عنوان مقاله:

بررسی ریزساختار و سختی روکش های فولاد PH۴-۱۷ و استلایت ۶ ایجادشده با فرایند رسوب نشانی مستقیم لیزری روی زیرلایه فولاد PH۴-۱۷

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خلاصه مقاله:

The purpose of this research is to laser cladding of stellite۶ and stainless steel ۱۷-۴PH powders on the substrate of stainless steel ۱۷-۴PH, and investigate its solidification microstructure. The results showed that the microstructure of the stellite۶ cladding has a cobalt solid solution ground phase with an FCC structure and Cr۷C۳ and Cr۲۳C۶ carbides. Also, the values of the primary dendrite distance and the distance of the secondary dendrite arm have decreased by moving away from the interface; The reason for this is related to the difference in the cooling rate in different parts of the coating. The microstructure of ۱۷-۴PH stainless steel coating includes martensitic, ferritic, and austenitic phases; Due to the same chemical composition of the substrate and the cladding, the weight percentage of elements such as iron, nickel, chromium, and copper did not change from the cladding to the interface. It indicates the uniformity of the chemical composition of the cladding and the substrate. The calculated microhardness for the cladding of stellite۶, the substrate and the cladding of stainless steel ۷-۴PH is about ۴۸۰, ۳۵۰, and ۳۵۰ respectively. The reason for the higher microhardness of the cladding is the presence of chromium carbides (Cr۷C۳ and Cr۲۳C۶) formed in the cobalt field and the cobalt solid solution field of the cladding.

کلمات کلیدی:

Laser cladding, Stellite, ۱۷-۴PH stainless, Solidification microstructure, Microhardness, روکش کاری لیزری, استلایت ۶, زنگ نزن PH۴-۱۷, ریزساختار انجمادی, سختی

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