

Effect of Regrinding on the Edge Strength of Tempered Glass

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Abstract

Laminated glass can have an edge displacement of the individual glass panes resulting from the lamination process. With regard to visible or exposed edges, this displacement reduces the optical quality of the glass component. The regrinding of the edge after lamination compensates the displacement and thus creates a highly transparent surface. However, regrinding tempered glass leads to a reduction of the compression zone near the edge and bears the risk of reducing the load-bearing capacity. The degree of this reduction was experimentally determined and evaluated at the Institute of Building Construction with the aid of both single-glass panes and structural component tests.

Keywords: glass edge, regrinding, tempered glass, edge strength

1 Introduction

The use of glass as a design element requires optical perfection. Thus, the structural components need to be fully transparent. The glass surface is supposed to be fully transparent, whereas the glass edge can appear as irregular and frosted. In particular, glass edges of laminated glasses might be offset and the interlayer may protrude beyond the glass panes as a result of the manufacturing process. Consequently, the individual glass panes in the construction remain clearly recognisable and the edge is not perceived as fully transparent. The glass edges have to be reworked in order to improve their optical quality in the case of glass constructions with exposed and directly visible edges, e.g. in flights of stairs or railing constructions.

Figure 1 shows a railing construction in which the glass edge is located in the immediate field of view of the user. In this example, the glass edges were not reworked. In figure 2, a juncture in the railing area can be seen which displays the irregular

behaviour of the interlayer (horizontal glass) as well as edge displacement (vertical glass).



Figure 1. Example of a railing construction with visible, untreated edges



Figure 2. Laminated glass edges with edge displacement and irregularity of the interlayer