

Procedure: Creep Test at SNL

Version Date:

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1 Test Description

Parameters	Value
Test Name	UNM - WP - Hy - 175-01
Salt Provenance (Circle One)	Avery Island / <u>WIP</u>
Test Type (Circle One)	<u>Hydrostatic</u> Shear
Salt Can Label	4F (full) / 5A (partial)
Water Added to Salt (Circle One)	yes / <u>no</u>
If Water Added, What Percent by Mass [%]	—
Temperature: [°C / °F]	175°C
Pressure [MPa / psi]	2,900 psi
Jacketing Components (Circle All)	<u>Outer Lead</u> - Outer Viton - Inner Lead - <u>Inner Copper</u>
Tested In (Circle One)	<u>Frame 2</u> / Frame 3

Table 1: Description of Test

from Dark Tank:

initial $\bar{\rho} = 0.719$

final $\bar{\rho} = 0.901$

} BCL (8/19/15)

2 Pre-Test Measurements

2.1 Height of components:

Components	Count	Component Label	Recorded Height [mm]
Platens	1	C3	37.27
	2	C1	37.27
Chamfer Discs	1	CP7 (T)	8.31
	2	CP1	12.83
Mesh Discs	1	NA	1.19
	2	NA	1.15
Cumulative Height of Components			mm

Table 2: Itemized List of Components for Height Measurements (No Salt).

2.2 Jacket Dimensions

If the test is performed at:

1. A temperature above 100 °C (high temp.) -> one outer lead jacket and one or more inner copper jackets will be used;
2. A temperature below 100 °C (low temp.) -> one outer Viton jacket, one inner lead jacket, and one inner copper jacket. Spatially, from outer to inner, the jacket order will be Viton, lead, and copper; with the salt being in contact with copper.

2.2.1 Height of Outer Jacket

This value will vary depending on which platens (steel or aluminium) and chamfer pieces are used, in general:

1. Outer Jacket: 10.125 inches (257.17 mm) to 11.0 inches (279.4 mm);
2. Inner Shell: 12.0 inches (304.8 mm) -> this is for both A1 and A2;
3. Specimen Clearance: 1.875 inches (47.62 mm) to 1.0 inches (25.4 mm);

NOTE: the maximum height inside Frame 2 and 3 is 12 inches (304.8 mm) - If the upper internal port of the shell is plugged, the available height is decreased to 11.75 inches (298.45 mm)

Jacket Description	Height	No. of Jackets Used
Outer Lead Jacket (mm)		1
Outer Viton Jacket (mm)	_____	_____
Inner Lead Jacket (mm)	_____	_____
Inner Copper Jacket (mm)	168	+68 1

Table 3: Height of Jacketing Components (if jacket not used, write "NA")

2.2.2 Checklist of Jacketing Materials:

Components	Count	Verification Checkmark (and Component Label is Applicable)
Platens	1	C3
	2	C1
Platen O-rings	1	✓ CP7
	2	✓ CP2
	3	✓
	4	✓
Platen Screws (0.25 inch 20 rnd)	1	✓
	2	✓
Screw-In Nipples	1	✓
	2	✓
Nipple O-rings	1	✓
	2	✓
	3	✓
	4	✓
Nipple Adapter (HIP HF4 connection)	1	✓
	2	✓
Nipple Plugs (HIP HF4 plugs)	1	✓
	2	✓
Chamfer Discs	1	✓ CP7
	2	✓ CP1
Mesh Discs	1	✓
	2	✓
Inner Copper Jacket (indicate No. used)		
Outer Lead Jacket	1	✓
Inner Lead Jacket	1	—
Outer Viton Jacket	1	—
Wire Ties - Wrapped Around Viton Jacket	1	—
	2	—
	3	—
	4	—

Table 4: Itemized List of Components for Mass and Volume Measurements (No Salt).

Measured Value	Values	Units
Prior to Dunk: Water Level Reading on Burette	57.9	mL (burette)
After Dunk: Water Level Reading on Burette	49.2	mL (burette)
Volume of Components (No Salt)	996	mL
Mass of Components (No Salt)	3.9802	kg

Table 5: Measurements of All Components (No Salt)

2.3 Measured Mass of Salt

2.3.1 Date:

4F

1704.87g

5A

411.6g

Parameters	Value	
Salt Can Label	4F / 5A	
Before Making Sample: Mass of Salt and Can (with lid)	_____	kg
After Sample is Made: Remaining Mass of Salt and Can (with lid)	_____	kg
Mass of Salt Used for Sample	2.1165	kg
Cumulative Mass of Components and Salt	6.0995	kg

Table 6: Mass of Salt

3 Pre-consolidation Measurements

3.0.2 Date: 6/17/15

3.0.3 Data Sample Rate:

Volume Displayed on ISCO Pump	Volume [mL]	Pressure [psi]	Time [hh:mm]
Initial Reading: prior to consolidation	567	10	0
Reading: When at pre-consolidation pressure	122	2900	5 min
Final Reading: after pre consolidation	240	10	5 min

Table 7: Pre-consolidation Details

Components	Volume [mL]	Mass [kg]
Preconsolidated Specimen (all components listed above plus salt)	2358.65	6.0995
Preconsolidated Salt (Salt Only)	1362.65	2.1165

Table 8: Pre-consolidation Measurements

3.1 Pre-Creep Test Measurements (After Specimen Has Been Preconsolidated)

3.1.1 Date:

Burette: 114.4978 mL/Burette Unit

Parameter	Values	Units
Prior to Dunk: Mass of Specimen (with all components)	6.0995	kg
Prior to Dunk: Water Level Reading on Burette	77.8	mL (burette)
After Dunk: Water Level Reading on Burette	57.2	mL (burette)
After Dunk: Mass of Specimen (with all components)		kg
Measured Volume Change of Salt Caused by Pre-consolidation		mL
Measured Volume of Salt Prior to Creep Test		mL

height of sample 247 mm
Table 9: Measurements Made During Seconds Dunk of Specimen (after pre consolidation).

4 Application of Heat to Obtain Test Temperature

Heat will be applied to the specimen until the desired test temperature is obtained, this will be done under quasi-atmospheric pressure.

4.0.2 Date:

4.0.3 Data Sample Rate:

Event	Date	Time	Confining Pressure [psi]	Comments
Start Temperature Increase	6/17/15		~0 (10 on Tscd)	
End Temperature Increase	6/18/15			

Table 10: Dates of Details of Temperature Increase

- Volume Expelled (si) during heating ~ 440.

5 Begin Creep Test

5.0.4 Date:

5.0.5 Data Sample Rate:

Event	Value	Comment
ISCO Pump Volume (Pre Pressure Increase)		
ISCO Pump Pressure (Pre Pressure Increase)		
Begin Pressure Increase	Time:	
End Pressure Increase	Time:	
ISCO Pump Volume (Post to Pressure Increase)		
ISCO Pump Pressure (Post Pressure Increase)		
ISCO Pump Flow Rate (Post Pressure Increase)		

Table 11: Details of Test Initiation

Post Creep (6-18-15)

Dunk Initial ~~77.~~ 76.4
Final 58.2

Mass
weight = 6.1157 kg
height 240 mm