

Pongthep Jansawat, Acting Sub Lt. 2014: High Temperature Deep Rolling on Stainless Steels AISI 420. Master of Engineering (Materials Engineering), Major Field: Materials Engineering, Department of Materials Engineering. Thesis Advisor: Assistant Professor Patipan Juijerm, Dr.-Ing. 51 pages.

High temperature deep rolling was developed from deep rolling at room temperature and performed on various metallic materials. In the present paper, optimization of high temperatures deep rolling on stainless steel AISI 420 has been investigated. The high temperatures deep rolling was performed with temperature range of 150 to 400°C. Residual stresses and Full width at half maximum (FWHM-values) were determined using X-ray diffraction method. The fatigue tests have been tested using rotary bending fatigue test. The results of the investigations, e.g. s/n curve and residual stress of the high temperatures deep rolled were compared to untreated, deep rolled at room temperature and high temperature deep rolled conditions. Thermal affected on decreasing of residual stress and work hardening because of thermal residual stress relaxation. However, deep rolling at 200°C induced beneficial effects on increasing the fatigue lifetimes because of mechanism of strain aging.

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Thesis Advisor's signature

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