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PULSED PLASMA SURFACE TREATMENT (PPST) OF STEELS AND INCONELS FOR MARINE AND OFFSHORE APPLICATIONS. --- PRACTICAL APPLICATIONS AND FUNDAMENTAL ASPECTS

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Pulsed plasma surface treatment (PPST) has been widely applied in the automotive- and tool industries for more than a decade. Such plasma assisted diffusion treatments in the form of nitriding, nitrocarburizing and oxidation have offered an environmentally friendly alternative to detrimental chemical processes.
The use of PPST as a cost-efficient, "green" process for offshore and marine applications, however, is more recent. For stainless steels and inconels the challenge has long been to surface harden components without loss in corrosion properties. If such materials can be surface hardened with negligible, or even improved corrosion properties, it will allow for some new and important applications. Parts may also be surface hardened with excellent shape-, surface roughness- and size stability. Hence, there will be no need for costly mechanical- or thermal post-treatments. It is also relatively simple to surface harden complex geometries and to scale up the process for large components.
PPST's have been conducted with a wide range of process parameters in an attempt to achieve the above mentioned goals. The microstructures have been characterized (electron microscopy and analytical methods) and then related to mechanical- and corrosion properties. In parallel to such characterizations, industrial tests have been conducted. Several examples of practical, commercial applications will be given.

Keywords
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