



# GFB

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# “Additional” features of the modern glazing

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# Modern glazing example





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## Same example in the context





# Main trends in the facades glazing

- the number of floors in the buildings is increasing;
- increase in the proportion of glazing in the facade surface (in modern buildings glass area takes up more than 80% of the facade area);
- increase in the size of applied glass products;
- the range of requirements for the glazing is expanding;
- the range of applicable glass and glass products is expanding too.





# “Sustainable stamps” on the market

- 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;
- The customer can find his choice in 3 predefined variants (with small variations):
  - 4F-16Air-4F
  - 4F-16Ar-4I
  - 4F-12-4F-12-4F





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## Core market



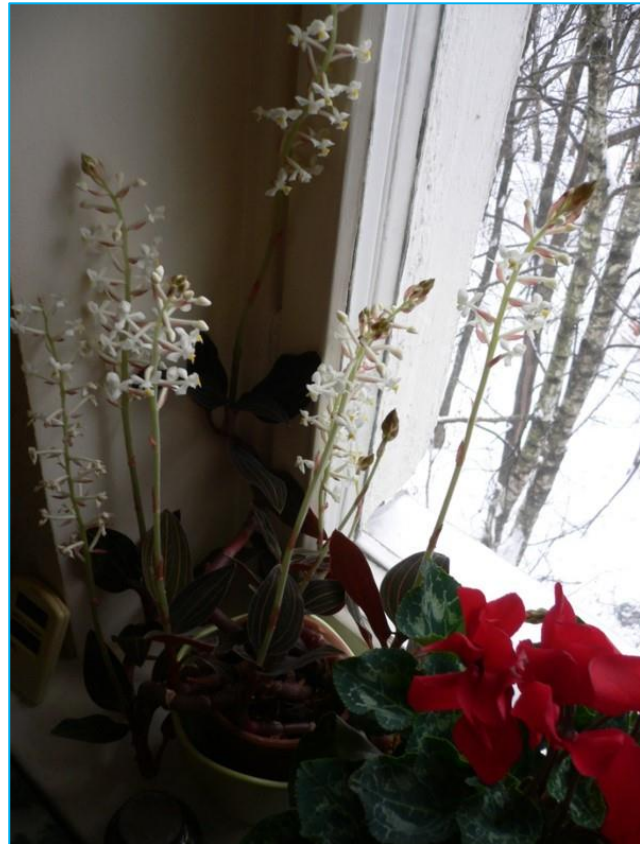




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# Energy efficient glazing





# Energy efficient glazing criteria

- Heating costs
- Conditioning and ventilation costs
- Light costs



Minimum per year





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# Thermal breakage

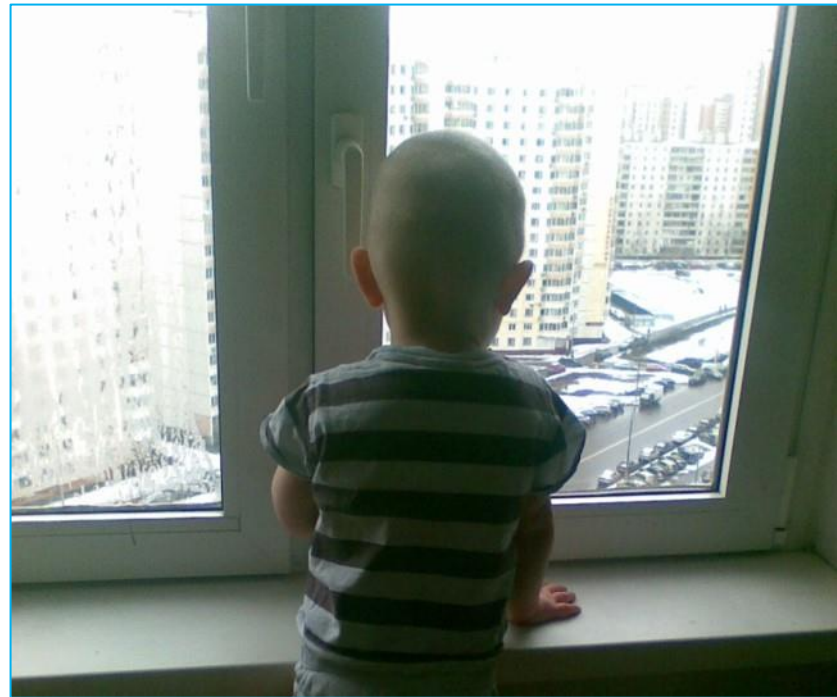




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# Safety glazing





# Safety glazing criteria

- The absence of breakage in normal use;
- Low probability of harm to human health, both within buildings and outside, in the glass destruction scenario;
- There is no risk to the environment.





