Anselmetti, F.S., Isern, A.R., Blum, P., and Betzler, C. (Eds.)
Proceedings of the Ocean Drilling Program, Scientific Results Volume 194

7. Data Report: Compressibility, Permeability, and Grain Size of Shallow Sediments, Sites 1194 and 1198[1]

Brandon Dugan,[2, 3] Chris Marone,[2] Tiancong Hong,[2] and Misty Migyanka[2]

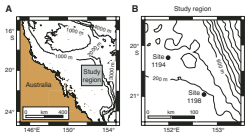
ABSTRACT

Uniaxial strain consolidation experiments were conducted to determine elastic and plastic properties and to estimate the permeability of sediments from 0 to 200 meters below seafloor at Ocean Drilling Program Sites 1194 and 1198. Plastic deformation is described by compression indices, which range from 0.19 to 0.37. Expansion indices, the elastic deformation measured during unload/reload cycles on samples, vary from 0.02 to 0.029. Consolidation experiments provide lower bounds on permeability between 5.4×10^{-16} m^2 and 1.9×10^{-18} m^2, depending on the consolidation state of the sample.

INTRODUCTION

Carbonate and siliciclastic sediments of the Marion Plateau, offshore Australia, were investigated during Ocean Drilling Program (ODP) Leg 194 (Fig. F1). In this study, we focus on the physical properties of Pliocene to late Miocene sediments at Sites 1194 (0–100 meters below sea floor [mbsf]) and 1198 (100–200 mbsf) (Table T1). Site 1194 is located east of the Northern Marion Platform in 373.9 m of water (Fig. F1B). It was drilled to 427.1 mbsf and penetrated sediment Megasequences D and B (Isern, Anselmetti, Blum, et al., 2002). From 0 to 100 mbsf, Site 1194 is dominated by mudstone and wackestone. Site 1198 is

F1. Location and bathymetry of study region, p. 7.



T1. Samples used in consolidation experiments, p. 16.

[1]Dugan, B., Marone, C., Hong, T., and Migyanka, M., 2004. Data report: Compressibility, permeability, and grain size of shallow sediments, Sites 1194 and 1198. *In* Anselmetti, F.S., Isern, A.R., Blum, P., and Betzler, C. (Eds.), *Proc. ODP, Sci. Results,* 194, 1–28 [Online]. Available from World Wide Web: <http://www-odp.tamu.edu/publications/194_SR/VOLUME/CHAPTERS/003.PDF>. [Cited YYYY-MM-DD]
[2]Department of Geosciences, The Pennsylvania State University, 305 Deike Building, University Park PA 16802, USA.
[3]Present address: U.S. Geological Survey, 384 Woods Hole Road, Woods Hole MA 02543, USA.
bdugan@usgs.gov

Initial receipt: 29 June 2003
Acceptance: 3 March 2004
Web publication: 13 August 2004
Ms 194SR-003

located northwest of the Southern Marion Platform in 319.4 m of water (Fig. F1B). Drilling Site 1198 to 522 mbsf recovered sediments from Megasequences D, C, and B (Isern, Anselmetti, Blum, et al., 2002). We studied Site 1198 from 100 to 200 mbsf, where the lithology is mudstone to skeletal grainstone.

We measured the sample deformation that results from an applied vertical effective stress under uniaxial strain conditions. This provides insights into the void ratio (or porosity), density, and permeability of the sediments during burial and consolidation. These properties influence heat and chemical transport in and around the Marion Plateau and affect the strength of the sediments.

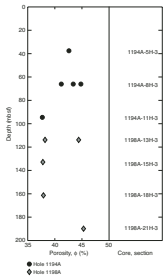
MATERIALS AND METHODS

Whole-round core samples were sealed in the core liner during Leg 194 to preserve the natural sample saturation. For each experiment, a core was removed from its liner and a vertically oriented, cylindrical subsample was trimmed and inserted in the fixed-ring consolidation cell. Each vertically oriented subsample had a diameter of 47.9 mm and an initial height of 19 mm. The mass (m) and volume (V) of each subsample was measured to calculate bulk density ($\rho_b = m/V$). All variables are defined in the nomenclature table (Table T2). Porous endcaps at the top and bottom of the cylindrical samples facilitated even drainage from the sample ends.

T2. Nomenclature, p. 17.

Initial sample porosity (ϕ_o) was calculated with equation 1 (Fig. F2; Table T1), assuming a water density (ρ_w) of 1000 kg/m^3, a grain density (ρ_s) of 2600 kg/m^3, and 100% water saturation:

F2. Initial porosity and depth of experimental samples, p. 8.



$$\phi_o = (\rho_s - \rho_b)/(\rho_s - \rho_w). \quad (1)$$

The initial porosity calculations neglect salt in the pore fluid. Calculations that account for salt mass in the system (Blum, 1997) result in less than 0.7% change in initial porosity.

Consolidation Experiments

Ten consolidation experiments were performed; five on samples from Site 1194 and five on samples from Site 1198 (Table T1; Fig. F2). Each sample was placed in the load frame, where contact between the sample, porous disks, and ram were established manually. Vertical stress was then computer-controlled throughout the consolidation experiment. Stress was increased at 0.1-MPa increments to ~0.5 MPa and then by 0.5-MPa increments to ~4 MPa. The samples were then unloaded to 1 MPa, reloaded to 4 MPa, and then loaded by 0.5-MPa stress increments to 6 MPa. Experiments concluded with unloading at 1-MPa intervals. Each stress increment (increase or decrease) occurred at ~0.1 MPa/s and was followed by a stress hold to allow excess pressure dissipation and completion of primary consolidation. After the completion of primary consolidation and onset of secondary compression, another stress increment was applied. Stress holds for the completion of primary consolidation were <15 min for these samples. Analysis of sample height as a function of time (log-time method) (Lambe and Whitman, 1979; Craig, 1992) was used to confirm the completion of primary consolidation, dissipation of excess pore pressure, and onset of secondary com-

pression. Sample height was measured throughout the experiments and sample diameter was constant; this allowed sample volume and porosity to be calculated throughout the entire experiment with equation 2 (nomenclature is defined in Table T2):

$$\phi_{\sigma v'+\Delta\sigma v'} = [V_{\sigma v'}\phi_{\sigma v'} + (V_{\sigma v'+\Delta\sigma v'} - V_{\sigma v'})]/V_{\sigma v'+\Delta\sigma v'}. \quad (2)$$

