

DECEMBER 2021

# **glass** **NEWS** SERVICE

## What are the goals for 2022?

Sustainability has been placed squarely at the front and centre of the IYOG 2022 project.

N.2 YEAR 2021  
Free copy

# CONTENTS

► **05** Editorial

Improving Quality and Efficiency in  
Pharmaceutical Glass Production with Bespoke  
Oxy Furnace Design and Management

**06** ◀

► **20** The International  
Year of Glass 2022

► **12** Glass Russia Magazine, November 2021: In  
Conversation with Fulvio Puccioni, Founder  
and CEO of Glass Service Italy

News about  
Glass Service

**18** ◀

► **28** Emanuele, sales manager at Glass Service,  
sits down with Glassonline to talk about Glass  
Service client's customization

Meet the team: Giulio

**26** ◀





# Editorial

## What will the *International Year of Glass* be like?

by Fulvio Puccioni  
CEO Glass Service

2022 is about to begin and for those who work in the glass industry it can be said without hesitation that it will start under the best auspices: last May the United Nations officially designated 2022 as The International Year of Glass (IYOG 2022).

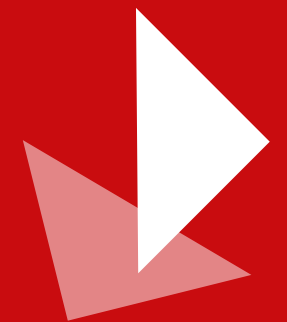
Therefore, we could not help but dedicate part of this issue to an in-depth exploration of this exciting theme. The International Year of Glass promises to be full of events held all over the world to support and promote the glass industry, highlighting the versatility of this sustainable and increasingly indispensable material. In the following pages you will find an interesting article that breaks down the history and significance of this event and details what awaits our sector in the coming months. Our wish to all those who share our commitment to excellence in glass production is that 2022 is truly a turning point, and that it will allow greater access to the economic and ecological solutions the glass industry can offer the world.

In this second issue of "Glass Service News" you will find new ideas and important data to keep you up to date with the latest developments from GS and across the industry. We've included an article about a complex furnace project we developed for one of our Chinese customers in the pharmaceutical sector-a market that has inevitably seen exponential growth in the last two years and that requires increasingly cutting-edge solutions. We are also happy to

introduce you to another member of the Glass Service team in our on-going series "Meet the Team".

The new year is a great time for setting new sights and at Glass Service we have many goals for 2022. Among them is the desire to build our magazine and continue to contribute to the world wide glass production community. We take this opportunity to thank all the readers who have shown their interest in the first issue, and who have motivated us to continue this project. Does your company have any goals for the coming new year? We'd love to hear from you on any of our social media platforms.

So we leave you to read our latest issue and hope it will inspire you to grow your company and make it unique. Happy International Year of Glass to all those who share our belief in the value of this material and work to improve its quality and performance every day.



## Improving Quality and Efficiency in Pharmaceutical Glass Production with Bespoke Oxy Furnace Design and Management

### THE GLOBAL PHARMACEUTICAL GLASS MARKET

In May 2021, we reported on the progress being made in ramping up pharmaceutical glass production to meet rapidly rising global demand. Growing applications for high quality neutral borosilicate glass from the healthcare sector have been compounded by unexpected and astronomical demand from the pharmaceutical industry as a result of the ongoing global vaccination campaign against COVID19.

In response, the glass industry is moving at speed to commission, design, build and fire up glass manufacturing facilities around the world, using the latest technological innovations to simultaneously improve plant efficiency, cost, performance and sustainability. This month we want to highlight an exciting case study that has been unfolding in Chongqing, China, featuring cutting edge glass melting technologies and showcasing what's possible for glass manufacturing plants when a bespoke, energy conscious approach is taken.



### THE CLIENT

For more than 18 months now, Glass Service Italy has worked hand-in-hand with a leading glass manufacturer, one that has produced more than 1000 billion Hydrolytic class II pieces of pharmaceutical glass, including vials and caps, all complying with YBB, ISO, EP, USP standards, as well as accreditation from CNAS. In 2019 the client wanted to go one step further and level up production to Hydrolytic Class I to better meet their customer needs for volume and value. In order to achieve this they came to Glass Service Italy for help.





