



**zippe**

right from the start



**Just another  
batch plant?**



**To Zippe it's far more than that. Be it a green field, turn-key plant, the modernization of an existing plant or simply the installation of individual equipment, each project means applying our vast experience, starting with engineering and design. We then employ our expertise in the manufacture with state-of-the-art technology right up to the commissioning by our highly qualified team and the reward of knowing that the customer is satisfied.**

right from the start 3

right from the start

# Hello and welcome

to the world of Zippe Industrieanlagen, an independent family company that has proudly served the international glass industry for over one hundred years.

Right from the start we have dedicated ourselves to the task of designing and manufacturing plants and machinery that help to create optimal melting material for intricate, unique and functional glass products of the highest quality.

Our passion has not diminished one bit and now, in our 4th generation, we continue to set the industry benchmark. Over decades we have seen many changes and improvements in the glass industry, many of which we have contributed to with developments that were ahead of their time.

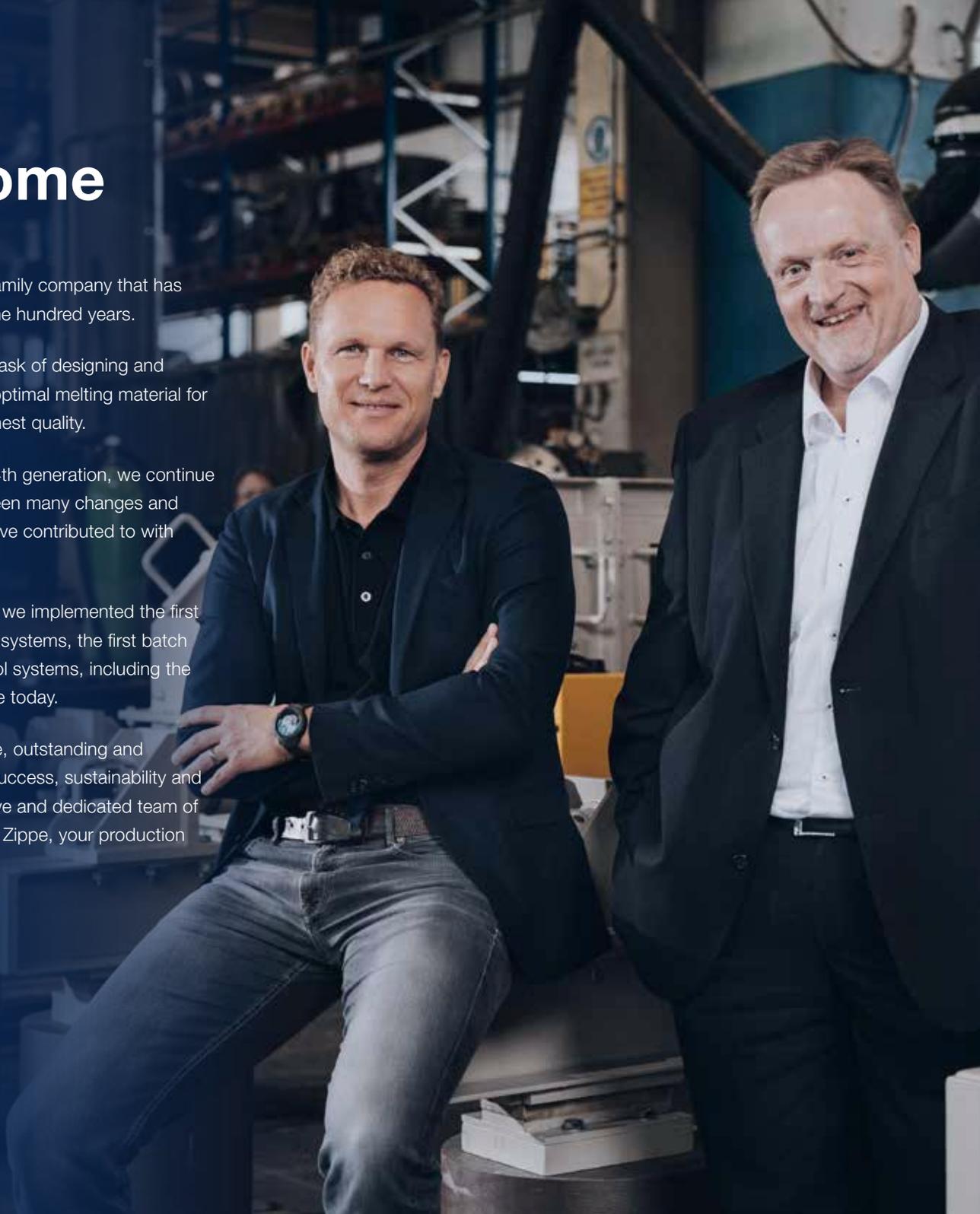
Our first batch chargers revolutionized the glass industry, we implemented the first fully automatic batch plants, the first internal cullet return systems, the first batch preheating systems and the most modern process control systems, including the most advanced plant-wide automation concepts available today.

Our aim, passion and drive continue to provide innovative, outstanding and economically sound solutions, designed to ensure your success, sustainability and productivity. To achieve this, our highly qualified, innovative and dedicated team of experts is always available to you, guaranteeing that with Zippe, your production process is... right from the start!

Yours sincerely,

Dr. Philipp Zippe

Dr. Andreas Emrich



# Experience counts – as do passion and expertise

Our core business is the development and construction of batch and cullet systems. As one of the pioneers in the industry, we are involved in key developments in the glass industry from the outset. Therefore it is not surprising that, around the world, you hear “it’s a Zippe“, our name being synonymous with ground-breaking technology.

Our customers’ objectives are our objectives. We do not rest until we have achieved optimum productivity for you and you are completely satisfied with the outcome achieved. We know the challenges facing glassmakers and make it our mission to help them deal with and master these, for example:

- ✓ **Improving productivity**
- ✓ **Realizing environmental & sustainability objectives**
- ✓ **Improving quality**
- ✓ **Coping with rapid market developments**
- ✓ **Improving safety**

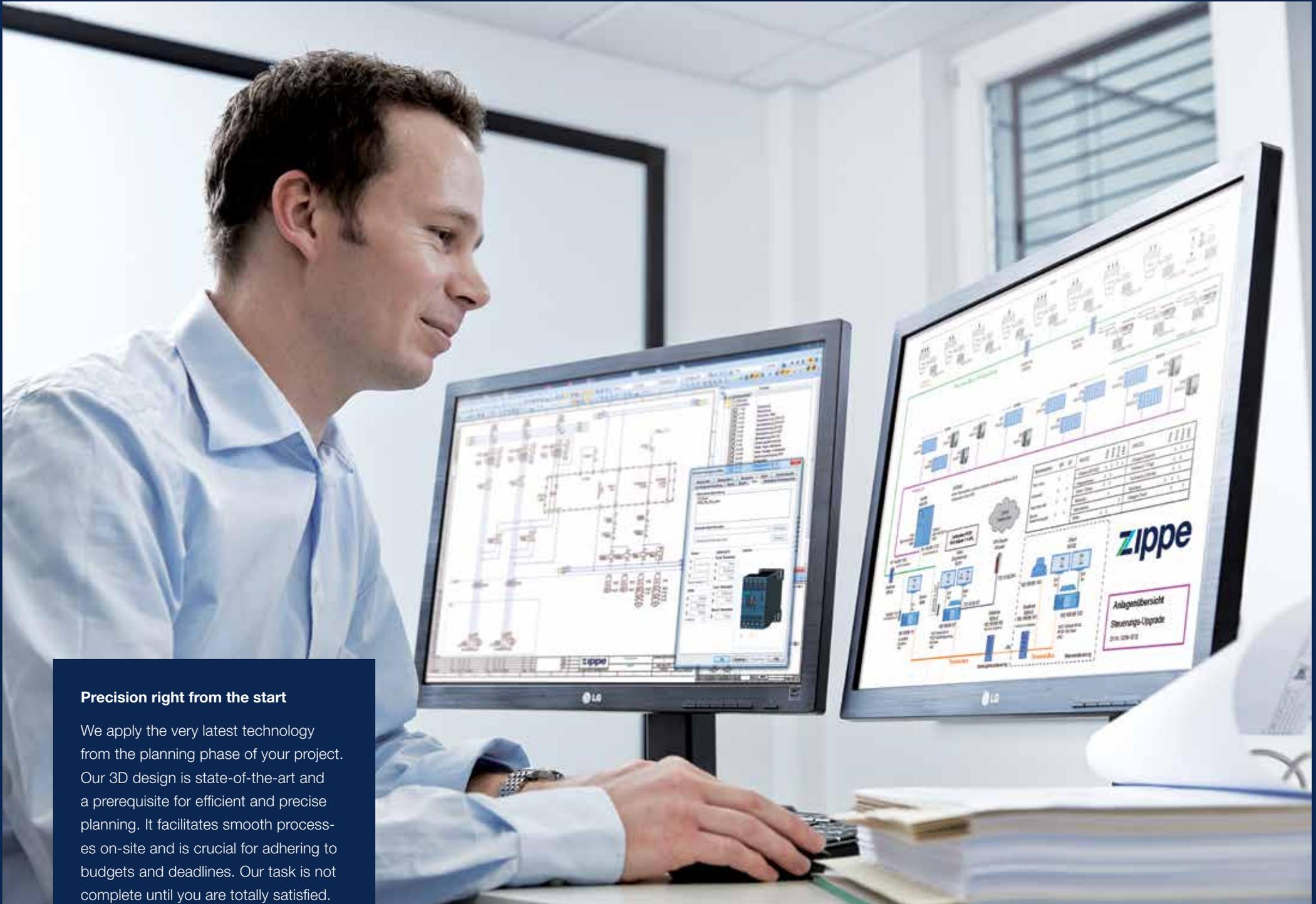


## Truly full, flexible service

Without our revered customers we would have no reason to exist and continue developing cutting-edge products and solutions. Therefore we must always reliably partner our customers and have the expertise and capabilities to deliver projects of any size.

