MATERIALS FOR CEMENTING THE SURFACES OF DETAILS AND THEIR STANDARDIZATION

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ABSTRACT

Heating occurs during heat treatment of steels Chemical-thermal treatment changes its hardness technological that occurs in the production process by increasing elimination of defects, defects.

Keywords: Mechanical change, heating, mechanical diagram.

The cementation process is widely used in industry due to its high efficiency and availability. After hardening, it can form a layer on the working surface of the part with high hardness, and it provides bending resistance, erosion resistance, contact resistance and wear fatigue strength. These properties are provided by a relatively soft and viscous core, which gives the necessary structural strength to the processed products.

It is known that the hardness of steel mainly depends on the amount of carbon. Low-carbon steels have good properties such as plastic deformation, cutting, welding. The lower the carbon content in steel, the lower the hardness, for example, if the steel has S<0.3%, the hardening efficiency is greatly reduced. Therefore, its surface is saturated with carbon in order to make steel better. Such a process is called cementation, and its environment is called carburizing. Cementation in solid, liquid, gas media is widely used in current practice.

Carbon or alloy steels with a carbon content of 0.08-0.3% are usually cemented. The carbon content of the cemented surface is around 0.8-1.0%, and the carbon content decreases from the surface to the inner layer. Only after a series of mechanical treatments are carried out on the tools are they cemented, then quenched and tempered at low temperature, and then machined again.

Агар машина воситаларининг юзасида цементадиялаш керак бўлмаган жойлари бўлса, ўша жойлар оловбардош лой ёки асбест билан ўраб қўйилади.

The characteristics of the cemented layer mainly depend on the temperature and the time of exposure to this temperature. Figure 1-2 shows the effect of temperature and time on cementation layer growth. After determining the method of cementation, the temperature is also determined. However, it should be said that the cementation temperature is determined by the temperature of the austenite structure, because carbon dissolves a lot in austenite, so the efficiency of carbon enrichment is high at this

temperature.

From the surface layer to the inner layer, the amount of carbon decreases, that is, from the surface inward, the following structural layers are located:

(P+Ts) - (P + F) - the structure of the material itself[1].

More carbon in the surface layer increases the brittleness of the layer. Therefore, the amount of carbon on the surface during cementation should not exceed 1.1-1.2%.

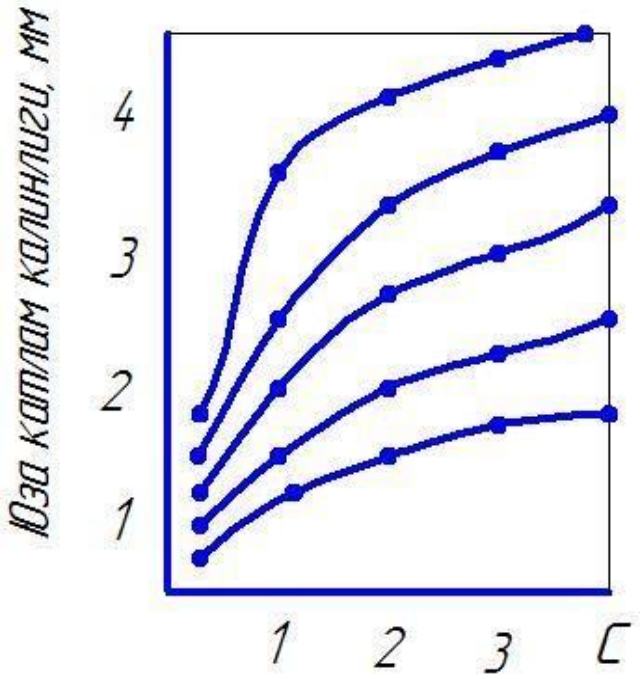

Figure 1. The graph of the effect of temperature and time on the process of diffusion enrichment of the steel surface with carbon: 1-1000 °C; 2-950 °C; 3-900 °C; 4-850 °C; 5-800 °C.