## THE CHALLENGE

Glass Service Italy experts were brought in to help hit three specific targets:

1. Production of neutral borosilicate pharmaceutical glass tube alfa 51 to Hydrolytic Class I
2. Reduction of energy consumption by more than 50% compared to their existing furnaces
3. CO2 emissions reduced by more than 50% (reduction 2220 ton/CO2 per year)

These goals represented a substantial change from the existing facility and furnace infrastructure, and specifically required support beyond the initial consultation, design and installation of a new furnace. To achieve new levels of efficiency, factors such as ease of maintenance, furnace productivity and consistency of the output quality become even more crucial and for this, long term support is essential.

In order to hit these targets the team set about addressing several factors that are unique to pharmaceutical glass production, including: very high melting temperatures, the level of glass viscosity, the elevated corrosion rate of refractories, the significant boron content volatilization and the thermal and chemical homogeneity of glass. To meet the key targets whilst taking into account these unique challenges, Glass Service Italy experts stepped in with a bespoke furnace design and installation, followed by comprehensive training on the management, maintenance and testing of the equipment and its output for optimal performance and batch consistency.

## CONSIDERATIONS WHEN IMPLEMENTING NEW MELTING TECHNOLOGY

Every client and every site is different and this is where Glass Service Italy comes into its own. With an expert team that is agile enough to design bespoke solutions for glass manufacturing clients, but large enough to have the experience, credibility and resources to tackle a project at any scale, they are well used to adapting cutting edge design to the specific needs of a client. In this case the team began with key adjustments on the furnace design and features that would mean all performance and quality targets could be met; these included:

- The specific geometry of the site and the corresponding design of the melting tank

- Defining the right heating method for the melting tank, in this case using combined gas fire and electric power
- Including a special batch charger for optimal furnace performance and precision
- Improving temperature control and as a result, glass homogeneity with water cooled bubblers
- Ensuring the quality of refractories for long furnace life
- Managing indirect heating in the working end and forehearth
- Incorporating surface drainage to remove glass defects



## THE FURNACE

Using these design features, Glass Service Italy's team designed and installed an Oxy-Fuel furnace, producing 22Tons/24h of high-quality neutral borosilicate pharmaceutical glass tube alfa 51 - designed, engineered, assembled and commissioned in China. The team then remained on site until the production stage to help ensure batch consistency and production efficiency whilst guiding the client on the proper maintenance and performance management.



#### THE OPENING CEREMONY

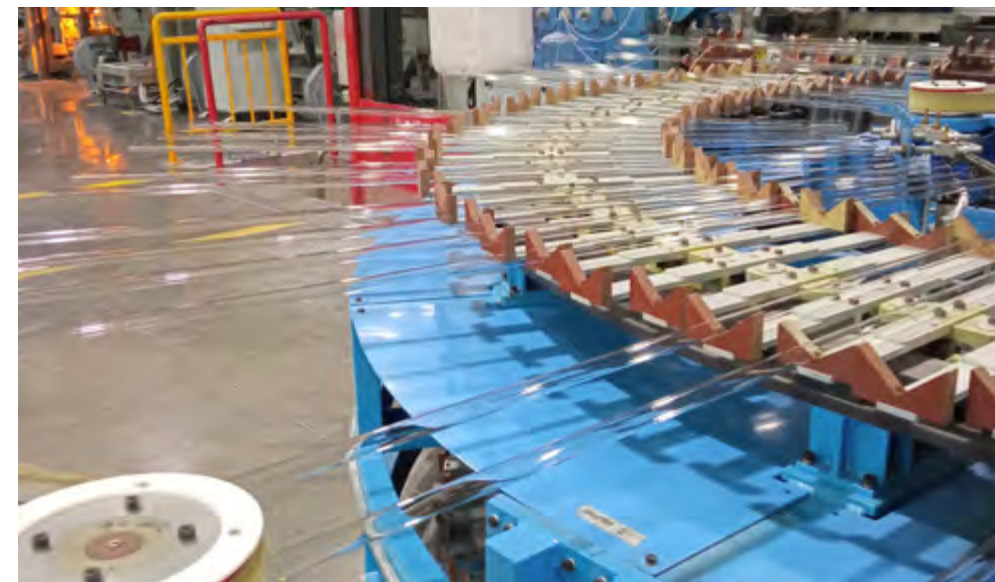
The time came to fire up the furnace in May and both the client and Glass Service Italy teams came together to mark the occasion with a ceremony to inspire good fortune for the plant and all those who work within it. Everyone gathered with confetti, celebratory banners and speeches as the furnace was fired up.

