

INFLUENCE OF MULTILAYERED COVERINGS ON INDICATORS OF FIRMNESS OF COMPRESSION MOULDS FOR CASTING UNDER PRESSURE

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Abstract: The problem of improving the operational stability of molds for injection molding using a hard coating by CIB. Describes an experiment to determine the specific quantitative and qualitative characteristics of hard surfaces, depending on their composition

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One of the main advantages of sheetings is increase in ability of material to resist education and growth of cracks, increasing the period of work of a compression mold before emergence of primary cracks on form-building surfaces. Increase in this parameter depends mainly on structure of a covering. The best operational indicators among the hard coatings put with the KIB method multilayered coverings possess [1]. This results from the fact that in multilayered coverings pluses of several single-layer coverings are combined at once. Alternation of a set of thin layers of coverings provides delay of growth of the cracks which are formed both in a covering and in compression mold material. All this in the sum gives the increased microhardness, low coefficient of friction, small coefficient of peeling of a covering from compression mold metal, small heat conductivity and so on. At the same time the scheme will be approximately identical to all multilayered coverings. The lower layer provides coupling with compression mold material, the top layer interacts with the filled-in alloy, that is, changing its structure, management of characteristics of process of casting and also the center serving as a barrier to growth of the cracks arising both in compression mold material and in a covering is possible. Use of additional layers for improvement of adhesion between layers is also possible. [1]

Multilayered coverings can consist as of one material which layers will differ depending on parameters of drawing a covering, and from different. At the same time the most perspective use of various structures for certain coat layers looks. At the same time there is no certain method of the choice of structures of coverings and also according to their quantitative and qualitative characteristics.

Considering conditions of process of casting under pressure of [2], one may say, that coverings have to meet the following requirements:

- to maintain the faltering, cyclically repeating temperature influences causing emergence of cracks

- to interfere with emergence of cracks, both in compression mold material, and in the covering,

- to interfere with growth of the formed cracks,

- to possess low coefficient of friction, for reduction of wear of the blanket interacting with the melted metal.

However for definition of a design of the multilayered covering meeting the above-stated requirements it is necessary to have full information on work of each covering of separateness. The highest rates among single-layer multicomponent coverings as in this case there is a possibility of variation of materials for the purpose of obtaining certain properties, the interacting layers a compression mold covering material possess. Also, an important point is that in comparison with simple two-component connections perhaps receiving abnormally high operational rates. However, when using complex structures there is a problem of impossibility of receiving a complex of necessary properties, the most frequent case is the impossibility of receiving a covering with a high rate of coupling with compression mold material at high value of hardness. It should be noted what the majority of working parameters of coverings define experimentally therefore drawing up the most optimum design of a hard multilayered coating is possible only after carrying out a comparative experiment which purpose is identifications strong and weaknesses of the most widespread single-layer coverings. [2]

References:

1. Savin I.A. Determination of the effectiveness of the use of robotic systems in mechanical engineering//European Journal of Natural History. 2016. № 3. P. 94-97.

2. Gavariyev, R.V., Savin, I.A., Leushin, I.O. Impact of the functional coating on service durability of injection molds for the zinc alloys pressure casting. (2016) Tsvetnye Metally No. 1. pp. 66-70 DOI: 10.17580/tsm.2016.01.11