Analysis of glass panels subjected to blast load

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The present doctoral dissertation contributes to the analysis of glass panels subjected to blast load, concentrating on monolithic and laminated glass prior to glass fracture. A straightforward graphical solution for monolithic glass is presented to identify maximum deformation and maximum principal stress for small and large deformations for static and idealized blast load without software. On the basis of experimental tests, load duration factors kmod for impact and blast load design for annealed glass, heat strengthened glass and fully tempered glass are proposed and design strength values for impact and blast design based on the European and German standards are suggested. As a result, blast pressure capacity charts for monolithic fully tempered glass plates subjected to idealized blast load are presented. Moreover, design temperatures of interlayer in blast design situation based on empirical data in accordance with Eurocode are determined for vertical double glazed and triple glazed units for Germany, showing that laminated glass should not be regarded with monolithic glass approach in general.