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Modelling of the carburizing and nitriding processes / Cavaliere, P.; Zavarise, G.; De Santis, A.; Perillo, M.. - STAMPA. - (2008), pp. 137-137. ((Intervento presentato al convegno TCN CAE 2008 tenutosi a Venezia nel 16-17 Ottobre 2008.

*Availability:*

This version is available at: 11583/2700712 since: 2018-04-17T14:56:51Z

*Publisher:*

consorzio TCN

*Published*

DOI:

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# Modelling of the carburizing and nitriding processes

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## ***Abstract***

The thermo-chemical diffusion process of carburizing and nitriding was modeled in the present study. The analyses led to the prediction of surface hardened layers dimensions and hardness in commercial steels. A diffusion model based on Fick's laws was applied to such steels in order to describe the growth kinetics of layers, then the analytical model was employed to perform finite element calculations. In such a way it was possible to calculate the carbon and nitrogen concentration in the cross sections of cylindrical samples and the consequent hardness profiles coupled with those of the residual stresses. The results from analytical model and FE calculations were compared with experimental data.