

The Mechanics of the “Eye”- Specimen Bend Test Investigated by Experiment and FE-analysis

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Abstract. A special bend test has been developed and applied for the purpose of characterization and comparison of the material ductility in steels manufactured by casting, or casting subsequently followed by hot open-die forging (ODF) or closed-die forging (CDF). The bending test specimen consists of a small rectangular plate of material with a round hole cut out in the middle. The test method revealed differences in ductility for the investigated materials. In this article, the mechanics of the process is studied by FEM-analysis. The stress and straining conditions in the bend where the material in the test fails are mapped in the analysis. Finally, the obtained results are compared with experimental test results on different steel materials.