

**CENTER FOR NUCLEAR WASTE
REGULATORY ANALYSES**

Proc. TOP-020

Revision 0

ADMINISTRATIVE PROCEDURE

Page 1 of 5

Title TOP-020 CLEANING OF STAINLESS STEEL LEACHING VESSELS

EFFECTIVITY AND APPROVAL

Revision 0 of this procedure became effective on 2/7/92 ^{BEM}
~~1/31/92~~. This procedure consists of the pages and changes listed below.

<u>Page No.</u>	<u>Change</u>	<u>Date Effective</u>
ALL	0	1/31/92 ^{BEM} 2/7/92

SUPERSEDED

Supersedes Procedure No. None

Approvals

Written By <i>Hersh K. Manaktala</i> Hersh K. Manaktala	Date 2/5/92	Technical Review <i>Gustavo A. Cragolino</i> Gustavo A. Cragolino	Date 2/5/92
Quality Assurance <i>Bruce Mabrito</i> Bruce Mabrito	Date 2/7/92	Cognizant Director <i>Wesley C. Patrick</i> Wesley C. Patrick	Date 2/7/92

**CENTER FOR NUCLEAR WASTE
REGULATORY ANALYSES**

TECHNICAL OPERATING PROCEDURE

Proc. TOP-020

Revision 0

Page 2 of 5

TOP-020 CLEANING OF STAINLESS STEEL LEACHING VESSELS

1. PURPOSE

The purpose of this procedure is to describe the procedure to be utilized for cleaning and preparing new and used stainless steel Type 304L or 316L leaching vessels for conducting aqueous leaching tests on borosilicate glass samples. This procedure is applicable for vessels to be used for leaching non-radioactive samples. This procedure implements the requirements of the Center QA Manual Sections 3, 8, and 13.

2. RESPONSIBILITY

2.1 The Principal Investigator of the project and personnel involved in cleaning the leaching vessels shall be responsible for the implementation and control of this procedure.

3. EQUIPMENT & SUPPLIES

The following equipment or equivalent (as determined by the Principal Investigator) are needed for the implementation of this procedure.

Equipment	Manufacturer	Model No.	Calibration Required
Type 304L Vessel with Blank Head	Parr Instrument Co.	22ml/45ml (A7AC11)	No
Type 316L Vessel with Blank Head	Parr Instrument Co.	22ml/45ml (A7AC11)	No
Teflon Sealing Washers	Parr Instrument Co.	For 22ml/45ml Leaching Vessels	No
pH meter, electrodes	Orion		Yes
Bomb Socket with Screws	Parr Instrument Co.	A22AC3	No
Bomb Wrench, 1 5/8" octagonal	Parr Instrument Co.	21AC4	No

**CENTER FOR NUCLEAR WASTE
REGULATORY ANALYSES**

TECHNICAL OPERATING PROCEDURE

Proc. TOP-020

Revision 0

Page 3 of 5

4. PROCEDURE

4.1 Teflon Washers

- 4.1.1 Soak for a minimum of one (1) hour in 6 M HNO₃ + 0.2 M HF.
- 4.1.2 Rinse thoroughly, for a minimum of five (5) times, in deionized (DI) water.
- 4.1.3 Soak in 6 M HNO₃ for a minimum of four (4) hours at 50°C.
- 4.1.4 Soak for a minimum of 0.5 hour in >60°C high-purity water by full immersion.
- 4.1.5 Soak for a minimum of eight (8) hours in DI water at >80°C by full immersion.
- 4.1.6 Boil for a minimum of 0.5 hour in DI water by full immersion.
- 4.1.7 Rinse with successive volumes of DI water until the pH of two successive solutions are within 0.5 pH units of the pH of DI water. A minimum of five (5) rinses is required.
- 4.1.8 Air dry the washers at room temperature.
- 4.1.9 Cleaned washers should be handled with clean white lint-free cotton gloves or clean forceps. **CAUTION:** The washers should never be touched with bare hands.
- 4.1.10 Store the cleaned washers in a vinyl bag, and identify the date of cleaning and label the bag as "CLEAN WASHERS".
- 4.1.11 The washers shall be used only once and then discarded.