#### THE RESULTS

The data speaks for itself. The tube diameter efficiency for this furnace is >80% on the 22mm diameter and the same for 16mm diameter with wall thickness efficiency of 100%!

#### FUTURE GLASS MANUFACTURING FOCUS

Glass is set to play a growing role in future sustainable development and key installations like this one in Chongqing are important in establishing glass's movement towards a more sustainable, technology-led and efficient manufacturing model. Ongoing developments in end-to-end process management continue to reduce the amount of energy used by glass manufacturing and the renewed focus on plant efficiency, maintenance, monitoring and output quality, signals that there is much more to come from this area of the glass sector.





## In Conversation with Fulvio Puccioni, Founder and CEO of Glass Service Italy

### DELIVERING FIRST CLASS PRODUCTION CAPABILITIES IN THE GLASS INDUSTRY

Glass Service Italy (GS) is recognised as a world-leader in the provision of reliable solutions for the glass manufacturing industry. GS technology ranges from batch plants to forming machine robots, heat recuperators to turnkey solutions, all engaged in the fabrication of borosilicate, soda-lime, lead crystal and other specialised glasses. Due to its excellent reputation and expertise, Glass Service is the preferred system integrator for global brands Comau Robotics and Honeywell Process Control in Italy. We sat down with Fulvio Puccioni, Glass Service CEO, to find out more about how he sees both glass manufacturing technology and the global glass market developing.



### Please tell us about your current or recently completed (most important) projects and supplies for the glass industry.

Glass Service has been working with some fascinating and forward thinking clients recently around the world. Our technology helps to deliver a wide array of glass products and we have seen strong demand for multiple product combinations including: N.3 Borosilicate medical tube furnaces for medical glass combined with the Danner technology; 24 tons per day (TPD) and 120 TPD regenerative furnaces; two forehearths for washing machine window batch plants; a 450 TPD container furnace and N.5 forehearths for the container industry and finally, combustion systems for perfume industry coloring forehearths so our both capacity and customers are wide ranging and diverse.



#### Which of your products are most in demand at glass plants now?

The demand for high quality pharmaceutical glass has been steadily growing for many years, but the recent explosion in demand caused by the pandemic is unprecedented. To meet this urgent and critical need to deliver the high quality glass at scale, manufacturers are increasingly looking to obtain the most innovative and reliable machinery available. Multiple defects can arise in the glass production process, even with first class raw materials, so the machinery and its good operation and maintenance is key for medical grade glass. For GS this has translated to huge demand for the design, build, installation and maintenance of our combustion systems for medical tube borosilicate glass. Glass manufacturers often have bespoke requirements and we find that working closely with our clients on their unique design or operational specifications means that the end product and installation fulfills their needs better as a result, whether it is a purpose built or turnkey solution.

