Partial safety factors for resistance of steel elements to EC3 and EC4 - Calibration for various steel products and failure criteria

Funded under: ECSC-STEELRES 8C

Abstract

Final report on Contract no. 7210-SA/322, 422, 936, 123, 521, 124, 838, 622, 1 July 1994 to 31 December 1997

Eurocode 3 and Eurocode 4 are at present ENVs. Those standards incorporate partial safety factors \([\gamma(M)]\) for resistance. \([\gamma(M0)]\) is related to member resistance without instability, while \([\gamma(M1)]\) is related to any limit state where instability governs. In the ENVs, \([\gamma(M0)]\) is taken equal to 1.1, contrary to the general opinion of steel construction experts who had proposed a value of 1.0. Hence the first aim of this project is to collect data by analysing the products of as many steel producers as possible.

Secondly, the safety factors are currently different from one country to another. So the present research project reconsiders a large number of design limit states, in order that future decisions for the value of \([\gamma(M1)]\) may be based on clear evidence, tending to limit the national deviations.

The first objective \([\gamma(M0)]\) is addressed by measurement campaigns in steel mills for hot-rolled product characteristics (dimensions and yield strength). Those measured values are used to compute resistances, which are compared with resistances resulting from the nominal values. A statistical analysis of deviations results in safety factors. The results are quite satisfactory, a value of 1.0 being justified.

For the second objective \([\gamma(M1)]\), the main methodology was to gather existing test results and to proceed with extensive statistical recalibration of the safety factors. The analysis does not lead to a simple generally applicable conclusion concerning the choice of \([\gamma(M1)]\).

Additional information

Authors: CHARBROLIN B, CTICM, Saint-Remy-les-Chevreuse (FR); No author stated, Labein, Bilbao (ES); No author stated, ProfilARBED, Esch-sur Alzette (LU); No author stated, RWTH, Aachen (DE); No author stated, The Steel Construction Institute, Ascot (GB); No author stated, TNO, Delft (NL); No author stated, SAES, Düsseldorf (DE)


Zuletzt geändert am 2002-07-16
Abgerufen am 2020-01-18

© European Union, 2020