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ISSN 1890-9515 Vol 19, No 2 (2026), Art 12, 1–26 https://doi.org/10.7577/formakademisk.6305

Peer-reviewed article

# Glass craft

## A new generation of designers and craftworkers rooted in re-interpretation of Portuguese traditions

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**Keywords**
Glassblowing, stained glass, craftworkers, art and design pieces

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## Abstract

*It is in the dialogue between the craftsworker and the designer/artist that the collaborative process of personal and professional interrelationships is established, whereby one person sometimes conceives of the design and the craft worker makes the piece. However, this interpretation is not at all linear, and in the specific case of glass (blown and architectural), owing to its technical complexity, it demands expert work by those who execute it. This paper will focus on the Portuguese glass panorama—that is, the relationship between studios, artists, and craftworkers—presenting innovative works and explaining the dialogues that occur during the process of glassblowing—the stories and methodologies. The paper will analyse designers' creations; students' research projects; and the last work done at Antunes heritage stained-glass studio, which I contributed to.*

# Introduction

According to Ezra Shales, most crafts are not solitary endeavours; he refers to them as "collated crafts" or "multihanded crafts" (Shales, 2017). Glass craft is a prime example of this collective approach. The complexity and skill required to create stained glass windows for a cathedral or to execute an intricate glassblowing piece often surpass the capabilities of a single craftworker. Glassmaking is a deeply collaborative process for which teamwork and shared expertise are essential. "Anthropologists and archaeologists have long assumed that many of the properties associated with craft–material, tools, techniques of the body, practical skill, are highly social and open to shared working" (Ravetz et al., 2017, 2-3).

Glassblowers' relationship with their craft is one of continual creative learning. Through years of experience, they develop a profound, tacit knowledge of the material, understanding its unique properties, limitations, and hidden possibilities. This intimate familiarity allows them to push the boundaries of their craft, innovating through practice and experimentation.

Moreover, the production process itself is dynamic, evolving through continuous dialogue between glassblowers and designers. This exchange of ideas fosters innovation, ensuring that the designers' artistic vision is realised and enhanced by the technical expertise and cultural insights of the glass craftpeople. Their role is not merely to execute a design but also to contribute actively to its refinement, drawing from their heritage and experience to shape the final piece.

When a glass-blown object requires additional decorative techniques, such as engraving, etching, or lapidation, the collaborative nature of the craft extends further. Specialists in coldworking are brought in to contribute their expertise, reinforcing the idea that glass

artistry is an intricate, multistage process that relies on the combined efforts of highly skilled individuals. This interplay of craftsmanship highlights the deeply interconnected and evolving nature of glassmaking, in which tradition and innovation coexist in the hands of those who shape the material.

Portugal has a long history of glass tradition, especially in the glassblowing industry, which has existed since the middle of the fifteenth century. It also has a vast patrimony of stained glass, especially in churches, owing to its religion, as well as governmental buildings. This heritage began during the dictator period, especially in the 1950s.

Currently, when visiting a glass design exhibition, it is common to see both the name of the designer and the craftworker who executed the glass piece, as the work is considered a collaborative work (Almeida, 2020). Regarding stained glass work, it is common to refer to the workshop that produced it and the artist who designed the cartoon.

It is in the relationships that emerge between the artist and the craftworker that the research presented here develops, as well as the synergies that may arise from these dialogues in the conception and execution of the works. Thus, projects in the field of blown glass are presented, including works created by university students from the Faculty of Fine Arts, Porto University (FBAUP), along with the final project carried out in the century-old stained-glass workshop, which closed following the death of its last owner.

This article presents the communication conducted at the CRAFT HUB INTERNATIONAL CONFERENCE “The Art and craft of the immateriality of glass: architectural and blown glass” in 2023.

## Glass Blowing – Marinha Grande

The origins of blown glass in Portugal can be traced back to the fifteenth century (Barros 1989), as written sources confirm the existence of glass production, identifying workshop locations and the names of several glass masters. However, the absence of well-preserved archaeological records of furnaces significantly limits our understanding of the types of glass produced and circulated in Portugal before the eighteenth century (Medici et al., 2017).

Nevertheless, the region that has become most renowned for glass production is Marinha Grande (near Leiria), where the tradition continues to this day, albeit in an almost exclusively industrial context and on a significantly smaller scale than it once did. Until relatively recently, it was common for family units to work in a blown glass factory, with fathers employed as glassmakers, mothers engaged in decoration, and their children participating in various sectors of the factory’s operations.

Marinha Grande is known as the glass region of Portugal. In the 1950s, Portuguese artists started working with the glassblowers of the Marinha Grande factories, thus beginning continuous design-made production, establishing a close relationship between artists and glassblowers, and causing the emergence of glass design in Portugal.