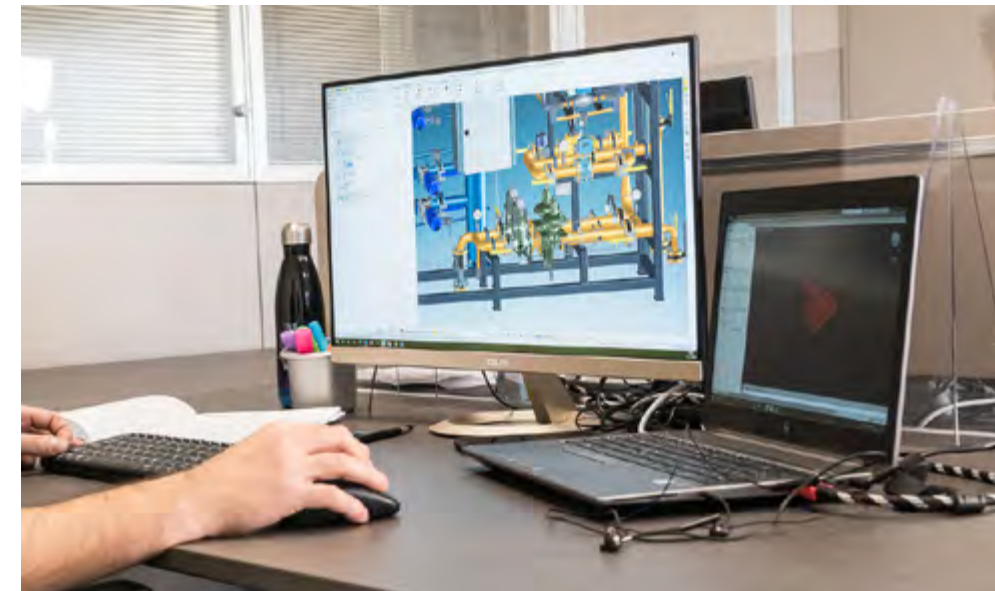


#### Has your business changed (and how) over the past two years?

In order to compete in technology-focused sectors, there is no time to sit still and glass manufacturing is no different. During the pandemic we have



continued to improve and increase our technological capabilities, whilst also expanding and adapting our technical service department. This new team is now set up to help remote-manage several businesses, garnering great results and positive feedback from our partners. As a result of the pandemic we have all been forced to find new ways to work and we want to be sure that agility remains at our core so that we can adapt to the needs and nuances of our clients and the wider market.

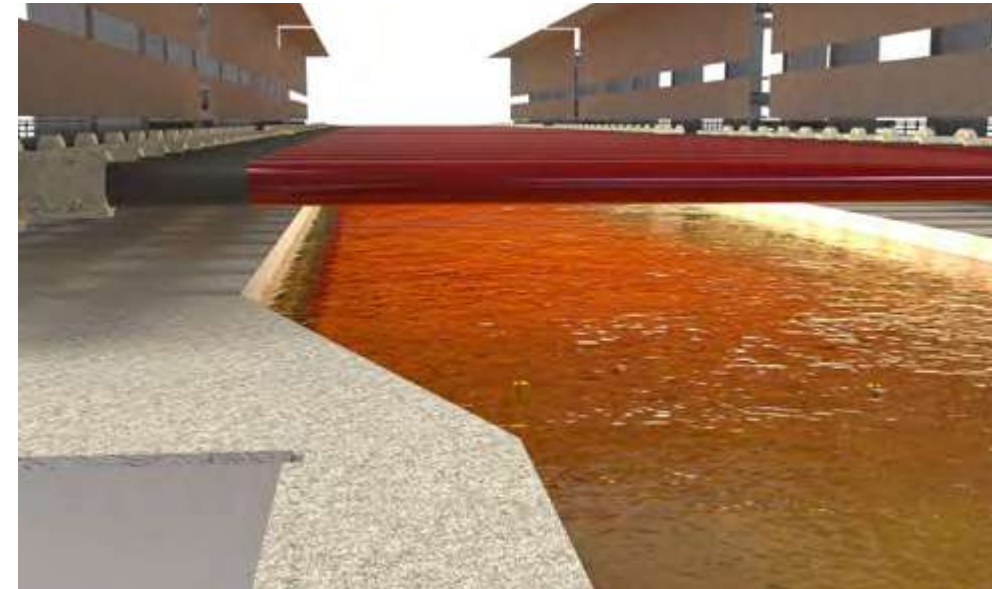


#### How do you see the preliminary results of 2021?

Despite the clear difficulties faced by everyone over the past two years, not least in our home country Italy, we are reassured to be able to report continued and steady business, with our turnover matching previous years at around €10mn. Now, as an industry, we are turning to cementing growth in a manner that is profitable for us, our clients, but also looking towards making a more positive impact for the planet. Glass manufacturing has shown itself to be able to stand the test of time before and we will continue to maximise our technological know-how to meet this growing and critical issue head on.

