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PII: S0264-1275(15)30608-0
DOI: doi: 10.1016/j.matdes.2015.10.030
Reference: JMADE 769

To appear in:

Received date: 9 August 2015
Revised date: 5 October 2015
Accepted date: 6 October 2015

Please cite this article as: Vadim Veiko, Galina Odintsova, Elena Gorbunova, Eduard Ageev, Alexandr Shimko, Yulia Karlagina, Yaroslava Andreeva, Development of complete color palette based on spectrophotometric measurements of steel oxidation results for enhancement of color laser marking technology, (2015), doi: 10.1016/j.matdes.2015.10.030

Development of complete color palette based on spectrophotometric measurements of steel oxidation results for enhancement of color laser marking technology

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In this work, we studied a technology of laser-induced coloration of metals by surface oxidation. A method of complete color palette development for enhancement of the technological industrial application is demonstrated for the 1.06 μm fiber laser with nanosecond duration of pulses. It is based on reflectance spectra dependence on laser processing parameters. AISI 304 stainless steel example confirms an applicability of this method. However, the results can be similarly used for other oxidizing metals and alloys under normal conditions. Sample color dependence on the light incidence angle (viewing angle) is also presented.

Keywords:
color laser marking; spectrophotometry; laser oxidation; complete color palette; stainless steel.

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