

Fatigue Strength of COLD formed structural steel details

FASTCOLD meeting agenda

June 8th, 2021

Session 1 – 9.00 am : 11.30 am CET

Welcome and Project overview

Section 1 - Mechanical characterization of cold-formed steel sections

- Assessment of the surface finishing conditions of cold formed specimens and statistical assessment of "on delivery" surface quality of cold formed steel sections
- Experimental characterization of the virgin material
- Experimental measurement of residual stresses induced by cold forming
- Experimental characterization of the material after cold forming
- Analysis of fatigue tests data on small-scale specimens, calibration of fatigue models and correlation of surface finish conditions with fatigue strength of cold formed materials
- Numerical simulation of the cold forming process and of the induced local residual stresses and experimental validation
- Optimization of choice of material and production parameters with regard to fatigue

Section 2 - Full scale detail testing and parametric study (Part 1)

- Global-local fatigue approaches for snug-tight and preloaded hot-dip galvanized steel bolted joints
- Cold formed rails in logistics structures
- Experimental and numerical fatigue assessment of cold-formed steel rails

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Session 2 – 3:00 pm : 5.30pm CET

Section 2 - Full scale detail testing and parametric study (Part 2)

- Fatigue in uprights for logistics structures
- Experimental and numerical fatigue assessment of cold-formed uprights
- Modelling approach for fatigue design
- Generation of database

Section 3 - Categorization of details and design rules

- Current fatigue design approach of cold formed profiles industry
- Analysis of results in view of detail categorization
- Fatigue design models and worked examples for cold-formed uprights - at least for bolted joints
- Development of a fatigue design model for cold formed steel details to be implemented in the general design method for fatigue, according to EN 1993-1-9
- Methods for fatigue design of cold formed steel structural details and calculation examples

Conclusions and proposals for Norms development

Discussion

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Speakers

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