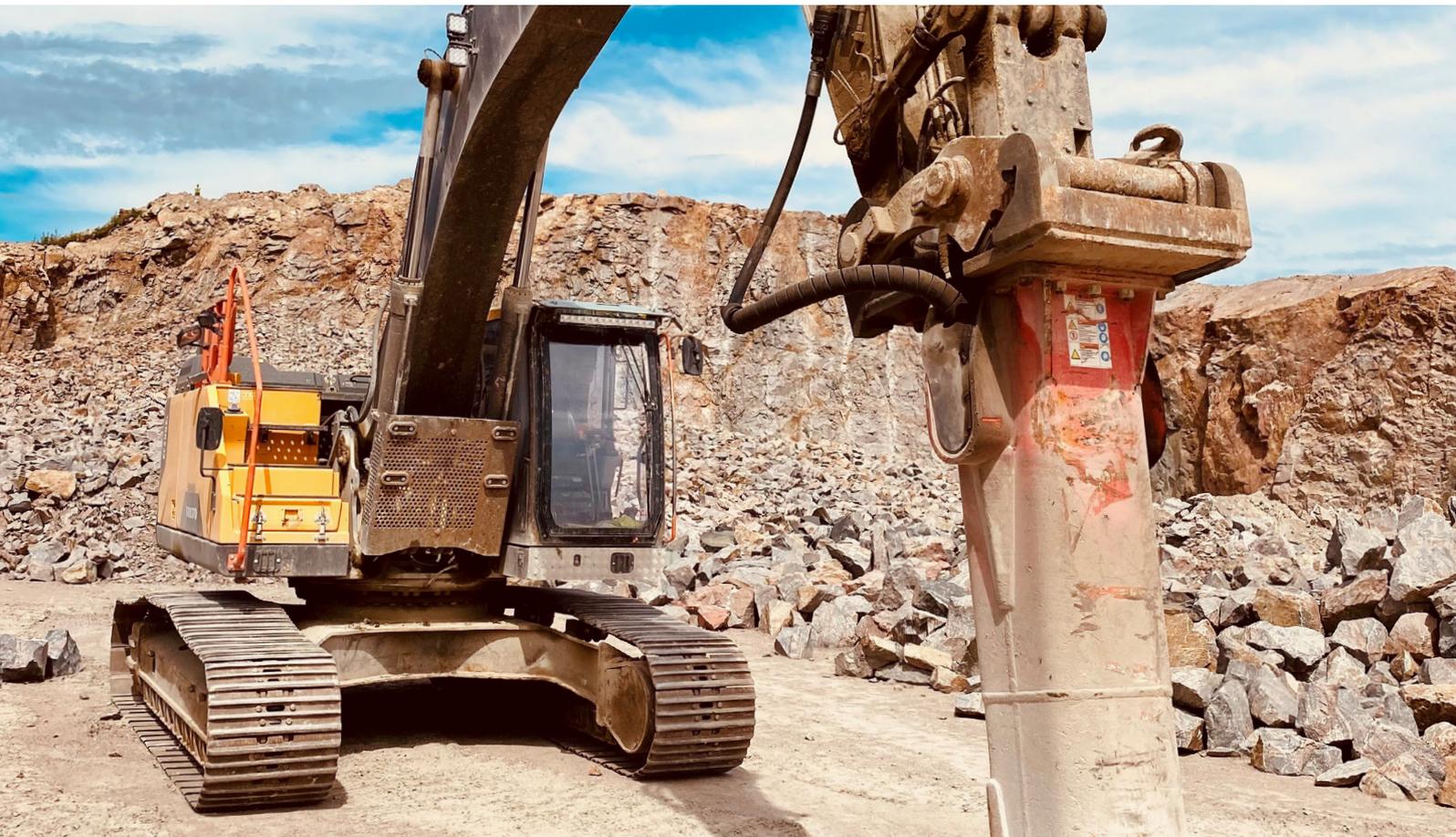




Unbreakable Screens Survey by Hammerglass and LECTURA

The awareness of regular glass alternatives –
the safe, economical and sustainable solution
for construction and construction-related industries



About Hammerglass

Hammerglass was set up in 2006 and today comprises three divisions – Property, Infrastructure and Automotive. Property focuses on the property and security sector and is currently alone in providing unbreakable insulating glass with a full insulating glass warranty for schools, shops, industry and more. Infrastructure has developed its own solutions for unbreakable noise barriers, bus shelters, travel centres, bridges and pedestrian and cycle tunnels. Automotive secures the driver environment in construction machinery and emergency vehicles. The company has a turnover of around 130 million SEK and a staff of 60 (2021). Approximately 30% of its turnover comes from exports, with the Scandinavian countries, Germany, the USA and Canada being the most important destinations. The company is owned by MD Bengt Nilsson, LMK Forward AB and NEA Partners AB.

About LECTURA

Founded in **1984**, LECTURA is a leading provider of machinery intelligence on the market and attracts around **1,000,000 professionals every month**, sourcing all kinds of heavy machinery data.

LECTURA's database contains over **160,000 heavy machinery models** and provides evaluations of used machines through online tools and digital solutions. LECTURA's service offer also includes technical specifications and data enrichment, product and market analyses, high-value lines, country-specific price development determinations and a variety of further, client-tailored services.

In addition, the web portal LECTURA Press provides the latest news from the heavy machinery industry and exclusive interviews with industry experts and market leaders. LECTURA also publishes the online magazine DigiMessenger and runs surveys on a variety of current heavy machinery industry topics.

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Introduction

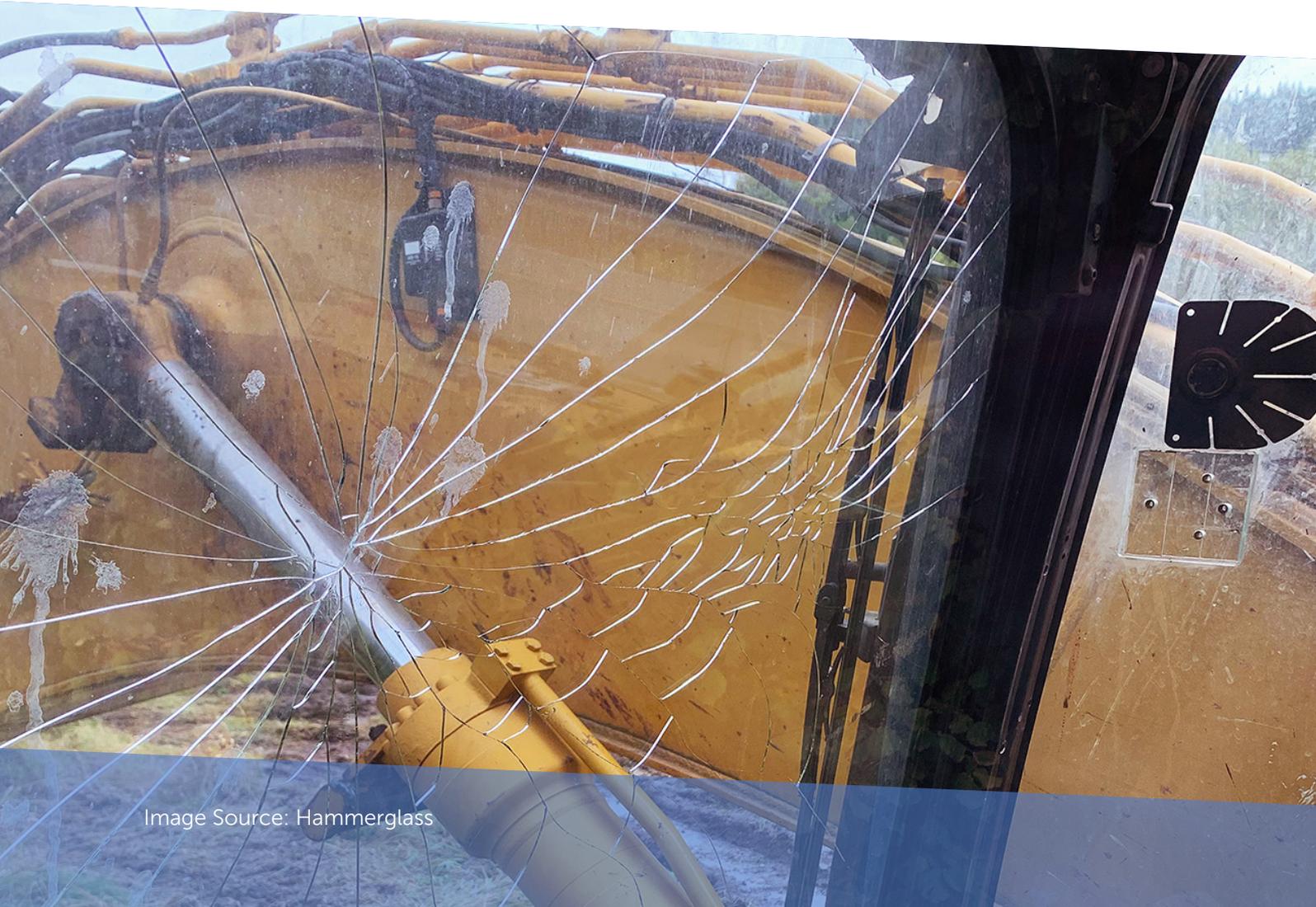
The importance of driver safety is getting more and more attention within the construction business. But there is still a long way to go - especially since almost every new machine is equipped with ordinary glass and not safer alternatives – alternatives that are already innovated and have proven to be the better choice. Not “only” regarding safety but also in ways that will have a positive impact on operating economic and sustainability. That is the message that Hammerglass has always strived to educate on, and we put great effort into testing our own products to show that modern hard-coated polycarbonate is a smart way to go forward.

