

The statistical interpretation of the strength of float glass for structural applications

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Abstract

The characteristic value of the strength of annealed float glass, to be used in structural calculations, is assessed by standards on the basis of a classical experimental campaign using the Coaxial Double Ring (CDR) test with additional overpressure. Experimental data were regressed according to the Weibull 2-parameter distribution, assuming that the induced state of stress is equibiaxial in practice. We show that, by splitting the data in two categories according to the surface under tensile stress (either the “tin” or the “air” side), a more accurate statistical interpretation can be obtained. Comparisons with the Normal and Log-Normal distributions are made with the chi-square goodness-of-fit test. Moreover, we observe that the calibration curve suggested by the test standard is not precise, and that the stress state in the testing configuration is not equibiaxial. Therefore the rough data need to be further corrected and re-scaled to a common reference condition, according to a criterion of equal failure probability, by determining the *effective area* of the loaded specimen. Doing so, the considered statical distribution are able to fit to the data with much more accuracy. Consid-

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