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## Some other issues





# Customer requirements



- Optical distortions in reflected light;
- Glass defects;
- Glazing color.





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# Optical distortions







# Standardization efforts

| <b>Glass type</b>                                   | <b>Active norms in Russia</b>      |
|---|------------------------------------|
| 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   |





# New CIS Interstate standards, approved in 2013

- In 2013 TC 41 “Glass” developed 32 new of CIS interstate standard:
  - 6 come to replace old acting standards
  - 26 are completely new standards
    - 17 are harmonized with ISO or CEN
    - 15 are original
      - 5 are specifications
      - 20 describe test methods
      - 7 are methodological standards





## 30 new GOST standards were developed during 2013 - 2014 and now they are officially active

- 25 standards in substitution of discontinued ones
- 5 new standards
  - 21 are harmonized with ISO or CEN
  - 9 are original ones
    - 11 are specifications
    - 17 describe test methods
    - 1 methodological
    - 1 formalize calculation methods





# New CIS Interstate standards developed in 2014-15:

| #  | English Title   | Harmonization        |
|----|---|----------------------|
| 1  | Heat soaked thermally toughened glass. Specifications                       | EN 14179-1:2005, IDT |
| 2  | Heat soaked thermally toughened glass. Evaluation of conformity             | EN 14179-2:2005, IDT |
| 3  | Thermally toughened alkaline earth silicate glass. Technical requirements   | EN 14321-1:2005, IDT |
| 4  | Thermally toughened alkaline earth silicate glass. Evaluation of conformity | EN 14321-2:2005, IDT |
| 5  | Glass and glass products. Test method for resistance to impact dual-tyres   | EN 12600:2002, IDT   |
| 6  | Glass and glass products. Test method for resistance to soft body           | —                    |
| 7  | Glass and glass products. Sound insulation values                           | EN 12758:2011, IDT   |
| 8  | Glass and glass products. Glass handling safety requirements                | —                    |
| 9  | Glass and glass products. Application guidelines                            | —                    |
| 10 | Self-cleaning coated glass. Specifications                                  | —                    |





# Standardization plans for 2015-2016

| #  | English Title  | Harmonization           |
|----|--|-------------------------|
| 1  | Thermally toughened safety glass panes for windows and side scuttles. Specifications                 | ISO 21005:2012          |
| 2  | Enamelled thermally toughened glass. Specifications  | —                       |
| 3  | Glass and glass products. Determination of thermal transmittance (U value). Calculation method       | EN 673:2011             |
| 4  | Glass and glass products. Determination of thermal transmittance (U value). Guarded hot plate method | EN 674:2011             |
| 5  | Curved glass. Terms and definitions  | ISO 11485-1:2011        |
| 6  | Curved glass. Technical requirements   | ISO 11485-2:2011        |
| 7  | Curved glass. Requirements for curved tempered and curved laminated safety glass                     | ISO 11485-3:2014        |
| 8  | Glasses for liquid level indicators. Specifications  | Supersedes GOST 1663-81 |
| 9  | Borosilicate glass. Technical requirements   | EN 1748-1-1:2004        |
| 10 | Glass ceramics. Technical requirements   | EN 1748-2-1:2004        |
| 11 | Soda lime silicate glass. Technical requirements   | EN 572-1:2012           |
| 12 | Alkaline earth silicate glass. Technical requirements  | EN 14178-1:2004         |





# Standard projects availability

- Texts of the standard projects on Russian available through TC 41 website <http://tc41.ru>
- All new versions of developing Russian and interstate standards will be available on the website too (on Russian language).





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Thank you for attention!





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