

Hot Isostatic Pressing of Radioactive Nuclear Waste: The Calcine at INL

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Hot Isostatic Pressing (HIP) is a method to consolidate dry metal and ceramic powders by increasing the temperature up to the sintering threshold and applying high pressure, typically 15-30 ksi in an inert Argon atmosphere.

This work presents the results performed together with Quintus Technologies and Department of Energy's Idaho Site contractors to significantly reduce the volume of dry calcine radioactive nuclear waste by HIP where the radioactive waste will be contained in a collapsible canister, heat treated in the HIP to solidify it so that zero emissions of radioactive isotopes are expected from the glassy end product. The classified end-product is then ready for transport to a repository for final disposal when available.

To be shown in the presentation is the cost ratio for HIP vs Vitrification is 1:1.74, and the volume reduction 20-70%, while vitrification increases the volume with 100%.

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