

TO THE POKOVKALES THERMAL WORK GIVE STEEL TO THE POKOVKAS TO HEAT AND COOLING

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Abstract: The quality of forgings and blanks made from them depends on the type of heat treatment they are subjected to. Depending on the designation of the heat treatment, forgings are divided into primary and final heat treatment types. Primary processing to give purpose – defects (crack, cracks) better The purpose of this is to make the cutting process easier. Figure 4.1 shows the temperature ranges for various types of initial heat treatment.. *Heated the pokovkas cooling* Cooling process after hot working by heating the shells metal to the quality big impact shows. To my daughter metal speed with Cooling can cause "cold" cracking and fissures.

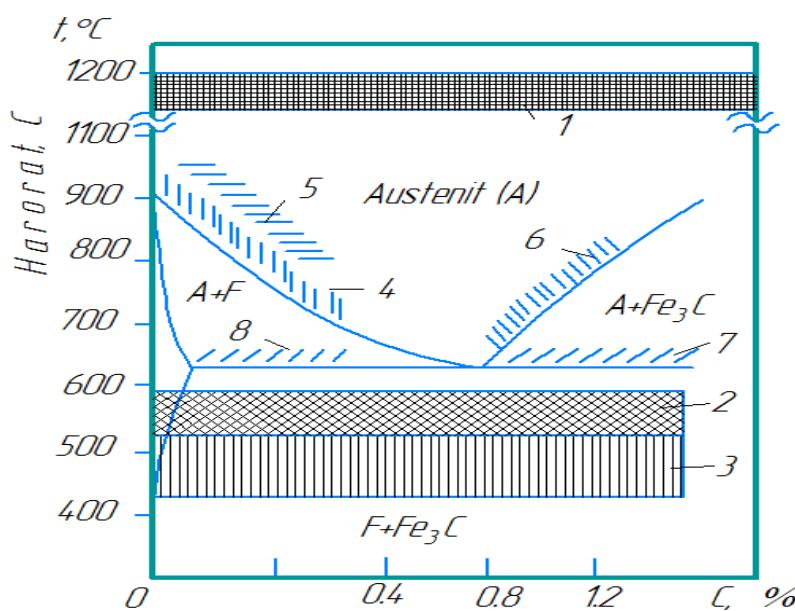
Keywords: The choice of the type of cooling of the heated billet depends on the chemical composition and properties of the prepared metals. In practice, several types of cooling of the heated metal are used: air, using thermostats.

Introduction: The cooling process of the billet occurs rapidly due to the influence of the outside air upon removal from the furnace and continues until it reaches the stamping unit, where the processes of hammering, stamping and rolling of the billets are continued. The cooling process is completed after the pressure treatment process is completed. then stops, that is temperature slowness with room to the temperature is decreasing To the pokovkas thermal processing to give to oneself typical features there is. The most important of them is the temperature difference throughout the entire body of the shell (mainly in large shells), as a result of which

the spatial transformation does not occur uniformly, resulting in the formation of different structural types (from martensitic in the surface parts of the workpiece to pearlite in the middle parts). In addition, the temperature difference throughout the shell, as a result of which the structural transformation does not occur in one system, causes the formation of internal stresses, which negatively affects the properties of the shell.

Figure 4.1. Temperature range for thermal treatment of shells:

1 – homogenization; 2 – low with temperature (recrystallization); 3 – voltage to take for release; 4 – full softening; 5,6 – normalizing; 7,8 - partial softening



Result. As a result of the completed heat treatment, the necessary structure is created, which ultimately results in the formation of the required properties for the finished part

Cooling of the metal under a special press device occurs more quickly than cooling in air (Figure 4.3). The time from the start of the hammering to the end of the hammering depends on the processing process. The quality of the shells and the blanks made from them depends to some extent on it. to the type of heat

treatment given depending on, divided into initial and completed types. at low temperatures the pokovkas cooling, surface in the fields stretching voltage happened

This results in cracking and spalling defects. To prevent such situations from occurring, large pots should be placed in a furnace heated to 300 - 400 ° C to cool from the austenization temperature. Discharge thermal from processing then cleaning structure perlite to be If required, then stress relief is mainly carried out by heating at higher temperatures (500 - 550 ° C). It is necessary to study the different stress states in different steels and develop the necessary heat treatment procedure.

The chemical composition of steels always contains the element hydrogen, which reduces the quality of the steel and, under certain conditions, leads to the formation of internal defects - irregular internal cracks. Therefore, many coatings are thermally processing of giving from the beginning again one internal into the cracks end Internal cracks are thin cracks of a similar shape, the reason for their formation is the influence of additional internal stresses (structural, thermal and mechanical). Most often, internal cracks occur in bearing, structural (mainly chromium-nickel, chromium-marginate), and also tool steels, and in rare cases, in carbon steels. Cracks do not form in steels that are not resistant to the $\gamma = \alpha$ spatial transformation, that is, in steels belonging to the austenitic and ferrite classes. Internal cracks also do not form in ledeburite steels (high-speed, high-carbon chromium steels, such as X12M).

When irregular internal cracks form, stresses are created in a small part of the metal due to two factors. The determining factor is the hydrogen pressure, which is due to the decrease in the solubility of the molecules in the solid solution state and the formation of voids and grains in the crystal lattice. within the border to dislocation (this in place diffusion process intense The $\gamma \rightarrow \alpha$ transformation of the crystal lattice occurs mainly in the martensite mechanism. certain size increase

additional fibers from interruption tension generation does. If all fiber in the break tensions aggregate steel. Combined with temporary resistance, this creates an irregular internal crack .

Conclusion. The formation of an internal crack defect is to some extent related to the structural condition, the structure defect to the level, the density of the material, from it except for non-metallic additives depends. Rule according to internal cracks cleaning middle More common in parts. In large-scale castings, these defects are located in the areas of liquidation saturated with carbon, phosphorus, sulfur and alloying elements. An internal crack defect is formed under the influence of additional internal stresses (structural, thermal and mechanical), that is, processes that increase the hydrogen content in the solid solution, which can cause a decrease in the content of $4-8 \text{ cm}^3 \text{ per } 100 \text{ g}$ of metal . The slowest hydrogen removal occurs during cooling of austenite, which accelerates the decomposition process. Internal crack defect eliminate to do for below in order thermal processing will be held:

- austenite again cooling with to perlite (carbon and less alloyed in steels) or bainite (in alloyed steels) structure;
- isothermal maintenance at certain temperatures ensures the mobility of hydrogen and its disappearance from the package;
- isothermal at temperature holding standing slowly cooling, less level internal tension is created;

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