

after laser peening indicating an increase in the corrosion resistance of the material. More confirmation study is required to identify the improvement in fatigue and wear resistance. Low energy Nd:YAG laser is feasible to perform Laser Shot Peening. When using low energy laser, peening without sacrificial coating is more beneficial to induce higher magnitude compressive stress. Depending on the material properties the higher surface roughness may cause deterioration in corrosion resistance, this can be investigated further.

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References

- [1] S. Sathyajith, S. Kalainathan, S. Swaroop “Surface modification of 17-4 PH stainless steel by laser peening without protective coating process” *Surface & Coatings Technology* 278, 2015, 138–145.
- [2] Yuji SANO, Koichi AKITA, Kiyotaka MASAKI, Yasuo OCHI Igor ALTENBERGER and Berthold SCHOLTES “Laser Peening without Coating as a Surface Enhancement Technology” *JLMN-Journal of Laser Micro/Nanoengineering* Vol. 1 (3), 2006.
- [3] S. Kalainathan, S. Prabhakaran “Recent development and future perspectives of low energy laser shock peening” *Optics & Laser Technology* 81(2016), 137–144.
- [4] S. Prabhakaran, S. Kalainathan “Warm laser shock peening without coating induced phase transformations and pinning effect on fatigue life of low-alloy steel” *Materials and Design* 107 (2016) 98–107.
- [5] Xizhang Chen, Jingjun Wang, Yuanyuan Fang, Bruce Madigan, Guifang Xu, Jianzhong Zhou “Investigation of microstructures and residual stresses in laser peened Incoloy 800H weldments” *Optics & Laser Technology* 57, 2014, 159–164.
- [6] Majumdar, Jyotsna Dutta, Evgeny L. Gurevich, Renu Kumari, and Andreas Ostendorf. "Investigation on femto-second laser irradiation assisted shock peening of medium carbon (0.4% C) steel." *Applied Surface Science* 364, 2016, 133-140.
- [7] P. Mukherjee, A. Sarkar, P. Barat, T. Jayakumar, S. ahadevan and Sanjay K. Rai “Lattice Misfit Measurement in Inconel 625 by X-Ray Diffraction Technique”. 2006
- [8] S. Sathyajith, S. Kalainathan “Effect of laser shot peening on precipitation hardened aluminum alloy 6061-T6 using low energy laser” *Optics and Lasers in Engineering* 50, 2012, 345–348
- [9] Gill, Amrinder S., Abhishek Telang, and Vijay K. Vasudevan. "Characteristics of surface layers formed on inconel 718 by laser shock peening with and without a protective coating." *Journal of Materials Processing Technology* 225, 2015, 463-472.
- [10] Li, Yinghong, Liucheng Zhou, Weifeng He, Guangyu He, Xuede Wang, Xiangfan Nie, Bo Wang, Sihai Luo, and Yuqin Li. "The strengthening mechanism of a nickel-based alloy after laser shock processing at high temperatures." *Science and Technology of Advanced Materials* 2016.

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