4.2 New Leaching Vessels

- 4.2.1 Open the vessel using proper wrench (specifications provided above), and remove the washer carefully with a forceps.
- 4.2.2 Clean the vessel and the lid with reagent grade ethanol for at least five (5) minutes in an ultrasonic bath.

**CENTER FOR NUCLEAR WASTE
REGULATORY ANALYSES**

TECHNICAL OPERATING PROCEDURE

Proc. TOP-020

Revision 0

Page 4 of 5

- 4.2.3 Rinse with deionized (DI) water five (5) times.
- 4.2.4 Let the leaching vessels stand in a 1% nitric acid solution for at least one (1) hour at 90°C under a hood.
- 4.2.5 Rinse with DI water at least five (5) times.
- 4.2.6 Let the leaching vessels stand in DI water for a minimum of one (1) hour.
- 4.2.7 Rinse the vessels again with DI water.
- 4.2.8 Fill each vessel to about 80-90% of its volume, close the vessel and let it stand for 16 hours in a 90°C oven.
- 4.2.9 Remove the vessels from the oven, remove an aliquot of water from each vessel and measure its pH.
- 4.2.10 If the pH falls outside the range of 5.0 to 7.0 units, repeat steps 4.2.6 through 4.2.9.
- 4.2.11 Air dry the cleaned leaching vessels, and store in a dust-free cabinet.
- 4.3 Previously Used Leaching Vessels
- 4.3.1 Remove all remaining glass from the vessel by brushing with a test-tube brush under running tap water, and then rinse at least five (5) times with DI water to remove all glass particles.
- 4.3.2 Let stand in a 1% nitric acid solution for one (1) hour at 90°C under a fume hood.
- 4.3.3 Rinse at least five (5) times with DI water.
- 4.3.4 Place vessels in a stainless steel beaker filled with DI water and boil for at least one (1) hour.
- 4.3.5 Proceed as in step 4.2.8 and 4.2.9 of New Leaching Vessels procedure given above.
- 4.3.6 If pH falls outside the range of 5.0 to 7.0 units, repeat steps 4.3.4 and 4.3.5 given above.

**CENTER FOR NUCLEAR WASTE
REGULATORY ANALYSES**

TECHNICAL OPERATING PROCEDURE

Proc. TOP-020

Revision 0

Page 5 of 5

5. STORAGE, IDENTIFICATION, AND SHELF-LIFE OF THE CLEANED
LEACHING VESSELS

Install the teflon washers and close the leaching vessels using appropriate wrench (as specified above). Each leaching vessel shall be identified with a unique identification number with a waterproof ink or by other methods such as scribing, etching, punching, stamping, etc. A matching number shall be used for the cover. The leaching vessel and its cover shall be constructed from the same type of material, e.g., Type 304 stainless steel, Type 304L stainless steel, Type 316 stainless steel, etc. The cleaned and closed leaching vessels shall be stored in a dust-free cabinet. The leaching vessels should be handled only with clean, white lint-free cotton gloves.

6. RECORDS/DATA RETENTION

No QA records are generated as a result of this procedure.

**CENTER FOR NUCLEAR WASTE
REGULATORY ANALYSES**

TECHNICAL OPERATING PROCEDURE

Proc. TOP-020

Revision 1

Page 1 of 1

Title **CLEANING OF STAINLESS STEEL LEACHING VESSELS**

EFFECTIVITY

Revision 1 of this procedure makes this procedure obsolete. This procedure consists of the pages and changes listed below.

<u>Page No.</u>	<u>Change No.</u>	<u>Date Effective</u>
1	0	12/11/2000

Note: This procedure, TOP-020, has been replaced by an ASTM Test Method C 1285-97.

Please remove and destroy this procedure in your notebook/holder and return the acknowledgment page to CNWRA Document Control with your signature and date.

Supersedes Procedure No. N/A

Approvals			
Written by Vijay Jain	Date 12/11/00	Technical Review Gustavo Cragno	Date 12/11/2000
Quality Assurance Bruce Mabrito	Date 12/11/2000	Cognizant Director Budhi Sagar	Date 12/12/2000