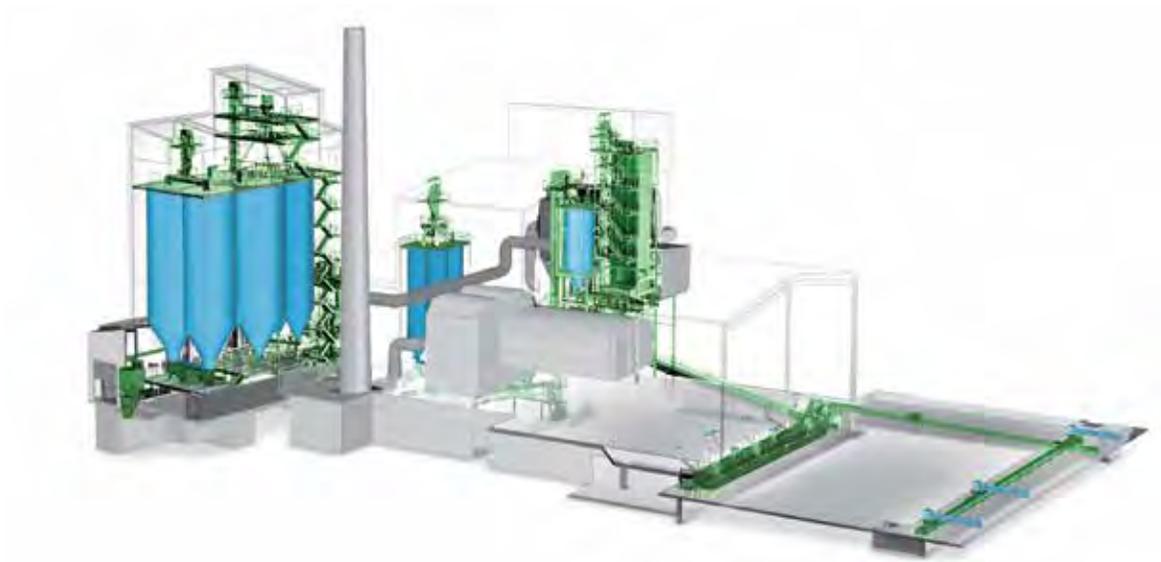
Our flexibility, a trait that all our customers hold in high regard, ensures that we are quickly able to respond to varying requirements and changing trends, creatively and always with a spirit of innovation.

These attributes are but a few that make us a preferred supplier for industry leaders. As one of the few full-service providers in the glass industry, our spectrum covers all service ranges within plant construction, encompassing engineering, planning, design, production, automation technology, installation, site management for all disciplines, commissioning, training for your personnel, and services for ongoing operation, staying true to our motto: “right from the start”.



### Precision right from the start

We apply the very latest technology from the planning phase of your project. Our 3D design is state-of-the-art and a prerequisite for efficient and precise planning. It facilitates smooth processes on-site and is crucial for adhering to budgets and deadlines. Our task is not complete until you are totally satisfied.

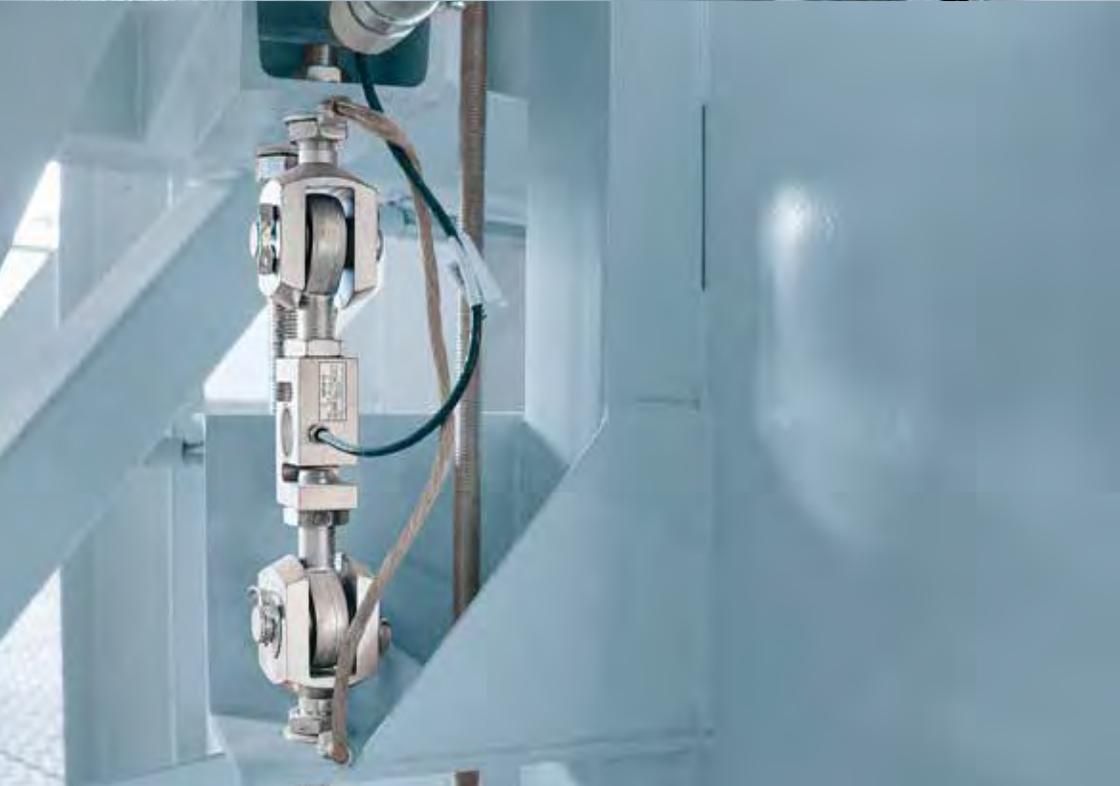


## Individual solutions – right from the start

Whether you have precise technical specifications, or broad glass manufacturing requirements, we immerse ourselves in your world and put forward a proposal for the best possible realization of your project. The general conditions for the construction of a plant, such as raw material availability and climatic conditions vary across the globe. These and a multitude of other factors are taken into account in planning and providing you with the best solution. With the successful completion of over 650 batch plant projects, we have vast experience across all aspects in our sector of the glass industry and ensure that you receive the best possible system to meet your needs.

Amongst the many facets of engineering that we can offer are:

- Feasibility studies**
- Plant optimization**
- Plant checks**
- Project management**





## Good batch: good glass

It's that simple. But getting the batch to be good is where our expertise comes into play.

Zippe batch plants ensure that the batch for every glass type is fed into the furnace fully automatically: the required amount with the exact consistency and homogeneity needed, at the right time, 24 hours a day, every day.

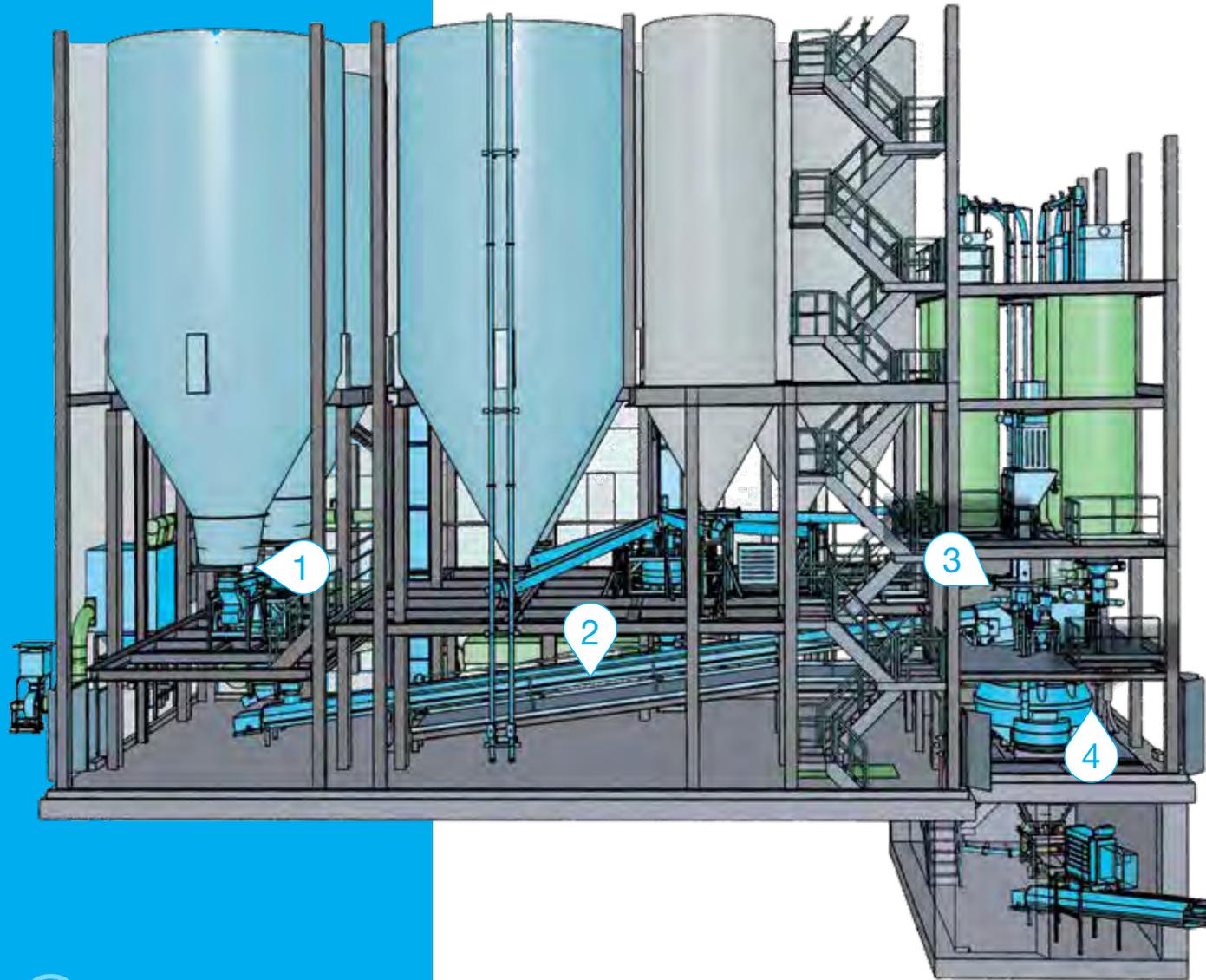
### **Your system, exactly to size, no matter what size.**

Innovative and solution-oriented, our team of experts ensures smooth and on-schedule realization of every project from single machines to turnkey solutions. Leading global companies place their trust in our professionalism and experience because we channel all our energy and effort into continuous development, innovation and safety. Our unflinching endeavors are what make Zippe a preferred partner for all our customers and the key to your efficient glass production.