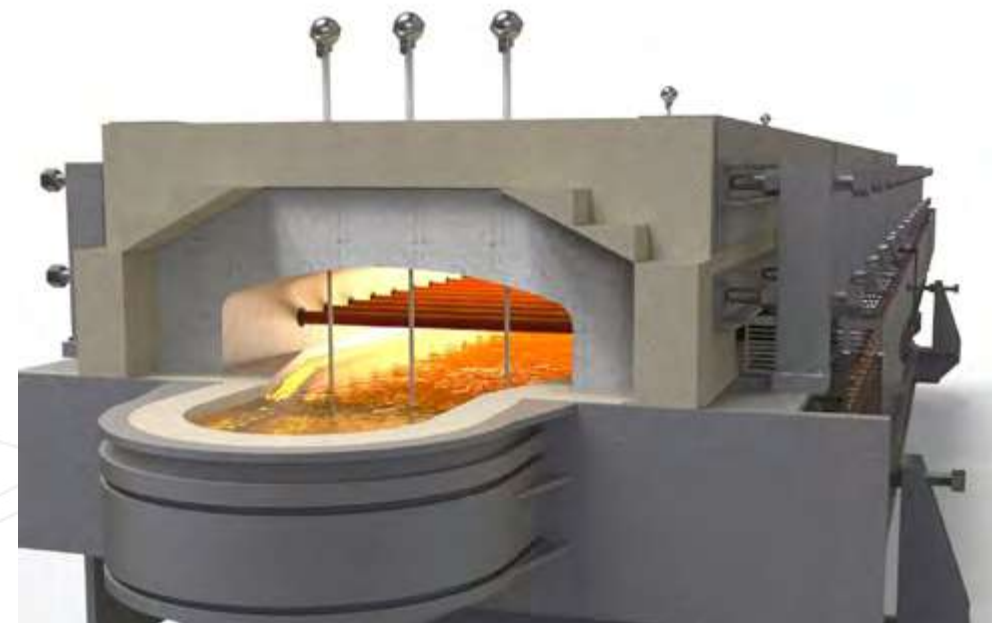
## Glass Service Italy advocates electricity to cut carbon and costs

In March 2020 the EU announced that Europe's economy and society must become climate-neutral by 2050 with at least a 55% reduction by 2030. One of the key components of this move is expected to be the carbon market where carbon can literally be traded, but the prices are expected to get very high as these targets get closer. It could become prohibitively expensive for traditionally resource hungry industries like glass manufacturing. To reduce both costs and emissions the glass sector needs to carefully choose the right heating system. The current common options are gas, oxy fuel and hydrogen, with each carrying both its benefits and pitfalls. However with more consideration of electric heating tech we can provide a potentially carbon free source, removal of combustion gas which can be expensive or sometimes totally unavailable, and provide better heat conversion efficiency, greater insulation (no need for gas exhaust chimneys) and improved installation and customisation options. Hydrogen remains an option but it is still in the testing phase so for now, examining the potential for electric heating is the arguably the best option.



Glass Service Italy has developed an electric heating system for forehearths that compares strongly on sustainability numbers against its counterparts; generating 0kg/h of CO<sub>2</sub> compared to 24.38kg/h for gas power, the same for air-gas and 7.99kg/h for Oxy-Gas (this refers to a standard zone with L=2860mm). Moreover, electrical heating systems also run at 2.88 Euros per hour compared to 4.42 Euros for its Air-Gas counterpart, and finally, but perhaps of most interest, the running energy costs are reduced by 40%.

As a result of these figures, the choice moving forward is becoming increasingly clear. At Glass Service Italy we are ready to work with our customers to achieve better results for both the carbon footprint and the economical cost of glass manufacturing.





## The International Year of Glass 2022

On May 18th, the UN declared 2022 to be the International Year of Glass (IYOG), sparking a chain of excitement throughout the art, social and industrial worlds. Now that the fanfare has quietened a little, we wanted to pause for a moment and take stock of what this means and what is being done to turn this initial enthusiasm into productive outcomes. How might this global spotlight impact the glass industry, the wider community and the planet, and what can we expect to see in the coming 18 months?