The sample void ratio ($e = \phi/[1-\phi]$) and stress at the end of each stress hold are used to calculate the compression (c_c) and expansion (c_e) indices of the samples. The compression index in equation 3 characterizes plastic deformation along the linear portion of the e-log(σ_v') plot, which is interpreted to represent primary (virgin) consolidation (e.g., Craig, 1992):

$$c_c = (e_{\sigma v'} - e_{\sigma v'+\Delta\sigma v'})/\log[(\sigma_v'+\Delta\sigma_v')/(\sigma_v')]. \quad (3)$$

The expansion index in equation 4 describes the elastic portion of the e-log(σ_v') plot characterized by the linear unloading/reloading paths (e.g., Craig, 1992):

$$c_e = (e_{\sigma v'} - e_{\sigma v'+\Delta\sigma v'})/\log[(\sigma_v'+\Delta\sigma_v')/(\sigma_v')]. \quad (4)$$

Sample deformation during stress holds provided estimates of the coefficient of consolidation (c_v) and of the permeability (k) of the samples at multiple consolidation states during virgin deformation (Table T3). The log-time method was used to estimate c_v for primary consolidation (see Lambe and Whitman, 1979; Craig, 1992), and k was calculated using c_v with equation 5:

$$k = c_v m_v \mu, \quad (5)$$

where

- m_v = the coefficient of volume compressibility ($m_v = [1/(1+e_o)][-\Delta e/\Delta\sigma_v']$) for a given effective vertical stress increment ($\Delta\sigma_v'$),
- μ = the dynamic viscosity of water (we assume $\mu = 0.001$ Pa·s),
- e_o = the initial void ratio, and
- Δe = the change in void ratio during the stress hold (Table T2).

Grain Size Analysis

A Malvern Master-Sizer Dynamic Laser Light Scattering/Light Diffraction Particle Size Distribution Analyzer was used to determine grain size on seven samples from Sites 1194 and 1198. The particle size analyzer can measure particle sizes from 0.05 to 900 µm.

We evaluated the grain size distribution for each core section in the study (Table T3).

Dry sediment samples were mixed with deionized water to make a sediment-water mixture. The mixture was placed in a sonicator and stirred to establish a uniform concentration of particles in the water. The mixture was then analyzed to evaluate the grain size distribution; d_{10}, d_{50}, and d_{90} are reported (d_{10} = the grain size at which 10% of sample is finer, d_{50} = the grain size at which 50% of sample is finer, and d_{90} is the grain size at which 90% of sample is finer) (Tables T2, T3). Dupli-

T3. Consolidation and grain size results, p. 18.

cate and triplicate analyses were performed and standards were analyzed to demonstrate reproducibility of the distributions.

RESULTS

Results from the experiment are included in Tables T4, T5, T6, T7, T8, T9, T10, T11, T12, and T13 and Figures F3, F4, F5, F6, F7, F8, and F9. Compression indices (c_c) for the samples ranged from 0.19 to 0.37, and expansion indices were approximately 10% of the compression indices ($0.02 < c_e < 0.029$) (Table T3). Sample 194-1194A-5H-3, 135–137 cm, had the greatest decrease in void ratio during loading (Fig. F3). This was the shallowest sample, and its entire deformation path was plastic deformation. Samples 194-1194A-8H-3, 138–140 cm, and 194-1198A-21H-3, 140–142 cm, had the highest compression indices (Table T3) but experienced plastic deformation for stresses exceeding ~1 MPa (Figs. F4B, F9); they had less total deformation than Sample 194-1194A-5H-3, 135–137 cm, which had a lower compression index.

Estimated permeability (Table T3) was greatest (5.4×10^{-16} m^2) for Sample 194-1198A-15H-3, 135–137 cm, at an effective vertical stress of 0.99 MPa. The same sample had the lowest estimated permeability (1.9×10^{-18} m^2) of all the experiments at an effective vertical stress of 5.3 MPa. The consolidation experiments were performed without sample backpressure; therefore, partial air saturation may have developed. Partial air saturation impedes water drainage; thus, the consolidation-based permeability could be lower than the absolute permeability of the sample with 100% water saturation. Moran et al. (1995) compared consolidation-estimated permeability to low-gradient permeability measurements and documented that consolidation-estimated permeability was equal to or lower than direct low-gradient measurements of permeability. With the possibility of partial air saturation and the consolidation method of estimating permeability, our estimates are considered a lower bound on permeability for these sediments.

Holes 1194A and 1198A have similar d_{10} and d_{50} that do not vary significantly with depth (Table T3). Exceptions to this are (1) increased d_{10} (1.3 µm) of Sample 194-1194A-11H-3, 135–137 cm, and (2) increased d_{50} (54 µm) of Sample 194-1198A-13H-3, 139–141 cm (Table T3). The major grain size variation between the sites is d_{90}; Hole 1194A has a maximum d_{90} = 89 µm, and d_{90} decreases with depth. In contrast, Hole 1198A is dominated by $d_{90} > 100$ µm and shows no depth trend (Table T3).

