OBTAINING HIGH-CARBON COATINGS FROM MARTENSITE-AUSTENITIC STRUCTURE FOR WORK UNDER CONDITIONS OF SLIDING FRICTION WITHOUT LUBRICANTS

V.I. Savulyak, V.Y. Shenfeld, S.O. Panasiuk

Dr.Sci.Tech., vsavulyak@mail.ru
Cand.Tech.Sci, lerashef76@mail.ru
Student, geronimo2012@rambler.ru

Abstract: *This article considers the influence of liquid weld pool lifetime for receiving carbon coatings from martensite-austenitic structure. These structures function well under conditions of friction without lubrication. The influence of the liquid pool was studied using final element analysis.*

Keywords: *strength, crystallization, coating, friction, temperature.*

General part

Development of wear-resistant material for using in the specified wear and tear conditions is a challenging task. Studying the influence of structure on the wear resistance of steels showed that among all structures of iron alloys residual austenite has maximum wear resistance under dry friction, despite its low initial strength that is much lower than the hardness of martensite and cementite [1-4].

To ensure high wear resistance alloy should contain 50-80% of strengthening phase, located in austenitic - martensitic matrix with ratio of M/A=80/20…60/40 [5].

Corresponding structures of high-carbon coatings were obtained by changing the cooling rate of deposited weld metal. [6].

We studied the influence of welding deposit rate (Vw.d. = 26; 23; 20; 17; 14; 11 m/h) during the existence of liquid weld pool, on the parameters of temperature field and the structure of high-carbon coating: deposited weld metal, fusion zone and base metal in the heat-affected zone. Other parameters of welding deposit mode were fixed at the level: U=28 V, V_{wire}=104 m/h, d_e=1,4 mm.

For studying surfaced coatings we made samples with thickness of 10 mm, width of 50 mm and length of 90, from steel 45 (weight of 2 kg.).

Welding deposit was done on each of the samples so that welding deposit rate decreased. Creation of high-carbon layer was provided by a combination of deposited wire Св08Г2СА and carbon fabric of brand УУТ-2 ТУ6-06 И 78-85 with density of 250 g/m^2. Coating was performed using welding facilities in an atmosphere of shielding gases УД-209М.

Table 1 shows the values of weld pool lifetime in a liquid state.

Table 1: *Lifetime of liquid weld pool at welding deposit rate*

Lifetime of weld pool in a liquid state, sec.					
$V_{w.d.}$=26 m/h	$V_{w.d.}$=23 m/h	$V_{w.d.}$=20 m/h	$V_{w.d.}$=17 m/h	$V_{w.d.}$=14 m/h	$V_{w.d.}$=11 m/h
0,8	1	1,2	2	3	5