**High strength and oxidation resistant stainless steels, what can we expect from nanostructuring?**

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Harvesting wind or marine energy requires the development of high strength and oxidation resistant metallic alloys. The oxidation behavior is often controlled by the chemistry while the mechanical behavior is typically more sensitive to microstructural parameters. It is well known that the yield stress of alloys is strongly dependent on the grain size (Hall and Petch law), and thus reducing the grain size in the submicron regime appears as an interesting opportunity to significantly increase the strength of oxidation resistant alloys. Such an approach rises however two important questions: How such material could be produced? And will the ultrafine or nano-structure affect the oxidation behavior? In this presentation, we will address these two questions on the basis of recent work carried out on nanostructured 316 stainless steels obtained by severe plastic deformation and spark plasma sintering. A special emphasis will be given on the process-structure relationship and on the combination of strength and oxidation resistance that could be achieved.