

Title (en)
METHOD FOR HEAT TREATING THE WHEEL RIM OF RAILWAY VEHICLE WHEELS

Title (de)
VERFAHREN ZUR WÄRMEBEHANDLUNG DES RADKRANZES VON SCHIENENFAHRZEUGRÄDERN

Title (fr)
PROCÉDÉ DE TRAITEMENT THERMIQUE DE LA JANTE DE ROUES DE VÉHICULES SUR RAILS

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Application
EP 11788346 A 20110803

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Abstract (en)
[origin: WO2012016566A2] The invention relates to a method for heat treating the wheel rim of railway vehicle wheels, in particular train wheels. The aim of the invention is to provide a method in which a homogeneous, substantially pearlitic microstructure is created over the entire cross-section of the wheel rim of the rotationally symmetric body designed as a rail vehicle wheel wherein at the same time the required strength values and hardness values in the wheel rim of the rail vehicle wheel can be precisely set for the functional cross-section of the wheel rim by optimizing the heat dissipation in regard to the time and the heat amount and wherein strength values and hardness values that rise in particular toward the interior of the wheel rim. Said aim is achieved in that the running rim (7) of a first rail vehicle wheel is divided into zones, namely the running surface zone (19), the flange zone (17), the hardness zones (21) lying under the running surface zone (19) and the flange zone (17), the two running rim end face zones (22, 23) connected to the running surface (5) or the flange (4), and the running rim bottom zone (20), and at least one cooling medium is applied to the said zones in a volumetric-flow- and time-controlled manner depending on the microstructures to be achieved on the running rim (7) on the basis of a basic program divided into thermal phases, wherein: first the running surface zone (19) and the connected flange zone (17) are cooled starting at the outer profile of the running rim (7) to a depth of 0.5% of the diameter of the railway vehicle wheel (1) at a low cooling rate under stabilizing formation of a homogeneous pearlitic microstructure in order to form a cooling medium transfer band (15), by means of which subsequently the cooling effect of the still acting cooling medium for the heat conduction for the actual hardening process of the hardness zones (21) lying under the cooling medium transfer band is damped; at the same time the cooling medium (12, 13) is applied to the two running rim end face zones (22, 23) in order to prevent, in conjunction with the heat dissipation zone, heat from flowing back into the hardness zones (21) and affecting the already produced microstructure in the hardness zones (21), wherein cooling by means of a cooling medium (14) occurs additionally in the lateral area of the flange (4), after the concluded heat treatment of the first railway vehicle wheel, the wheel is subjected to a materials sample evaluation, and corrections values (cooling medium amounts associated with the thermal phases, the cooling medium type, and the specification of the heat dissipation from the secondary area of the railway vehicle wheel (1) and of the speed of the rotational drive of the railway vehicle wheel (1)) for the hardening of a further railway vehicle wheel are specified on the basis of the target/actual comparison in regard to the microstructure and the hardness values in order to optimize the heat treatment process; and the values found in such a way are stored in a database and are available for series production of railway vehicle wheels (1) of this specific type.

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