

# ISO 12540:2017-03 (E)

## Glass in building - Tempered soda lime silicate safety glass

---

<b>Contents</b>		<b>Page</b>
Foreword .....		v
Introduction .....		vi
1	Scope .....	1
2	Normative references .....	1
3	Terms and definitions .....	1
4	Glass products .....	3
5	Fracture characteristics .....	3
5.1	General .....	3
5.2	Accidental human impact .....	3
5.3	Fragmentation .....	3
6	Dimensions and tolerances .....	4
6.1	Nominal thickness and thickness tolerances .....	4
6.2	Width and length (sizes) .....	4
6.2.1	General .....	4
6.2.2	Maximum and minimum sizes .....	5
6.2.3	Tolerances and squareness .....	5
6.2.4	Edge deformation produced by vertical tempering .....	5
6.3	Flatness .....	6
6.3.1	General .....	6
6.3.2	Measurement of overall bow .....	8
6.3.3	Measurement of wave or roller wave distortion .....	9
6.3.4	Measurement of edge lift (for horizontally tempered safety glass only) .....	10
6.3.5	Measurement of perimeter deformation of glass produced by air cushion toughening process .....	11
6.3.6	Measurement of local distortion (for vertically tempered safety glass only) .....	12
6.3.7	Limitation on overall bow, roller waves and edge lift for horizontally tempered safety glass .....	12
6.3.8	Limitation on overall bow, wave and perimeter deformation for tempered safety glass manufactured by air cushion process .....	13
6.3.9	Limitation on overall bow and local distortion for vertically tempered safety glass .....	13
6.3.10	Other distortions .....	14
7	Edge work, holes, notches and cut-outs .....	14
7.1	General .....	14
7.2	Edge working of glass for tempering .....	14
7.3	Profiled edges .....	15
7.4	Round holes .....	15
7.4.1	General .....	15
7.4.2	Diameter of holes .....	15
7.4.3	Limitations on position of holes .....	15
7.4.4	Tolerances on hole diameters .....	17
7.4.5	Tolerances on position of holes .....	17
7.5	Holes/others .....	18
7.6	Notches and cut-outs .....	18
7.7	Shaped panes .....	19

<b>8</b>	<b>Fragmentation test .....</b>	<b>19</b>
<b>8.1</b>	<b>General .....</b>	<b>19</b>
<b>8.2</b>	<b>Dimensions and number of test specimens .....</b>	<b>19</b>
<b>8.3</b>	<b>Test procedure .....</b>	<b>19</b>
<b>8.4</b>	<b>Assessment of fragmentation .....</b>	<b>20</b>
<b>8.5</b>	<b>Minimum values from the particle count .....</b>	<b>21</b>
<b>8.6</b>	<b>Selection of the longest particle .....</b>	<b>22</b>
<b>8.7</b>	<b>Maximum length of the longest particle .....</b>	<b>22</b>
<b>8.8</b>	<b>Test report .....</b>	<b>22</b>
<b>9</b>	<b>Other physical characteristics .....</b>	<b>22</b>
<b>9.1</b>	<b>Optical distortion .....</b>	<b>22</b>
<b>9.1.1</b>	<b>Tempered safety glass produced by vertical tempering .....</b>	<b>22</b>
<b>9.1.2</b>	<b>Tempered safety glass produced by horizontal tempering .....</b>	<b>22</b>
<b>9.2</b>	<b>Anisotropy (iridescence) .....</b>	<b>22</b>
<b>9.3</b>	<b>Thermal durability .....</b>	<b>23</b>
<b>9.4</b>	<b>Mechanical strength .....</b>	<b>23</b>
<b>9.5</b>	<b>Surface pre-stress .....</b>	<b>23</b>
<b>10</b>	<b>Marking .....</b>	<b>24</b>
<b>11</b>	<b>Packaging .....</b>	<b>24</b>
	<b>Annex A (normative) Pendulum impact test methods .....</b>	<b>25</b>
	<b>Annex B (informative) Alternative method for the measurement of roller wave distortion .....</b>	<b>26</b>
	<b>Annex C (informative) Example of particle count .....</b>	<b>28</b>
	<b>Annex D (informative) Method for the measurement of the surface pre-stress of tempered safety glass .....</b>	<b>31</b>
	<b>Bibliography .....</b>	<b>33</b>