Emília Margarida Marques is a social anthropology researcher who illuminates the complex transmission of technical knowledge among Marinha Grande glassblowers and their key social roles (Marques, 2000, 2013). In recent decades, most manually operated glass factories in Marinha Grande have gradually disappeared owing to complex social and economic challenges in the country (Santos, 2022). Many glassworkers are retiring, and a new generation is not emerging to meet the industry's needs. As a result, traditional glassmaking techniques are at risk of vanishing and being forgotten forever (Almeida, 2024). It is crucial to honour and consider this to enable the examination and integration of this heritage into contemporary social contexts.

In recent decades, several approaches have been taken to Marinha Grande glass from a contemporary art and design perspective, highlighting the potential of the knowledge accumulated through the experience of multiple generations of glassmakers.

With this commitment to transmitting knowledge and expertise, CRISFORM (a public institution established in 2000) implemented a long-term specialised training programme, fostering a strong connection with the region's glassmakers. Through this initiative, knowledge was passed on to a new generation. This programme, which remains unique, has produced craftworkers and designers who have helped preserve and perpetuate the skills acquired. Among these students, three stand out: Rita Barata, Nelson Figueiredo, and Joana Silva.

## A new generation of Designers and Craftworks

Rita Barata works at the Atlantis glass factory, collaborating with master glassmakers in the art glass sector. VISTA ALEGRE ATLANTIS is currently the most prestigious glass factory in Portugal. Although it is not located in Marinha Grande, it is situated nearby—approximately 30 km south—in Alcobaça. Founded in 1944, the company collaborated with renowned designers in the 1970s, including Venetian Alessandro Lenarda and American Geral Gulotta.

Barata is the only female glassblower working at a glass factory in Portugal to have pursued her training with a particular emphasis on blown glass, engaging in continuous dialogue with master glassmakers from the factory and guest designers (Figure 1). She works in close collaboration with master craftsman José Esteves, a representative of the older generation,

positioning herself as an integral member of the team, wherein learning remains an ongoing process. Together, they produce works for a range of designers.

Barata notes that some designers have never worked with glass and that it therefore becomes necessary to articulate both the potential of the material and the parameters of what can and cannot be achieved. This observation underscores the importance of mediating between material knowledge and creative intention. It highlights how the transmission of specialised expertise functions not only as a technical clarification but also as a pedagogical moment, enabling designers to recalibrate their expectations in dialogue with the intrinsic properties of glass. There are technical limitations for aesthetic choices, as some ideas for shapes are simply not feasible" (Groth, Kimmel, 2024, 25). Barata explained this as follows,

> We work side by side. Designers bring their projects and ideas in the form of drawings; the possibilities and limitations are then discussed. As we move into the production of prototypes, they remain engaged throughout the process until they are satisfied with the outcome. At that stage, the team gains a clear understanding of the precise requirements and can continue production independently, without the designers' direct supervision (interview with Rita Barata, 2025).

**Figure 1**

*Rita Barata working at Atlantis factory. Photo@ Rita Barata.*

This account illustrates a collaborative dynamic in which knowledge is transmitted intergenerationally and negotiated collectively. The process involves a gradual shift from direct oversight to autonomous execution.

In parallel, Barata pursues her artistic work using blowing and lampworking techniques. These are works of a freer nature, are produced without moulds, and are thus markedly distinct from the technicist approaches typically associated with factory production. In the piece *What the Hell Is this Shit* (Figure 2), presented at the Passage of a Testimony exhibition at the Glass Museum in 2025, Barata employs humour through the representation of a cluster of flies, an intervention that would not be technically sanctioned or accepted by the community of master glassmakers.

This work exemplifies a deliberate departure from established conventions, foregrounding experimental and irreverent strategies that challenge the normative frameworks of craft and industry. By mobilising humour and subversion, the piece destabilises expectations of technical virtuosity, shifting emphasis towards conceptual provocation and artistic autonomy.

**Figure 2**

*Rita Barata piece, What the hell is this shit. Photo@ Rita Barata.*

In 2015, Nelson Figueiredo opened his glassblowing studio, where he creates his pieces (Figure 3) while collaborating on projects for other artists and designers. For these commissioned works, he sometimes subcontracts assistants to help manage the complexity

of the pieces, and Barata is occasionally one of those who support him in this process. In their discussions, the designers and artists who have worked in his studio highlight the sophistication of the execution, whereby each craftworker plays a collaborative role in the creative process, which Otto von Busch refers to as the "collaborative skills of bodies" and "craft practitioners know that a mental possibility, however impressive, is not enough. The word of practice, or "bodyhood", does not emerge solely from our mind, but in synchronization with our hand and body" (2013, p.138.139).

Discussions and planning for the piece's creation always begin with a technical drawing, which is presented in advance. The designer holds a preliminary meeting, either remotely or at the studio, during which various execution possibilities are explored, along with the technical constraints. The design of the piece is often adjusted in response to these considerations. According to Figueiredo,

> It is not always possible to achieve precisely what the designer envisages; often, the outcome surpasses the initial projection. At other times, certain forms must be compromised. It is also quite common for designers to develop new ideas in the midst of the manufacturing process and to wish to interrupt it, thereby generating a new object (interview with Nelson Figueiredo, 2025).