batch plants



# Inline Plants – flexible, for medium to large volumes

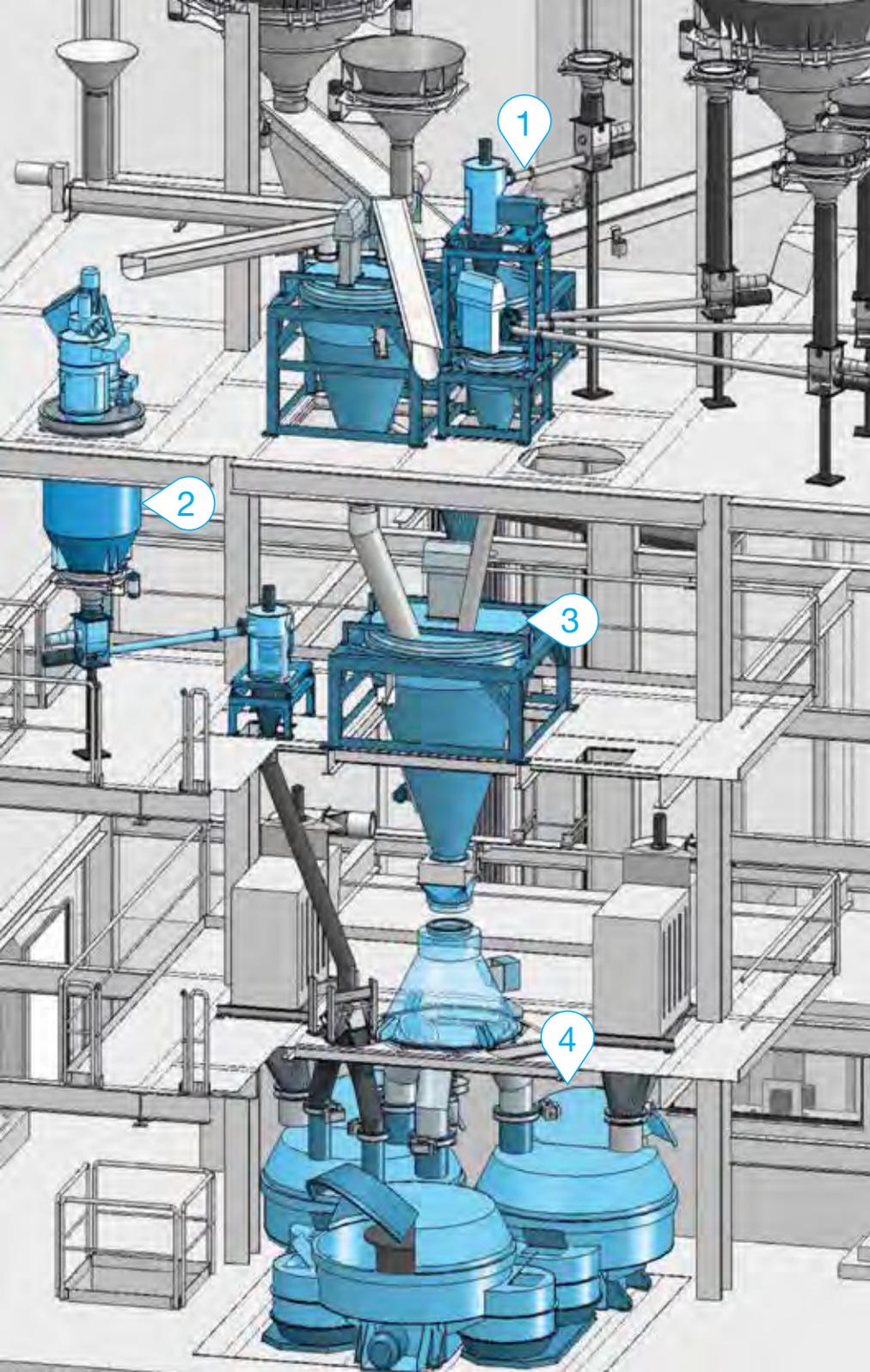


In inline plants, the silos are arranged next to each other in a row. These plants are ideal for medium to large outputs (150 to 1,200t per day), and are used when various raw materials, silos and formulations are required.

The more silos are needed, the more scales are required. In an inline plant these can be arranged more flexibly. All scales empty out onto a collecting belt conveyor which transports the weighed raw materials to the mixer. Inline plants can also be equipped with several mixers.

This enables supplying several furnaces with batch, e.g. for different glass colors. The advantage of inline plants, however, is their flexibility. These plants can subsequently be expanded with additional silos and scales in order to, for example, increase production or to produce additional types of glass.

- 1 Dosing and weighing
- 2 Collecting belt conveyor
- 3 Small components (premix)
- 4 Mixing



## Tower Plants – compact for small to medium volumes

Tower plants are designed for small to medium capacities (10 to 450 t per day). They are normally equipped with one, but can also be equipped with multiple mixers and can supply several melting furnaces. The silos and the raw material scales are arranged above the mixer and empty directly into it by gravity.

The difference to the inline plant is the lack of a collecting belt conveyor, which is advantageous in terms of minimizing dust development. Due to the lower output, tower plants can be designed very compactly and therefore only require a relatively small area.

- 1 Dosing and weighing
- 2 Small components (premix)
- 3 Check scale
- 4 Mixing

*Plant with concrete silos*



*Plant with steel silos*



## Concrete or Steel Silos

Most batch plants are designed with steel silos. This allows for greater flexibility. For example, additional steel silos can be planned into the plant right from the start and can be cost-effectively retrofitted at a later stage. Concrete silos, on the other hand, are often used where there is a need for very high furnace capacity (over 800 t per day) and high silo storage.

Whether a plant is designed as a concrete or steel structure depends on the installation site, since country-specific regulations regarding, for example, earthquakes or weather conditions, must be taken into account.

Steel silo plant during the installation phase



**No matter what kind of glass you produce, with Zippe you're right from the start.**

## Container Glass

The term "container glass" includes the most commonly produced glass products today, e.g. drinking bottles of all types or preserving and packaging glass. On average, anywhere between 50 - 90% of post-consumer glass is used during production. The majority of container glass is made from soda-lime glass.



### Characteristics of container glass

The color of glass is often changed (flint, green, amber) to enable flexible production. Plants must be able to fulfill all color spectrums.

- Higher ratio of cullet, up to 90%
- Cullet handling plays an important role
- Higher wear protection very important (because of the higher ratio of cullet)

## Continuous Flexibility

### The Zippe dosing belt conveyor

When dosing continuous streams of bulk material, flexibility is a necessity. This requirement is reliably met with a high level of accuracy, by the Zippe dosing belt conveyor, across the threshold range. Dosing belt conveyors can be used practically everywhere, especially in the container glass industry. They are characterized by their compact size. Zippe has its own dosing belt conveyor system.

Conveying capacity: 10 - 80 t/h

Length of the dosing belt conveyor:

2,000 - 4,000 mm



## Float Glass

Any glass in flat form is described as float glass, regardless of the manufacturing process. The most common manufacturing process for flat glass is the float glass process. However, float glass can also be produced as pattern glass. Float glass products are primarily used for windows or architectural glass during construction.

Other areas of use include automotive glass, mirrors, solar glass for photovoltaic and solar thermal energy. For most of these applications, the glass produced is subjected to additional processing in order to adapt it to the corresponding conditions where it will be used.



### Characteristics of float glass

- Plants produce considerably more output than container glass production
- Lower (external) ratio of cullet
- First Zippe float glass plant in 1984
- The furnaces do not require such frequent color changes

## Special Glass

Typically, special glass includes display glass for computer screens, televisions and smartphones (TFT, LCD) and must meet very specific requirements. This requires scientific studies, which only very few manufacturers conduct. The results of these studies are special glasses with high chemical and thermal resistance as well as glasses with various special optical or electrochemical properties. These glasses are used in, for example, industries such as chemicals, pharmaceuticals, electrical engineering, electronics, apparatus engineering and optics.



### Characteristics of special glass

- Many small components
- High accuracy required when weighing
- Extensive expertise needed when handling raw materials
- “Low iron” partially required
- Special glass is characterized by its properties, such as its high optical purity and homogeneity, chemical resistance, or temperature change resistance

## Fiber Glass

Fiber glass consists of long, thin fibers. During production, thin fibers are pulled from a glass melt and further processed into any number of end products. Fiber glass is used, for example, for cables to transmit data and flexibly transmit light, for instance laser beams. As roving or as a textile fiber, they are used in heat and sound insulation as well as in plastics reinforcement.

Fiber glass products are resistant to ageing, weathering and chemicals and are fire-proof. Their high elasticity makes these products ideal for improving the mechanical properties of plastics. In addition, their ability to transmit light is used in various technical applications. Fiber glass is almost always produced by means of the nozzle drawing process.



### Characteristics of fiber glass

- Predominantly light and very dry raw materials require certain characteristics in the batch plant regarding
- Design (tower plant)
  - Transportation (pneumatic)
  - Mixing process (pneumatic blender)



*Lifting a new belt bridge including belt conveyors into position ...*



*... for the cullet transport to 4 furnaces during plant operation*

*Integration of a new additional mixer and transfer section*



*Integration of an additional small component weighing system*



# Ensure that your plant is always up to speed

To increase the productivity of your plant or reduce costs, modernization of a plant can be a sensible and viable alternative to a completely new investment.

First we ascertain what it is you require and then highlight all the issues, such as your infrastructure, economical requirements, the technology to be deployed, deadlines and costs in detailed discussions. This is followed by our specialists taking a close look at your plant after which they propose a concept tailored to your specific needs. Important issues such as operational reliability are also taken into consideration. Also modern remote maintenance solutions guarantee maximum safety.

Our experience means that we are able to leverage strategies that will minimize the effective downtimes of your plant, or even avoid them altogether. Our services in all aspects of system modernization and expansion enable us to assist you in optimizing your batch plant and bring it in line with the latest technologies available.

**GOOD TO KNOW** - our specialists also carry out modernization of systems that were not necessarily “Made by Zippe”.

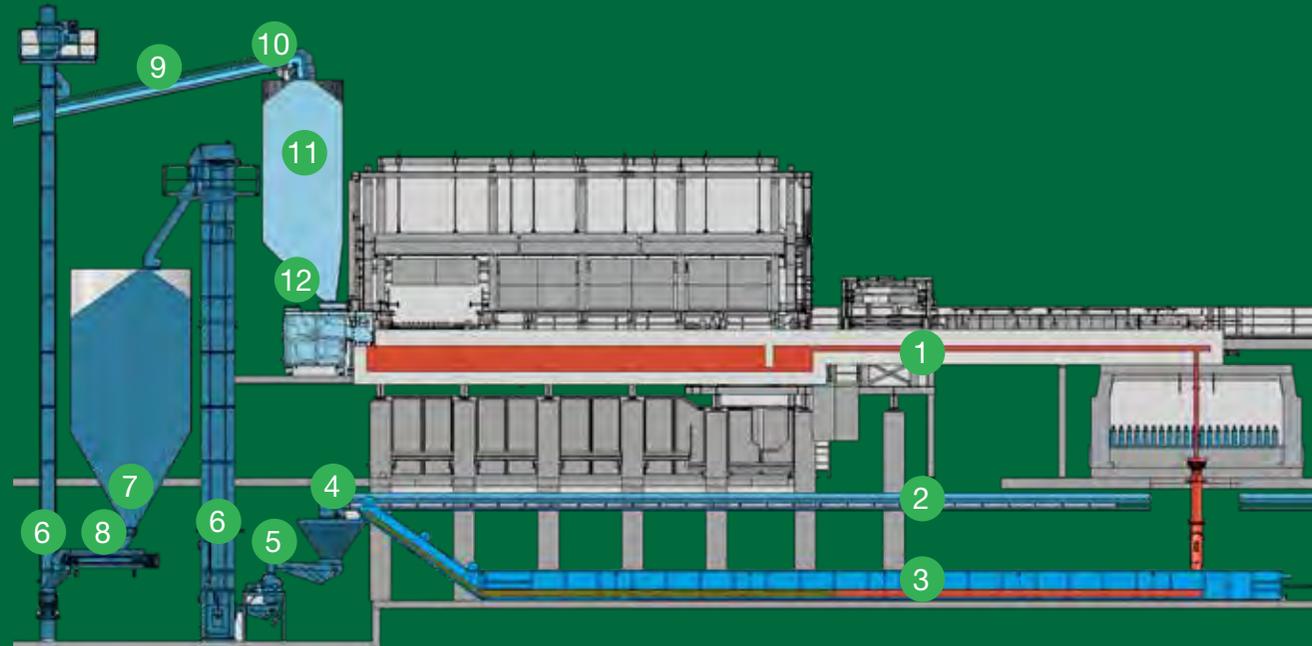


batch plant  
modernization  
17

## Sustainability is part of our range

Zippe offers a range of equipment and technology geared to maximize the usage of raw materials, avoid wastage, while saving you energy and minimizing energy costs.

