Contribution ID : **224**   Type : **Poster**

Investigation of Residual Stress and Mechanical Properties of Steelwork After Laser Cleaning

Thursday, 25 November 2021 18:52 (1)

Surface preparation of steelwork for structural repainting is often conducted by sandblasting method in which abrasives (sands) are blasted onto the painted surface at high speed, removing the old paint and rust/dirt by the impact of the blast. This conventional method would cause irreversible damage to the underlying substrate, deteriorating its mechanical and fatigue performance. Laser cleaning has attracted attention as an alternative to conventional cleaning methods as an environmentally friendly and economical technology that removes paint and corrosion efficiently while inducing minimal damage to the surface of the material.

This research investigates the mechanical properties and residual stresses of the laser cleaned steel samples from the Sydney Harbour Bridge. Laser cleaning using nanosecond laser was performed on the structural steel plates removed from the Sydney Harbour Bridge. The plates were then tested at the Australian Nuclear Science and Technology Organisation (ANSTO) for residual stress measurement and the University of Sydney for the microstructure characterisation and microhardness testing.

Results of the residual stress measurements indicated that the residual stress profile changes at the surface after cleaning. This study enhances the understanding of changes in residual stress and mechanical properties at the surface of a steel subjected to laser cleaning.

Level of Expertise

Student

Presenter Gender

Man

Pronouns

Which facility did you use for your research

Australian Centre for Neutron Scattering

Students Only - Are you interested in AINSE student funding

Do you wish to take part in the Student Poster Slam

Condition of submission

Yes

Primary author(s) : TSUMURA, Yutaka (Sydney University)

Co-author(s) : PARADOWSKA, Anna (ANSTO)

Presenter(s) : TSUMURA, Yutaka (Sydney University)

Session Classification : Poster Session

Track Classification : Manufacturing & Engineering