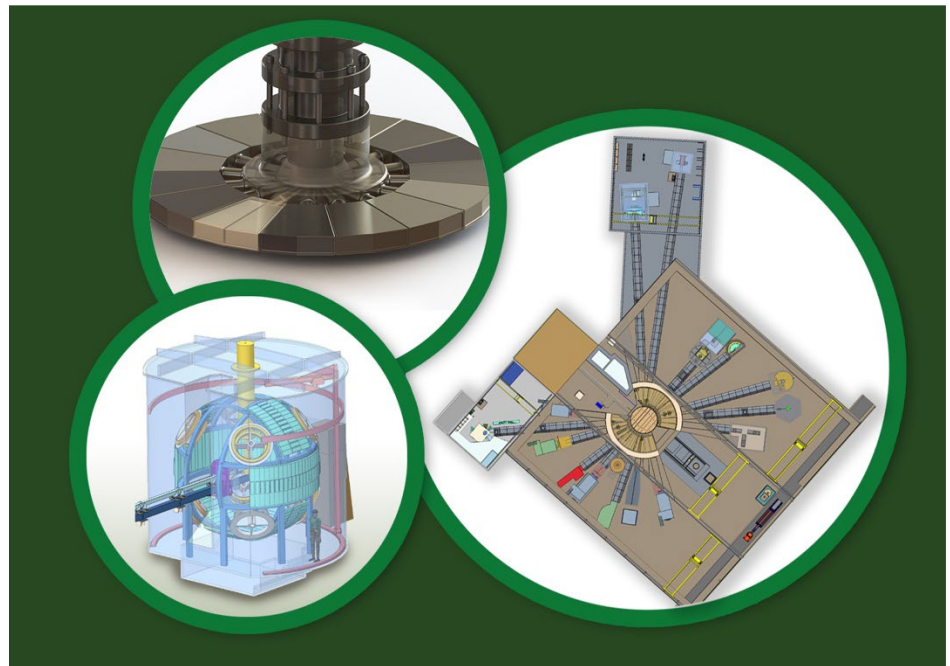


SECOND TARGET STATION (STS) PROJECT

Specification for Hot Isostatic Pressing of Second Target Station Target Materials



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October 2024

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SECOND TARGET STATION (STS) PROJECT

**SPECIFICATION FOR HOT ISOSTATIC PRESSING OF SECOND TARGET
STATION TARGET MATERIALS**

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Date Published: July 2026

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Oak Ridge, TN 37831-6283
managed by
UT-BATTELLE, LLC
for the
US DEPARTMENT OF ENERGY
under contract DE-AC05-00OR22725

1 REQUIREMENTS FOR HIP BONDING

1.1 SCOPE

The bonding process described in this document outlines the process and steps required to bond a machined spallation weldment (tungsten/tantalum assembly with Interlayer) within an Inconel Shroud assembly.

The latest released edition of ASTM A1080 shall be followed fully with the following refinements and modifications.

1.2 REFERENCE DOCUMENTS

ASTM A1080 – “Standard Practice for Hot Isostatic Pressing of Steel, Stainless Steel, and related alloy castings.”

1.3 PROCESS PARAMETERS

1.3.1 Atmosphere

Parts shall be processed within an inert atmosphere of 99.998% minimum purity.

Environment sampling frequency shall be by gas chromatographic analysis at an interval 2 times or more during the HIP cycle. Sampling schedule shall be proposed and agreed upon prior to start of work.

1.3.2 Temperature Ramp

Furnace and parts shall rise to temperature at a rate of at least 15°C/min. In addition, cooling shall be done rapidly (at least 10°C/min) to below 600°C.

1.3.3 Hold Temperature

The parts shall be processed at temperatures of 954°C ±10°C.

1.3.4 Hold Time

The parts shall be held at the specified temperature and Pressure and environment for a minimum duration of 2.0 hours, but not to exceed 3 hours.

1.3.5 Pressure

The parts shall have an applied pressure of at least 300 MPa.

1.4 OXIDATION PREVENTION

The assemblies shall be enclosed in a multi-layer oxidation prevention jacket as follows:

- 1-2 layers of 0.1-0.15 mm molybdenum foil, totally enclosing the samples with all joints folded and crimped to limit atmospheric intrusion.
- 2-3 layers of 0.1-0.2 mm zirconium foil, totally enclosing the samples (including the molybdenum foil wrapping) with all joints folded and crimped to limit atmospheric intrusion.
- The Vendor shall provide all oxidation prevention material.

The autoclave shall be cleaned prior to use using a prior high temperature pump-down.

1.5 QUALITY REQUIREMENTS:

The HIP process shall have at a minimum documentation as required by ASTM A1080 and have traceability for:

- Operating parameters for each autoclave/vessel used in production.
- Software and instrumentation used for control and documentation purposes.
- Gas and quality used to backfill or quench.
- Contact fixturing within the Autoclave.
- Methods of gas dilution, replenishment, reuse, and purification shall be documented in a written procedure.
- Fixtures, plates, trays, spacers, hangers, containers, and baskets shall be made of a material compatible with the parts to be treated or shall be adequately isolated to ensure that undesirable reactions, product contamination, and distortions do not occur.

1.6 AUTOCLAVE TYPE/QUALIFICATION

Autoclave shall consist of inert gas pressurization, internally heated cold wall pressure vessel type with Molybdenum heating elements.