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## Hot deformation studies of low alloy steel through thermo-mechanical processing

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In order to minimise defects like cracking during hot forging of steels for making components like high strength fasteners, gears, axle and crank shaft, parameters like temperature, strain and strain rate play a vital role in producing a defect free forging for a given steel. In the present work, an attempt has been made to study hot deformation behaviour of a low alloy steel having 0.24% C and 1% Cr using thermo-mechanical simulator Gleeble 3800. Cylindrical samples of diameter 10 mm and length 15 mm have been used for thermo-mechanical compression at a temperature of 900°C and at strain rates of 0.01, 0.1 and 1 per second. Critical temperatures ( $Ac_1$  and  $Ac_3$ ) of the steel were determined by dilatometry and were found to be 802°C and 880°C respectively. Flow curves obtained at 900°C for various strain rates were found to exhibit strain hardening, dynamic recrystallisation and softening behaviour. These aspects have been discussed along with microstructures.

### Biography

Sumeer Kumar Nath is a Professor in the Department of Metallurgical and Materials Engineering, Indian Institute of Technology, Roorkee, India. He has 37 years of teaching and research experience. He has 62 research papers in peer reviewed national and international journals and 65 papers in national and international conferences. He has guided 15 PhD dissertations. His research interest includes Physical Metallurgy and Tribology of Materials.

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