ACKNOWLEDGMENTS

This research used samples and/or data provided by the Ocean Drilling Program (ODP). ODP is sponsored by the U.S. National Science Foundation (NSF) and participating countries under management of Joint Oceanographic Institutions (JOI), Inc. This research was supported by a JOI/U.S. Science Advisory Committee grant (Dugan). Reviews and comments by P. Blum, D. Saffer, and E. Screaton strengthened the manuscript.

T4. Stress and porosity, Sample 194-1194A-5H-3, 135–137 cm, p. 19.

T5. Stress and porosity, Sample 194-1194A-8H-3, 135–137 cm, p. 20.

T6. Stress and porosity, Sample 194-1194A-8H-3, 138–140 cm, p. 21.

T7. Stress and porosity, Sample 194-1194A-8H-3, 142–144 cm, p. 22.

T8. Stress and porosity, Sample 194-1194A-11H-3, 135–137 cm, p. 23.

T9. Stress and porosity, Sample 194-1198-13H-3, 135–137 cm, p. 24.

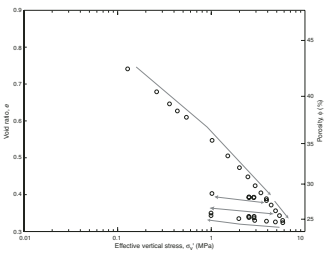
T10. Stress and porosity, Sample 194-1198A-13H-3, 139–141 cm, p. 25.

T11. Stress and porosity, Sample 194-1198A-15H-3, 135–137 cm, p. 26.

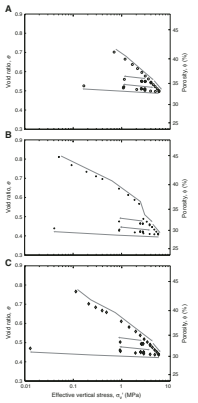
T12. Stress and porosity, Sample 194-1198A-18H-3, 135–137 cm, p. 27.

T13. Stress and porosity, Sample 194-1198A-21H-3, 140–142 cm, p. 28.

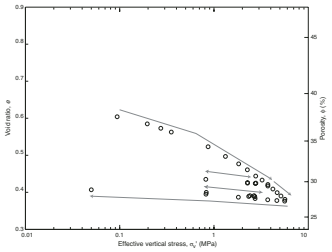
F3. Deformation behavior, Section 194-1194A-5H-3, p. 9.



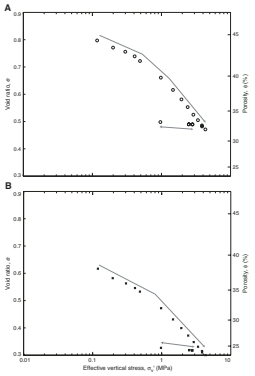
F4. Deformation behavior, Section 194-1194A-8H-3, p. 10.



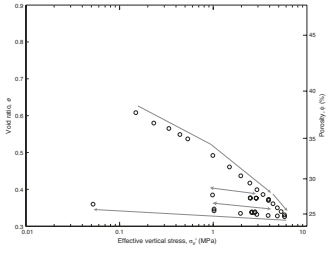
F5. Deformation behavior, Section 194-1194A-11H-3, p. 11.



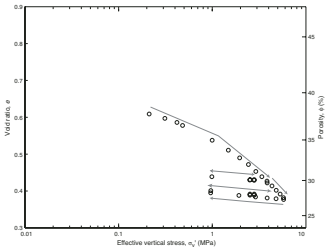
F6. Deformation behavior, Section 194-1198A-13H-3, p. 12.



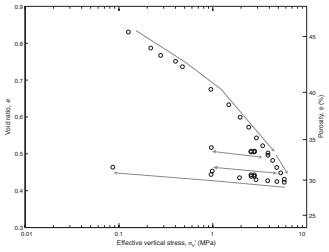
F7. Deformation behavior, Section 194-1198A-15H-3, p. 13.



F8. Deformation behavior, Section 194-1198A-18H-3, p. 14.



F9. Deformation behavior, Section 194-1198A-21H-3, p. 15.



REFERENCES

Blum, P., 1997. Physical properties handbook: a guide to the shipboard measurement of physical properties of deep-sea cores. *ODP Tech. Note,* 26 [Online]. Available from World Wide Web: <http://www-odp.tamu.edu/publications/tnotes/tn26/INDEX.HTM>. [Cited YYYY-MM-DD]

Craig, R.F., 1992. *Soil Mechanics:* London (Chapman and Hall).

Isern, A.R., Anselmetti, F.S., Blum, P., et al., 2002. *Proc. ODP, Init. Repts.,* 194 [Online]. Available from World Wide Web: <http://www-odp.tamu.edu/publications/194_IR/194ir.htm>. [Cited 2003-06-29]

Lambe, T.W., and Whitman, R.V., 1979. *Soil Mechanics* (SI ver.): New York (Wiley).

Moran, K., Gray, W.G.D., and Jarrett, C.A., 1995. Permeability and stress history of sediment from the Cascadia margin. *In* Carson, B., Westbrook, G.K., Musgrave, R.J., and Suess, E. (Eds.), *Proc. ODP, Sci. Results,* 146 (Pt. 1): College Station, TX (Ocean Drilling Program), 275–280.

Figure F1. A. Location and bathymetry of the study region (shaded box), offshore Australia. Contour interval = 1000 m. **B.** Bathymetry of the Marion Plateau study region documenting the location of Sites 1194 and 1198 (solid circles). Contour interval = 200 m.