With Hammerglass, you take a stand. You choose to show empathy and gratitude towards the driver in the cabin by valuing the hard work that he or she is doing by minimizing the risk of physical harm. You also take a stand for the future. With Hammerglass, you don't have to worry about expensive glass breakage that keeps the machine standing still, and you can use the screen much longer than a conventional window. And fewer newly ordered screens mean a less deep climate footprint. We don't have time for that kind of unnecessary loop. We must maintain our resources and use them as cleverly as we possibly can. Choose sustainable available options!

The knowledge of what alternatives there are to equip machines with safe solutions is too low. With this survey, we wish to raise our own knowledge on how the wind is blowing through different markets and regions; and use this information to continue our journey to change the business mindset on driver safety.

Hammerglass slogan is that “we want every driver to come home safe after work”. More than 30 % of the respondents handle glass breakage up to 5 times a year. The consequences of these breakages have, in turn, resulted in several cases of physical injury and standstill costs.

That must change. And now is the time.



Methodology

Since this research aimed to raise awareness on circumstances under which the glass breakage occurs and on people's opinions, the survey method was chosen. It also meets the requirements of collecting information on a broad range of things from many people in a relatively short time.

The survey ran from 27th May to 28th June and targeted respondents from a variety of industry sectors, working in companies of various sizes and owning fleets of different sizes. Specifically, the analyses were focused on the regional level and targeting six regions.

- Scandinavian countries (Sweden; Denmark; Norway; Finland)
- DACH (Germany, Austria, Switzerland)
- France
- Italy
- Spain
- United Kingdom

The regions were chosen to cover the countries of Hammerglass market (sales offices). The results for the remaining regions were elaborated rather briefly (they are presented in the appendix at the very end of this report).

The survey aimed to investigate the awareness of glass breakage possibility and consequences, knowledge about unbreakable screen technologies and factors affecting the glass purchase choice.

A questionnaire of 13 questions, in total (the maximal number of questions people could answer based on their previous responses), was published in LECTURA Specs webpages of five different language versions (English, German, French, Spanish, and Italian). Participation was voluntary.

The survey begins with three demographic questions with which we aim to describe the survey sample and find out on whom are the results generalisable. Then, one filter question about whether the glass on respondents' vehicles ever broke is presented. Based on the reply to this question, the subsequent paths were a little bit different. Respondents who reported the glass breakage were asked about the causes and consequences of such breakage. On the contrary, those who have not encountered such an accident were asked directly about their purchase behaviour and factors affecting the purchase decision.

In total, 21 907 respondents agreed on participation. From the final sample, responses from agricultural sector representatives were excluded. Thus the final sample consisted of 13 737 people. Considering the numbers for the six preselected regions, 633 respondents were from Scandinavia, 3 997 respondents were from German-speaking countries, 1 337 of the respondents were from France, 856 of the respondents were from Italy, 829 from the United Kingdom and 392 from Spain. The objective of the following chapters is to explore how and to what extent the data received in the survey reflect the behaviour, experience and opinions of industry representatives' population.

Results

The survey analyses consisted of inspecting the responses received by the total sample and a more in-depth focus on differences between replies according to the region of origin. In this chapter, the results for predefined regions are inspected, respectively (the remaining results are mentioned in the appendix). First, the survey sample properties are explored, followed by the questions about unbreakable screens technology.

Survey Sample Overview

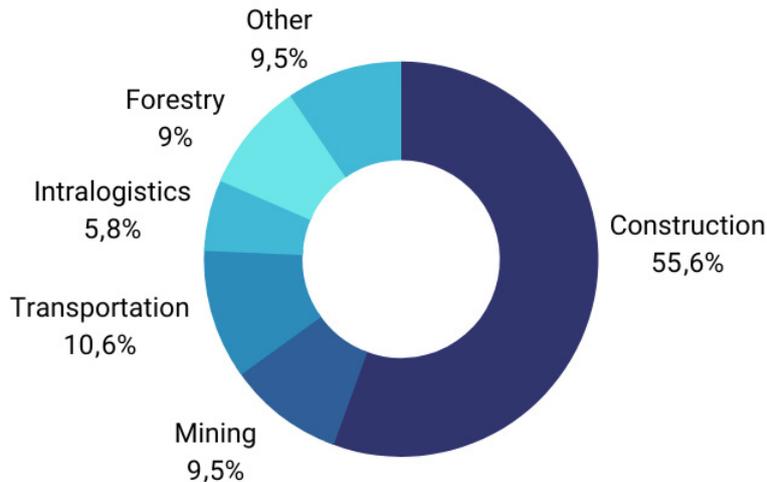
- **Regardless of the region of respondents origin, some characteristics prevail in the survey sample.**
- **Most respondents work in the construction sector, in companies, up to 10 employees and their fleet size is up to 10 vehicles.**
- **Yet, there are some generalisable differences according to the region of origin, but to a relatively small extent.**

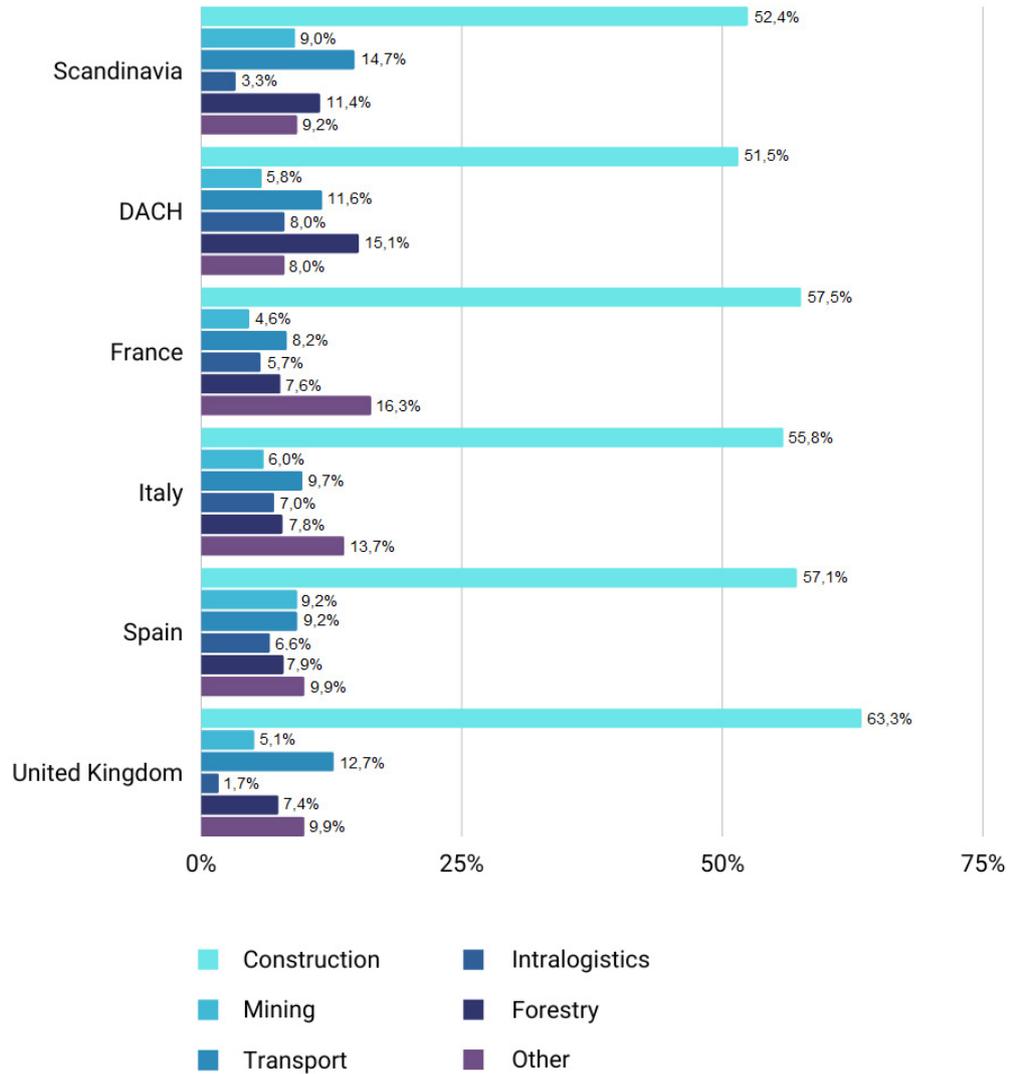
This very first results chapter aims to explore who the people that participated in the survey are: the industry sector they work in, the size of the company they work in, and the size of their fleet in the number of vehicles. With this, we aimed to give more in-depth insight on who will be the results applicable.

Sector of activity

Globally, most of the survey respondents (55,5%) were from the construction sector. The proportion of respondents from other sectors was lower. Beginning with respondents from transportation sector (10,6%), followed by respondents from mining (9,5%) and forestry sector (9,0%) ending at intralogistics sector (5,8%). It is also worthy of mentioning there were almost 10% of respondents whose activity does not fit any of the predefined categories.