Tangible artefacts, such as prototypes, embody knowledge-making processes that evolve and transform through collaborative interactions with others (Groth, Gulliksen, 2024). This corroborates what Nelson Figueiredo states in his interview, that the initial ideas established by the designers are often modified through the dialogue developed between both parties and through a more comprehensive understanding of the material and its capacities and limitations. Craft practice engages intelligence in concrete, shifting, and often unpredictable situations, shaped by the interplay of the maker, the material, the tools, the technique, and the task (Brinck, 2024). Figueiredo highlights the importance of practical know-how and of understanding how the material behaves for the conception of a piece to succeed. Numerous authors reinforce this position, "trail provides the information" (Shales, 2017), attesting to the centrality of tacit knowledge within craft practice (Bradt, 2019).

The production of works designed by others is regarded as a form of commission, a practice distinct from the creation of pieces authored by the maker himself. This passage underscores the tension between individual authorship and collective making, foregrounding how tacit knowledge not only shapes material outcomes but also complicates the attribution of creative agency. It highlights how artisanal expertise mediates between concept and execution, and it raises questions of recognition within collaborative frameworks.

Nelson Figueiredo also owns a small gallery next to the Glass Museum, where he exhibits and sells his original pieces (Figure 4).

**Figure 3**

Nelson Figueiredo working at his studio. Photo @ Nelson Figueiredo.

**Figure 4**

*Nelson Figueiredo pieces in his gallery. Photo @ Nelson Figueiredo.*

Joana Silva has a BA in glass and ceramic design and produces her pieces in collaboration with other craftworkers, such as Arlindo Francisco, José Esteves and Cláudio Duarte.

Numerous examples concerning the learning process of modelling on the potter's wheel in the making of a ceramic piece are provided by Ingar Brink (2024) and Camilla Groth (2017, 2024), who explain the procedure step by step. This methodology can be transposed and applied to glassblowing, and where Erin O'Connor (2024) emphasises the importance of understanding how to manipulate the material. Bodily posture, such as the inclination of the body on the bench, and the handling of hot glass with nothing more than sheets of damp newspaper determine the ultimate form of the piece (Figure 5). Such embodied knowledge, encompassing posture, manual engagement, and the pressure exerted by the hands, is acquired through sustained practice, even though, as Jessica Hemmings (2023) notes, it may not be something that can be teachable.

This passage focuses on the notion of tacit and embodied knowledge within craft practice, situating technical skill in not only verbal instruction but also corporeal experience. The reference to both ceramics and glass underscores the transferability of pedagogical approaches across materials while simultaneously acknowledging the limits of explicit teaching when confronted with forms of knowledge that are enacted rather than verbalised.

Regarding the dialogues established between Silva and the glassmakers, she states,

> They are inherently singular. Communicative processes are not uniform across practitioners, nor can they be expected to remain consistent throughout different projects. In some cases, the intended objective may be realised without explicit dialogue; in others, collaboration may reach the point of seeking to apprehend one another's lived realities, articulated through references to quotidian situations and material objects (interview with Joana Silva, 2025).

Such dynamics highlight the contingent and situated nature of collaborative practice, whereby meaning is co-constructed through varying degrees of dialogue and shared experiential knowledge.

In her work, Silva integrates traditional techniques and ancestral forms; however, she develops them beyond a purely technical approach, engaging in a contemporary (re)interpretation. Regarding her piece *Colour* (Figure 6), she states,

> The concept emerges from the process, in which two layers of colour are applied. A dark outer layer encapsulates white, symbolising the light within. The form is inspired by the wheel, an object that enables movement and acceleration. Life is represented

through a cold-cut incision, marking the pursuit of an inner luminosity and transparency, a journey towards clarity and enlightenment (interview with Joana Silva, 2024).

**Figure 5**

*Joana Silva working at CENCAL with the assistance of Eduardo Frois. Photo @Joana Silva.*

Owing to the country's economic challenges, CRISFORM was forced to close its doors in 2011. However, in a fortunate turn of events, that same year, CENCAL (an institution dedicated to ceramic training) stepped in to take over CRISFROM's facilities. Recognising the importance of preserving glass craftsmanship, CENCAL continued some of the existing glass programmes, ensuring that the knowledge, techniques, and traditions of the craft were not lost.

Since 2011, Joana Silva has coordinated the glass training course at CENCAL, consolidating its curriculum and reinforcing its role as a bridge between traditional glassmaking and contemporary innovation. Under her direction, the programme has remained a key site for artistic and technical development, fostering new generations of practitioners while ensuring the preservation and transmission of ancestral knowledge.