- |   |                   |   |                |    |                                 |
|---|-------------------|---|----------------|----|---------------------------------|
| 1 | Hot glass         | 5 | Cullet crusher | 9  | Batch and cullet conveying belt |
| 2 | Cold glass        | 6 | Elevators      | 10 | Lifting magnet                  |
| 3 | Scraping conveyor | 7 | Cullet silo    | 11 | Furnace silo                    |
| 4 | Cullet hopper     | 8 | Belt scale     | 12 | Batch charger                   |





## Scraping Conveyors

Glass production always generates a certain amount of glass waste. Scraping conveyors are used to deliver the still hot glass drops or threads back into production. These scraping conveyors are positioned under the molding machine and guarantee hot glass recycling around the clock, 24/7 production with minimum deployment of personnel.

Our scraping conveyors are exactly aligned to the requirements of our customers. Their length and design are based on the drop points of the hot glass waste. There is no escaping the fact that scraping conveyors are the foundation for all automatic factory cullet processing plants.

### Exactly what you need:

- Scraper tank in standard steel or stainless-steel design
- Scraper length and tank width in variable design
- Scraping conveyor with or without double bottom

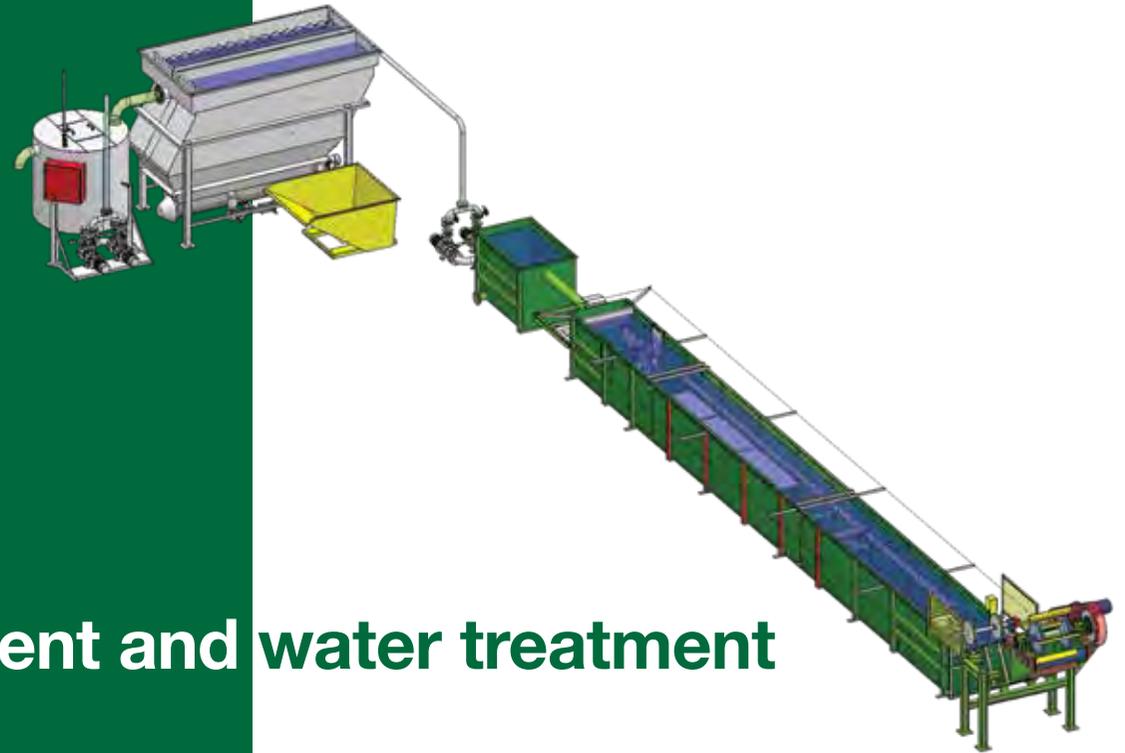
### The features at a glance:

- Low wear due to high quality materials
- Simple installation
- Service and maintenance friendly
- Conveying speed adjustable by Zippe control system
- In-house production at our plant in Wertheim



### Falling tubes

Falling tubes convey the arising hot glass into the scraping conveyor. They can be manually or automatically adjustable, in a fixed execution and/or with vibrating drive.



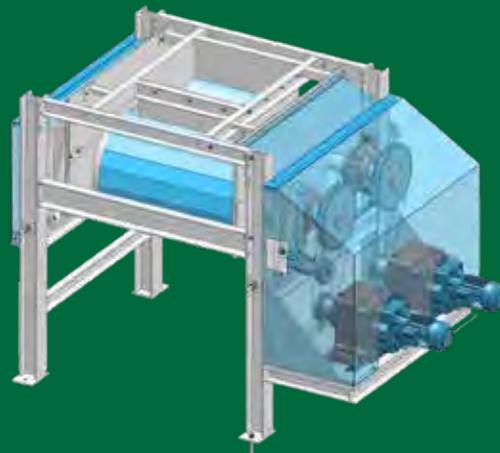
# Scraping Conveyor equipment and water treatment

### Gob mangle roller

Very large, heavy hot glass gobs (hot gobs) are rolled out over two rollers to a predetermined glass thickness by means of this roller.

Hereby the glass gobs attain an essentially larger surface and cool down more rapidly. The required distance for cooling and granulating the hot glass in the scraping conveyor is significantly reduced.

Both squeezing rollers submerge into the scraping conveyor's cooling water whereby the separate cooling of the squeezing rollers is not required.



Fundamentally, all solids which form a sediment over time can be easily and economically separated with the lamella separator. Depending on the density, these are generally solids with a diameter larger than 50 µm.

To separate smaller particles such as impurities, flocculation agents are implemented in order to produce settleable flocs.

### Zippe scraper water treatment

- reduces fresh water and waste water costs
- separates disposal of oil and glass mud
- affords environmental protection due to less waste water

# Intelligent scraping with the ZMART® Scraper Control

At Zippe, we continuously improve our products to ensure that our machines are state-of-the-art.

Two areas of particular concern to glassmakers are reducing wear and minimizing the portion of fine material in scraping conveyors. For this reason Zippe developed the innovative ZMART® Scraper Control System.

Depending on the gob weight and quantity of gobs or hot bottles, this advanced control system module decides whether and at which speed the scraping conveyor operates.

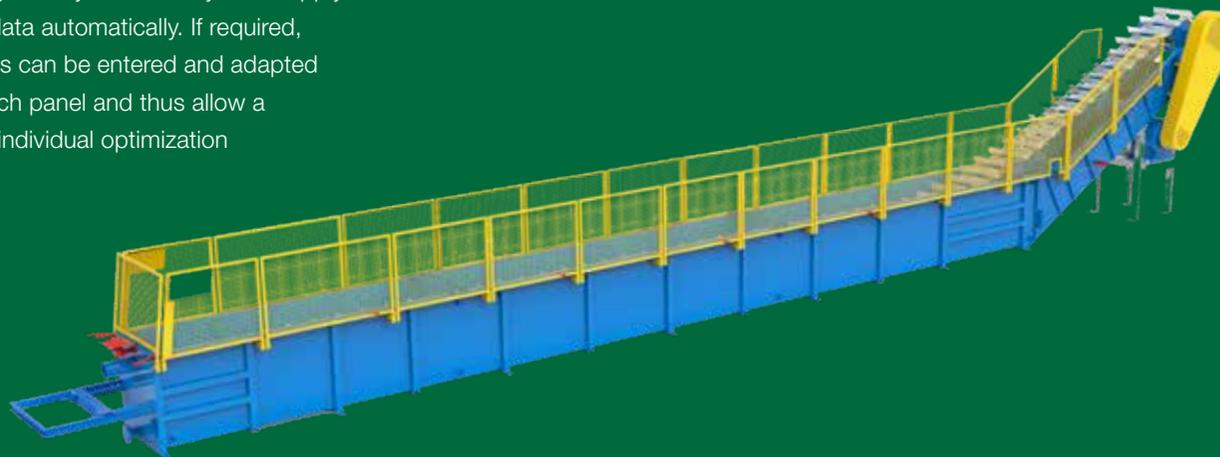
Furthermore, the required operating time is calculated individually and minimized. Standardized interfaces between the IS machines and the scraping conveyor control system supply the production data automatically. If required, these parameters can be entered and adapted manually via touch panel and thus allow a continuous and individual optimization of the process.

In this way high operational flexibility is achieved, the operation time is reduced to a minimum and, above all, this cost-saving alternative is permanently available.

The ZMART® Scraper Control System has already been successfully commissioned and is fully functional.

#### The benefits at a glance:

- reduction of wear, extending the lifespan
- minimization of fine cullet portion
- lower maintenance
- considerably lower energy consumption
- cost saving and CO<sub>2</sub> reduction



factory cullet recycling

## Crushers – custom made

### Zippe BRV hammer crusher

The BRV crusher for crushing container glass, tableware and float glass is robust and reliable and is therefore ideally suited to the harsh operational conditions in a glass plant.

The impact hammers and impact plates are made of high-quality electric steel casting which has proven to be excellent for crushing glass.

The material abrasion is so minimal that it has no effect on highly sensitive glass. The crusher casing is easily opened to quickly replace impact hammers and impact plates.

It is driven by a V-belt drive with a three-phase motor.