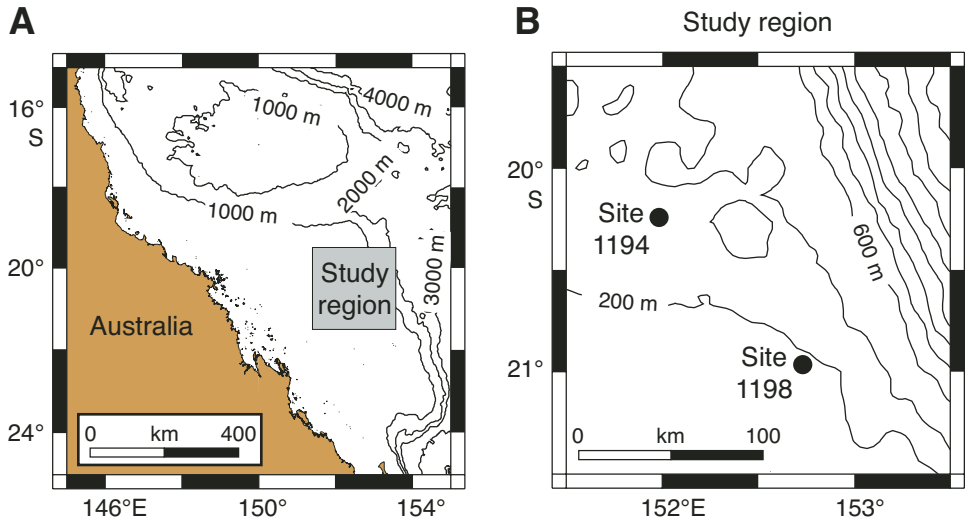


Figure F2. Initial porosity and depth of experimental samples from Holes 1194A and 1198A. Core and section for each sample are labeled.

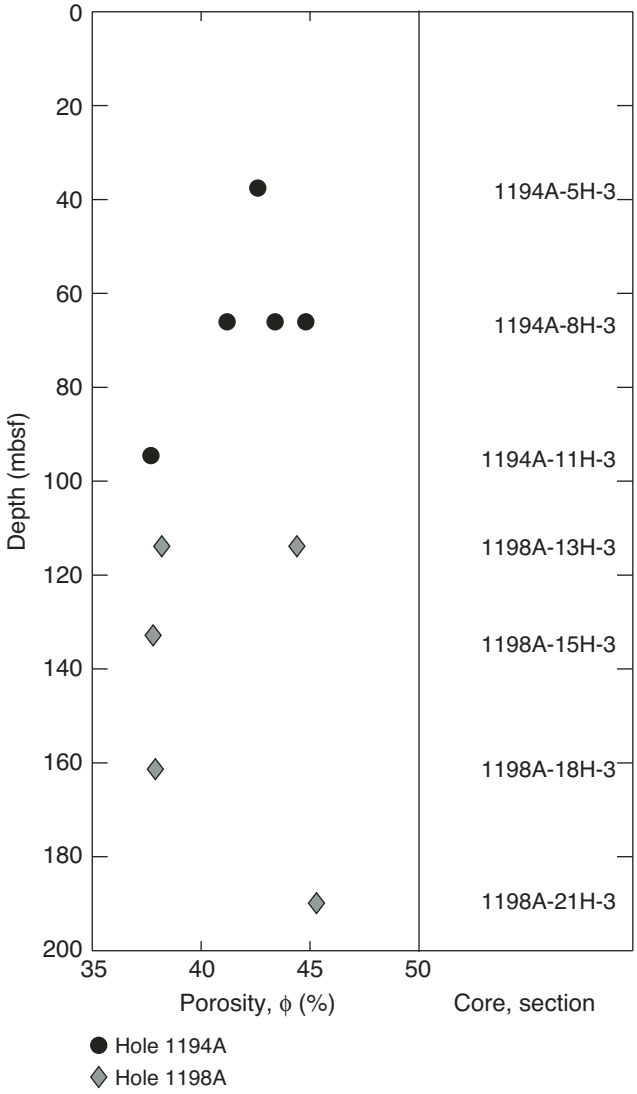


Figure F3. Deformation behavior for Sample 194-1194A-5H-3, 135–137 cm. Void ratio is plotted on a linear scale on the left y-axis and equivalent porosity is plotted on the right y-axis. Gray arrows illustrate loading/unloading/reloading paths. Raw data are provided in Table T4, p. 19.