**Figure 6**

*Joana Silva, piece "colour", 2023. Made at Nelson Figueiredo studio with the assistance of Arlindo Francisco. Photo @Joana Silva.*

## Art students and craftworkers

CENCAL enables art and architecture students to access blown glass and lampworking, supporting projects, including master's and PhD theses.

The courses conducted at CENCAL are consistently supervised by a faculty member. I initially launched this initiative, and today, several faculty members share the responsibility for guiding the students. While the students were preparing tools, I spoke with the glassmakers about how the course was progressing. Many indicated that the course provided a welcome respite from repetitive factory work. Others added that it was highly rewarding to hear the students' ideas, see their designs, and partake in the execution of the pieces. Others added that it was highly rewarding to hear the students' ideas, see their designs, and partake in the execution of the pieces. Occasionally, they wondered how the students managed to develop such intriguing projects, as they combined various materials and forms to produce surprising results. There were times when they felt somewhat sceptical, assuming that the design would not be successful; however, through dialogue with the students, they were able to overcome these obstacles. The students, in turn, expressed great respect for the master's opinion, noting that during their discussions, the initial designs were often modified.

Insightful quotations from Groth are interwoven throughout this section to substantiate the significance of the collaborations described, reinforcing their conceptual and practical value. These citations not only lend theoretical grounding to the discussion but also illuminate how such collaborations evolve through materialised processes, revealing the reciprocal relationship between dialogue, experimentation, and the physical realisation of ideas.

The conceptual focus of Catarina Bach's master's research is to unveil, reveal, and make shadows known, aiming for projections of an inaccessible interior. Beginning with two-dimensional drawings on the glass surface, she uses the fusing technique to imprison various metal lines of varying thicknesses within the glass. She uses glass panels as a fine art material in the form of a canvas that is displayed on the wall. Bach participated in a blown glass workshop at CENCAL in 2022, marking her work's transition to three-dimensionality. Guided by master glassmaker Francisco, who taught her the fundamentals of glassblowing, she embarked on her journey in this field. From the creation of forms, to the incorporation of metals, dialogues are established between the glassmaster and the apprentice, facilitating the transmission of the technical skills required for working with hot glass. The following year, she returned for another course, in which she was quickly able to develop her work almost independently. This was important, as when we engage physically with a material, it reacts to our movements and presence. The marks or traces we leave behind reveal aspects of who we are while exposing the boundaries and limitations of our bodies (Groth, 2017).

**Figure 7**

*Catarina Bach working at CENCAL with the assistance of Arlindo Francisco. Photo @Catarina Bach.*

**Figure 8**

*Catarina Bach piece, Flammascopium. Photo @Catarina Bach.*

One of her works won the Material 2024 prize at the MilanoVetro-35 exhibition. Titled Flammascopium, this phallic-shaped work features a gradient of shadows that are projected in the interior of the piece through the interplay of coloured filaments. These filaments gain a tangible presence, resembling chromatic brushstrokes that layer and merge within the glass form (Figures 7 and 8).

Originally from Brazil, Giulia Yoshimura, attended the master's programme in fine arts at FBAUP. With a background in architecture, she develops urban art projects through the creation of pictorial murals that are dispersed across Brazil and Europe. In her research, she sought to explore the question "In what ways is nature perceived in the urban environment?", working on the concept of "plant blindness", as articulated by James Wandersee and Elisabeth Schussler. She became enamoured with glass in its various artistic expressions, engaging with the notion of "presence in absence" in her blownglass pieces, which she developed during her training at CENCAL. She would use a plant body, onto which she would pour molten glass, causing the form to vanish and leaving an imprint of what was once present. Consequently, the glass piece contains the impression of this plant body, which has been burnt away and ceases to exist. This serves as a poignant commentary on the environmental issues afflicting nature owing to the deadly fires that destroy vegetation.

The work that we create can be understood as an extension of ourselves because it inevitably carries elements of our self-expression (Groth, 2017). Giulia Yoshimura has attended CENCAL three times to train in blown glass techniques. Her initial pieces were crafted under the guidance of master glassmaker Arlindo Francisco, who taught the process step by step, exemplifying the most effective methods to achieve the desired results. After her continuous handling of the incandescent glass, she was able to largely develop the pieces independently during her final training (Figure 9). Her final master's exhibition presents these pieces alongside her paintings (Figure 10).