### WHAT IS THE INTERNATIONAL YEAR OF GLASS?

In 2018, led by The International Commission on Glass with the Community of Glass Associations and ICOM-Glass, more than 1500 academic institutions, associations, teachers, museums and industry representatives from nearly 80 countries and 5 continents came together in one voice to call for glass to be celebrated across all the fields it touches.

The result of this collaborative effort is a dedicated year of recognition in 2022, with a diverse array of international and local events planned to showcase the important place glass holds in our lives - whether we realise it or not. If you are interested in glass sculptures, use glass tableware, keep up with the very latest glass-enabled technologies, have had a vaccine injection from a pharmaceutical glass vial, work in industrial glass manufacturing or have links through something else entirely, there is something for you in the coming year. Interested parties will find a host of seminars, conferences, museum exhibitions and bespoke publications ready to inspire a new look at this ancient material.

### BASED ON PAST UN 'INTERNATIONAL YEARS' WHAT CAN WE EXPECT TO SEE?

In 1959 the UN declared the first 'International Year', launching a project aimed at highlighting some of the crucial issues impacting both people and the planet at the time. These have continued ever since, with International Years dedicated to concerns as varied as World Refugees (1959), Education (1990), Light and Light-based Technologies (2015), Crystallography (2014) and many more. Each past project set out clear targets, outlining the central philosophies





Interested parties will find a host of seminars, conferences, museum exhibitions and bespoke publications ready to inspire a new look at this ancient material.

and goals that it hoped to achieve, and invariably these declarations have inspired peer-led gatherings, new and broad education strategies, initiative funding and future planning to accelerate the meeting of those targets. The International Year of Glass will build on this established platform and we can expect to see technology, industry and artistic communities come together in the process.

#### WHAT ARE THE GOALS FOR 2022?

Glass is one of the most adaptable, transformative and sustainable materials ever created and the IYOG 2022 activities will look to tell the story of its fascinating history, which is so intertwined with our own. Moreover, the events of next year will serve to highlight the advantages and competitive edge that glass holds over other materials, not least the role it is set to play in future technological design and in underpinning sustainability initiatives such as the UN's Sustainable Development Goals. More on this below.





**In the EU, 74% of containerglass, the first glass sector in tonnage, is recycled which saves approximately 9 million tonnes of CO2 every year. (Glass Alliance Europe)**

#### GREEN CREDENTIALS

In the EU, 74% of container glass, the first glass sector in tonnage, is recycled which saves approximately 9 million tonnes of CO2 every year. (Glass Alliance Europe).

Sustainability has been placed squarely at the front and centre of the IYOG 2022 project and as part of the UN's push towards its Sustainable Development Goals. In addition to the fact that it is made almost entirely from natural materials and is infinitely recyclable, glass also plays a key part in residential energy efficiency and renewable energy development and much is being done to combat the large energy and raw material resource demands for glass manufacturing. The IYOG will seek to highlight the positives and to encourage action on reducing the carbon footprint of glass production. The glass industry will have the opportunity to show how much it has achieved already and to outline plans to go further in contributing to global climate change targets.



#### THE GLASS INDUSTRY - HISTORY AND INNOVATION - BACK TO THE FUTURE

Glass has been with us for eons; the first evidence of glass-making dates back to around 3,600 BC in Mesopotamia, although some have suggested that it may go even further back in Egypt. Throughout history, glass has featured in the growth and development of society and industry - in the Renaissance, with Venice's dominance and colourful Murano glass, in the groundbreaking production of the sheet glass used in London's Crystal Palace and more recently in enabling a flourishing renewable energy movement - glass has a colourful past. Its future is set to be even more extraordinary and the IYOG has come at the perfect time to showcase the exciting trends set to arrive soon. Some of the most exciting, boundary-pushing technologies relying on glass innovation include:

- Pharmaceutical glass, medical devices, optics, augmented / virtual reality / smart glasses
- Non-reflecting properties - essential for clean energy generation
- Bespoke smart coatings in buildings and construction - smart mirrors and photosensitive, switchable, flexible, transparent and well insulated glazing
- Developing substrates with functional integrations for electronics, particularly those with touch screens, fibre optics and OLEDs in iPhones, laptops and in-car displays to name a few

Projects like the International Year of Glass enable progression in achieving world economic recovery and 'building back better' from the Coronavirus disease. Whether it's glass that has been to the moon and back or something as seemingly mundane as window panes, a beautiful drinking goblet or your smartphone screen, the magical substance that is glass has had a powerful presence in the lives of most people on earth for thousands of years. What wonders lie ahead for this most useful, but also beautiful, material?