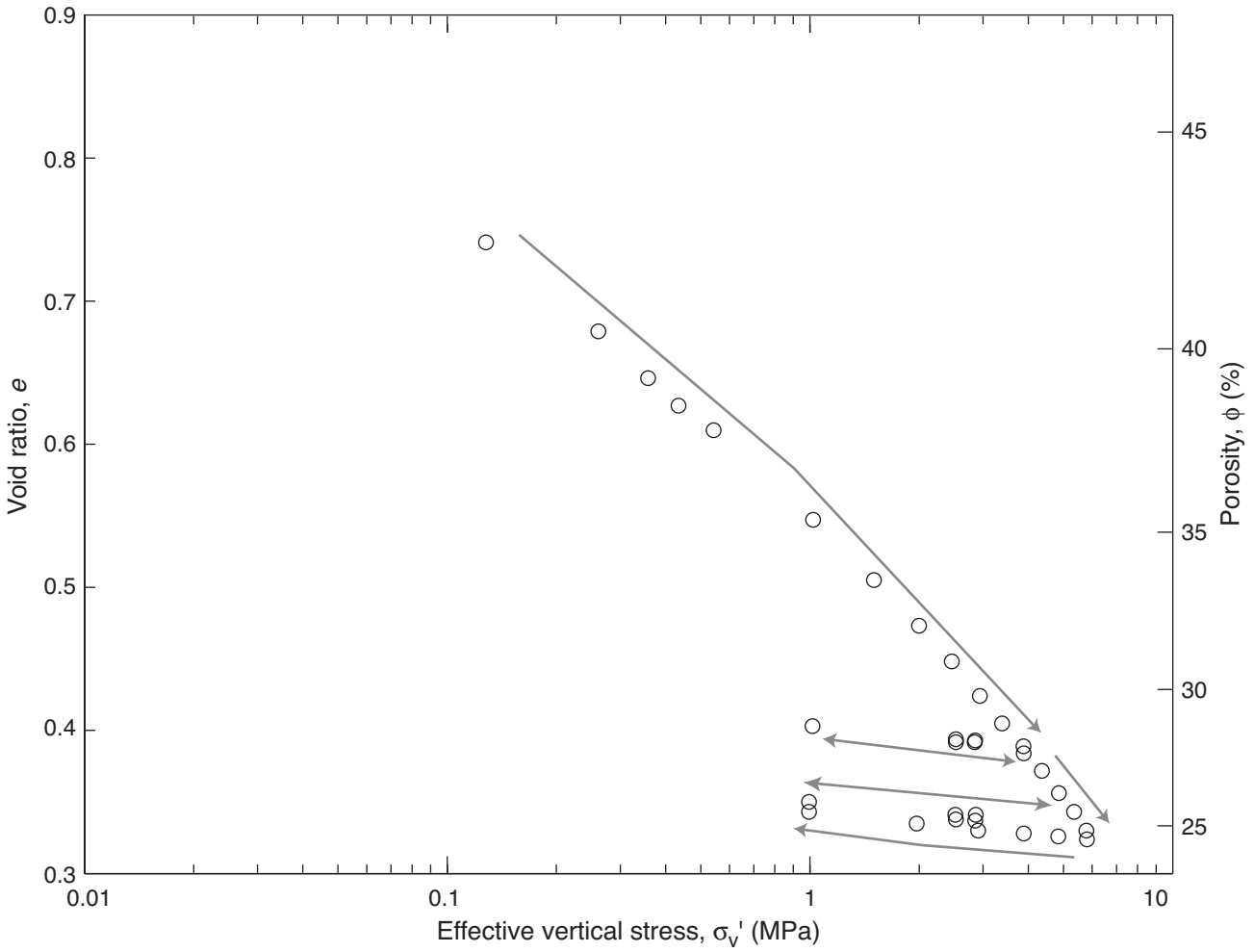


Figure F4. Deformation behavior for (**A**) Sample 194-1194A-8H-3, 135–137 cm, (**B**) Sample 194-1194A-8H-3, 138–140 cm, and (**C**) Sample 194-1194A-8H-3, 142–144 cm. Void ratio is plotted on a linear scale on the left y-axis and equivalent porosity is plotted on the right y-axis. Gray arrows illustrate loading/unloading/reloading paths. Raw data are provided in Tables T5, p. 20, T6, p. 21, and T7, p. 22.

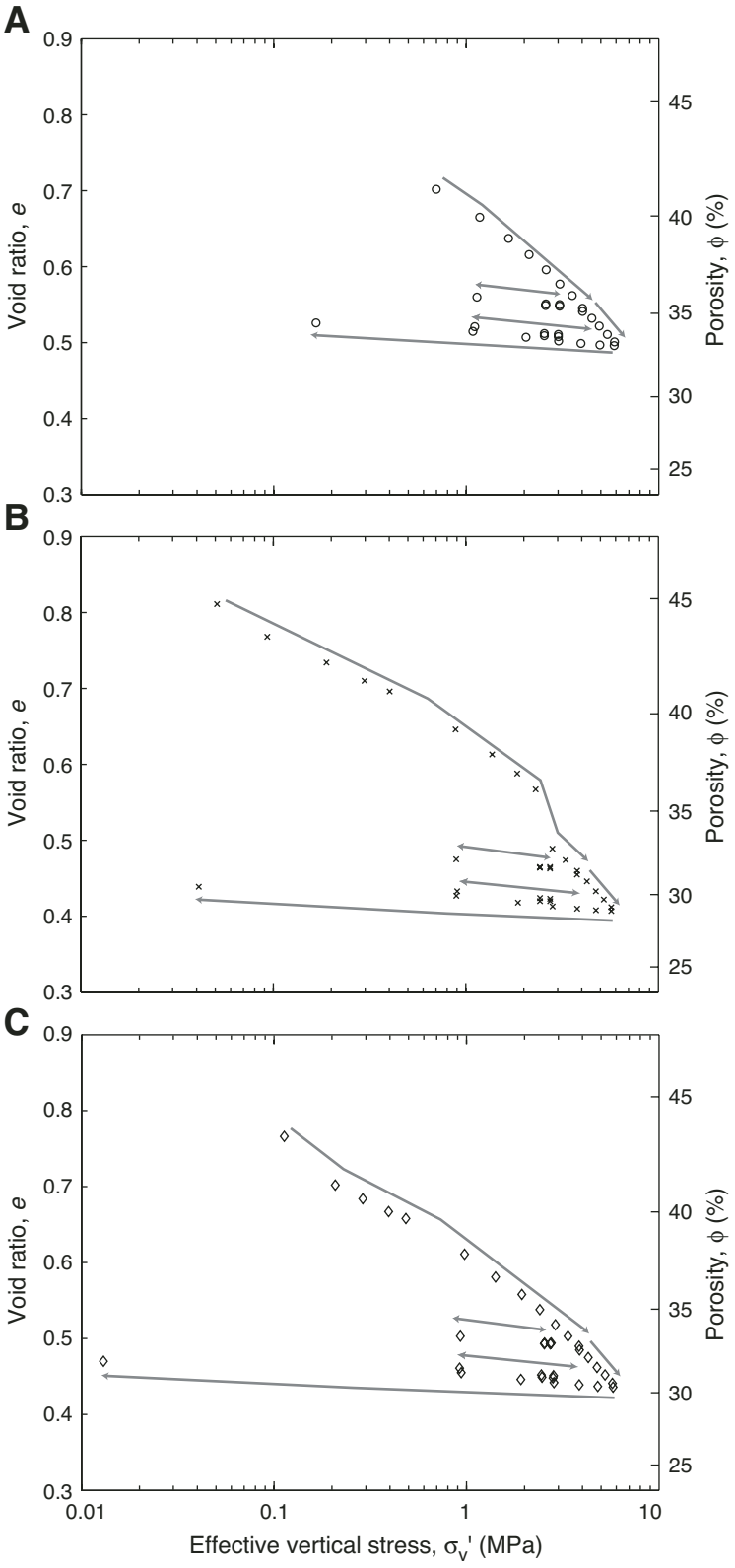


Figure F5. Deformation behavior for Sample 194-1194A-11H-3, 135–137 cm. Void ratio is plotted on a linear scale on the left y-axis and equivalent porosity is plotted on the right y-axis. Gray arrows illustrate loading/unloading/reloading paths. Raw data are provided in Table T8, p. 23.