**Figure 9**

*Giulia Yoshimura working at CENCAL. Photo @ Giulia Yoshimura.*

In her master's research, Inês Amorim established a relationship between art and industry. The glass was encased in a metal structure that was constructed in advance. A strong relationship was fostered between Amorim and the glassmakers because of their work together in the CENCAL workshops. Amorim's enthusiasm for the blowing technique allowed her to participate in the Erasmus+ programme, during which she produced some pieces at the Rona Factory in Slovakia. The dialogues that were established were surreal; the glassmakers spoke only Slovak, and Amorim's attempts to communicate in English were futile. Through drawings and gestures, the pieces gradually took shape. Amorim brought the metal moulds, and the glassblowers at the factory used them to make the blowing pieces. The mould is not merely an auxiliary tool in the process but also an integral component of the artwork itself. In 2024, when completing her master's thesis, she developed some pieces at the Ifa-Vidro factory in Portugal with the assistance of glassblower Cláudio Duarte, using the same methods that had been employed at the Rona Factory. She made the metal moulds, and Duarte made the glassblowing piece that integrate with the mould (Figure 11).

The behaviour of the molten glass – its changing viscosity and pliability under heat and weight – is something that cannot be held in mind as an idea (Bart, 2019, 13), for it is important to have the knowledge of a glassblower. Inês Amorim and I had to go to the factory after working hours, at 1.30 am, to be able to make the pieces, and during this period, we also saw other designers making pieces there with the assistance of two other craftworkers. It is common for Claudio Duarte to make pieces for other artists after hours. With Duarte the language was no longer a barrier. Images of the completed pieces were shown to the glassmaker, allowing for a clearer visual understanding of the intended form. Throughout the creation process, dialogues flowed seamlessly. According to Groth "craft can also be seen as a form of embodied knowing that involves materials, tools and social communication" (2017, 100). Amorim remarked that she did not fear the possibility of the piece failing, as she liked to explore the immateriality of glass. In contrast, this appeared to be a significant concern for the glassmaker. Following the first attempt, however, the difficulties were gradually overcome through non-verbal communication, conveyed primarily through gestures. This account illustrates the asymmetry of perspectives within collaborative practice: Whereas the designer/artist may embrace risk and the possibility of failure as part of the creative process, the glassmaker, rooted in a tradition of technical mastery, may experience failure as a professional or material setback. As Groth quotes, "The craft practitioner's process includes taking risks and, therefore, inevitably also failure. Problems related to materials and techniques emerge and need to be worked through and solved" (2024, 84). The eventual resolution through gestural dialogue foregrounds the role of embodied and non-verbal communication as a critical mode of negotiation in the studio environment, bridging different professional cultures and expectations.

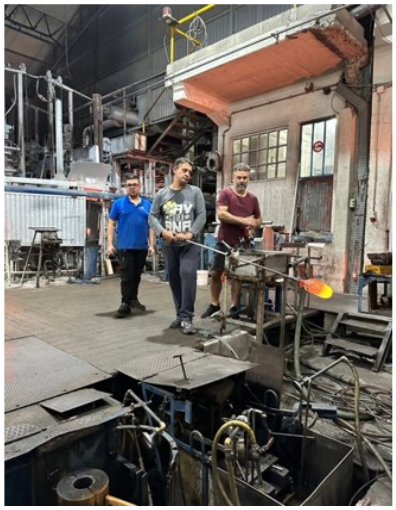
Amorim's final master's exhibition, which was characterised by its unconventional nature, was held in a church, and the piece was exhibited among other works. At first glance, the glass droplet appears to be trapped within the metallic structure. However, upon closer inspection, it becomes evident that the form has flowed beyond the framework, surpassing its limits. The choice of presentation—placing the piece on an elegant cushion—enhances its aesthetic value (Figure 12). The combination of various materials is a distinctive feature of Amorim's work.

**Figure 10**

*Glass blowing piece exhibit at Fisga gallery in her Master's graduation exhibition. Photo @ Giulia Yoshimura.*

**Figure 11**

*Inês Amorim piece being made by Cláudio Duarte at Ifvidro factory. Photo @ author.*



