

14th International Fatigue Congress - IFC14

Madeira, Portugal, 29th June – 3rd July 2026 (<https://ifc14.tecnico.ulisboa.pt/>)

THEMATIC SYMPOSIA PROPOSAL

Symposium Title: **Laser Peening and Related Residual Stress Engineering Processes for Fatigue Improvement**

Symposium Chairs:

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Symposium Description:

Load-bearing metallic structures and components subjected to cyclic loading often fail due to fatigue. Advanced residual stress engineering techniques, such as laser peening, have proven to be highly effective in suppressing fatigue crack initiation and growth, thereby significantly extending the service life of metallic structures. In addition to enhancing fatigue resistance, surface engineering techniques can also improve corrosion resistance and wear behavior. Achieving optimal application of these residual stress engineering techniques requires a comprehensive understanding across multiple stages — from process simulation and residual stress design to mechanical performance prediction considering the induced stress fields. This symposium focuses on recent advancements in the experimental, numerical, and industrial aspects of applying advanced residual stress engineering methods for extending the service life and reliability.