

Fluoride Salt Cleanup System

The fluoride salt cleanup system (FSCS) is designed to remove water, oxygen, and sulfur, as well as particulates, from the salt. The batch system is used to melt and clean new salt received from commercial vendors as well as to intermittently clean previously used salt.

The oxygen content of a salt directly impacts metal corrosion and therefore system lifetime. The FSCS is an enabling capability to supply clean salt for other systems (e.g., liquid salt test loop, salt flow calibration stand, salt cell) and for other research and development efforts such as corrosion testing.

The salt is loaded in a 1.8 m nickel crucible. The system is capable of holding 165 kg of salt powder (~82 L of liquid salt). The salt is melted and then sparged with HF and H₂ to remove oxygen and sulfur. After the cleanup is finished, the salt is transferred through a filter to a storage vessel. An argon cover gas is maintained throughout the process.

Besides the cleanup crucible, the system includes gas supply and control systems for HF, H₂, and argon, as well as an off-gas scrubber. Instrumentation and controls include a heater system, temperature and pressure measurements, and HF and H₂ leak detection.

Key Capabilities

- Provides clean salt for research activities.
- Up to 165 kg of salt powder can be loaded in one batch.
- Up to 240 kg of liquid salt can be cleaned in one batch.

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Salt cleanup crucible



Loaded salt powder



Hydrogen fluoride cabinet



Hydrogen storage