For specific blanket and divertor applications in future fusion power reactors a replacement of presently considered Reduced Activation Ferritic Martensitic (RAFM) steels as structural material by suitable oxide dispersion strengthened (ODS) ferritic martensitic steels would allow a substantial increase of the operating temperature from \( \sim 550^\circ C \) to about \( 650^\circ C \). Temperatures above \( 700^\circ C \) in the He cooled modular divertor concept necessitate the use of ferritic (RAF) ODS steels, which are not limited by a phase transition. Therefore a 13Cr1W ferritic ODS steel is being developed. The work concentrates on establishing an optimum processing route, as well as analyses and qualification of the produced alloys by SEM and analytical TEM. 13Cr ferritic steel powder together with 0.3 wt-% \( \text{Y}_2\text{O}_3 \) and 0.3 wt-% Ti powder was ball milled under varying milling parameters using a ZOZ Attritor Simoloyer CM01. The milled powders were filled in specially designed stainless steel cans, degassed at 400\(^\circ \text{C}\) for two hours and finally sealed. After this preparing step the powders were consolidated in a HIP (Hot Isostatic Press) device.

The mechanical properties of prepared as hipped samples were investigated by performing hardness measurements and tensile tests: The hardness is \( \sim 430 \text{ HV} \) and strength is \( \sim 1270 \text{ Mpa} \) at room temperature. Applying of further thermo-mechanical heat treatments can improve the mechanical properties. Optical microscopy (OM), Scanning electron microscopy (SEM) and Transmission electron microscopy (TEM) have been performed for analyses of specimen microstructure. General TEM investigations show two regions with different grain sizes. The first one has an average grain size of 1-8 \( \mu \text{m} \), the second one is in between 50-200nm. Furthermore analytical and high resolution TEM has been used to study the morphology, chemical composition and spatial/size distribution of ODS particles. Particles composed of Y, Ti and O were detected and analyzed in detail. These results will be presented in comparison to reference alloys.