#### The features at a glance:

- Long lifespan
- Adjustable grain sizes
- Simple installation
- Service and maintenance friendly
- Low-vibration, therefore no complex foundations required
- Manufactured in-house

Performance	BRV 30	BRV 50	BRV 70	BRV 100	BRV 101
Capacity approx. (t/h)	0.5 - 3	3 - 8	8 - 18	18 - 30	18 - 30
Weight approx. (kg)	700	1,000	1,300	1,600	1,900
Drivers capacity (kw)	2.2	3	5.5	7.5 - 11	18.5 - 30
Hammers (quantity)	10 / 20	18 / 36	26 / 52	38 / 76	38 / 76
Discharge opening (mm)	300 x 300	300 x 500	300 x 700	300 x 1,000	300 x 1,000

The indicated capacity data are average values for container glass. Performance depends on rotor speed, glass type and thickness, type of feeding, crushing degree etc.

# Crushers for float glass

During the production of float glass, waste, in the form of glass plates and border stripes (edges), continuously accumulates in the cutting line area. This waste must be disposed of automatically without disrupting the glass production process. We have developed special Zippe crushers for various crushing requirements.

**Lowerable emergency plate crushers** have extractable crushing tools and are placed above the roller conveyor over the glass ribbon. In the event of malfunctions on the cutting line, etc., the entire production must be disposed of for a short time. The continuously fed glass is crushed and the cullet transferred to the basement area.



**Inline plate crushers** are installed underneath the roller track. Defective plates are automatically conveyed out of the production line and transferred into a plate crusher by means of a diverter.



Edges, created by cutting the plates, are fed to the **edge crusher** by means of a cullet hopper. If no sufficient cellar or cullet canal exist, an edge crusher can be placed on both the left and the right side of the production line.



For further processing, the pre-crushed pieces of float glass are flexibly and reliably crushed to the grain size required for the melting process by the **BRV hammer impact crusher**.

## Post-consumer glass recycling – Zippe has the technology

Recycling gains more and more in importance. What was already the norm in industrial countries a long time ago, is now on the agenda in almost all countries around the world. However, there are still big differences in the quality of the collection systems. In some countries the raw material glass is collected and sorted according to color; sometimes, however, it is collected completely mixed. The proportions of foreign substances (metals, ceramics, waste in general, etc.) also differ from country to country.

Initially, all this information as well as the required capacity of the plant are discussed by Zippe and the customer to design a recycling plant according to exact customer needs.

Post-consumer glass recycling plants typically comprise conveying, crushing, screening, and sorting technology (for example CSP, all-metal separation, color sorting). Zippe designs, supplies, and builds complete post-consumer glass recycling plants, including the automation systems that regulate all processes.



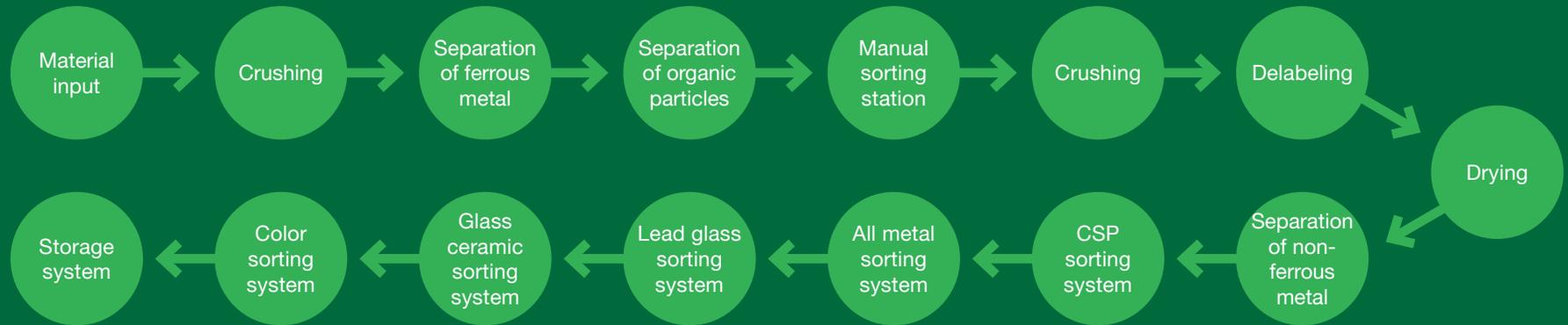
## Your possibilities

The customer can decide whether “only” the basic engineering, the equipment, the assembly supervision and the commissioning is done by Zippe or whether services such as steel construction, on-site assembly or training are required.

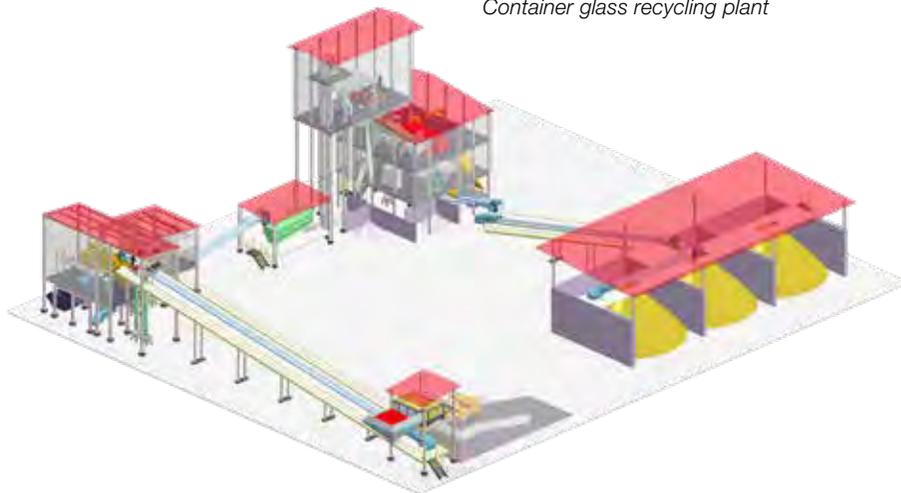
No matter which, Zippe can design, construct and offer the optimal system backed by extensive experience and expertise – worldwide!



## Our technology



*Container glass recycling plant*



*Flat glass recycling plant*





## Always ahead: Zippe puts the control of your plant in the palm of your hand

Zippe batch plants are equipped with the latest control systems on the market with numerous practical functions so that every system can be specifically tailored to the requirements of our customers. If required, entire plants can now be monitored and controlled from mobile devices such as tablet PCs or a smartphone, with innovative user interfaces.



# Zippe automation technology – as individual as your system

Applying state-of-the-art control technology plays a key role in the optimal operation of a batch plant and is responsible for the efficient, reliable and reproducible operation of the system. This is why we attach great importance to the development of powerful software and hardware systems. Our next generation automation and control systems make Zippe one of the few companies able to carry out complete control development and realization in-house. In this way we are able to guarantee our customers tailor-made and flexible solutions and provide the fast, effective support they have come to expect.

Our 24-hour support service means that an expert can be reached by phone or email around the clock. Once a secure connection has been established, the Zippe engineer is granted online access to the control system and can then provide remote assistance in the fastest possible way.



# control & automation

## Conceptual design, development, integration

Our spectrum of services ranges from the development of new systems for batch plants through the modernization of existing plants to the development of special dosing and weighing controls, including corresponding weighing computers and weighing indicators.

To achieve this, we work very closely with the most important component suppliers such as Siemens, Schneider and Rockwell, enabling us to offer the latest developments in all our control systems in record time. But, “right from the start” means that we are only satisfied when there is a seamless integration of the required systems into your overall production process.

## Offering you all the right solutions:

- 1 Project coordination
- 2 Electrical / hardware design
- 3 Software development
- 4 Switch cabinet construction
- 5 Installation and commissioning
- 6 After-sales-service

# batch charging

For Zippe, everything started with the construction of batch chargers for the glass industry. We have not deviated from this path and continue to manufacture state-of-the-art batch chargers to this day and will continue doing so in future. Our vast experience, unfailing production quality and ongoing innovations are reflected in the many features of our machines.

No matter what type of glass or furnace, glass manufacturers around the globe value Zippe batch chargers due to their reliability and efficient furnace feeding.

## Precision engineering right from the start

Zippe batch chargers are characterized by high reliability and efficiency. They ensure an exact, continuous, and dust-free material flow into the melting furnace. We are always in close contact with our customers and constantly refine our batch chargers according to the requirements and wishes of the glass industry.

# Good vibrations with the Vibrotube®

## Reducing emissions and energy consumption right from the start

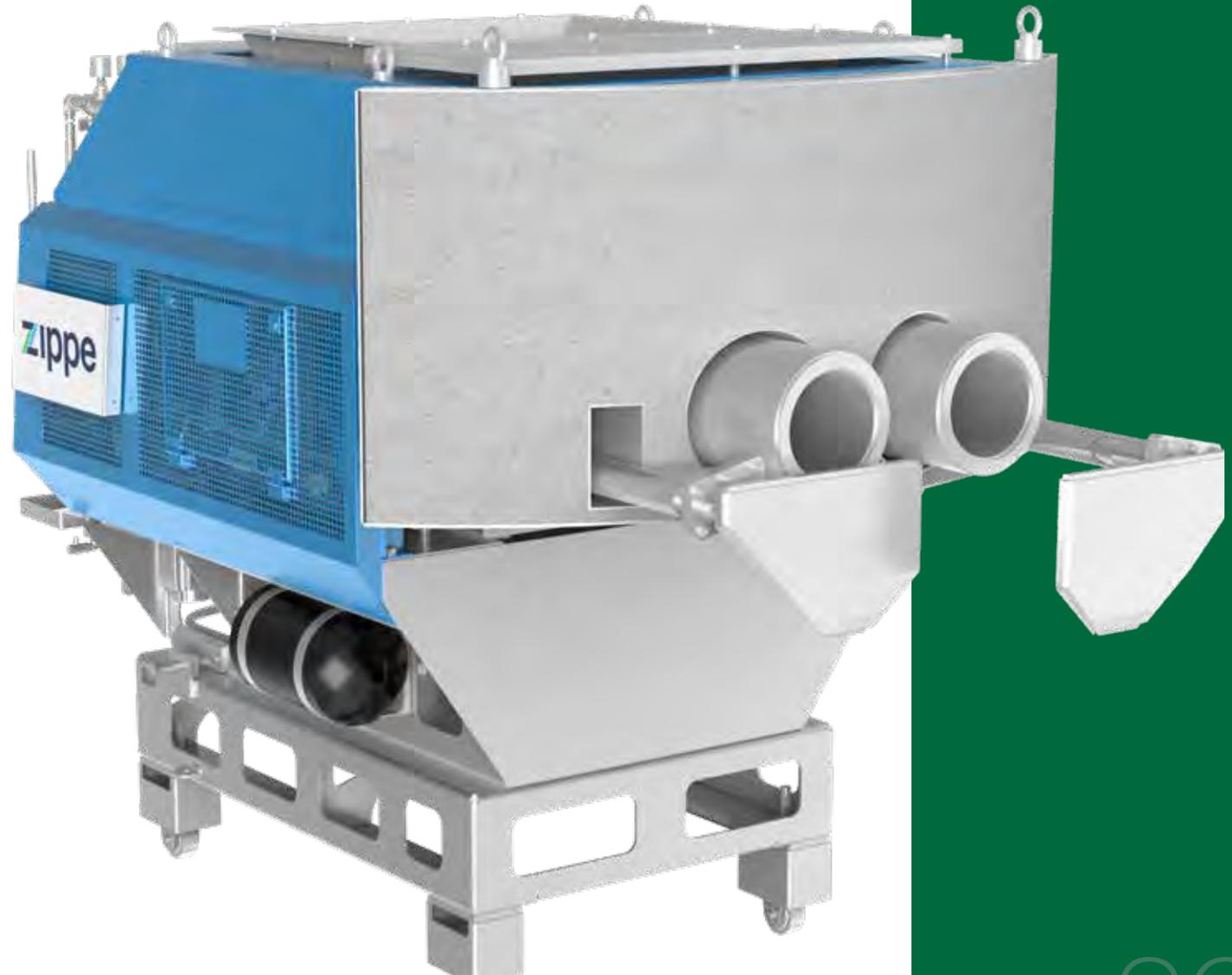
The Zippe Vibrotube®, considered the most advanced and efficient charger on the market, uses a completely closed doghouse leading to considerably lower wear compared to alternative systems. Due to the closed doghouse and the optimized charging pattern, valuable melting energy is saved.