On regions-level analyses, the data for each revealed the respondents from the construction sector being most represented - compared the numbers among the regions, the highest numbers were received in the case of the United Kingdom sample (63,3%) compared to 51,5% obtained from DACH. The numbers for the mining sectors vary from 4,6% (France) to 9,2% (Spain). The lower numbers are only for Intralogistics (ranging from 1,7% received in the Scandinavian sample to 8% received in DACH). The numbers for the remaining sectors were similar (from about 8%, peaking at 15%). Details and numbers for each region are presented in the graph below.

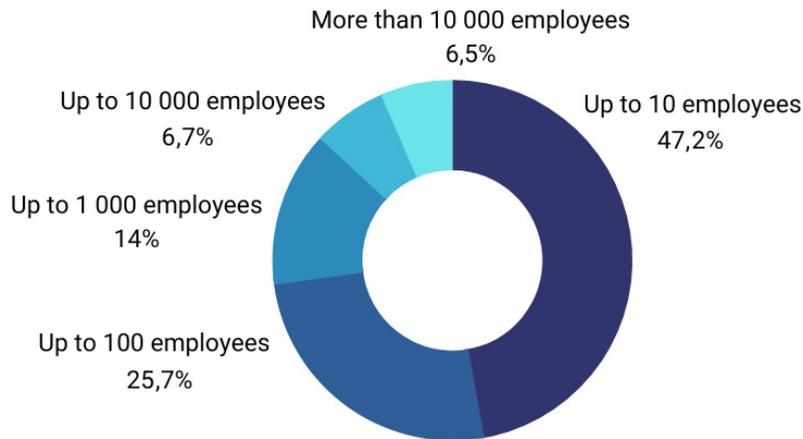


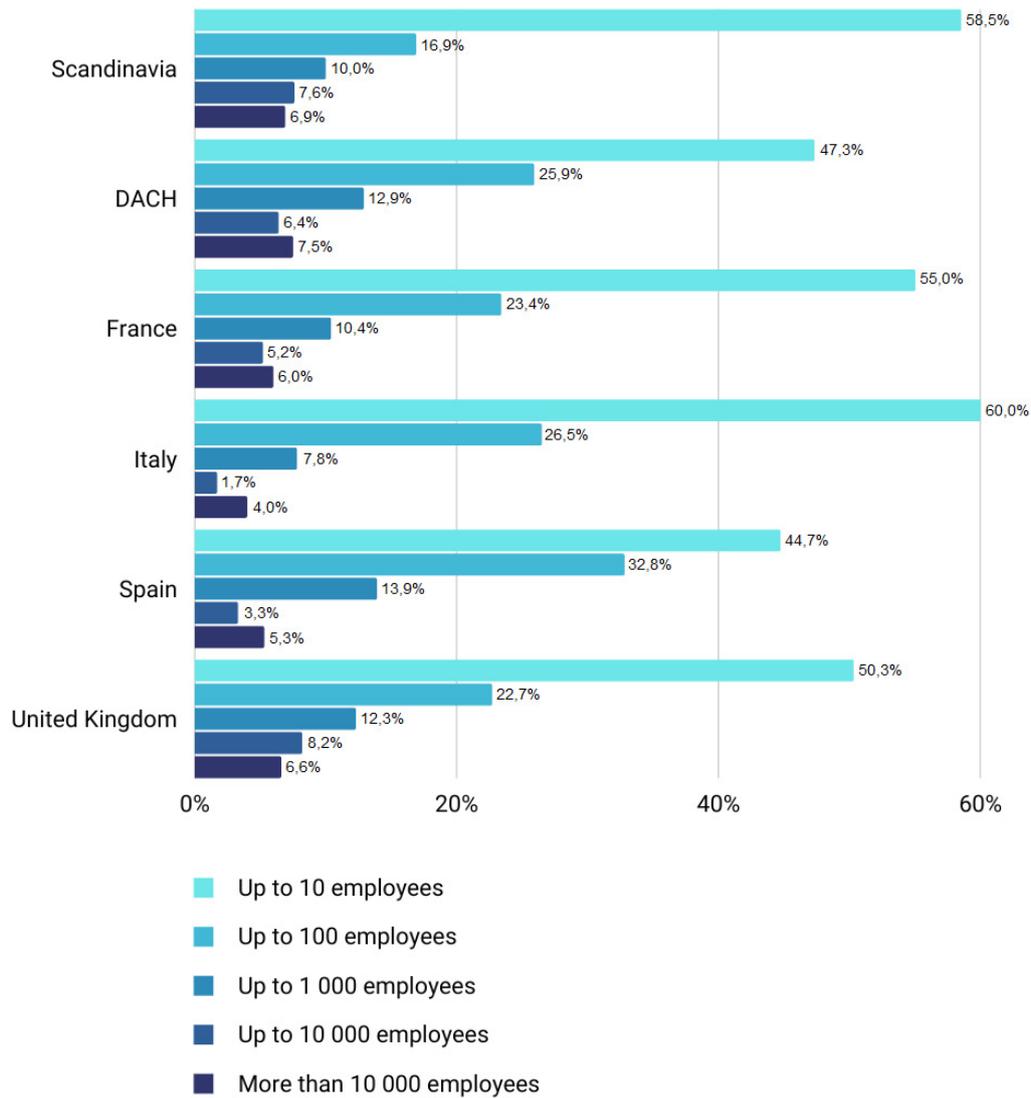


Company size in number of employees

The results of the next question concerned on the company size according to the number of employees revealed most respondents (47,2%) work in the small ones (up to 10 employees), followed by those who work in companies up to 100 employees (25,7%). The proportion of replies of up to 1000 employees is reaching 14%, whereas when it comes to any other larger companies, the numbers do not exceed 7 %.

Speaking specifically about the differences in the distributions according to respondents' region of origin, the numbers mainly reflect the global results. The number of people working in companies up to 10 employees prevails in all regions, followed by the number of respondents working in companies up to 100 employees and to a lesser extent up to 1000 employees. However, there are some differences in the number of responses received from people working in companies of up to 10 000 employees and from those working in companies of more than 10 000 employees. Although the global results reveal that the larger the company, the smaller the representation among the respondents, in DACH, Spain, France and Italy, it is the opposite.

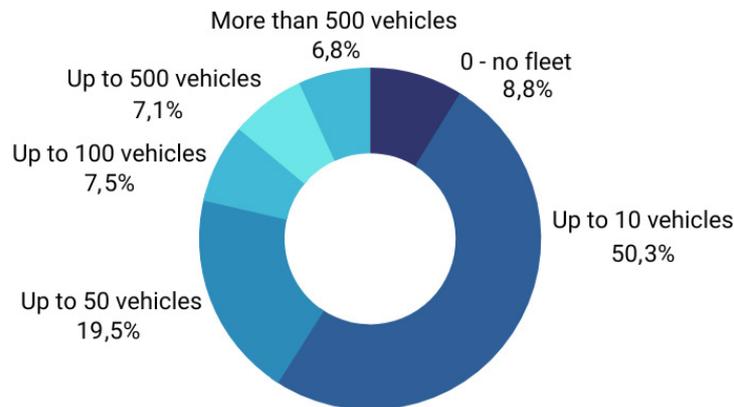


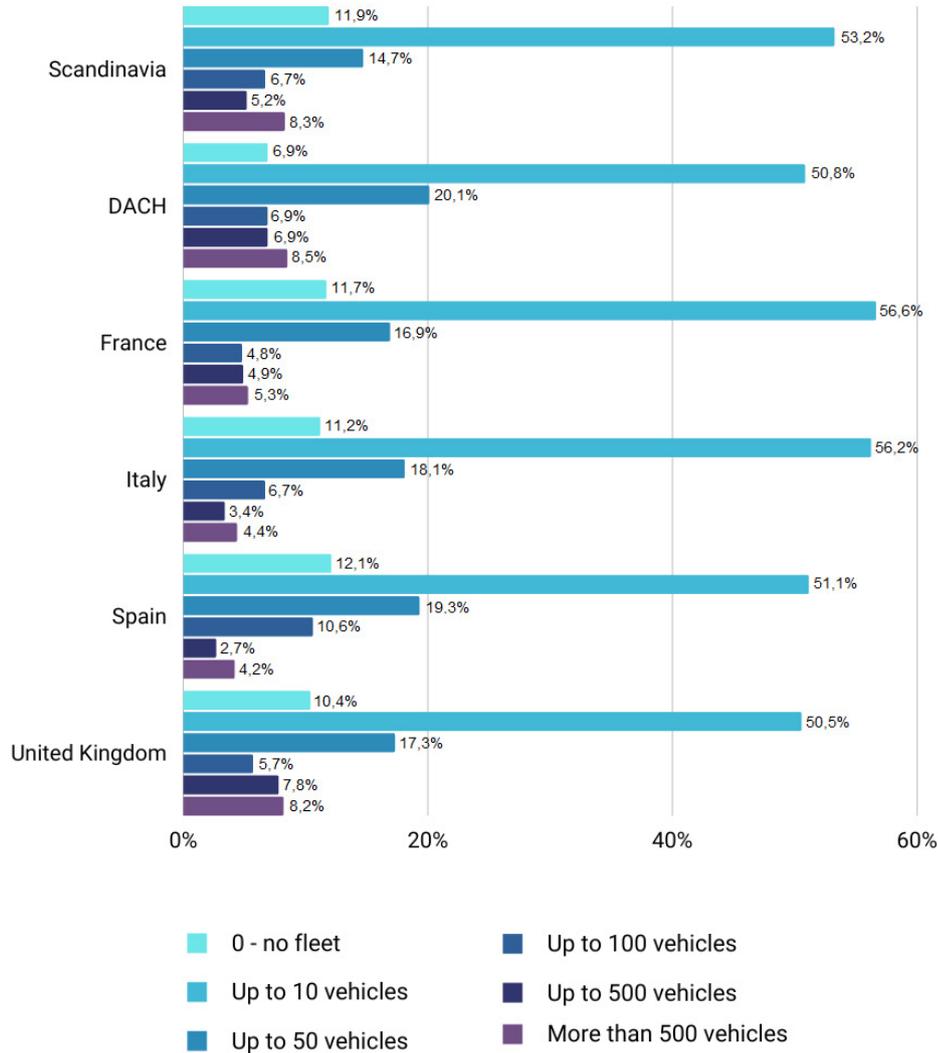


The fleet size

The last question concerning the respondents' characteristics was about the size of their fleet. Although 8,8% of the respondents claim they own no fleet, the remaining number revealed a similar pattern as the previous question. 50,2% of respondents claimed their fleet consists of up to 10 vehicles; the following 19,5% reported the size is up to 50 vehicles. As the chart depicts, the remaining options were represented by less than 8%, indicating a downward trend as the size of the fleet increases.