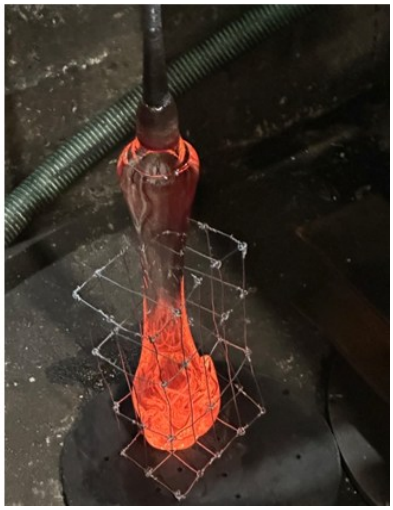
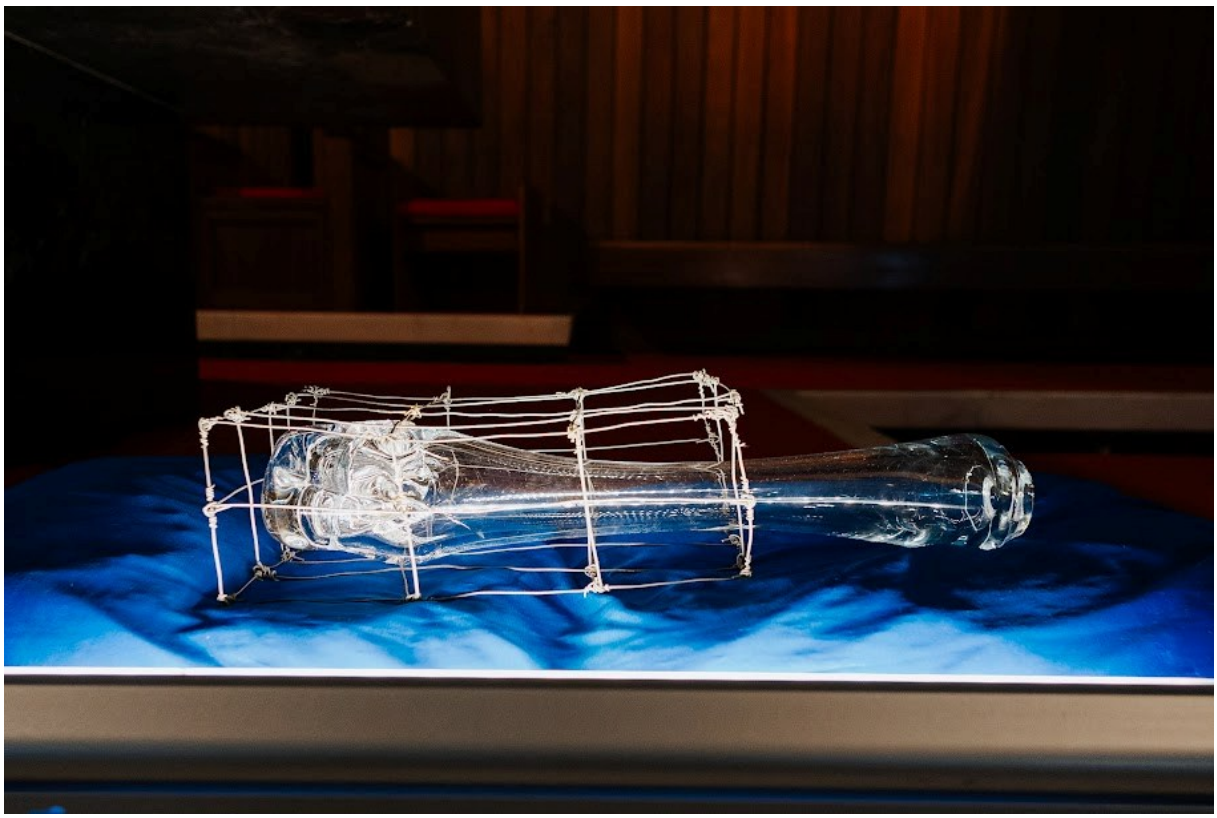


**Figure 12**

*Inês Amorim piece exhibited at the Church Nossa Sr. Do Perpétuo Socorro, Porto. Photo @ Inês Amorim.*



## Architectural Glass

Brian Clarke states that “glass is a basic architectural material with essential roles of function to fulfil” (Clarke, 1979, 21).

The earliest stained glass windows in Portuguese territory were designed for the Monastery of Santa Maria da Vitória in Batalha and date back to the 1430s and 1440s (Redol, 2014). In France and Belgium, stained glass was also employed in non-religious buildings; however, in Portugal, particularly during the nineteenth century and the first quarter of the twentieth century, which coincided with the movement that prompted the revival of this art form in Europe, stained glass functioned primarily as a painting technique that was specifically adapted to sacred spaces. It was only in the twentieth century that stained glass saw significant development in Portugal, with numerous works of artistic excellence created by renowned Portuguese artists and the establishment of a dedicated stained-glass studio, demonstrating that stained glass remains vibrant and relevant today (Almeida, 2021). Most of the artists who create stained glass merely design the studies, known as cartoons, which are subsequently enlarged, transposed, and executed in glass by craftspeople in specialised

workshops. Portugal had two notable workshops: Ricardo Leone in Lisbon and Antunes in Porto.

## Antunes stained glass studio

Stained glass usually requires collaboration between the artist and specialised makers; however, João Aquino Antunes (1946–2022) uniquely combined both roles, mastering the craft in his father's workshop and inheriting its generational expertise. He was a professor at FBAUP from 1973 to 2008 and the third-generation owner of a stained-glass studio founded in Porto in 1906. Earlier generations of his family collaborated with national artists and expanded production; however, Antunes focused on his own designs, especially grisaille paintings. The studio, though reduced in scale, maintained its quality and remained active until his death.

In 1969, Antunes produced a *dalle de verre* installation for a church in Porto; it was recognised as the first instance of abstract architectural glass in a religious context. Composed of 22mm-thick glass fragments meticulously shaped with a tungsten hammer, the work integrates subtle figural elements within a predominantly blue field. The resulting diffusion of light generates a contemplative, almost transcendental atmosphere that reinforces the spiritual experience of the sacred space (Almeida & Lochorey, 2021).