### The features at a glance:

- Complete sealing of the doghouse
- Reduction of wear
- Perfectly adjustable to production conditions
- Energy savings due to optimized charging pattern

### Technical data:

Conveying capacity	50 - 500 t / 24h
Machine width	1940 mm
Doghouse depth min.	600 mm
Adjustable swivel angle	± 4 °
Stroke	up to 280 mm
Connection control cabinet	32 A
Water connections	2 x 1½"
Total water consumption per water cycle	10 - 15 l / min
Pusher width	140 - 340 mm



## Tested time and again – the sophisticated, “indestructible” EVP Batch Charger

At Zippe, we pride ourselves on finding the best ways to improve your productivity and profitability. Our EVP batch charger is considered to be among the most efficient and most reliable batch chargers on the market and can be applied for all container glass doghouse types.

The special construction of the EVP charger and the use of a heat protection shield means that charging at relatively small doghouse openings is possible while at the same time sealing the doghouse and reducing possible heat loss. Additionally, the capacity of the batch charger can be continuously or discontinuously regulated by a command signal of the glass level measuring system.

By dividing the batch into small portions by means of the pusher, a bigger contact surface and hereby faster melting is possible.

Due to a very large outlet opening, the amount of cullet can add up to 100% without leading to blockages. EVP batch chargers are situated in front of the melting furnace which makes all areas easily accessible. For maintenance work, such as the exchange of the pusher, the batch charger can easily be pulled away from the furnace, massively reducing production downtimes and maintenance costs.

The Zippe EVP batch chargers rank among the most straightforward and reliable batch chargers on the market.



## The ECD, a class of its own

This batch charger makes it possible to charge batch onto the melting surface while avoiding fall height and dust generation.

The swivelling of the pusher allows a targeted directional control of the material flow and thus ensures the even distribution of the batch onto the melting surface. The design of the batch charger allows the doghouse to be sealed, thus saving energy.

### Technical data

Type	Approx. charging capacity t / 24 h	Connected load kW	Size of gate mm
ECD 20	40 - 80	1.1	80 / 100 x 250
ECD 30	40 - 160	1.1	80 / 100 x 350
ECD 40	120 - 240	1.1	80 / 100 x 450
ECD 50	200 - 340	1.1	80 / 100 x 550
ECD 60	280 - 500	1.1	80 / 100 x 650

\* depending on input temperature

### Design

The batch charger consists of a feeding hopper with a heat protection shield, a water-cooled pusher, a swivel device and a supporting plate.

### Function

The batch flows from an intermediate hopper into the doghouse and is pushed into the glass melting furnace by means of a pusher driven by a frequency-controlled geared motor.

The charging capacity is automatically determined by the glass level measuring system by changing the motor speed.

The intermediate hopper and pusher are mounted on a swivel unit which can be swivelled by 35° / 44° by means of an electrically operated cylinder, guaranteeing optimal batch charging. Depending on customer requirements, 3 or 5 swivel positions can be selected.

A stationary version is also available. The stroke length of the pusher can be adjusted manually.

Approx. cooling water consumption l / min

Approx. weight kg

20 - 30\*

880

20 - 30\*

950

30 - 40\*

1,020

30 - 40\*

1,070

30 - 40\*

1,120



## The Cold-Top Charger – true high-tech for electric furnaces

The batch is transported from an intermediate silo into the feeding hopper of the batch charger and then fed into the furnace via a vibrating chute driven by an air piston vibrator. The vibrating chute can be replaced by a conveyor belt for specific applications. Besides rectangular furnaces, hexagonal furnaces can also be fed.

The charger moves both from left to right and from front to back during the charging process. The charging rate is optimally adjusted by a glass level measuring system to meet the furnace conditions.

Each cold-top charger is designed to meet the customer's individual requirements and is thoroughly evaluated and tested.



batch charging

# batch charging

## The float glass chargers: robust and efficient – no matter what size

The use of several machines in one doghouse allows the stream of glass batch to be directed both in terms of direction and volume, thus reaching an optimum charging of the glass surface.

Zippe float glass chargers can be configured for all doghouse widths.

Depending on the existing height, the filling volume of the furnace silo can be freely selected.

Each machine can be quickly retracted in case of emergency. The time required by trained personnel is only approximately 20 minutes.

The speed of the charging chute is individually adjustable.

The standard chute is air-cooled. On request a water-cooled version can be supplied.

Delivery and installation of dust covers is available upon request. Depending on the requirements, these can be pulled out at each site (two-part). An automatic central lubrication system can also be integrated on request.



## A specialist: the Zippe Screw Charger

Screw chargers are suitable for charging all types of furnaces, whereby a doghouse is not required. Several batch chargers are arranged parallel or opposite each other in case of large furnaces or high furnace outputs.

A particular advantage is that the furnace is completely sealed on the side of the charger, which is a prerequisite for oxy-fuelled furnaces. It is also advantageous for conventionally heated furnaces due to energy saving, prevention of dust and constant furnace pressure.

### Capacity:

Type	SF 150	1 t / h
Type	SF 200	2 t / h
Type	SF 250	3 t / h
Type	SF 300	4,5 t / h

Further data on request.

Highly advanced measurement systems ensure exact and reliable determination of the glass level in the furnace during the melting operation. If the glass level sinks below a specified level, a signal is automatically relayed to the batch charger that then feeds new molten material into the furnace.

## Exact measuring – it's all in the details

### BZ 24 Mechanical Glass Level Measuring System for Container Glass Furnaces

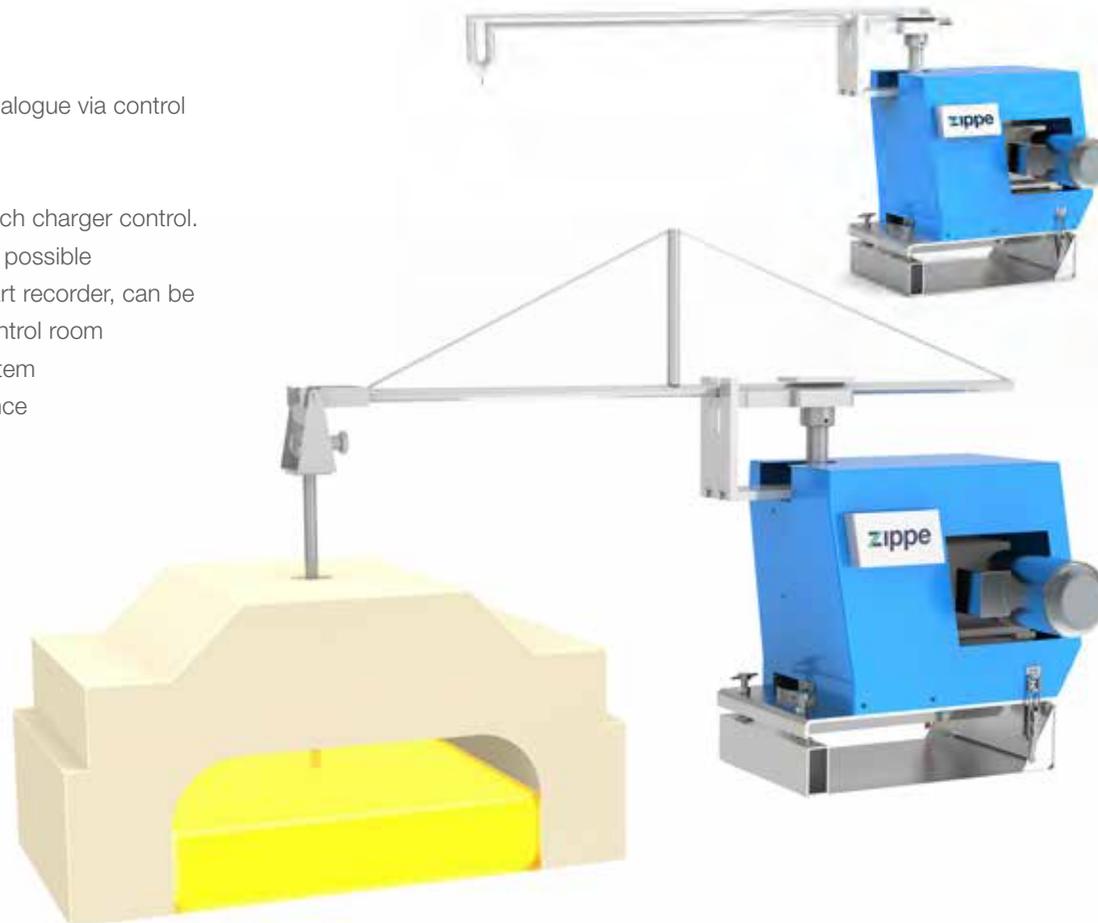
The glass level measuring system is available in two versions: firstly the BZ 24 S/H, with a water-cooled electrode, for installation directly at the furnace, for measuring through the side wall, and secondly the BZ 24 S/V, with a ceramic electrode, for installation at the feeder, for measuring through the feeder.

#### The features at a glance:

- Fully digital processing of measured values
- Parameterization of the measuring system in dialogue via control unit or web interface
- Text display of measuring status
- Integrated proportional regulator usable for batch charger control. Optional bus connection to higher level control possible
- The control and display unit, as well as the chart recorder, can be mounted in a control cabinet of the furnace control room independently of the glass level measuring system
- Reliable mechanical equipment, low maintenance

#### Technical data:

Measuring range	± 5 mm of calibrated glass level height
Angle of declination	7° - 30°
Projection distance	3 - 20 m
Measuring accuracy	± 0.01 mm
Light source	halogen lamp 24 V / 150



glass level  
measuring

**A 400 t/d batch  
preheater with  
a cullet ratio of  
40 - 60%**



# Sustainability right from the start

Rising energy costs mean production processes in glass production must be made as efficient as possible. One way to save costs is to use the waste gases from the melting process to preheat the batch and cullet. This enables a reduction in the melting energy requirement between 10 and 15%.

