

Title (en)
Method of rolling a metal product

Title (de)
Verfahren zum Walzen eines Metallproduktes

Title (fr)
Procédé de laminage d'un produit métallique

Publication
EP 0988903 A1 20000329 (FR)

Application
EP 99402297 A 19990920

Priority
FR 9811761 A 19980921

Abstract (en)
The process involves rolling a metal product in at least one rolling cage (1) associated with a calculation unit (4) comprising a calculator and a mathematical model for regulating the rolling force applied by the tightening apparatus (17). The installation used to implement the process comprises: (a) a rolling cage having two spaced columns (11); (b) at least two superposed working rolls (12, 12') between the columns of the cage; (c) device for control of feed of the product (2) for rolling in a rolling nip (22) delimited by two arcs of contact (20, 20') of the product (2) with the two rolls, between an inlet and an outlet section of the rolling nip (22); tightening apparatus (17) for applying pressure on the rolls and the cage to regulate the gap between the working rolls (12, 12') corresponding to a desired reduction in thickness and to maintain the gap during the rolling pass by applying between the working rolls (12, 12') a rolling force that depends on the mechanical and physical characteristics of the cage and the product and the conditions of passage of the metal in the rolling nip, and determines a yielding effect for different elements of the cage tending to augment the gap; and (d) devices (31, 32) controlled by a calculation unit (4) comprising a calculator (40) associated with a mathematical model, to regulate the tightening apparatus. Before each pass the calculation unit (4) associated with the mathematical model (40) determines a predictable value of the contraction stress of the metal corresponding to the deformation to be realized in the considered pass by taking into account during rolling the microcrystalline structure of the metal constituting the rolling product (2). The rolling force to be applied in order to obtain the desired thickness reduction is calculated before each pass as a function of the predictable value of the contraction stress and its development during rolling.

Abstract (fr)
L'invention a pour objet un procédé de laminage d'un produit métallique par passes successives dans au moins une cage de laminage (1) associée à une unité de calcul (4) comportant un calculateur et un modèle mathématique (40) pour le réglage de la force de laminage appliquée par les moyens de serrage (17). Conformément à l'invention, avant chaque passe (x), le calculateur associé au modèle mathématique détermine une valeur prévisible de la contrainte d'écoulement du métal correspondant à la déformation à réaliser dans la passe (x) considérée, en tenant compte de l'évolution, au cours du laminage, de la structure microcristalline du métal constituant le produit à laminier, et la force de laminage (Fx) à appliquer pour obtenir la réduction d'épaisseur souhaitée est calculée avant chaque passe (x) en fonction de la valeur ainsi prévue de la contrainte d'écoulement et de l'évolution de celle-ci pendant le laminage. <IMAGE>

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IPC 8 full level
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