Again, analyses on the regional level revealed somewhat similar results. From 6,9% (DACH) to 12,1% (Spain) of respondents claimed they have no fleet, whereas more than half of the respondents in each region reported their fleet consists of up to 10 vehicles. From 14,7% (Scandinavian countries) up to 20,1% (DACH) respondents, moreover, revealed their fleet consists of up to 50 vehicles. In the global results sample, we perceive the lower frequency of replies as the number of fleet vehicles increases - on a regional level, however, some exceptions are depicted in the chart below.







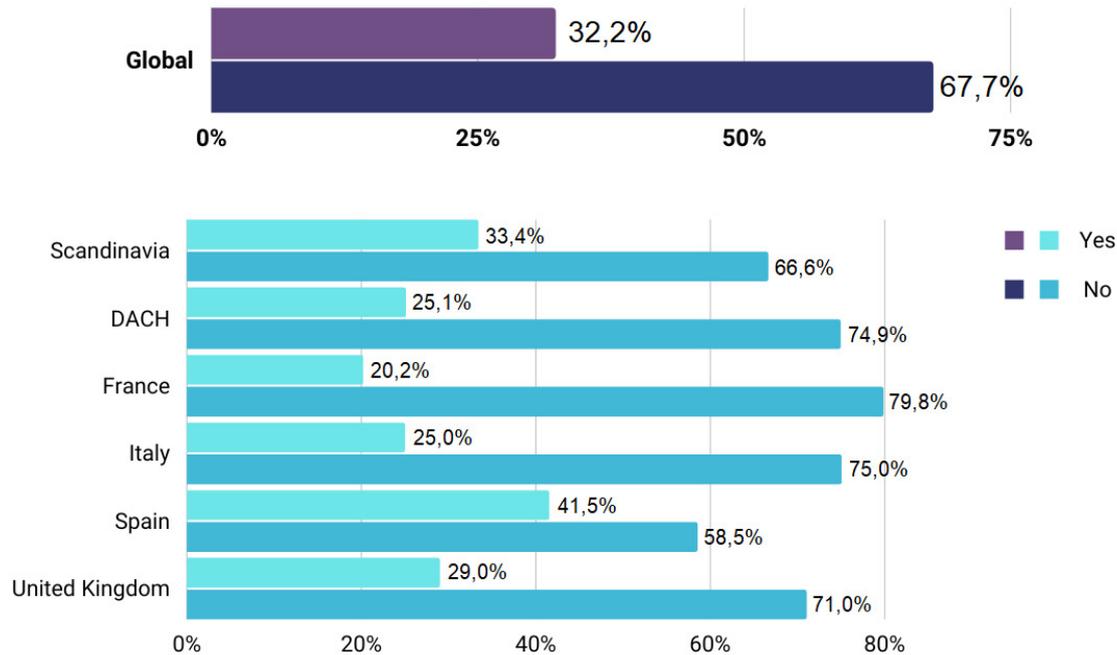
Glass Breakage Experience and Consequences

- About a third of respondents say the cause of the glass breakage is stones and debris; another 20% report the collision with large objects.
- When glass breakage happens, people mostly mind the replacement costs.
- Original glass providers are the number one among glass providers in general for about half of respondents.
- From a third to a half of people (depending on the region) handle the glass installation by themselves.
- Hard coated polycarbonate is the most well-known technology in the current market.

The prevalence of glass breakage

The first question asking about the experience with broken or shattered glass was simple, just asking respondents whether they have ever experienced such damage. The global results reveal that almost 70% (67,7%) of the respondents have not experienced glass breakage yet. The remaining 32,2%, on the other hand, confirmed it has already happened to them.

Regarding the differences according to the region of origin, the results were as follows. The numbers of those respondents who reported the glass breakage vary from 20,2% (France) to 41,5% (Spain). Moreover, except for Scandinavian countries and Spain, the numbers of replies for breakage occurrence do not exceed 30%. Conversely, the numbers for those who claimed glass breakage had never happened to them range from 58,5% to 79,8%.



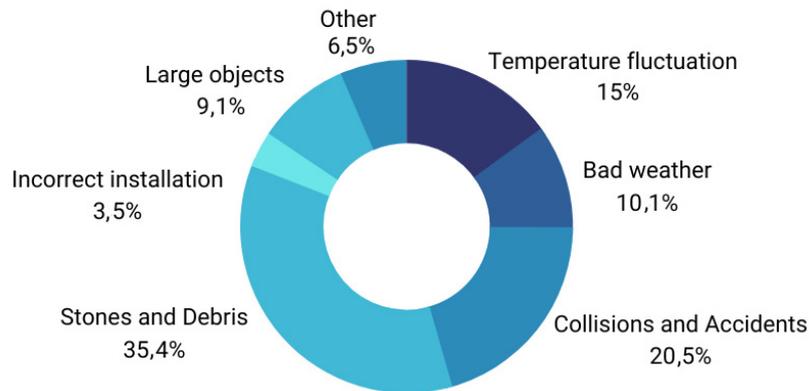
The most frequent causes of glass breakage

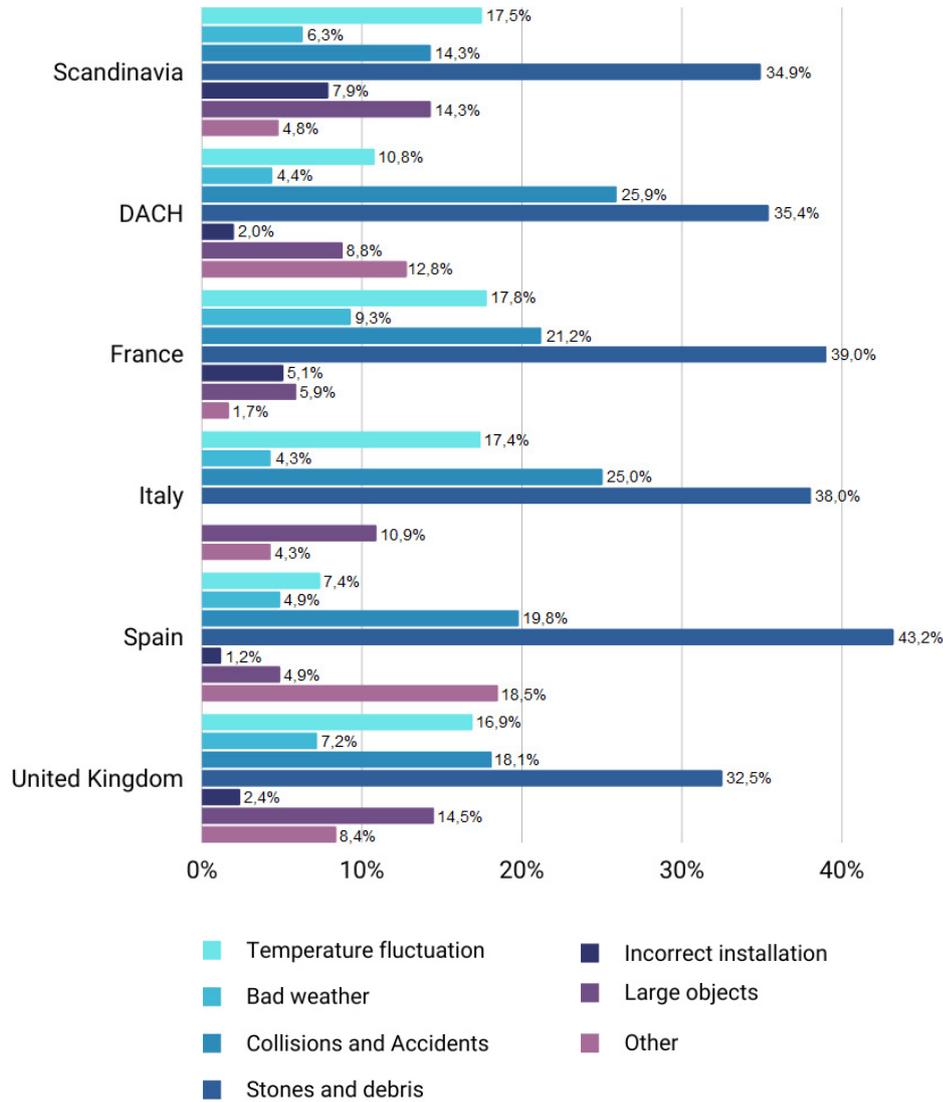
Since the so far results revealed that among the survey respondents about 30% had to deal with a broken machine glass, the exploration of finding out what was the cause of the breakage comes to the place.