Recognising the historical and artistic significance of three generations of work at the Antunes studio and its cultural legacy in Porto, João Aquino Antunes commissioned the creation of a stained glass museum to exhibit part of the family collection.

## Colourful skylight

In 2021, at Antunes's request, I designed a cartoon for the stained-glass skylight of the Stained-Glass Museum (Museu do Vitral) in Porto.

Skylights are a highly distinctive architectural feature of Porto city. Throughout the city, they can be found in the roofs of nineteenth-century bourgeois houses, and the museum is no exception. However, rather than the stained glass being inserted into the pre-existing skylight, a new inverted skylight was created at the request of Professor Aquino and installed beneath the original one.

This intervention demonstrates a negotiation between heritage architecture and contemporary artistic practice, whereby the new structure does not replace the historic element but, rather, establishes a layered dialogue with it. Such an approach foregrounds strategies of architectural palimpsest, in which innovation emerges through juxtaposition rather than substitution, thereby allowing the past and present to coexist within the same

spatial frame. Here, the study of forms and the colours underlying them was conceived symbolically. John Gage further notes that to develop a study of colour in art, one must undertake a sensitive and precise observation, and that colour is not merely a “measurable datum” (Gage, 2006).

Before beginning,the work several conversations were held with the craftmaker, José Oliveira, who had worked in the studio all his life, to understand the dynamics of the workshop, accompanied by a rigorous study of the works previously produced there. I conducted this investigation before and during my PhD, where I followed the work produced in the studio. This preparatory stage highlights the importance of contextual immersion and ethnographic observation within craft-based research. By engaging directly with the practitioner and systematically examining the workshop’s output, the process foregrounds not only technical understanding but also the cultural and social dynamics that shape craft practice. Several studies were conducted by me and presented to Professor Aquino, from which a choice was made by me, followed by an enlargement to full scale of the window size. After the approval of Antunes came that of Oliveira. In the discussions held with Oliveira, it was noted  by both that some adjustments to the design, such as the sizes of the background glass pieces, would be necessary (Figure 13).

According to Peter Domer (1997), craftspeople are in control of their work. We can say that they are in control of what they are making because they are subject matter experts who understand the materials that they work with. For this reason, the suggestion made in the dialogue with the craftworker was taken into account.

**Figure 13**

*Preparation of the drawings for the stained glass. Photo @ author.*

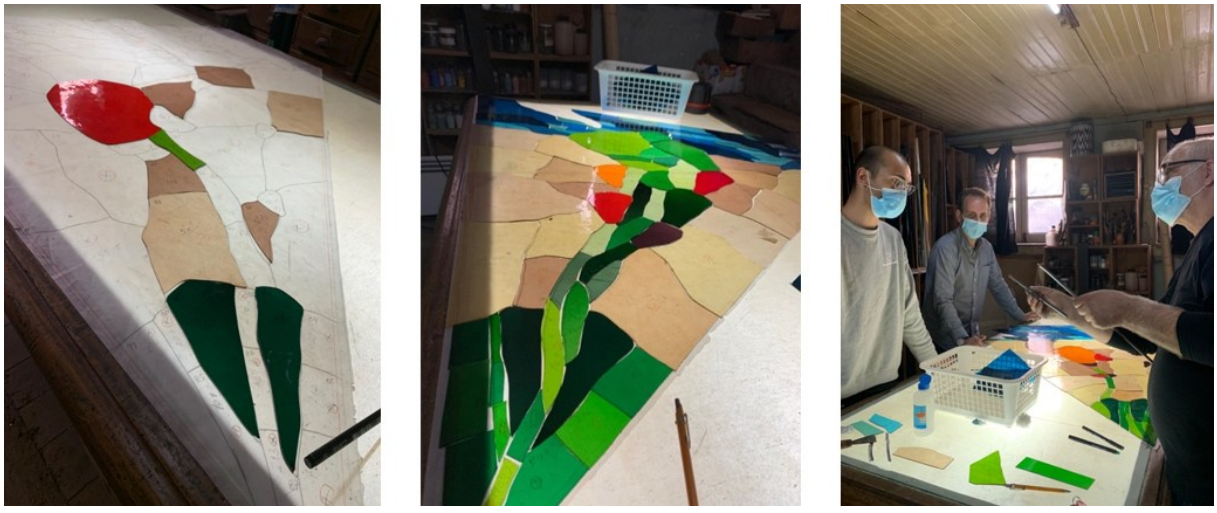
The next step  of the process was to select the glass, initially from the available samples, and then verify whether there was enough glass in stock in Antunes studio. My goal was to use only the glass available in the workshop, which was not a problem, as there was a large stock of colours. Once I made the selection was made, the glass-cutting process began (Figure 14 assisted with this task.). Given the advanced age of the worker, it was necessary to enlist the help of additional staff to ensure that the stained glass window was completed in time for the opening of the museum. Miguel and António Miranda, as well as Antunes's godson, João Faria Dias, assisted with this task (Figure 15).