## Meet the team: Giulio

Good evening, I'm Giulio Isernia and I'm the commercial director of Glass Service.

On a human and professional level, I think the true strength of Glass Service lies in its past. I have been working at this company for twenty years and I have been able to verify first-hand, to analyze the evolution in this period: we have gone from a small company, we have grown progressively over time and we have crossed a river, we crossed a ford. We went from small plants to large plants. We went from local clients to international clients and this allowed us, every day, to ask ourselves if we were doing well, were we dealing with clients in the best way.

So we have built, day-by-day, an international credibility and internally through discussion, through debate, because obviously we are many people, often with different ideas. We have always managed to find a synthesis and to have been able to offer our customers a unique solution from our company.

In all this, I must say that we have maintained a very human dimension because at the end of the day, Glass Service is like a family company, the relationships are informal and this has always allowed us to manage internal relationships



in the best way and to present ourselves in the best possible way towards customers. So I believe that in recent years the strength of Glass Service has been its technical solutions and technology but above all the fact that we have maintained good human and social relationships within the company that have allowed it to grow and improve constantly.

Our goals are based on our past, this is extremely important, we must continue to have an eye on what we have done and also look to the future. The future means continuing in our technological evolution, which has allowed us, in the last 10 / 12 years to make a significant qualitative leap: we entered the borosilicate neutral glass sector, which is then converted into tubes to make vials and bottles; this was an exceptional qualitative leap by Glass Service.

In the past we focused only on furnaces and their batch plants and components, in recent years we have made a qualitative leap. For example, turn-key plants which in many emerging countries provide solutions that are not limited by the supply chain or to the batch plan. Instead we can offer a complete project from start to finish, therefore: from the treatment of raw materials, passing through the batch plant, through the furnace, through the forming assembly lines at the cold end and the auxiliary services.

We can offer the customer a global answer, this is the important thing. We must maintain the ability to offer customers even just individual components, increase our presence with the big players in the glass sector, but at the same time be ready, as we are, to offer new customers, even emerging customers in the glass sector, turn-key plant services. We want to become partners of these new customers and be ready to support them in their ideas, in their hopes for growth in the glass sector.



## Emanuele, sales manager at Glass Service, sits down with Glassonline to talk about Glass Service client's customization

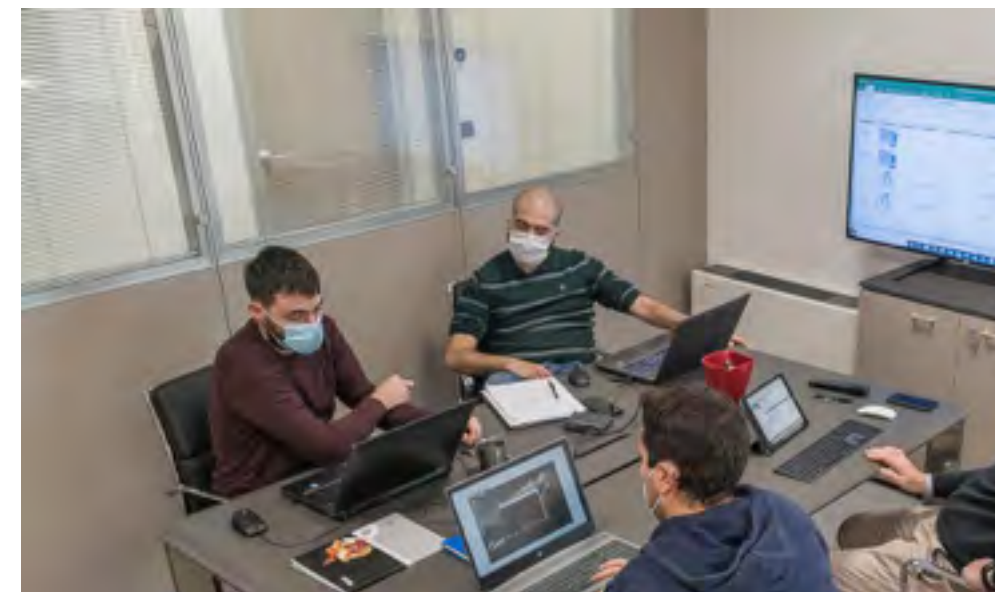
**In our last interview with your CEO Puccioni, we learned that GS was founded by people with extensive experience in the glass industry. How has that experience influenced the company's services to the glass industry?**