As the analyses on the global sample indicate, more than one third (35,4%) believes their glass broke because of stones and debris.

From the remaining, 20,5% of respondents reported their machine glass broke during a collision or an accident, and 9,1% claimed their machine glass broke because of being hit by a large object (like a tree log or cargo). The replies also reflected the possibility of weather conditions causing the breakage. 15% of respondents claimed the glass broke due to a sudden temperature fluctuation, and 10,1% thinks weather conditions caused the glass to break. The pleasant surprise is that the glass breakage happened due to incorrect installation only in 3,5% of total cases.

However, such results do not appear to be applicable universally. The analyses conducted on the regional level revealed small yet significant differences. For example, from an Italian sample, none reported incorrect installation resulted in machine glass breakage. On the other hand, almost 8% of Scandinavian respondents believe their glass broke through the fault of the person who installed it. Also, there are some differences in case of temperature and weather conditions. For example, in Spain only 12,3% of people think the weather and temperature conditions made their machine glass break; the numbers obtained from France, moreover, exceed 27%, followed by the UK and Scandinavia. The numbers given for accidents caused by stones and debris and large objects also vary from region to region - by up to 10%.





The frequency of glass breakage among construction-related sectors representatives

It has already been described whether and why the glass breakage happened.

However, no information has been provided of how frequent, on average, the glass breakage happens yet. In this case, a little bit different approach was set - an open-ended question. The respondents were asked to think about and estimate how many times their machine glass breaks. The replies were later categorized.

Following this approach, the global results indicate that most people experience up to 5 glass breakages per year (about 70%). That leads to a consideration of whether people whose glass has ever broken face some problems with either the technology/ installation or work in kind of adverse conditions.

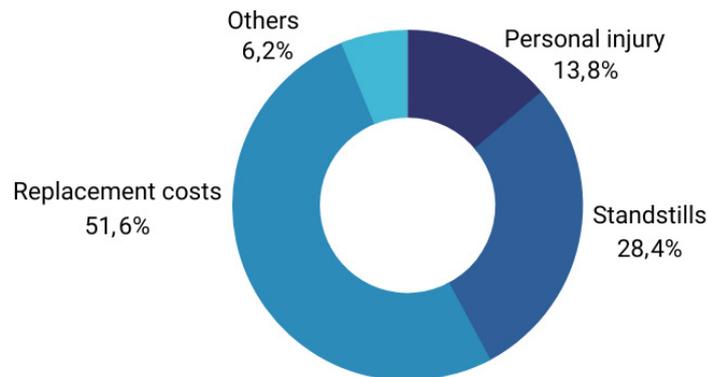
The numbers for each region are presented in the chart below. The highest number of respondents who reported a higher frequency of glass breakage than once a year are from Scandinavia. On the other hand, though there were many such replies even obtained from German-speaking countries, at the same time, it is the region where people reported on average the lowest frequency.

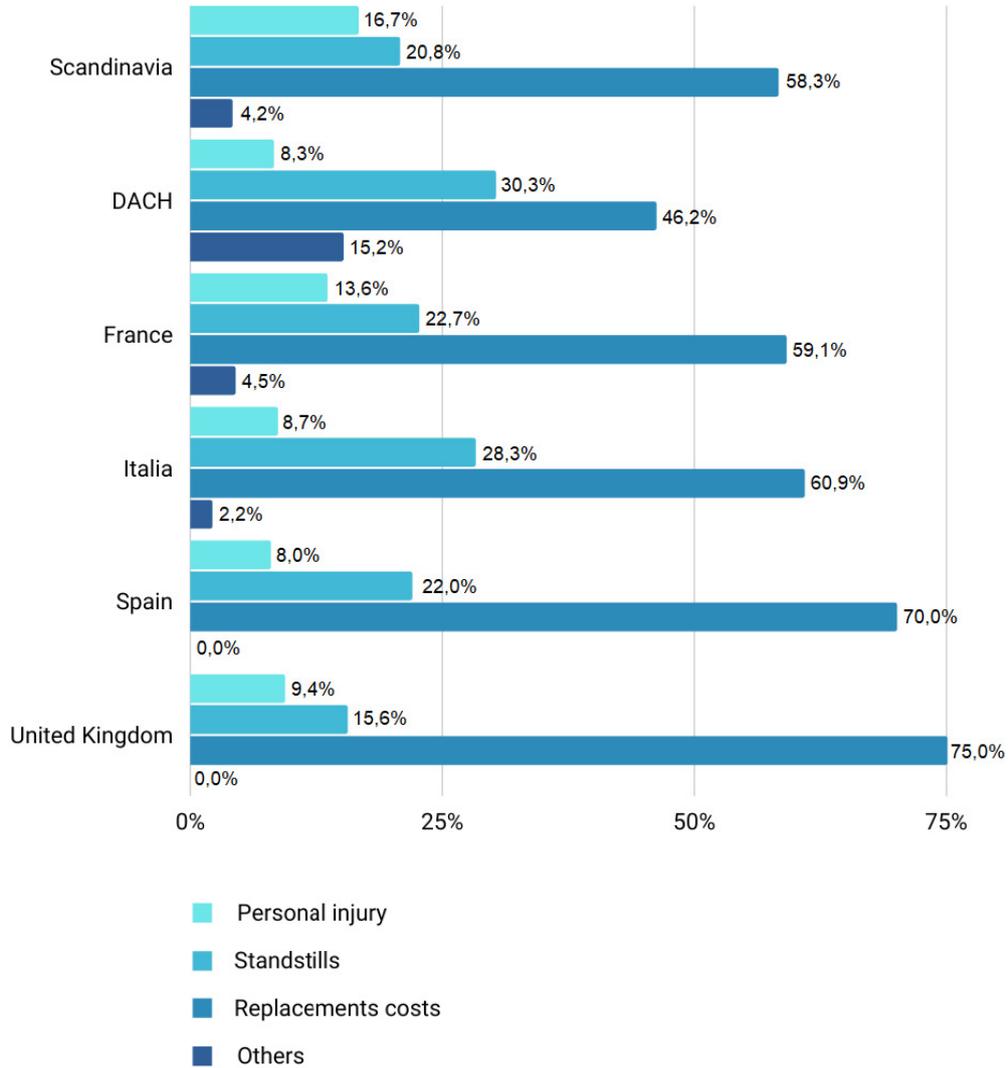
The most significant consequences of glass breakage

Except the causes, also the consequences of the glass breakage were inspected. Based on the previous experience and observations, as the most significant, three categories encompassing personal injury, standstills and replacement costs were set as the predefined options. The respondents had, however, also had a chance to state their own replies.

Regarding the global results, more than half (51,7%) of respondents claimed the glass breakage resulted in replacement costs. This reply was followed by standstills (28,4%) and, however, much less frequently by personal injury (13,8%). Only 6,2% of respondents underwent different consequences. Those who specified such a reply claimed it was, for example, an experience of uncomfortably or a loss of staff.

On a regional level, unlike the causes, the differences were, however, highly pronounced. For example, Spanish and British respondents did not state any other option that the three predefined. For these two samples, we also observe quite a similar distribution of the remaining replies. When it comes to the replacement costs, these were least frequently chosen by respondents from German speaking countries (46,2%) - which is, actually, more than 20% less than in the case of the 75% from the British sample. Also, regarding standstills and personal injury, there are significant differences between the most numerous and least numerous representations - about half the difference.



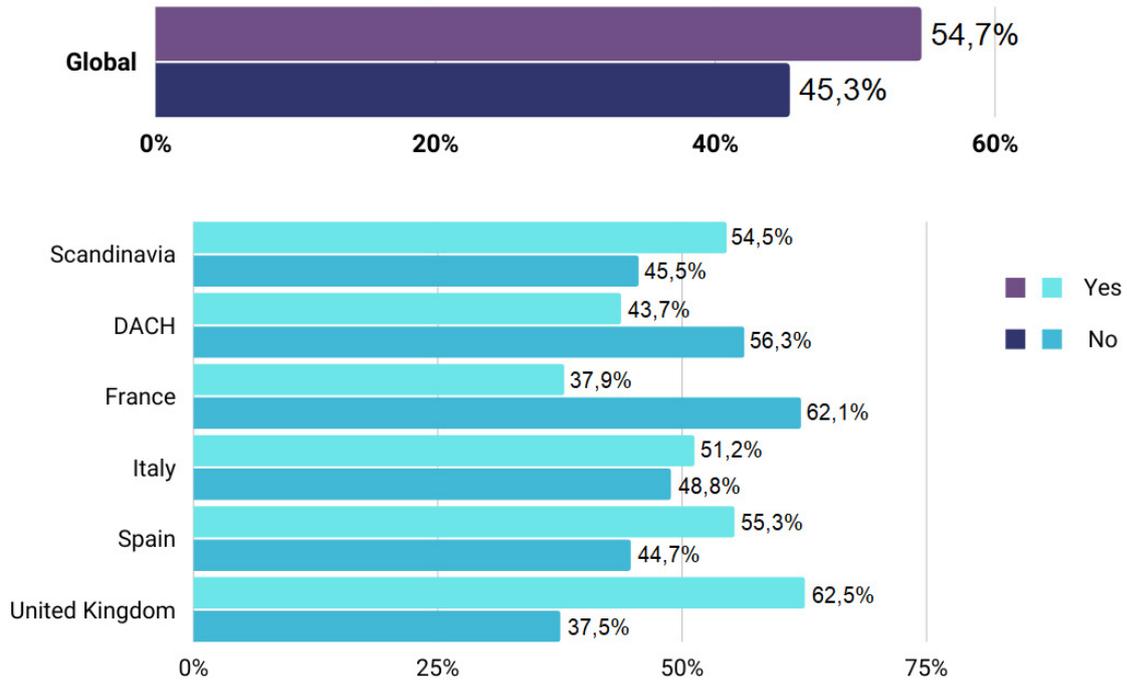


Do people equip their machines with additional security add-ons?

