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[\[PDF \(1007K\)\]](#) [\[References\]](#)ULTIMATE STRAINS OF STRUCTURAL STEELS AGAINST
DUCTILE CRACK INITIATIONHanbin GE¹⁾, Makio KAWAHITO²⁾ and Masatoshi OHASHI³⁾

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This paper aims to propose a criterion in terms of equivalent plastic strain or axial strain against ductile crack initiation for structural steels. For this purpose, tension test on round steel bars is simulated by finite element method and strain progression during the necking process until ductile crack initiation is investigated. Due to very large strain involved in this simulation, the common used constitutive model for structural steels is modified, and the Gurson's micro void model is employed to consider the material deterioration. As a result, a prediction criterion for structural steels is put forward in terms of stress and equivalent plastic strain. Moreover, a relation between local strain and global strain is obtained and ultimate strains are proposed to evaluate ductile crack initiation for fiber analysis of steel structures in seismic design.

Key Words: ductile crack initiation, structural steel, brittle fracture, micro-void model, ultimate strain

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