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WELDING ROD

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2 Claims. (Cl. 219—8)

The present invention relates to an electrode for electric arc welding, consisting of special materials having high resistance, high coefficient of percentage lengthening and high resilience and which does not have structural modifications caused by thermal actions and therefore do not cause variations of the mechanical characteristics.

Electrodes for arc welding employed heretofore present several disadvantages which are overcome by the present invention.

The alloy constituting the material to be deposited for the welding, according to the present invention, does away with the disadvantages and is characterized by a very low content of carbon, a greater percentage of manganese and the addition of improving components such as the Si, Cr and Mo.

The reduction in the percentage of C serves to prevent the structural variations of hardening due to the high velocity of cooling especially in the first layer of the deposited material; such reduction, however, would tend to simultaneously diminish the resistance of the added material and to lower its elastic limit. The presence of a greater percentage of manganese which, however, must not be too high as, otherwise, the various disadvantages of structural variations would appear, partially prevents the reduction of the resistance.

The addition of Si reestablishes the value of the elastic limit.

The Cr and the molybdenum are added within certain limits as improving elements in relation to the welding.

The Ni may also be added as a stabilizing element for the structure, and to improve the mechanical characteristics of the material; such addition does, however, influence the characteristics and the particularities of the alloy under the point of view of the invention.

Particularly the alloy according to the present invention is characterized by the reciprocal proportions of constituents.

For the purpose of enabling one skilled in the art to practice the invention an average composition is given, by way of example only, of the material for an electrode according to the present invention, which presents a resistance of 72 kgs./sq. mm. and a lengthening coefficient of 22% determined with a small bar of circular cross-section, having a length equal to five times its diameter.

	Per cent
C	0.08 to 0.11
Mn	1.2 to 1.4
Si	0.25 to 0.35
Cr	0.55 to 0.75
Mo	0.25 to 0.35

As aforesaid, an addition of Ni from 0.15 to 0.25% may be made for the indicated purposes.

If, for the constitution of an electrode which may be bare or protectively covered, the material indicated above is employed, several advantages are realized and especially, for weldings on high resistance steel (beyond 55 kgs./sq. mm.) total insensibility to thermal actions, possibility of electrodes which, through slight modifications of the percentages indicated above by way of example, may reach, without any thermal treatment, very high coefficients of resistance up to 110 kgs./sq. mm.; an absolute homogeneity for all the layers of deposited material at the welding seam, and particularly a high value of the lengthening coefficient which will remain the same for the material constituting the first layers upon steels of very high resistance; in this manner the shrinkage tensions will be eliminated as they are absorbed by the lengthening of the deposited material, further also cracks will be done away with, and it will be possible to effect weldings also upon very large structures, the whole without any necessity of normalization, the value of the resilience of the weld will be maintained unaltered and high, the hardened zones of welding will be eliminated and better conditions of operation and of practical results will be realized carrying out weldings hitherto thought impossible (high resistance armours).

Having now described my invention what I claim is:

1. A welding rod consisting of 0.08 to 0.11% carbon, 1.2 to 1.4% manganese, 0.55 to 0.75% chromium, 0.25 to 0.35% molybdenum and remainder iron, said rod giving a welding line having a tensile stress of 70 to 80 kg./mm.^{2}, the material constituting said welding line being resistant to the customary hardening thermal treatments.

2. A welding rod consisting of 0.08 to 0.11% carbon, 1.2 to 1.4% manganese, 0.55% to 0.75% chromium, 0.25 to 0.35% molybdenum, 0.25 to 0.35% silicon and the remainder iron.

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