

PROJECT NAME: Lined Molten Salt Tank (LIMOSA)

Last 5 digits of project number: 34209
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BACKGROUND and OVERVIEW

- LIMOSA is an extension of the Gen3 CSP "Liquid Pathway" project to evaluate 720°C thermal energy storage based on molten chloride salts.
- While SETO selected the Particle Pathway for Gen3 demonstration, LIMOSA was created to resolve a major risk factor with molten chloride salts—design of an insulated tank to contain 720°C salt.

METHODS

- 200 kg of ternary Mg/Na/K-chloride salt is melted and purified in a vessel (melter), then transferred to the prototype storage tank (LIMOSA).
- The LIMOSA tank is monitored to quantify its thermal performance.
- The LIMOSA tank is drained and analyzed to evaluate the condition of the liner.

KEY MILESTONES

- Designed and assembled test system leveraging experience from Oak Ridge National Lab and Liquid Pathway Phases 1 and 2. Utilized SETO-developed coating in Melter and LIMOSA tank.
- Developed new graphite-foil barrier to protect insulation from salt intrusion and wetting.
- Presented system design at SolarPACES 2023

CONCLUSIONS

- Supply chain issues and challenges working with molten salt created schedule delays.
- Salt purification and transfer to LIMOSA tank occurring in Q2 FY24.
- Demonstration of graphite foil barrier will mitigate risk associated with salt-wetting of internal insulation and promote technical viability of internally lined salt tanks.

CONCENTRATING SOLAR-THERMAL POWER TRACK

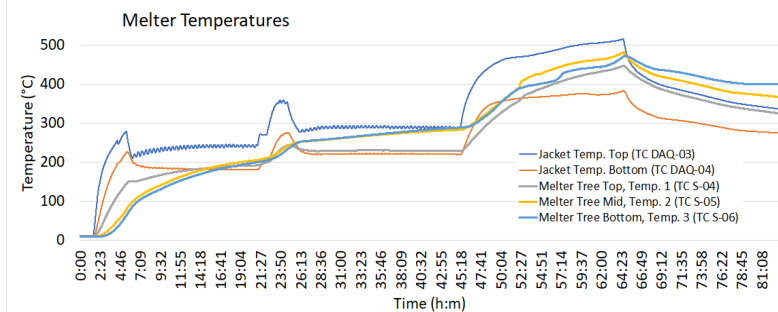
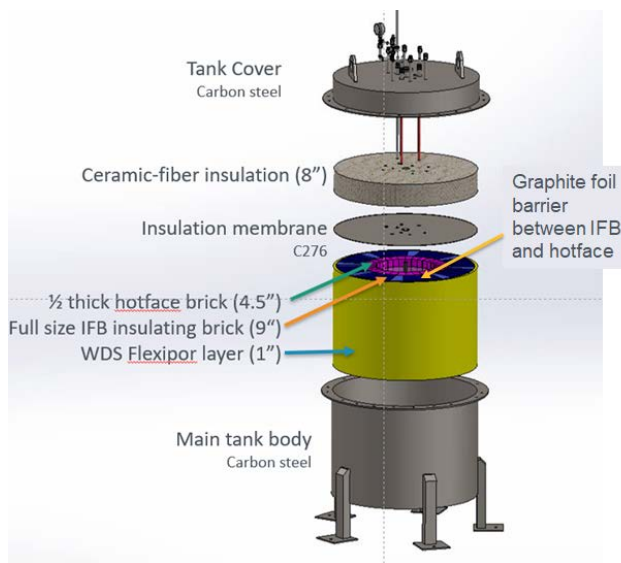
Demonstrate and de-risk an internally lined tank design for molten-salt thermal energy storage benefitting CSP and nuclear-energy sectors.

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Report



Multilayer liner required to protect insulation and tank shell



Salt melting profile

Multi-layer insulating liner:

- Protective hotface brick
- Graphite liquid barrier
- Insulating firebrick
- Carbon steel tank shell

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