Simultaneously, CO<sub>2</sub> emissions can be reduced considerably and the capacity of production increased. A batch preheater can be planned as an integrated element of batch processing, but also as a retrofit later. As a pioneer of this technology, Zippe continues to refine its capabilities to offer you the most advanced systems that are also right for the environment.

## Container Glass Regenerative Green, 84% Cullet, 3.62 Gj/To:

The graph shows an energy balance of a state-of-the-art, efficient container glass furnace. Still, about 30% of the total energy input is usually lost through the stack. Batch and cullet preheating can regain the major part of that loss.

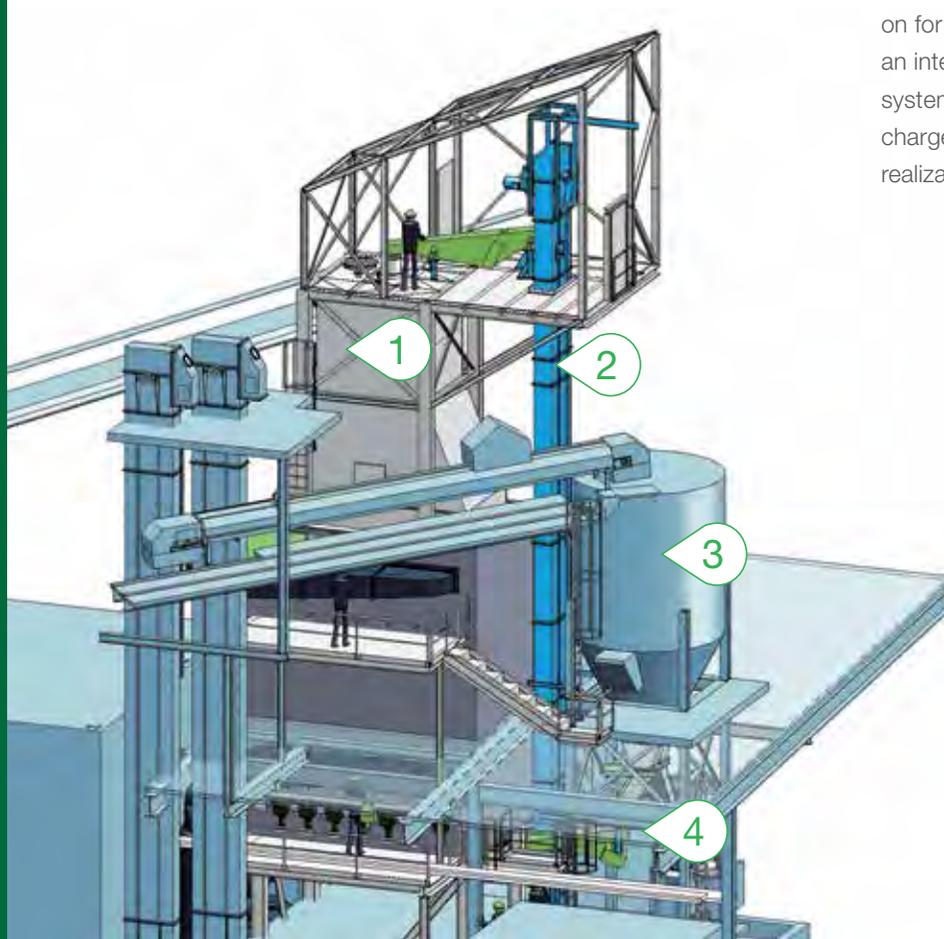


batch preheating

## Energy savings – by using furnace waste gases

Zippe has been a pioneer in this technology since the early 1980s and today has the most extensive wealth of experience in the glass industry. Over the years, batch preheating technology has reached a very high level of development. The systems run reliably, are easy to operate, and have no moving parts inside, which contributes to low wear and tear and a long service life. The latest systems, such as the Advanced Batch Preheater (ABP®) can operate practically independently of variables such as the cullet ratio. We are therefore in a position to offer preheaters for batches with low cullet contents.

Whether you require a preheater as an add-on for cullet only, or a batch preheater as an integral part of your batch preparation system with a perfectly matching batch charger, we will advise you regarding the realization of your expectations.



- 1 Preheater
- 2 Bucket elevator
- 3 Furnace silo
- 4 Batch charger

### The advantages of batch preheating are:

1. Reduction of melting costs
2. Reduction of emissions (CO<sub>2</sub> and NO<sub>x</sub>)
3. Increase in energy efficiency
4. Increase in plant productivity
5. Aging of the regenerators improves preheating efficiency over time (countervailing effect)

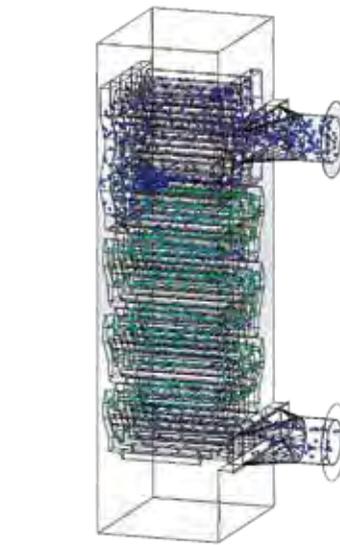
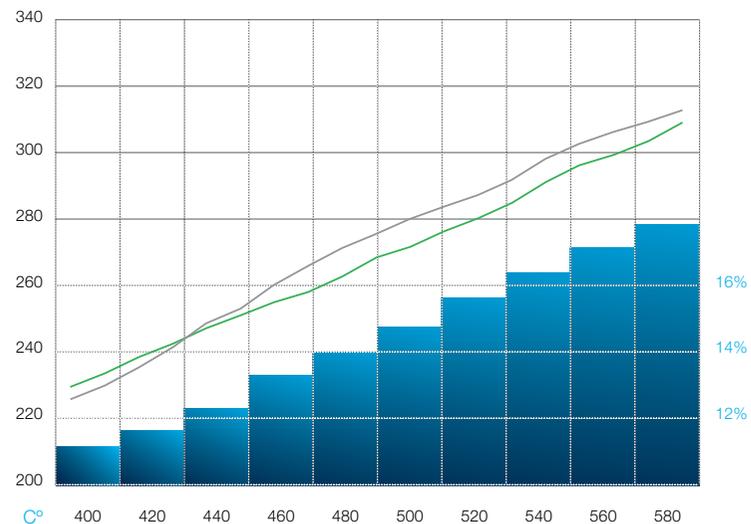
### The facts – savings in concrete numbers:

1. 10-15% savings in fossil fuels and/or electrical energy
2. Increase in furnace tonnages in a similar range through accelerated melting process

### Operation data of an existing installation:

The higher the waste gas temperatures, the higher the potential recovery of energy and savings.

- waste gas
- material
- energy saving (%)



Each preheater and its heat transfer is calculated and simulated individually via advanced simulation software.

Waste gas inlet	480 °C
Waste gas outlet	270 °C
Batch input	15 °C
Batch outlet	280 °C
Batch throughput	15.5 to/h
Cullet ratio	80%
Saving of natural gas	7.8%
Saving of electrical energy	62.2%
Total energy savings	14%
Saving of energy costs	27%
Saving of natural gas	4,390,000 m <sup>3</sup> /year



# ∞ installation & commissioning

Our supervisors and project engineers realize projects around the globe. For steel structures and buildings, we work closely with local providers and engineering consultants but the management of all projects remains with Zippe. When you contract Zippe, you get Zippe: core components are installed on-site by our expert team who has undergone specialist in-house training. Our customers benefit from their many years' experience, having worked on some of the most diverse construction sites imaginable. Working in tandem with them, our software specialists provide support for the control systems, providing smooth interaction between mechanics and electrics.

## Turning plans into reality – across the world



### **And beyond installation: Testing your systems**

We work closely with you following the commissioning of your plant. This is to ensure that any problems can be detected even before they can occur. To achieve this we offer a detailed Zippe plant check, in which we propose relevant actions and assist you to optimize your maintenance routines. As a result, the service life of your plant can be prolonged, further maximizing your investment.

**High storage  
batch plant and  
batch transport**



## Why a Zippe Plant Check?

Nowadays, nobody can afford unscheduled plant downtimes caused by unforeseen repairs or insufficient utilization of plant potential.

Numerous factors can develop over the years that affect the functional reliability of your plant components:

1. Wear and damage of plant components
2. Modified operating parameters that have changed in the course of the plant operating time
3. Changed safety standards
4. Outdated hardware and software
5. Discontinued components (no longer available from the system supplier) amongst others.



The Zippe Plant Check is a complete package which includes all work and services required for a thorough examination of your plant. This determines if and which repairs and parts are necessary.

Of course, we adapt the plant check according to the requirements of your plant.