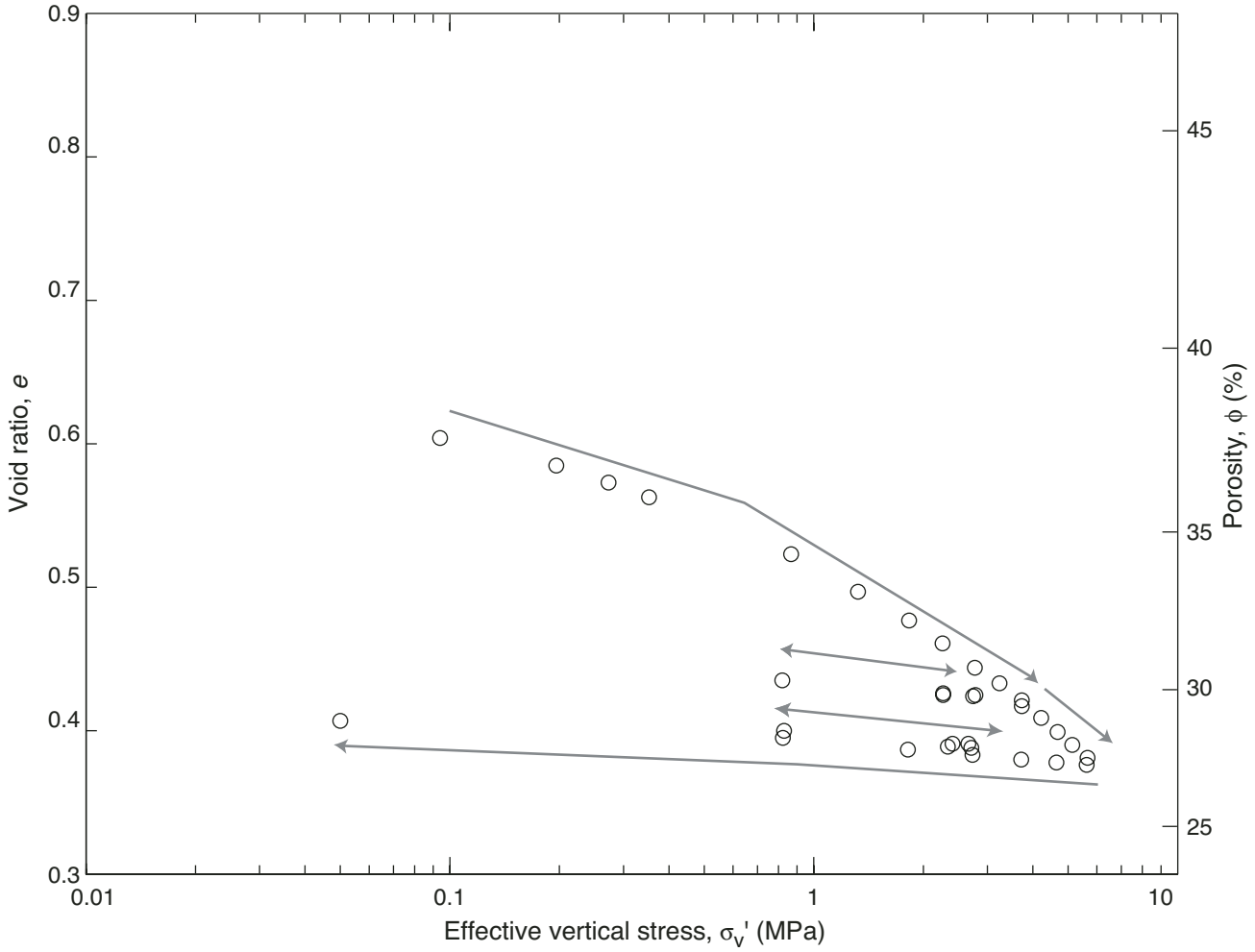


Figure F6. Deformation behavior for (**A**) Sample 194-1198A-13H-3, 135–137 cm, and (**B**) Sample 194-1198A-13H-3, 139–141 cm. Void ratio is plotted on a linear scale on the left y-axis and equivalent porosity is plotted on the right y-axis. Gray arrows illustrate loading/unloading/reloading paths. Raw data are provided in Tables T9, p. 24, and T10, p. 25.