Carbon enrichment of steels is also widely used in repair techniques. In this case, extinguished special rods of pistachio coal or coal, as well as activating compounds are added and together with coke, it forms a solid material. VaSO3 in the solid releases and activates the carbon atom. SaSO3 prevents solid materials from sticking together. The used concrete materials are sifted and the usable part is added to the new concrete material.

Carbon enrichment of steel in a hard environment is usually carried out at 920-950°C. The time of keeping steel at this temperature depends on the thickness of the layer, for example, if the thickness of the layer is 0.7-0.9 mm, the time of keeping it at high temperature is 6-8 hours. If the thickness of the layer is equal to 1.2-1.5 mm, the holding time at temperature is 9-14 hours. If it is clear that austenite consists of natural small grains, the tempering temperature can be slightly increased [2].

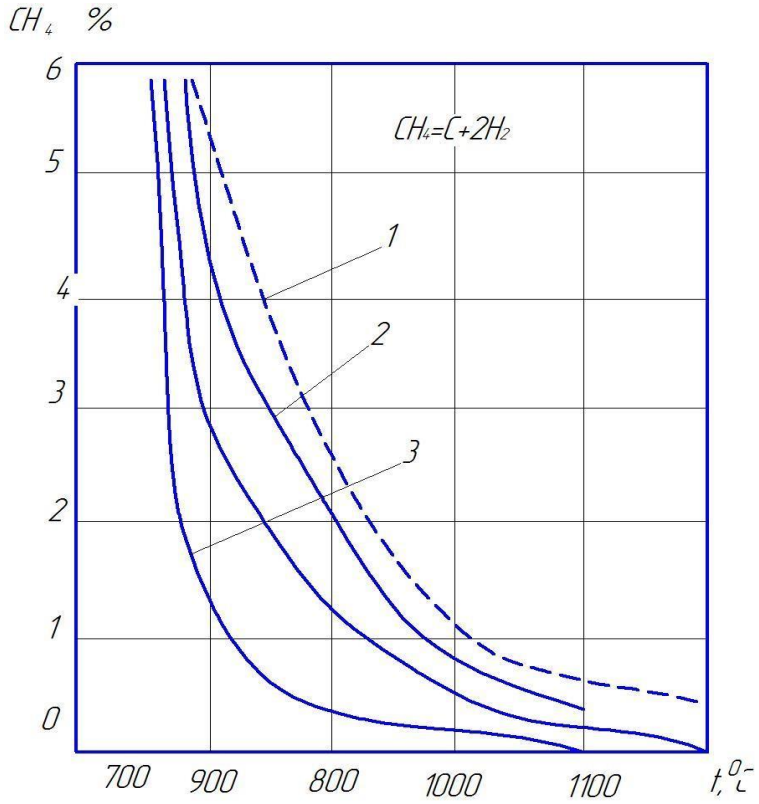

Figure 2. The composition of SN4 and N2 is different from austenite. 1-0.92% °C; 2-0.5 % °C; 3-0.16 % °C.

Carbon enrichment of the surface using a gas (often SN4) has a number of advantages over that in a solid medium. In this case, it is easy to ensure the required thickness of the layer, the time of the process is short, and it is possible to mechanize and automate it. In addition, no special equipment is used for cementation, thermal processes can also be carried out using this furnace. In a liquid carburettor, the performance of cementation can be increased by 3-5 times compared to that of a solid medium carburettor. The electrolysis process in salt solutions is often used for this. If the steel austenite has a natural fine-grained structure, it is cooled in air to 840-860oC after cementation, then quenched in water or oil and subjected to low-temperature tempering. In the second tempering, the steel is heated to 760-780oC. In this case, the cemented layer is strengthened and its hardness increases. But the time of this technological process increases, as a result, the cost of the product increases. The thickness of the surface layer of carbon steels is 60-74 HRC as a result of welding, and that of alloyed steels is equal to 58-61 HRC (the hardness of alloyed steels is slightly less due to austenite). In all cases, low-temperature release (160-1800C) is given.

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