621.762

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APPLICATION OF TECHNOLOGY FOR CENTRIFUGAL CASTING PRODUCING GRADIENT COMPOSITE MATERIALS

A testing of centrifugal casting technology to produce the gradient composite materials based on aluminum alloys reinforced with ceramic particles of different nature and composition was conducted. It was shown that the surface layers with the high concentration of the reinforcing phase are formed through the directed disperse particles migration in a liquid metal suspension. It was found that the width of the gradient layers and the distribution of particles in them vary depending on the specific weight of the reinforcing phase particles. It was established that the introduction of the reinforcing fillers (basalt fibers, Al_2O_3 particles) increases the hardness of the surface layer of the material in 1.1 - 1.3 times compared with the initial aluminum alloy.

Keywords: centrifugal casting, gradient composite materials, aluminium alloy, reinforcing phase

	ρ , / 3	$(\rho - \rho), / ^3$	
Al_2O_3	3,99	1,33	
Al ₂ O ₃ SiC	3,2	0,54	
	2,75	0,09	
SiO ₂	2,65	-0,01	
SiO ₂ B ₄ C	2,5	-0,16	
()	1,7	-0,96	

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. (2)

(. 2). 90 ,

60 , 60 .

. 2. ,

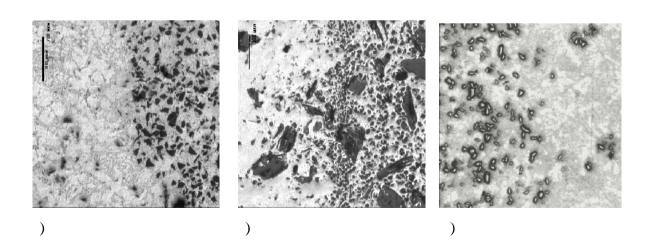
1	12-10% Al ₂ O ₃ (\emptyset = 40)
2	12+10% (Ø = 200-400)		
3	12+2%Al ₂ O ₃ +3%		
4	12+10% Al ₂ O ₃ +2%		
5	12+10% ₄ (∅≤60)		
6	12 + 5% (Ø =12 ,	≤3)

 $T=210\pm10^{\circ}$, $T=750\pm10^{\circ}$, n=1200 ,

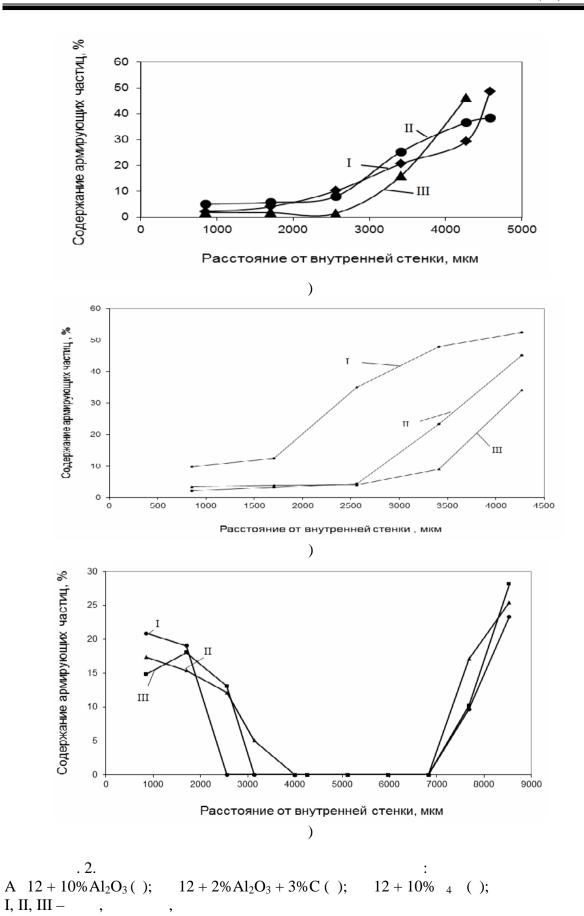
. «Leica». -

1 (4271-001-18606393-00).

· (.1 2) (.3 4) - (.2 4).



. 1. (): A
$$12 + 10\% \, Al_2O_3$$
 (); $12 + 2\% \, Al_2O_3 + 3\% \, C$ (); $12 + 10\% \, _4$ ()



 Al_2O_3 1 2 . 3.): () $12 + 10\% Al_2O_3 + 2\%$ (); 12 + 5%3

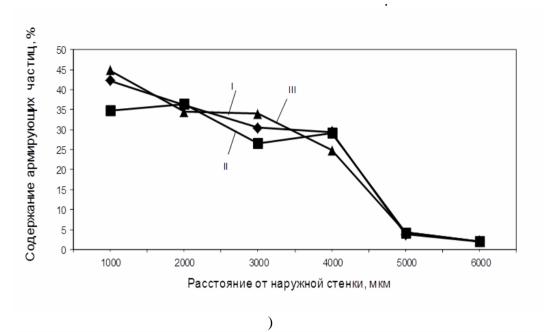
4,

5

 Al_2O_3

Al₂O_{3.} 5,

ρ - ρ



Содержание армирующих частиц, % 30 25 20 15 10 ΙП 5 0 1000 2000 7000 8000 3000 4000 5000 6000 Расстояние от наружной стенки, мкм

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. 4. $12 + 10\% \, Al_2O_3 + 2\% \quad (\);$ 12 + 5%(); I, II, III –

6,

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12 (
                                                        2)
                                                                                         6)
                                               1,1-1,2
                                        1,2-1,3
                Al_2O_3.
                       (Al<sub>2</sub>O<sub>3</sub>)
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