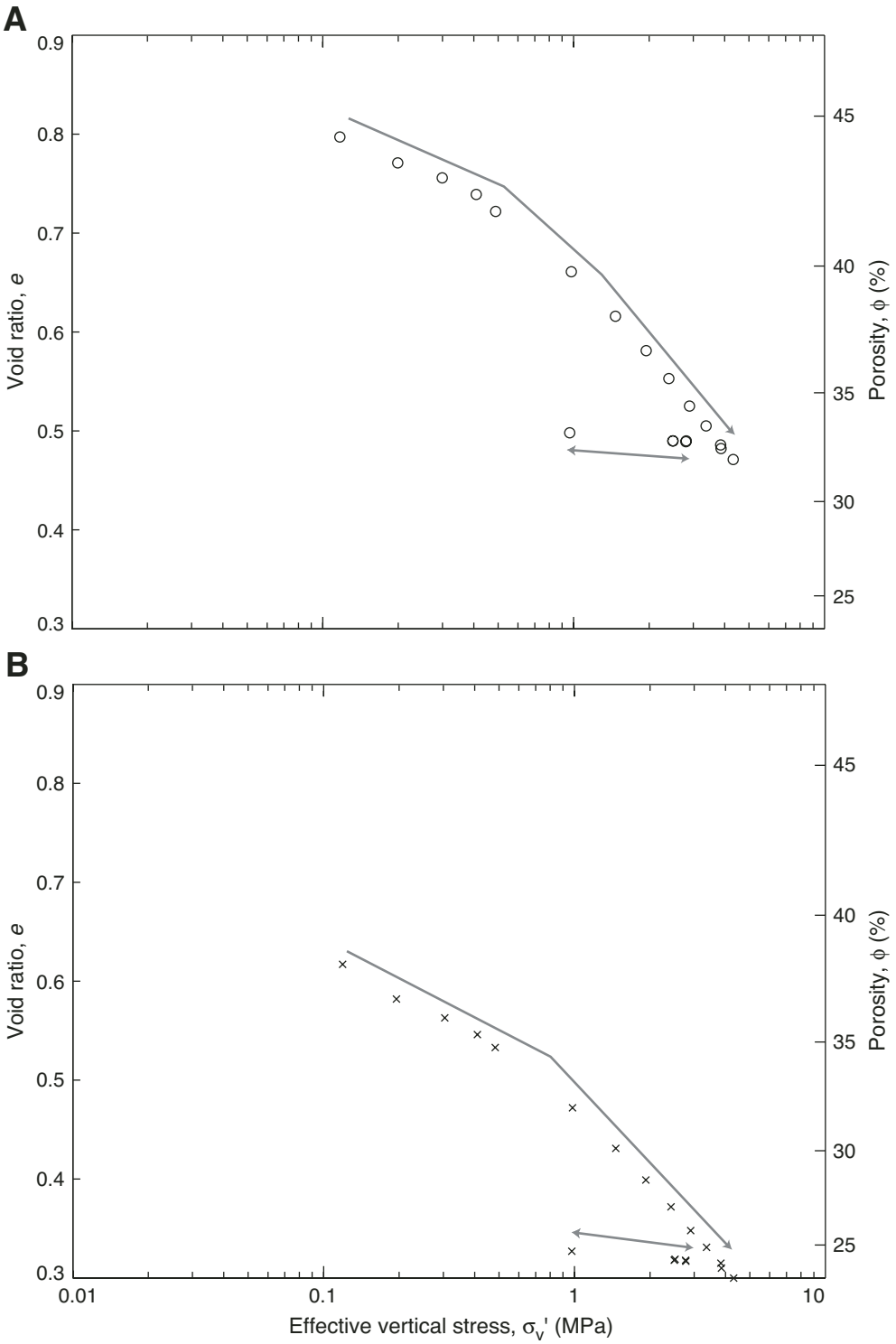


Figure F7. Deformation behavior for Sample 194-1198A-15H-3, 135–137 cm. Void ratio is plotted on a linear scale on the left y-axis and equivalent porosity is plotted on the right y-axis. Gray arrows illustrate loading/unloading/reloading paths. Raw data are provided in Table **T11,** p. 26.

