

Procedure: Creep Test at SNL

Version Date:

August 7, 2015

~~X~~
Failed

Form Completed By: TDL

1 Test Description

Parameters	Value
Test Name	UNM-WP-HY-175-05
Salt Provenance (Circle One)	Avery Island <u>WIPP</u>
Test Type (Circle One)	<u>Hydrostatic</u> / Shear
Salt Can Label	3C
Water Added to Salt (Circle One)	yes <u>no</u>
Target/Actual Added Water Content	$w = \frac{m_{\text{water-added}}}{m_{\text{salt}}} =$ _____
Temperature: [°C / °F]	175°C
Pressure [MPa / psi]	14, 22, 30, 38 (MPa)
Jacketing Components (Circle All)	Outer <u>Lead</u> Outer Viton - Inner Lead - Inner <u>Copper</u> x 2
Tested In (Circle One)	Frame 2 <u>Frame 3</u>
Test Target (permeability / fractional density / etc)	

Table 1: Description of Test

2 Pre-Test Measurements

2.1 Height of components:

Components	Count	Component Label	Recorded Height [mm]
Platens	1	C9	37.05
	2	C2	37.10
Chamfer Discs	1	CP2	8.35
	2	CP3	12.73
Mesh Discs	1	NA	1.07
	2	NA	1.05
Cumulative Height of Components		47.35	mm

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

2.2 Jacket Dimensions

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 10.5 inches (266.7 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 1.5 inches (38.1 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)	220	1
Outer Viton Jacket (mm)	—	—
Inner Lead Jacket (mm)	—	—
Inner Copper Jacket (mm)	134	2
Height of Total Sample (mm)		

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	2	C9, C2
Platen O-rings	4	✓
Platen Screws (0.25 inch 20 rnd)	2	✓
Screw-In Nipples	2	✓
Nipple O-rings	4	✓
Nipple Adapter (HIP HF4 connection)	2	✓
Nipple Plugs (HIP HF4 plugs)	2	✓
Chamfer Discs	2	CP2 CP3
Mesh Discs	2	✓
Inner Copper Jacket (indicate No. used)	2	Thickness of 1 Sheet of Copper (mm): 0.10
Inner Lead Jacket	—	Jacket Thickness (mm):
Outer Lead Jacket	1	Jacket Thickness (mm): 1.5
External Hose Clamps	4	

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

2.2.3 Volume and Mass of Components (No Salt)

Measured Value	Values	Units	Comments
Prior to Dunk: Water Level Reading on Burette	51.4	mL (burette)	
After Dunk: Water Level Reading on Burette	42.5	mL (burette)	
Volume of Components (No Salt)	1009.03	mL	
Mass of Components (No Salt)	3.8441	kg	4.1566 + HC
Approximate Outside Diameter of Sample		mm	
Dunk Tank Volume Factor: 114.4978 mL/Burette Unit			

Table 5: Measurements of All Components (No Salt)

* include 4 full Hose Clamps
 Vol HCTails E 312
 F 410 mL 10 mL

$$\begin{aligned}
 & \text{DOT} \\
 & 8.9 \times 114.4978 = 1019.03 \\
 & \quad \quad \quad - 10 \text{ HC} \\
 & \quad \quad \quad \hline
 & \quad \quad \quad * 1009.03 \text{ mL}
 \end{aligned}$$

2.3 Measured Mass of Salt

2.3.1 Date:

Parameters	Value	
Salt Can Label	3C	
Before Making Sample: Mass of Salt and Can (with lid)	1.9455	kg
After Sample is Made: Remaining Mass of Salt and Can (with lid)	0.4262	kg
Bulk Mass of Salt Used for Sample	1.5193	kg
Cumulative Mass of Components and Salt	5.6004	kg

Mo HC
Tails

Table 6: Mass of Salt Before Preconsolidation

4 Hose Clamp
Tails = 75.63g

3 Pre-consolidation Measurements

3.0.2 Date: 11/10

3.0.3 Data Sample Rate: N/A

1201
490 psi He

Volume Displayed on GUI	Volume [mL]	Pressure [psi]	Time [hh:mm]
Initial Reading: prior to consolidation			
Reading: When at pre-consolidation pressure			
Final Reading: after pre consolidation			

Table 7: Pre-consolidation Details

Parameter	Values	Units
Prior to Dunk: Mass of Specimen (with all components)	5.6008	kg
Prior to Dunk: Water Level Reading on Burette	62.4	mL (burette)
After Dunk: Water Level Reading on Burette	45.1	mL (burette)
Preconsolidated Specimen (all components listed above plus salt)	17.3 1980.21	mL
After Dunk: Mass of Specimen (with all components)	5.6012	kg
Average Height of Specimen	215.34	mm
Average Outside Diameter of Specimen	103.42	mm
Bulk Salt Volume (Salt and added water):	971.78	mL
Dunk Tank Volume Factor: 114.4978 mL/Burette Unit		

Table 8: Measurements Made After Preconsolidation of Specimen.

$\Delta_{PC/OT} = 1563.42$

FD = 0.724

Pre Consolidated

Height mm

(- 28.40 mm block)

244.10 215.7

242.99 214.59

243.36 214.96

244.49 216.09

Av = 215.34 mm

Diameter mm

103.63

102.90

103.27

103.86

Av 103.42

Top

104.86

103.06

104.51

104.47

Bot

105.75

106.72

106.14

104.66

Parameter	Values	Units
Salt Only - Volume: $V_{sample}^{salt} = V_{sample}^{bulk} * (1 - w)$		mL
Salt Only - Mass: $m_{sample}^{salt} = m_{sample}^{bulk} * (1 - w)$		kg
Salt Only - Density: $\rho_{sample}^{salt} = m_{sample}^{salt} / V_{sample}^{salt}$		kg/m ³
Salt Only - Fractional Density: $\bar{\rho} = \rho_{sample}^{salt} / 2160$		-

Table 9: Post-Consolidation Density Calculations

4 Application of Heat to Obtain Test Temperature

4.0.4 Data Sample Rate: 1,000

Event	Date	Time	Confining Pressure [psi]	Expelled Silicone Oil Volume (mL)
Start Temperature Increase	11/13/0	11:40	12	0
End Temperature Increase	11/14	8:30	8.2	?

Table 10: Dates of Details of Temperature Increase

5 Creep Test

5.0.5 Date (Start Test):

5.0.6 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

End
of
Data