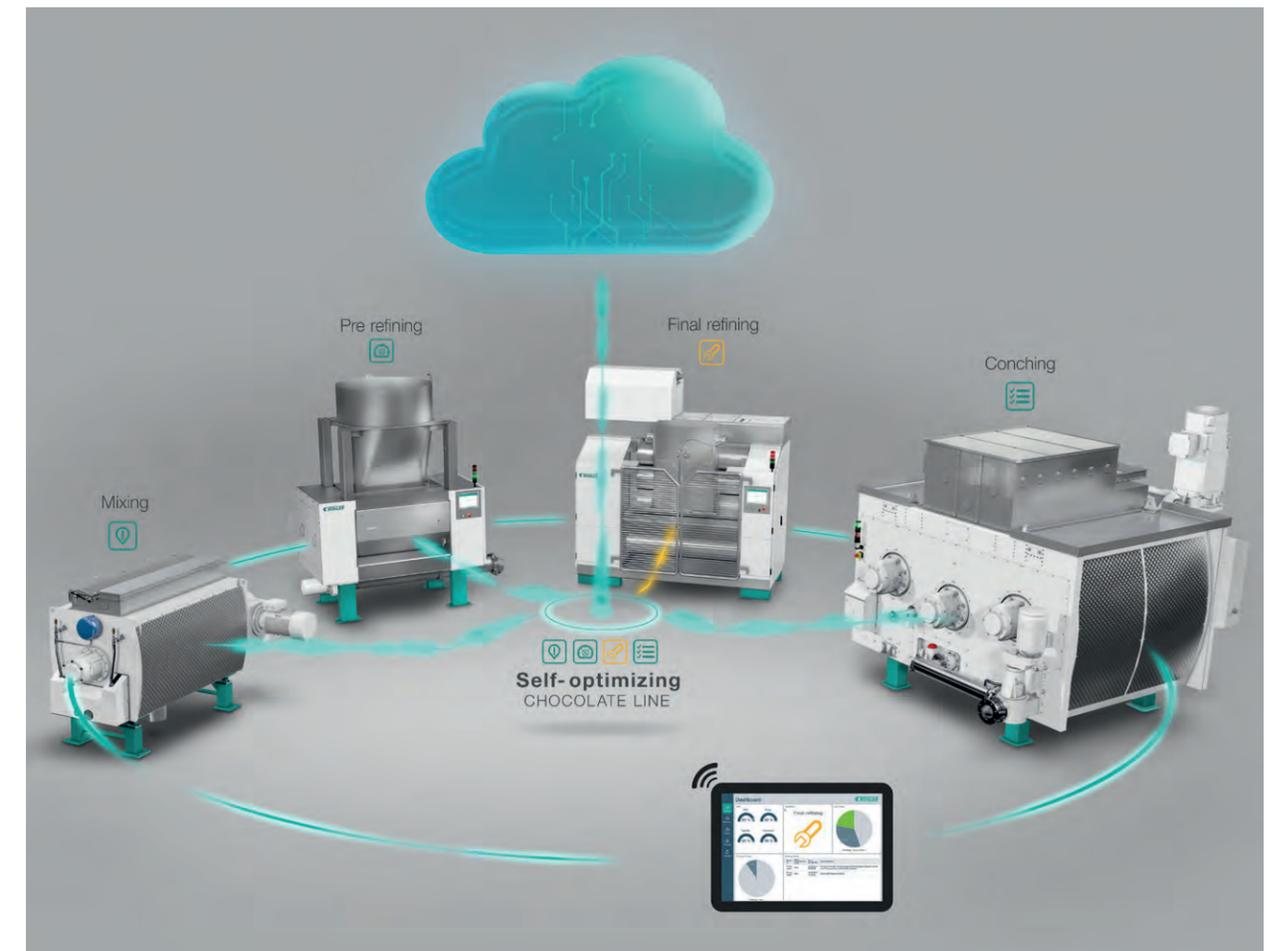


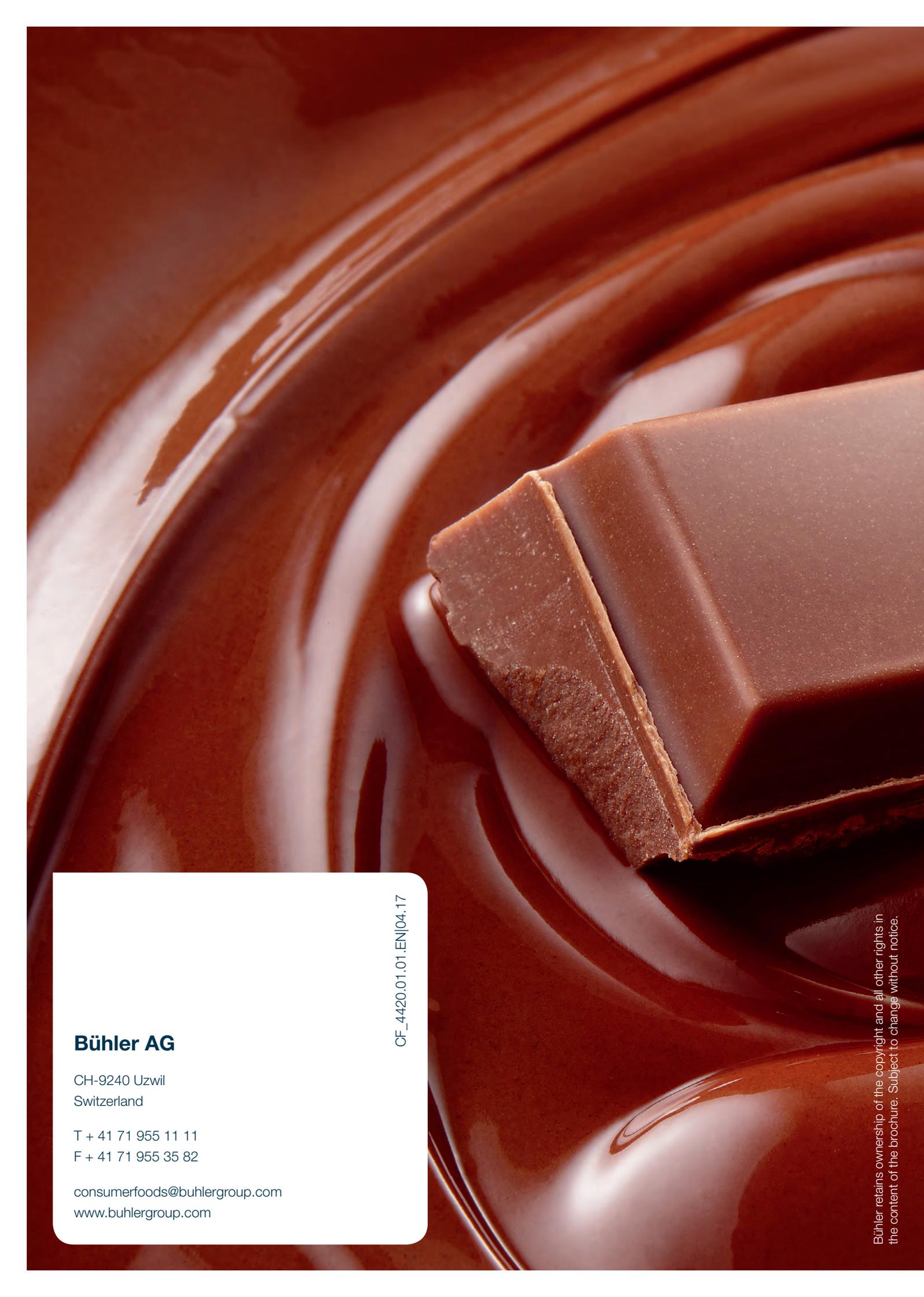
## Digital Services. Self-optimizing chocolate lines – the future in chocolate mass production.

The increasing availability of sensor and actuator systems and rapidly advancing networking technologies make it possible! We are starting to develop the next process generation, which propels quality and throughput to the next level.

High productivity and consistent product quality are important factors for succeeding in the industrial production of chocolate. The increasing availability of sensors, actuators, and IoT technologies are now opening up opportunities for further enhancing production efficiency in this area. Today Bühler can

show, for instance, how the “Smart Chocolate Factory” will change chocolate mass production in the future. The technology leader is ready to supply smarter process monitoring and control for its proven DoMiReCo production line.





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