"Over the years, Glass Service team members have experienced the evolution of this industry, the advances in research, technology and engineering in the field. This taught us the value of education, investing in young engineers and developing technologies. In this way, we continue to contribute to that legacy, keeping an eye on the future while utilising the lessons of the past. We also used that know-how to build GS into a one-stop shop where our clients have access to everything they may need, from a turnkey plant to highly specialised furnaces, automations and systems, tailor-made technological solutions, dedicated customer support, on-site training and after sales assistance."



**In your daily work, what would you say are the biggest problems you've noticed your clients are facing?**

"Many clients aren't able to utilise standardised furnaces and components. For example, some may have space limitations and require furnaces designed to fit within their existing structure. Others may need only a small, targeted intervention in an otherwise operational plant. Whatever the case, our skilled engineers are able to tailor solutions to their exact needs. We fabricate and test components in-house, install on-site and work side-by-side training our client's team to ensure the highest level of quality and success with the least amount of disruption to their workflow."





#### Can you give me some examples of GS's customised solutions for clients?

"There are several common problems that glass manufactures face, each in their own way. For example improving the quality of the finished product by reducing or eliminating the annoying cat scratches, the defects that affect the quality of the finished product and create waste. The Glass Service stirrer, available in two different configurations, has the advantage of being installed on one side, leaving more space for maintenance and for refractory paddle replacement. Adding our stirrer machine not only removes cat scratches but also has a secondary effect of glass homogenisation.

Another problem some of our clients face is limited space, requiring components with reduced dimensions. They may need customisations, such as a stirrer with an integrated water box for the spout change and a crane tool. Down to the smallest detail, we are able to customise components according to the client's request.





Precision glass level checking is often requested as well. Our glass level machine is able to precisely self-adjust to within 0.1 mm. We have also created software that recognises the zero level and adjusts itself automatically.

And finally, we have built and launched 15 borosilicate glass furnaces for the medical sector and each reflects the demands of the client's customisation requirements in terms of glass characteristics. We have developed projects with both Danner and Vello lines and with refractory design solutions to ensure a four-year run of stable production with reduced energy consumption."



**Right now, climate is a hot topic. Does Glass Service offer any services or customisations that can help your clients be more efficient and reduce their CO2 carbon footprint?**

"We recognized there was an opportunity for energy conservation and reducing waste in the distributor and forehearth, because despite consuming a significant amount of energy, these areas are not normally optimized in terms of energy saving and environmental impact. So Glass Service is investing in research and development to propose new heating solutions through oxy-fuel combustion and systems with electric resistances.



Right now we are working on utilising electrodes and furnace combustion systems with electric boosting as a more efficient means of heating furnaces. We already have more than 40 projects installed all over the world and we can offer systems for melting end booster, thermal barrier, refining booster and throat booster in both stand alone and integrated configurations. To manage the voltage, we can use a circuit type with an On Load Tap Changer transformer or a Thyristor unit. Meanwhile, we are also closely following the developments in hydrogen combustion technology as a potential energy source for the future."



Check the video:

<https://www.glassonline.com/video-interview-with-emanuele-donati-sales-manager-of-glass-service/>





**Glass Service S.r.l.**  
Via Cascina Lari  
Cap. 56028  
San Miniato (PI)



[www.glassservice.it](http://www.glassservice.it)

