Oxide dispersion strengthened (ODS) ferritic steels are candidate materials for applications in fission and fusion nuclear reactors. The strengthening of ODS steels is achieved by a uniform dispersion of very fine (10-50 nm) oxide particles ($Y_2O_3$ or $TiO_2$) in the steel matrix and by an ultra-fine ferritic grain microstructure. This talk will present a study of a Fe-14Cr-1W-0.4Ti steel strengthened by 0.3% of $Y_2O_3$ particles and produced by a low energy mechanical alloying, focusing the attention on the effect of the production method on the mechanical and microstructural properties.