

“Additional” features of the modern glazing

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1 = glazing, 2 = low emissivity, 3 = safety, 4 = transparency

Abstract

Today a number of sustainable stamps have developed and both manufacturers of glass and glass products and their consumers tired from them. For example:

- To reduce heat loss one needs to use low-emissivity glasses;
- To provide shock resistance safety films are needed;
- To improve sound insulation one has to use double-chamber, triple glazing.

We are persistently talking about energy efficiency and security for over 20 years all together. As a result, both of these subjects lost the interest of everyone who regularly attends glass workshops, conferences, reads industry publications or visit relevant sites. However, the public, who does not visit these events and publications, still knew nothing about modern glazing. We need some new approaches, new topics of interest to people who did not catch our traditional conversations.

At the same time, we said almost nothing about the many features of modern glass, which can be useful to certain groups of consumers: increased transmission of ultraviolet radiation, absence of splinters when the glass is broken, the warm window-sill etc. There are quite a lot of such properties and it is possible to expand of state-of-the-art glazing and complex IGUs application if such features will be bear in mind.

Introduction

We want to discuss some properties of the modern glazing mostly to mark some objects to study for the glass industry and to start new approaches to the specific customers. Of cause, our experience bases mostly on the CIS glazing market. As glass expert consultants, we receive many questions concerning specific needs of the projects. Today there are many glass types offered to the customers as we listed in the Table 1. It is obvious, that each of them has its own advantages, interesting properties for the consumer.

Energy efficient glazing

Let us start from the new approaches to the traditional themes.

Table 1. Glass types on Russian market

Glass type	Active norms in Russia
Flat glass, including:	GOST 111-2001
- Colorless	GOST R 54170-2010
- Extra clear	GOST R 54170-2010
- Tinted	GOST R 54169-2010
- Patterned	GOST 5533-2013
- Wired	GOST 7481-2013
- Wired polished	GOST 7481-2013
Laminated glass, including:	GOST 30826-2001, GOST R 54171-2010
- Shock resistant	GOST R 51136-2008, «-»
- Vandal-proof	GOST R 51136-2008, «-»
- Bulletproof	GOST R 51136-2008, «-»
- Safety	GOST 30826-2001, GOST R 54171-2010
- Blast proof	GOST 30826-2001, GOST R 54171-2010
- Fireproof	GOST 30826-2001, GOST R 54171-2010
Chemically strengthened glass	Absent
Tempered glass	GOST 30698-2000, GOST R 54162-2010
Heat-strengthened glass	GOST R 54180-2010
Glass with solar control or decorative hard coating	GOST R 54179-2010

Glass with solar control or decorative soft coating	GOST R 54178-2010
Energy saving glass with hard coating	GOST 30733-2000, GOST R 54177-2010
Energy saving glass with soft coating	GOST 31364-2007, GOST R 54176-2010
Self-cleaning glass	Absent
Glass with anti-bacterial coating	Absent
Glass with multifunctional coating	Absent
Frosted glass	GOST 32360-2013
Lacquered glass	GOST 32559-2013
Glass with polymer films	GOST 32563-2013
Insulated glass unit	GOST 24866-99, GOST R 54175-2010

To begin with, we want to discuss energy saving. This is favorite subject of the industry for the long time. However, when customers hear about energyefficient windows using, IGU with low-emissivity glass etc., they frequently respond with the simple idea that “Why need I to bother? My home is very warm!” Most of the customers from multistory buildings in large cities are sure that the comfort in their apartments depends from the heating system. In the last years, heating of the residential building in Russia is quite reliable. References to the norms or building codes have no positive effect to the customers. But if we take into account the comfort problems during the spring and fall, we can find that there are gaps between real outdoor weather conditions and central heating work. It is normal to have no heat with outside temperature of 9°C. Energyefficient glazing could provide additional support for the comfort inside in this case and help to keep temperature in the home or office on acceptable level.

It is worth to mention that in case of central heating failure energyefficient glazing can considerably increase the time of temperature fall to 0°C – from 8 hours to up to 72 hours in the model with old mass-market building and outside temperature of -20°C. In practice, it means that there is enough time to deal with a breakdown. The conditioning and solar control problems are not so important for Russian conditions and customers but still they need to be taken into account during estimation of glazing project.

To finish with the heat transfer problems we want to discuss the “cold window-sill” question. It is not obvious for a customer that even air-tight and water-tight windows could support cold zone with strong convection currents and water condensation in the cold winter conditions. Such cold zone is uncomfortable for the home plants, furniture and residents. Low-emissivity glasses and energysaving IGUs will be actual if people can understand why it is necessary for them in their particular situation.

Safety glazing

Installation of the safety glazing in the residential building meets a lot of resistance from the customers in Russia. Usually the customers think about safety from the outside threats, And the only threat they really consider higher than 10 m is the bird crashes. But in our expert observations and conclusions we often mark that the real danger can be avoided if we will bear in mind our inside threads like children games. Considering all probable threats from both directions we can find reasons for the application of laminated glass, protection film coated glass, tempered glass, chemically tempered glass or heat-strengthened glass. Every type of safety glass has its own advantages, which can play the leading role for some customer group. Additionally, such types of glass can be combined in some complex glazing.

If we consider safety in a more wide therm than simple protection from injury and more like general protection of human health and the preservation of material values, it is possible to include soundproof or UV-protection capabilities into consideration. The life quality of the residents really depends from the noise level reduction and furniture color and fabric protection. In the case of lack of ultraviolet radiation - for example, in gardening - it is possible to use tempered extra clear glasses. They combine high solar radiation transmission with additional safety features. Also it worth to mention that there are antibacterial and self-cleaning glasses on the market for the last ten years at least. And they still can't find the way in the wide application market despite their obvious advantages.

Other issues

During the winter condensation on the window glass is usual issue. Radical solution of this problem is well-known IGUs with electroheating. Conductive glass have to be tempered and often is laminated (so improved sound insulation goes in addition).

In many privacy issues the perfect solution is the clear patterned or matted glass. In many cases such types of glass is the best alternatives in terms of natural lightning saving, cost and privacy protection. Tinted, colored, decorative coated glasses can add emotions in the building and visual appearance and outside view from the inside. Additionally, enamelled and lacquered glass is tempered in many cases, so they can provide safety features. Solar-control and multifunctional glass works better on the sun side of the building and protects from the excessive heat.

Conclusion

Many more ideas can be proposed to the customers in their particular project. We propose the wide diversified view on the glazing project development. Any small project needs to include a lot of specific characteristics of the site, location, residents etc. In that case none of the potential client will not pass over, everyone will become real clients.

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