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CHOICE OF THE OPTIMAL MATERIAL FOR THE SPECIAL TECHNOLOGICAL CONTAINERS FOR CHEMICAL HEAT TREATMENT

The special technological containers are one of the most critical kind of equipment for performing chemical heat treatment of workpieces. They are subjected to a complex set of thermomechanical loads in combination with the chemical saturation of the surface.

Attempts to make the special technological containers for chemical heat treatment of the structural steel are usually lead to their critical warping and embrittlement with the appearance of numerous cracks after few heat treatment cycles.

It was found that usage of the austenitic creep resisting steels would be most convenient for this type of equipment. Such steels are more expensive, but they provide much more long operation life.

This result is supported by experience in global practice, in particular, the material choice for this type of equipment by the German company Lohmann. The above also corresponds to the data of the following foreign and domestic standards for steels: European [1], US [2], Ukrainian [3].

It was determined that the following steels have the greatest resistance to creep at temperatures up to 1000°C and the highest silicon content required to slow down the diffusion of carbon during carburization: GX40NiCrSi25-20(1.4848) by EN 10295, HL by ASTM A297/A297M, 20X25H19C2J1 by ДСТУ 8781.

REFERENCES

1. (2002). Heat resistant steel castings EN 10295:2002. European Committee for Standardization. 15.
2. (2017). Standard Specification for Steel Castings, Iron-Chromium and Iron-Chromium-Nickel, Heat Resistant, for General Application. ASTM A297/A297M-17. ASTM Committee on Standards. 4.
3. (2018). Vylyvky zi stali. DSTU 8781:2018 [Steel castings]. Kyiv, 38.