**Figure 14**

*Preparation of the stained glass with the assistance of José Oliveira. Selection of the colours and cutting the glass. Photo @ author.*

**Figure 15**

*Preparation of the stained glass in the studio with the assistance of Miguel Miranda, António Miranda and João Faria Dias. Photo @ author.*



Embedded within a square-based pyramid, each of its faces serves as an allegory to the artist and the workshop, with the creators represented by the colours orange and red, which were used for the garments of significant figures in mediaeval stained-glass works. The soft lilacs and pinks are reserved for the stained-glass makers who performed the workshop work. These expensive colours, often including gold, are used as a tribute to these workers, who, though frequently anonymous, were essential to the completion of the artwork. One side of the pyramid represents the first generation, and another signifies the second generation, where father and son worked together. On the third face, the final generation is depicted. All three generation collaborated, along with an allegory to the artistic and pedagogical work of the professor. The fourth face of the pyramid, where green was used, symbolises the birth of the museum, captured in a herb that grows towards the sky, as I often saw on the workshop terrace. The blue, made through horizontal shapes at the top, represents both the sky and the Douro River, which flows through Porto city and can be viewed through the museum window.

Blue is one of the predominant colours used in Antunes's stained glass windows and was chosen in the work *Paisagem*. This colourful blue stained glass window with artificial light was presented by Antunes for the title of fellow professor, which was conferred by the School of Fine Arts at the University of Porto in 1988 (Almeida & Lochorey 2021). Blue also has a significant predominance in my artistic work, too. It is the colour of harmony, the divine, and the spiritual (Heller, 2007); it projects humanity into the infinite, and when the colour gains depth, it becomes calming (Kandinsky, 1987). Blue is sensitive, perceptible, and conveys tranquillity (Gage, 2006). In mediaeval stained-glass works, blue was the colour of the illuminated sky (Bell, 2009). The combination of blue and green is often used to depict the relationship between the divine and the earthly, as green represents hope, water, the colour of spring, and the rebirth of life (Fabri, 1967).

During the final installation of the work in the museum space, the artist was prohibited from attending. The craftsman explained that based on his extensive experience, artists often became anxious which would hinder work process. The stained glass consists of a skylight above the staircase. The coloured light is projected onto the entire building (Figure 16).

**Figure 16**

*Stained glass museum and the skylight. Photo @ author.*

In recent years, rapid advances in technology have significantly encouraged contemporary artists to employ digital technology and modern techniques in their artworks. Many artists around the world have applied glass, among different materials, to express their conceptual approaches. According to Paul Greenhalgh, “Designer-craftspeople who have engaged with alternative technologies during the last several decades present a more constructive, albeit still Luddite, model” (Greenhalgh, 2002, 8).

## Conclusion

The process of working with glass is complex because of not only demanding working conditions but also the nature of the material itself, which beginners often struggle to fully grasp. The glassmaker engages in continuous interaction with the material, maintaining an ongoing dialogue with the designer throughout the process. Although glassblowing is already an automated process for the most part, a human glassblower relies on tacit knowledge to conceive and enact a blown work, which is the result of a unique dialogue between maker and material. In this case, glass, cannot be envisioned according to any fixed concept.

This article aimed to provide an overview of the contemporary glass landscape in Portugal, focusing on its applications in blown and stained glass within a historical framework, as well as the developments in this field regarding the relationship between craftworkers.

Blown glass in Marinha Grande was highlighted both for its historical relevance and for the efforts to preserve and reinterpret ancestral knowledge for future generations. CRISFORM contributed significantly by providing specialised courses that enabled the transmission of

skills from master artisans. Many former apprentices now work in factories, collaborate with designers and artists in studios, and lead training initiatives at CENCAL, ensuring the continuity of glass expertise within contemporary artistic practice.

This article also highlighted the art of stained glass, with a particular focus on Portugal's longest-running stained-glass studio and its final commissioned work for the Stained Glass Museum, paying tribute to the craftsmanship and artistic legacy preserved within this field. Today, the role of glass in contemporary craftsmanship extends beyond traditional artistic endeavours; artists and designers play an active role in the craftmaking relationship.

ACKNOWLEDGEMENTS

The author would like to thank Rita Barata, Nelson Figueiredo, Joana Silva, Catarina Bach, Giulia Yoshimura and Inês Amorim for the permission to publish their work; and Vicarte for the support

PRR UID/PRR/00729/2025 (https://doi.org/10.54499/UID/PRR/00729/2025);

PRR2, UID/PRR2/00729/2025, https://doi.org/10.54499/UID/PRR2/00729/2025;

VICARTE UID/00729/2025 https://doi.org/10.54499/UID/00729/2025

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