# Safe in the long run with higher performance and lower risk

## Benefits of a Zippe Plant Check

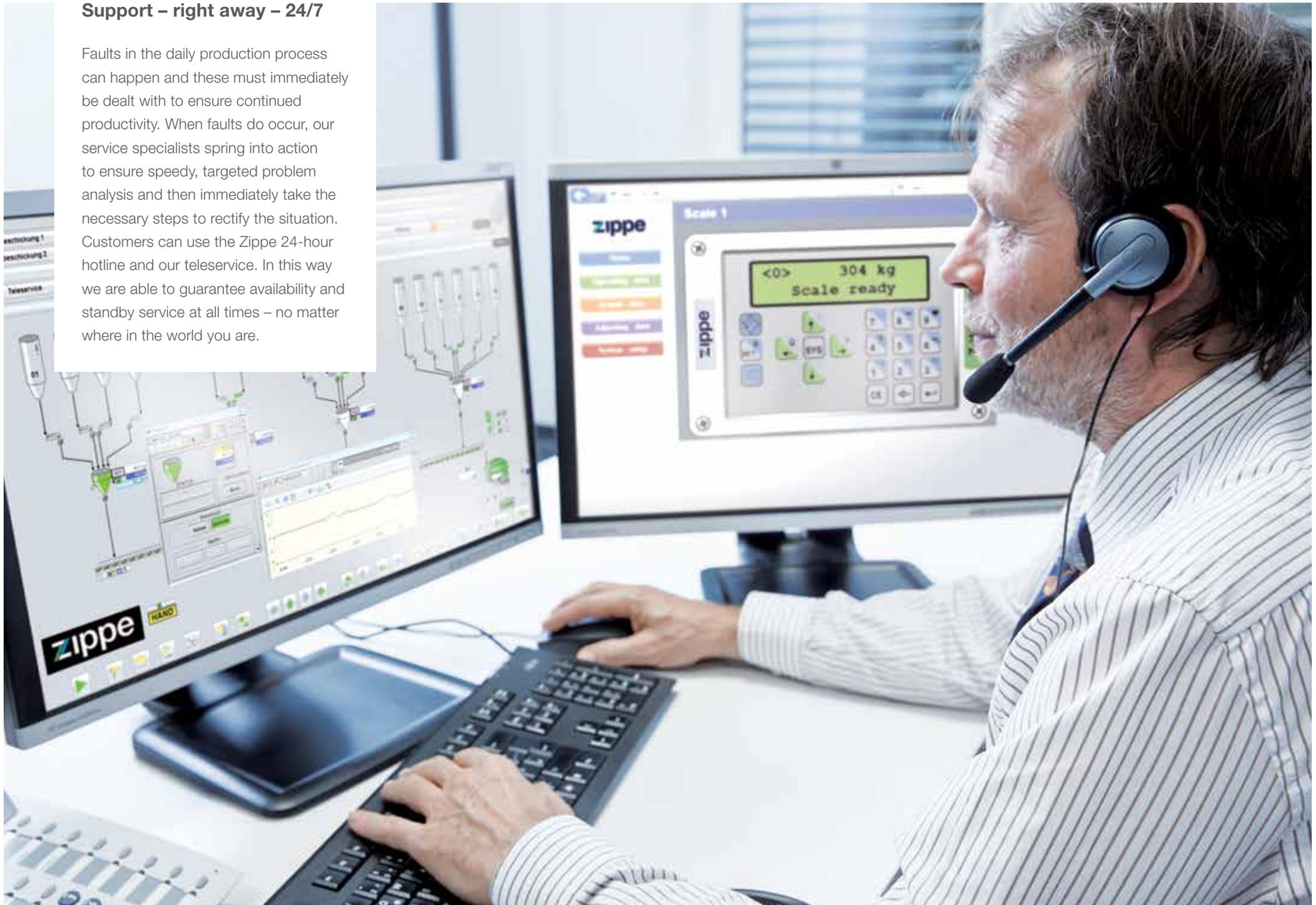
The preventive inspection of your plant provides certainty about its actual condition and gives you reliability and optimal production quality.

1. Reduction of unscheduled plant downtimes
2. Reduction of maintenance service
3. Reduction of repair and maintenance costs
4. Optimization of energy costs
5. Effective monitoring of plant status
6. Improvement of maintenance routines
7. Optimization of plant potential and plant parameters



## Support – right away – 24/7

Faults in the daily production process can happen and these must immediately be dealt with to ensure continued productivity. When faults do occur, our service specialists spring into action to ensure speedy, targeted problem analysis and then immediately take the necessary steps to rectify the situation. Customers can use the Zippe 24-hour hotline and our teleservice. In this way we are able to guarantee availability and standby service at all times – no matter where in the world you are.



## Right on track

We believe that nothing can replace first-hand information which is why we pass on our knowledge and experience to you and your employees in intensive training sessions. In this way they can learn how to operate the new system perfectly, simultaneously preventing any operator errors.

# Quality is mandatory



We offer you, our customer, the best possible quality in all aspects of our mutual business relationship. This is a non-negotiable aspect of our business and service offering which all our customers will attest to, all around the world. To further build our credibility and quality promise, we use a modern quality management system complying with DIN EN ISO 9001 and that is TÜV CERT certified.

training  
& service



## Ongoing expertise and service require a solid foundation



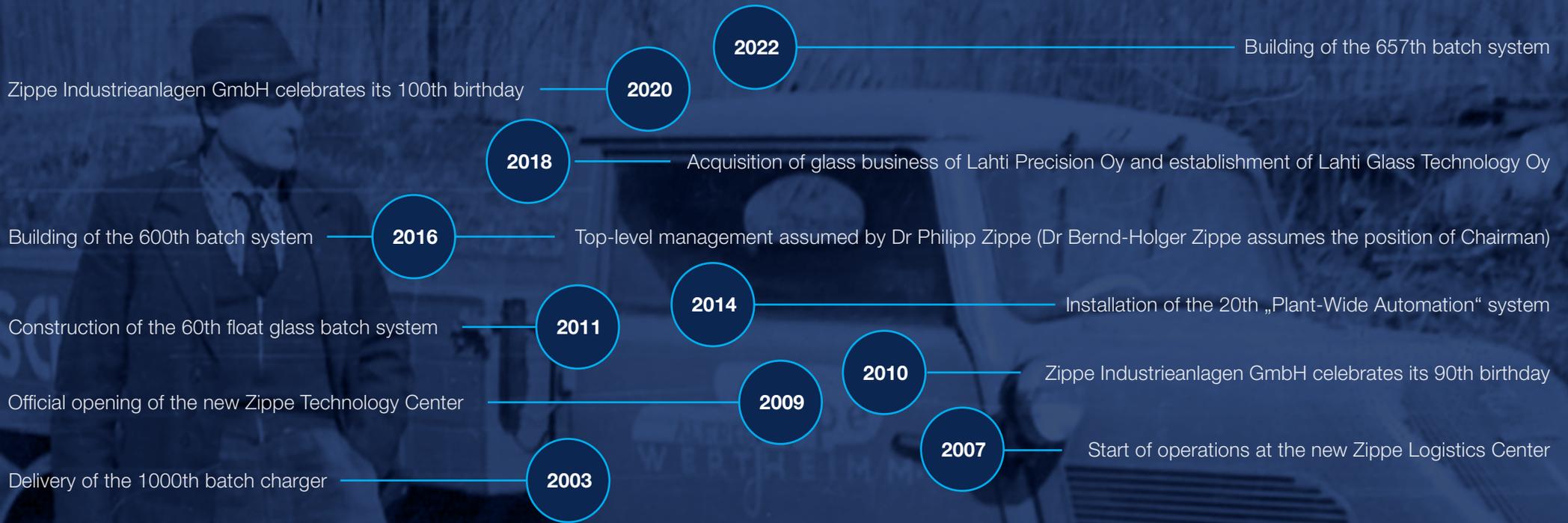
At Zippe we place great emphasis and importance on enabling the future generations to continue what we have dedicated ourselves to while simultaneously making a start to their own careers. Young adults are given training to become precision engineers, electronic engineers, technical product designers and industrial administrators. They are given excellent support by our training managers and engineers which many regional and national winners will attest to.

*Trainers pass on their expert and practical knowledge to trainees in our apprenticeship workshops.*

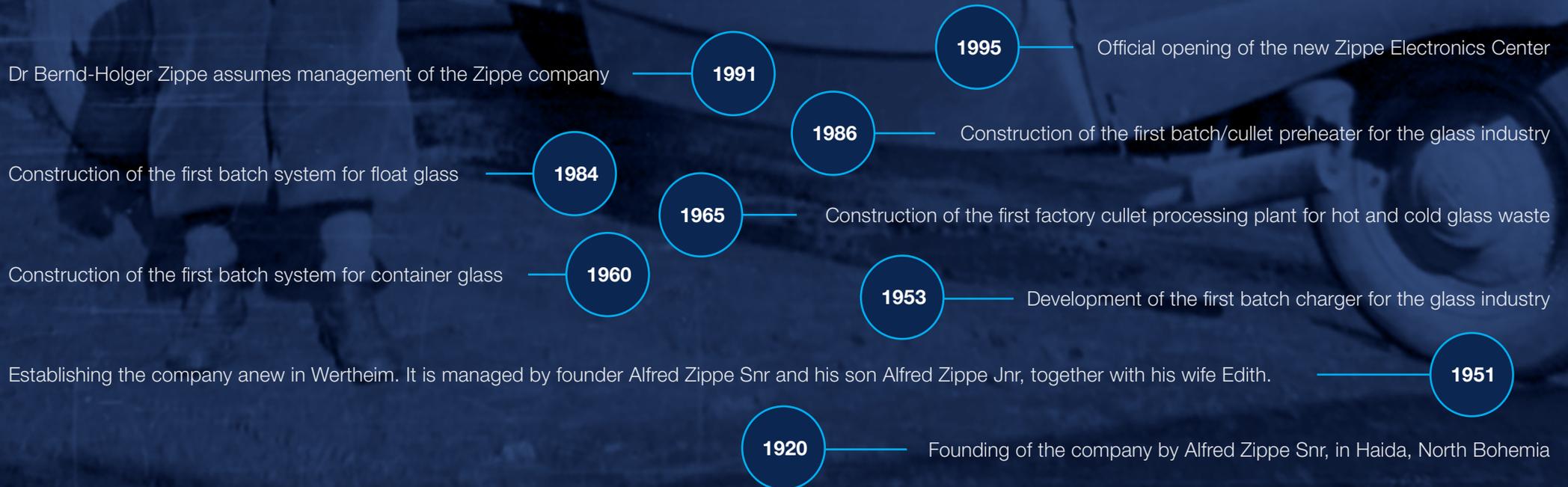


**“It’s a Zippe”:  
our in-house production**

The Zippe production area is over 4,000 m<sup>2</sup> in size and sees the manufacture of batch chargers, scraping conveyors, crushers and other key system components every day. Many of the 55 production employees have been at Zippe for many years and know every bolt, nut and welding seam, allowing for the highest levels of quality and reliability in all that we do. This is also where our service engineers and supervisors learn their skills for deployment around the globe.



## Getting it right – from the start: Zippe’s historic highlights





Following the formation of the family business in 1920 in Haida, North Bohemia (a well-known glass making region), Alfred Zippe Snr relocated his business to Wertheim am Main, Germany.

In 1953 the foundations were laid for Zippe to become a leading player in the glass industry, especially after Alfred Zippe Jnr developed the first fully automatic batch charger. Although many decades have passed we are still seen as one of the world's leading suppliers of state-of-the-art batch and cullet plants, ensuring the manufacture of high quality glass batch – reliably and economically.

## Spreading our expertise and passion for glass worldwide



With six subsidiaries and 30 representatives worldwide, our presence extends to all key markets in the glass industry and every project comes with its own requirements, with no two technical solutions being the same.

Challenging? Absolutely. But the more intricate the task at hand, the greater our ambition and drive to find a tailored and cost-effective solution. For you. And we're not too old to learn. In fact, quite the opposite: Zippe is where it is today, continuing to lead the way thanks to our heritage of future orientation, continuous development and an unwavering passion for glass.



# zippe

right from the start

Zippe is situated less than an hour's drive from Frankfurt international airport in Wertheim, a picturesque old town nestled on the banks of two rivers, surrounded by a beautiful landscape with lush vineyards. With its ornate, half-timbered houses, winding alleyways and charming ambience, overlooked by Germany's largest stone castle, Wertheim has a rich glass tradition, which we are proud to have helped to form. It certainly is worth a visit - as is Zippe. We look forward to seeing you.

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