The last question provided only to respondents who experienced the machine glass breakage concerned they use some additional security add-ons. Current security systems are not only an effective way to prevent the machine from being stolen but also a solution for avoiding machine damage, providing protection to the operator. Unfortunately, some of them may have some disadvantages and work as obstacles to smooth machine operating. For example, grids may obstruct the view and spoil the sight radically. Since Hammerglass aims to produce grid-free screens, even this topic is relevant in the context of the current survey.

Globally, the numbers of those using the add-ons and who have not installed them yet seem to be distributed somewhat equally. On the other hand, still, the numbers of respondents using the add-ons prevail. More than half of them (54,7%) have already installed it; the remaining 45,3% have not done so yet.

Even though the analyses on the regional level speak for some differences, it appears like such differences are not significant. Whilst in four of the predefined regions more than half of the people install the addons in their machines, in France and German-speaking countries, it is about 40% at best. (which, of course, is also not a bad result). Such numbers reveal that the difference between the rates of add-ons instalment in France (37,9%) and the UK (62,5%) reaches almost 25%.



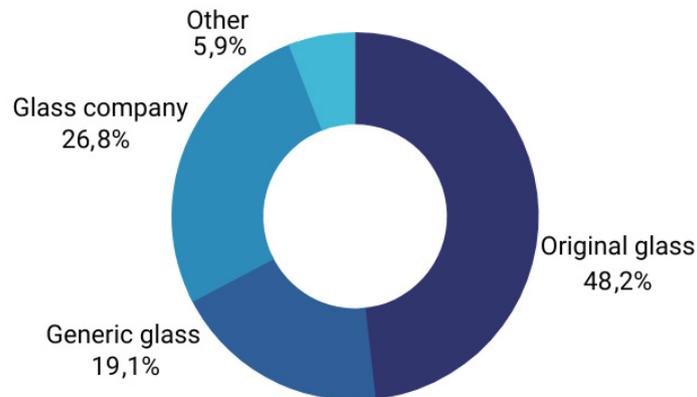
Glass Purchase and Installation

The most popular glass providers

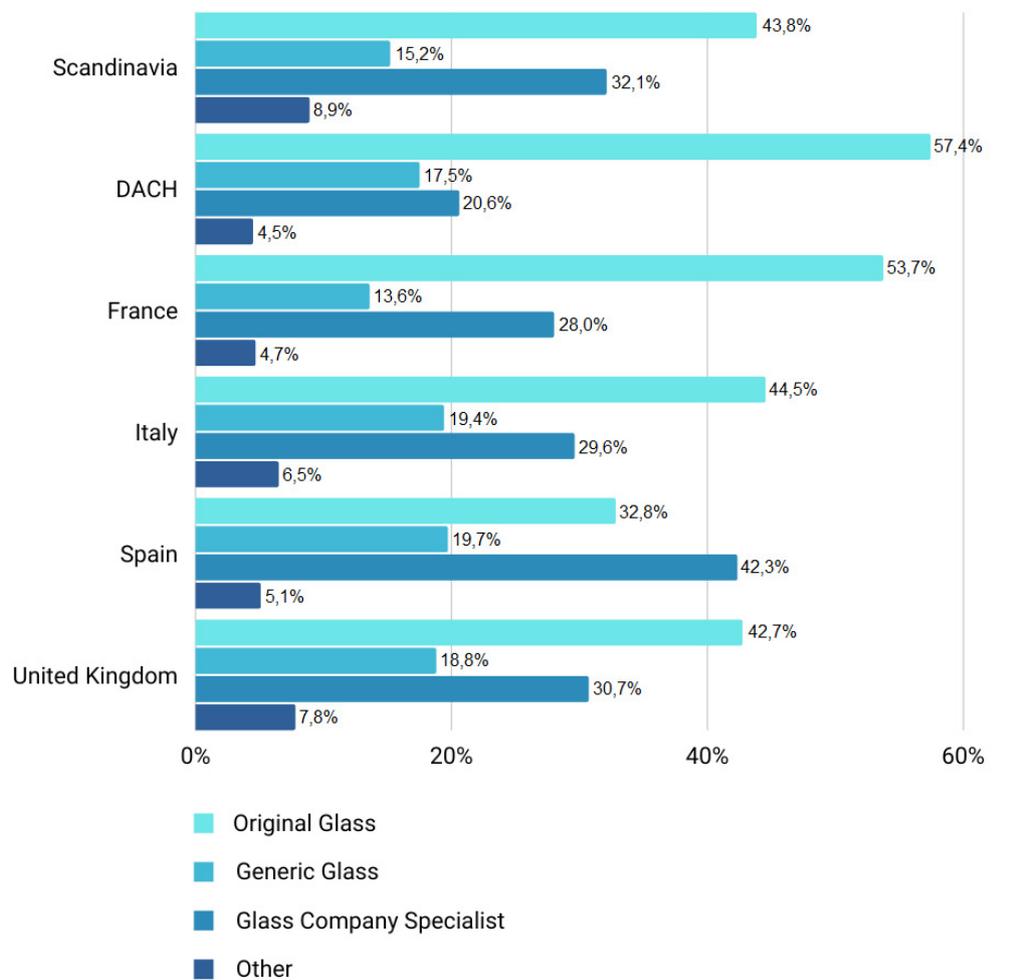
The rest of the survey questions were again presented to all respondents. Thus, regardless of whether the respondents experienced glass breakage or not, all of them were asked where they purchased the glass.

Probably because of the higher quality standards, most respondents (48,2%) purchase Original Glass. Thus, directly from OEMs or Certified Machine Service Shops. Popularity of original glass providers was followed only by glass companies, however, even at this point, the number of respondents who purchased the glass from glass company specialists was 20% lower (26,8%). Also, yet smaller, but quite a considerable number of respondents (19,1%) purchase generic glass - for example, from the internet website.

When it comes to the differences according to the regions, the popularity of different channels varies based on the region. For example, more than half of respondents from German-speaking countries (57,4%) and Frenchs (53,7%) prefer original glass



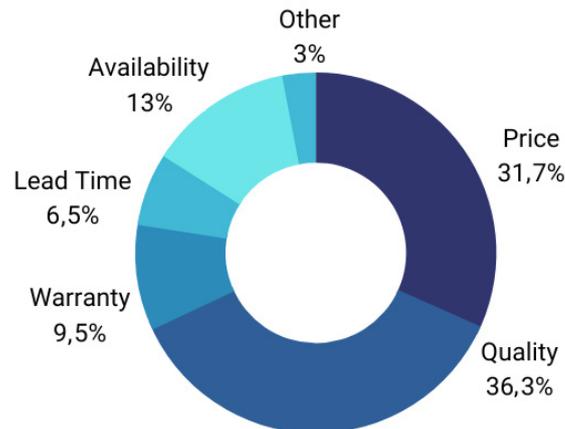
providers, though the popularity of such channels in Spain does not reach even 40%. The Spanish, on the other hand, mostly prefer glass companies. Regarding the generic glass providers, in none of the selected regions, their popularity does not exceed 20%.

