

Title (en)

ROLL OUTER LAYER MATERIAL FOR ROLLING, AND COMPOSITE ROLL FOR ROLLING

Title (de)

AUSSENSCHICHTMATERIAL EINER WALZE ZUM WALZEN UND ZUSAMMENGESETZTE WALZE ZUM WALZEN

Title (fr)

MATÉRIAU DE COUCHE EXTERNE POUR CYLINDRE DE LAMINAGE, ET CYLINDRE COMPOSITE DE LAMINAGE

Publication

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Application

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Abstract (en)

Provided are an outer layer material for rolls and a composite roll for rolling that have significantly improved wear resistance. The outer layer material for rolls has a graded composition in which the content of W decreases in a radial direction from an outer circumferential side of a roll toward an inner circumferential side of the roll. A surface of the outer layer material that is located at a position corresponding to a maximum diameter during use for rolling has a W-Co-based alloy composition containing, in mass %, W: 25 to 70% and Co: 5 to 45% and further containing C: 0.6 to 3.5%, Si: 0.05 to 3%, Mn: 0.05 to 3%, and Mo: 1 to 15%, with the balance being unavoidable impurities. Preferably, the outer layer material for rolls is formed by centrifugal casting. This outer layer material has significantly improved wear resistance as compared with high-speed tool steel rolling mill rolls. The composition may further contain, in mass %, one or two or more selected from Fe: 5 to 40%, Cr: 0.1 to 10%, V: 0.1 to 6%, and Nb: 0.1 to 3% and/or Ni: 0.05 to 3%. Preferably, the outer layer material having the above-described composition is used for an outer layer used for a roll. Preferably, the outer layer is integrally fused to an inner layer to prepare a composite roll for rolling. Alternatively, preferably, the outer layer is integrally fused to an intermediate layer, and the intermediate layer is integrally fused to the inner layer to prepare a composite roll for rolling. Also provided is an outer layer material for rolls having significantly improved wear resistance and a significantly higher Young's modulus as compared with those of conventional outer layer materials and having a good rolling load reduction effect. Also provided is a composite roll for rolling using this outer layer material. The outer layer material has a graded composition in which the content of W decreases in a radial direction from an outer circumferential side of the roll toward an inner circumferential side of the roll. The material of the outer layer material in a surface layer at a position corresponding to a maximum diameter during use for rolling has a composition containing, in mass %, W: 25 to 70%, Co: 5 to 45%, C: 0.6 to 3.5%, Si: 0.05 to 3%, Mn: 0.05 to 3%, and Mo: 1 to 15%, with the balance being unavoidable impurities. The contents of W, Co, Mo, and Fe satisfy the following formula [1]: where %W, %Mo, %Co, and %Fe are the contents (% by mass) of respective elements. The Young's modulus of the outer layer material for rolls is from 270 GPa to 500 GPa inclusive.

IPC 8 full level

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