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Introduction of Flux Pinning Centers for Use in Nb₃Sn Superconducting Wire DAVID RAHMANI, KYLE DAMBORSKY, PETER MCINTYRE, NATHANIEL POGUE, Texas A&M University Department of Physics — Powder metallurgy was used to introduce a homogeneously heterogeneous distribution of nanoscale flux pinning centers in Nb rod for future use in Nb₃Sn superconducting wire. The pinning centers consisted of Y, Y₂O₃, W, Cu, Zr, and Ti. Flux pinning centers in superconducting wire would prevent a decrease in critical current density in the presence of a high magnetic field. The blended powders were consolidated using Cold Isostatic Pressing (CIP) at 50000 PSI. The samples were analyzed and found to contain a high concentration of oxygen, which was found to be excessive for use in a superconductor and may have contributed to poor performance in CIP. Due to the high level of oxygen found in commercially available Nb powder, future attempts will require the manufacturing of Nb powder with a low oxygen content.

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