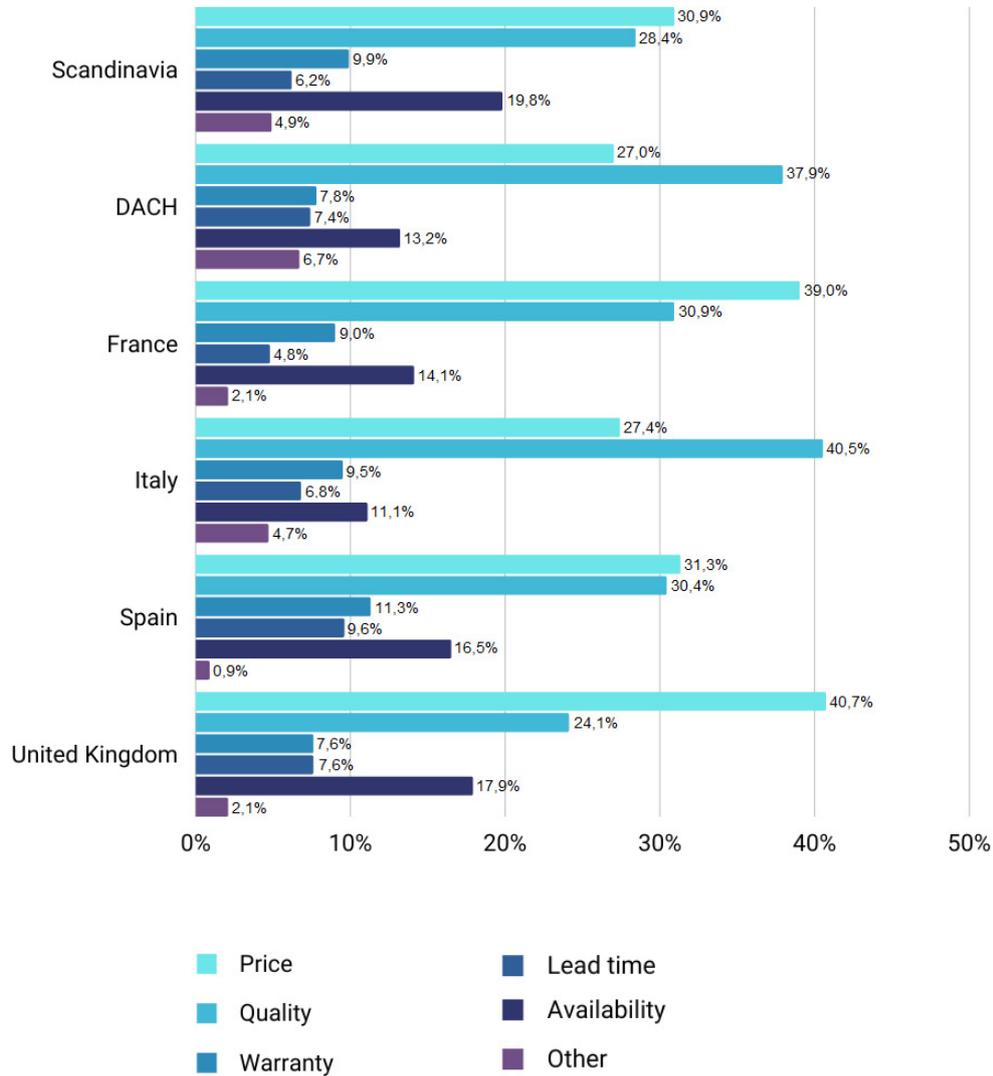


Factors affecting glass purchase decision

Besides the popularity of glass providers, the factors that affect the purchase choice is the information of the same relevance. Globally, the most important factor that triggers people's intentions to purchase the machine glass is the quality (36,3%) closely followed by the price (31,7%). However, even the availability is by 13% of people considered to be the most important factor. The remaining options, including warranty and lead time, were chosen only by up to 10% of people.

The most interesting is the distribution of the two most frequently chosen factors; the price-quality ratio in individual regions. Although the price is the most interesting factor in the United Kingdom (40,7%), France (39,0%), and to a lesser extent in Scandinavia (30,9%) and Spain (31,3%), the results from the Italian sample (40,5%) and German-speaking countries (37,9%) shown in these regions, people purchase the glass based on quality parameters. The third popular factor, availability, was most often chosen by Scandinavian (19,8%) and British respondents (17,9%).



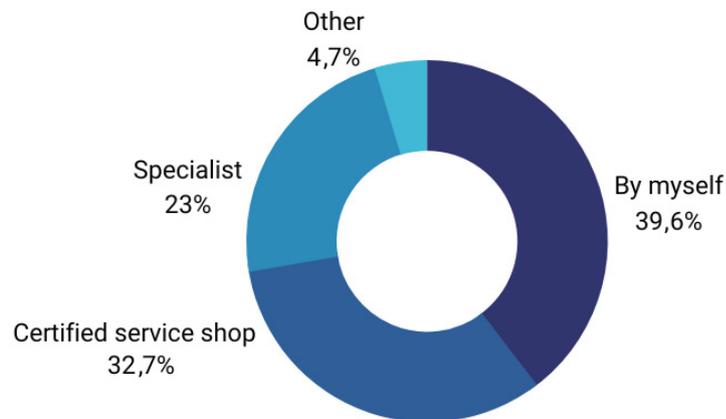


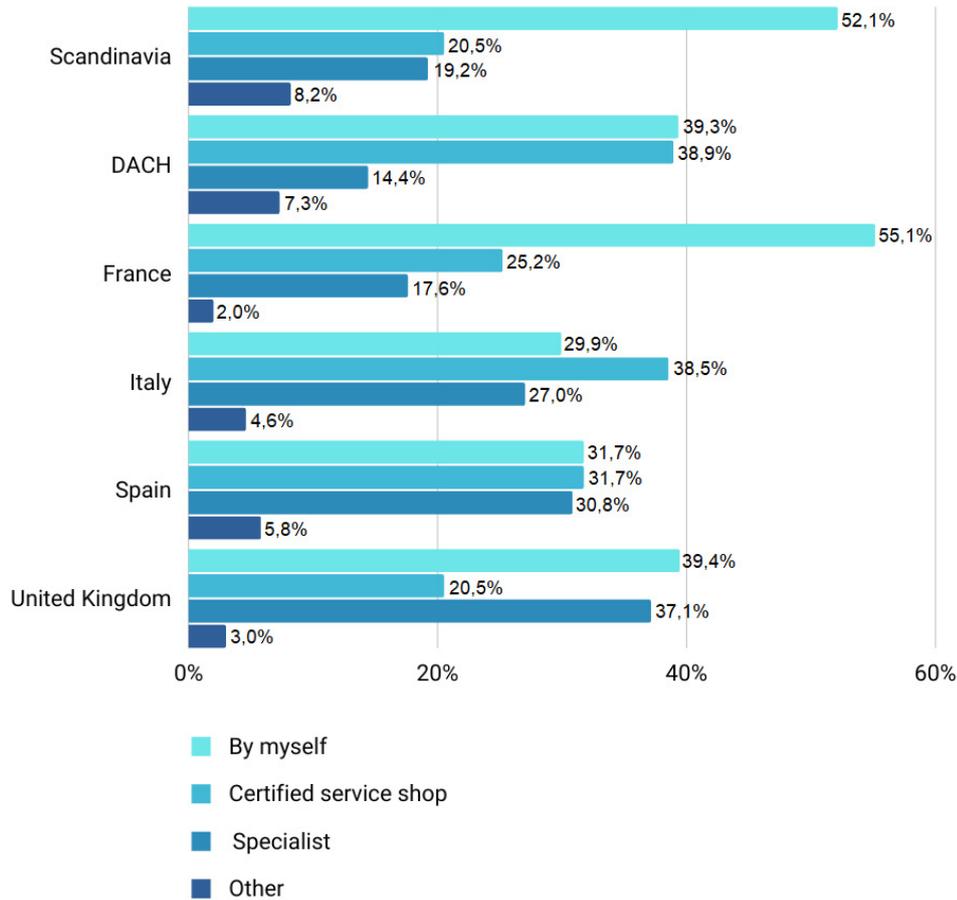
How do the construction-related sectors representatives handle glass installation?

Except for the process of glass purchase, the glass installation was in the scope of the survey, as well. The question focused on how respondents handle the installation and whose services they prefer.

At least in the global sample, the numbers of replies for all the predefined options are somewhat similar. Most of the respondents, however, admit they handle the installation by themselves (39,6%). About another third of people prefer the services provided by certified shops (32,7%), and the Glass Company Specialists are also quite frequently (23%) asked to install the glass.

Although the global results reveal a rank of preference of the three installation approaches, on the regional level, there are some differences. For example, asking the specialist for the installation is quite common in the United Kingdom (37,1%) and Spain (30,8%) - in the case of the former, such frequency even exceeds the popularity of certified service shops. It is also interesting that in Scandinavia (52,1%) and France (55,1%), more than half of the people handle the installation themselves.

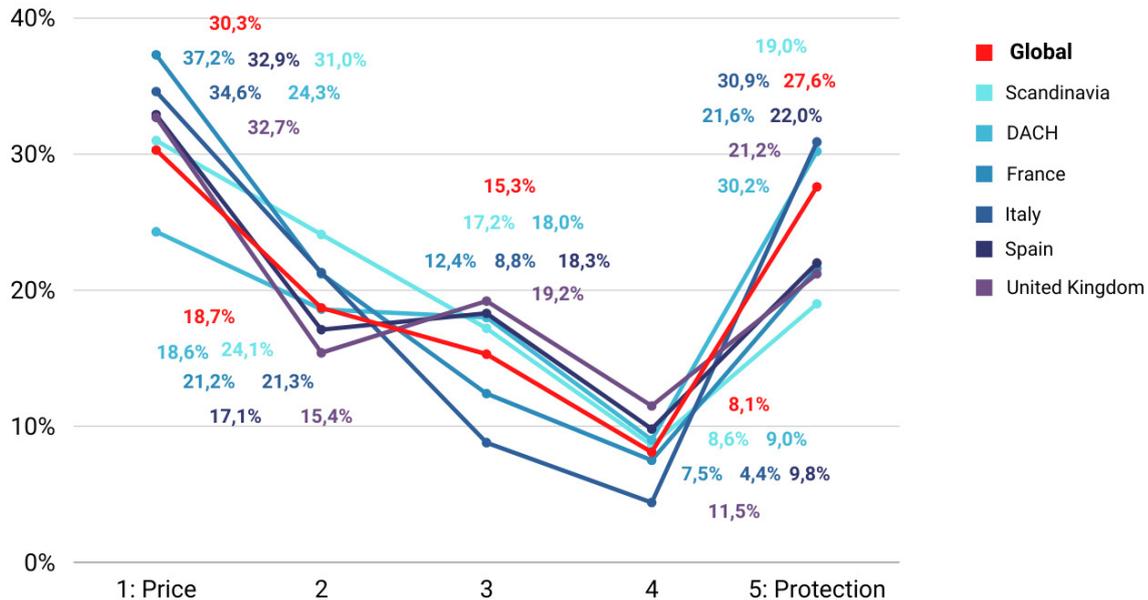




Unbreakable Glass Technologies Awareness

Willingness to pay premium for glass of higher protectability

Though in the question about factors affecting the purchase choice, the case of price was discussed as well, by the next question the survey aimed to investigate whether this factor beats the potential of the glass to protect the operator/driver. Using a 5 point scale where one end resembles the price, and the opposite the protection, the mean values from the global sample was 2,84 (SD = 1,6). Although one might think that this result reflects the need to seek a compromise, the opposite is true. Most respondents indicated either price only or quality only.





