

**METHOD FOR MAKING FLAT PRODUCT FROM LOW-CARBON STEEL**

A method for manufacturing flat product from low carbon steel includes heating the slabs to austenization temperature, holding at a predetermined temperature, roughing-down, forced cooling by means of special equipment to the temperature of finishing rolling, finishing to gauge comprising deformation completion at the temperature of 730-740° C with retarded cooling in the air, packing sheets into packets for further anti-flaking heat treatment, characterized by heating the slabs prior to rolling to the temperature of 950-970° C, speed of roughing in a break-down mill increases by 10-15%.

There exists a problem of rolling speed in rolling mill practice throughout the world, which leads to increased energy consumption.

In this regard, we apply an effective energy-saving rolling process related to ferrous metallurgy which can be used in the rolling industry for obtaining high-quality mill products.

We choose "The method for manufacturing flat product from low carbon microalloyed steel" patent of Ukraine for utility model No. 56680.

The method consists in heating slabs before rolling to an austenization temperature equal to 1150-1170 ° C, holding the heated material at a predetermined temperature for 3-4 hours, rolling heated slabs in break-down mills for 10-20 passes with a total compression level of 80-90% and then forced cooling by means of special equipment to the temperature of finishing rolling, finishing rolling with the deformation completion at a temperature of 730- 740°C with subsequent slow cooling in the air. After the deformation is complete, the sheets are stacked in packets for anti-flaking treatment.

The disadvantages of this method are the additional energy costs for heating to an excess temperature of the slab prior to the break-down mill, which in turn, increases the cost of forced cooling of the metal when leaving the break-down mills.

In this work, we make an attempt to improve on the method of manufacturing flat product from low-carbon steel by reducing energy consumption through reducing the heating temperature of the metal before rolling while increasing the rolling speed in the break-down mills.

This problem is solved due to the fact that applying the method for flat product manufacturing from low carbon steel, the heating temperature before the break-down mill should be lowered to 950-970°C, instead of the temperature of 1150-1170 ° C, to hold the slab at a predetermined temperature in order to equalize the temperature throughout the slab section , increase the rolling speed in break-down mills by 10-15%, fulfill forced cooling to the rolling temperature in a finishing cage, perform a finishing rolling in the finisher with deformation completion at the temperature of 730-740° C followed by slow cooling in the air.

An important technical result is to obtain high-quality flat product while reducing energy costs by decreasing the heating temperature of the metal prior to treatment and diminishing the duration of forced cooling before finishing. The austenitic temperature of the metal is reached during rolling at increased speeds.

When applying this method, the slabs are heated prior to rolling in a continuous slab reheating furnace to the temperature of 950 – 970° C, they are kept in the furnace for 3 - 5 hours, rolled in break-down mills, with increased speed by 10-15% in each mill, forced to cool to the temperature of finishing rolling, finishing with completing deformation at the temperature of 730- 740° C is fulfilled, slow cooling in the air, stacking sheets in packages, performing anti-flaking processing are carried out.

This is the way we are improving the method for manufacturing flat product from low-carbon steel. This technology will allow obtaining a dispersed ferrite-pearlite structure of the rolled plate material with minimal energy consumption by reducing the temperature of heating, and increasing the speed of rolling will allow increasing the productivity of the process.

*List of literature:*

1. "The method for manufacturing flat product from low carbon microalloyed steel" patent of Ukraine for utility model No. 56680.