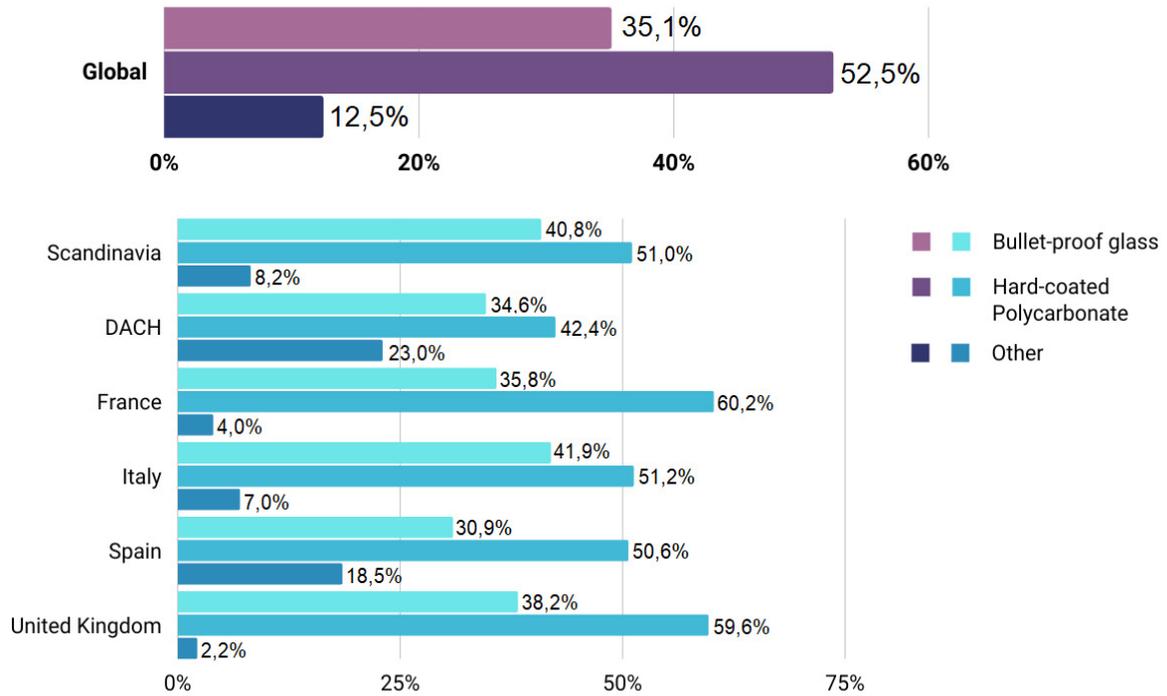
Regarding the differences between regions, for each, the means are similar to about 2,7 values. However, by simple inspection of mean values, it appears like respondents from German-speaking countries ($M = 3,02$; $SD = 1,57$) would prefer protection over the price. The French would, on the other hand, prefer a lower price; although it means they risk the potential of injury or accident. Such numbers are, on the other hand, of no values unless the distribution is inspected. Thus, the chart below is attached. Still, it reveals in many cases a very similar distribution as the global data.

The awareness of currently available unbreakable screens technologies

The last question was asked to explore whether people know the currently used machine glass technologies. Actually, there are not many of them in the market. From these the hard-coated polycarbonate and bulletproof glass are the two most often used and as the results reveal, well known.

Analyses conducted on the global sample revealed people being more aware of the former - hard coated polycarbonate (52,5%), whereas bulletproof glass know about a third of respondents (35,1%). The remaining replies were from those people, who know any other technology.

Regarding the regional analyses, the numbers quite reflect the global results. Hard coated polycarbonate is known to most people regardless of the region. For example, in the United Kingdom (59,6%) and France (60,2%) there are three-fifths of people who know this technology. However, despite the fact that bulletproof glass is in second place in all regions, at most, its knowledge was reported by almost 42% respondents (42%) at best.



Conclusion

Before the survey, there were many whys. Why is the knowledge of alternatives to equip machines with safe solutions too low? Why do people risk money leakage due to insufficiently equipped machines? Why it appears as people believe in myths overlooking current technologies are far ahead, and even simple solutions may be effective...

We believe the survey results revealing insight into people's behavioural patterns bringing an answer for even a couple of the questions. Since the survey sample consists of mostly construction, transport and mining workers, basically representatives of sectors where glass breakage may occur quite frequently – and according to the survey results, many of them face glass breakage even more than once every year – we believe the information provided by these people are of high relevance. Moreover, thanks to the high number of respondents, it was also possible to compare the results thorough Europe.



One of the most interesting of the survey was about the cause of the breakage. Almost half of the breakages were due to collisions with large (for example, logs or rocks) and small objects (stones and debris). These results confirm the working environment in construction sites may be quite dangerous once the workers and machine operators do not stick to high protection standards. Even though more than half of the respondents claimed the glass breakage costs them extra money, followed by a third reporting standstill (resulting in subsequent money leakage), almost 15% of the breakages result in personal injuries. Especially this is one of the crucial findings since Hammerglass technology is designed to prevent all of these consequences. The goal is to secure both the budget and health of its clients.

However, as the survey revealed, the perception of costs invested into the machinery glass seems to be somewhat distorted by many people. Although one can't put a price on safety, money is a big issue when purchasing glass for construction machines. About one-third of our respondents say that the price is "a driven factor". The thing, however, is, when they buy the screens with the smallest price tag, it's probably ordinary glass. And ordinary glass breaks. Every breakage leads to expensive downtime and new costs in purchasing replacement screens. What starts as a choice to minimizing cost actually ends up becoming the most expensive one.

Hammerglass aims to emphasize that even though its price tag is initially a bit higher compared to ordinary glass, it will turn out to be the most economical choice since Hammerglass doesn't break due to its high technological standards and investments in quality.

What seems to be interesting, on the other hand, is that the general awareness about glass technologies grows. More than 50% of respondents know hard-coated polycarbonate and its benefits which speaks in favour of raising technological standards. There was a time when polycarbonate didn't meet safety standards. That is not the case anymore. Nowadays, you have hard-coated polycarbonate to

compare with other screen solutions. It doesn't break. It keeps the machine driver safe and saves a lot of money. It makes the cabin climate more comfortable. It doesn't turn yellow. It holds for large, falling objects and explosives. The higher awareness of technologies is reflected by the fact most people tend to buy glass from OEMs or specialised shops. Thus, even though it seems the purchase price remains the most significant factor when purchasing glass, people become mind even the remaining, as well as consequences. What appears here to be the next step is to help people being educated in the field of safe machinery operating and how it relates to the equipment of their machinery.

Appendix

Find the elaborated data analyses and results [here](#).



Get your own tailored whitepaper

Whenever you want to **improve and grow your business** conducting a survey may help you. Despite the fact that there are plenty of research methods or strategies to understand your customers' behaviour, the easiest way to get information about people is to simply ask them. **Understanding your customers' perspective** and needs provides you with the most important information about the future development of your business and therefore determining priorities of its direction. Moreover, ongoing communication with your customers and demonstration of the interest in their needs helps **maintain their loyalty**.

LECTURA can get your survey in front of hundreds of thousands of industry professionals – your potential customers due to our large audience. **More than 1,000,000 professionals** research equipment on our ultimate buyer's guide LECTURA Specs every month. Moreover, they are actively engaging with our polls and surveys. More specifically, the engagement is about 4% which results in about **1,000 daily replies**. We provided our clients already with surveys focused on e.g., telematics, EaaS models, spare parts or equipment rating, having collected tens of thousands of answers.

When wondering about the targeting, LECTURA can select your respondents' sample based on some predefined criteria: region/country of origin, industry and type of business. To reach the criteria we are able to target to place your survey on specific web pages only or provide you with 13 language versions – English, German, Spanish, French, Italian, Dutch, Polish, Ukrainian, Czech, Turkish, Bulgarian, Romanian and Russian.

The survey questions are presented to respondents right immediately on the LECTURA Specs website. To make it more specific – the process of research collaboration with LECTURA is as follows.

At the beginning we **discuss the objectives** of the research – who is it for, why, what information do you want to obtain via your survey. When all previously mentioned is clear, you **create the questions** which we place on the webpages. After some time, the **data are collected** and it depends on you whether you want to analyse them by yourself (we are able to provide you the raw data in .xls, .sav or .csv format) or let the LECTURA Surveys to analyse them for you and provide you with a **comprehensive report of results**. Starting at 3.000€. More about LECTURA Surveys: <https://www.lectura.de/surveys/>.

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