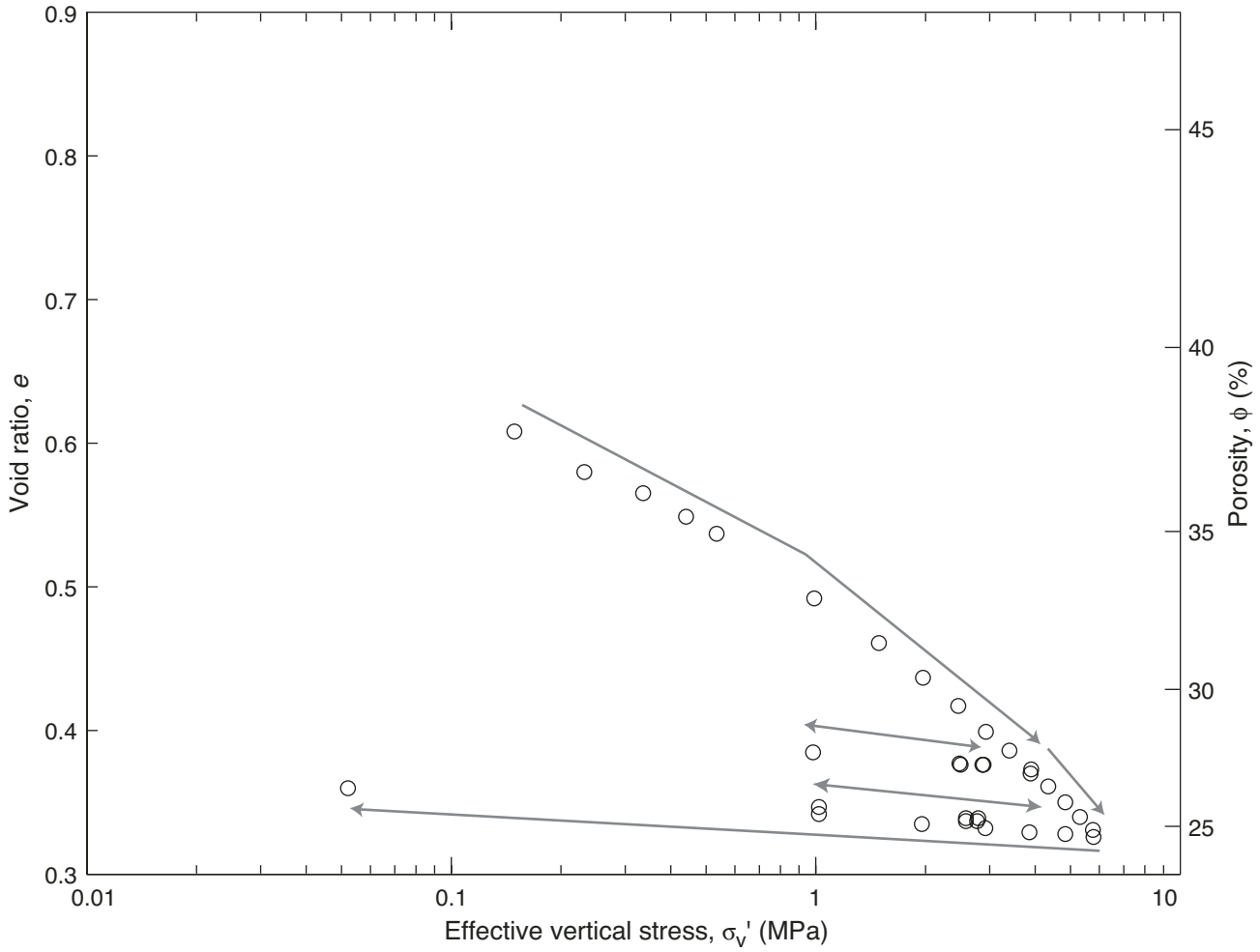


Figure F8. Deformation behavior for Sample 194-1198A-18H-3, 135–137 cm. Void ratio is plotted on a linear scale on the left y-axis and equivalent porosity is plotted on the right y-axis. Gray arrows illustrate loading/unloading/reloading paths. Raw data are provided in Table **T12,** p. 27.

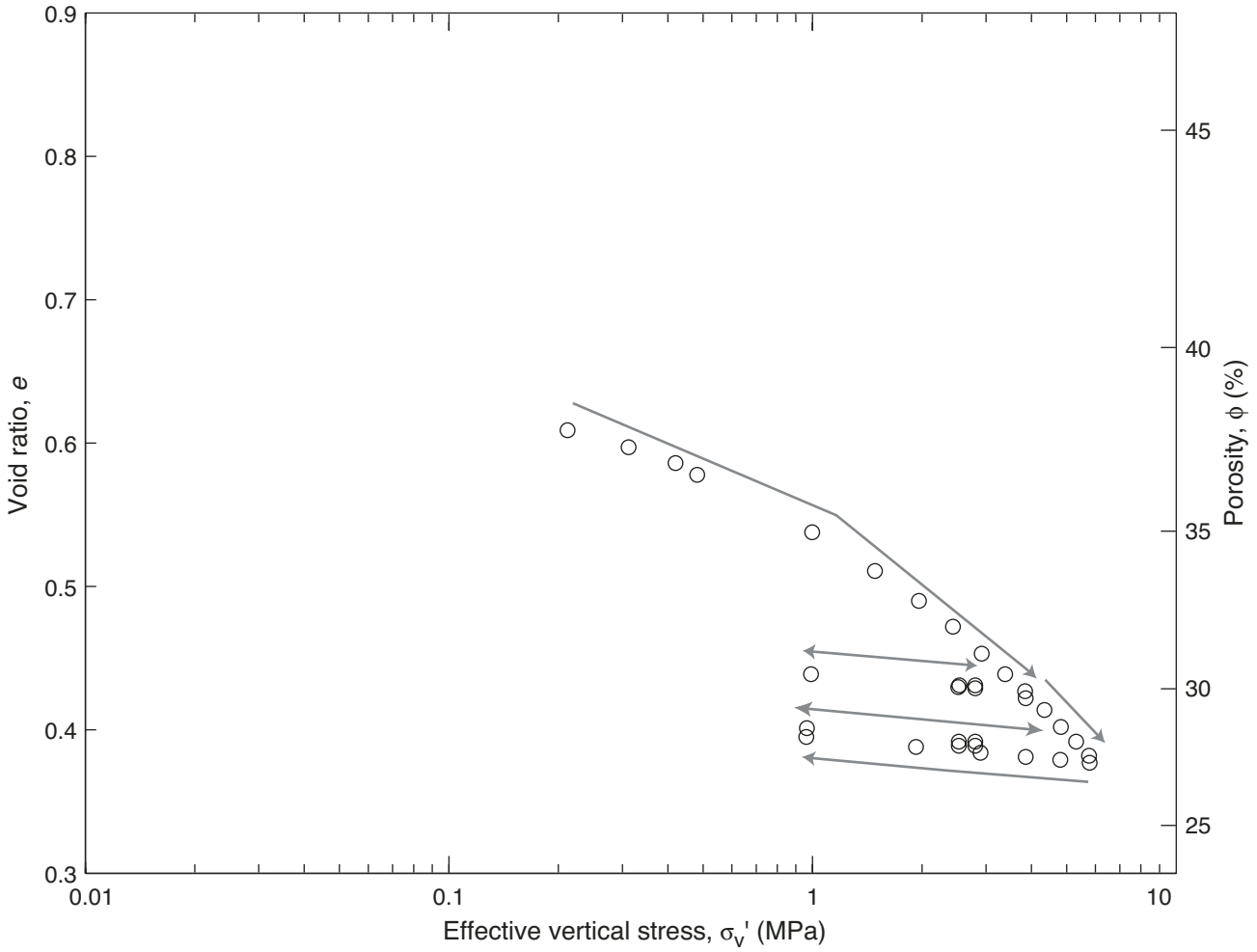


Figure F9. Deformation behavior for Sample 194-1198A-21H-3, 140–142 cm. Void ratio is plotted on a linear scale on the left y-axis and equivalent porosity is plotted on the right y-axis. Gray arrows illustrate loading/unloading/reloading paths. Raw data are provided in Table **T13,** p. 28.

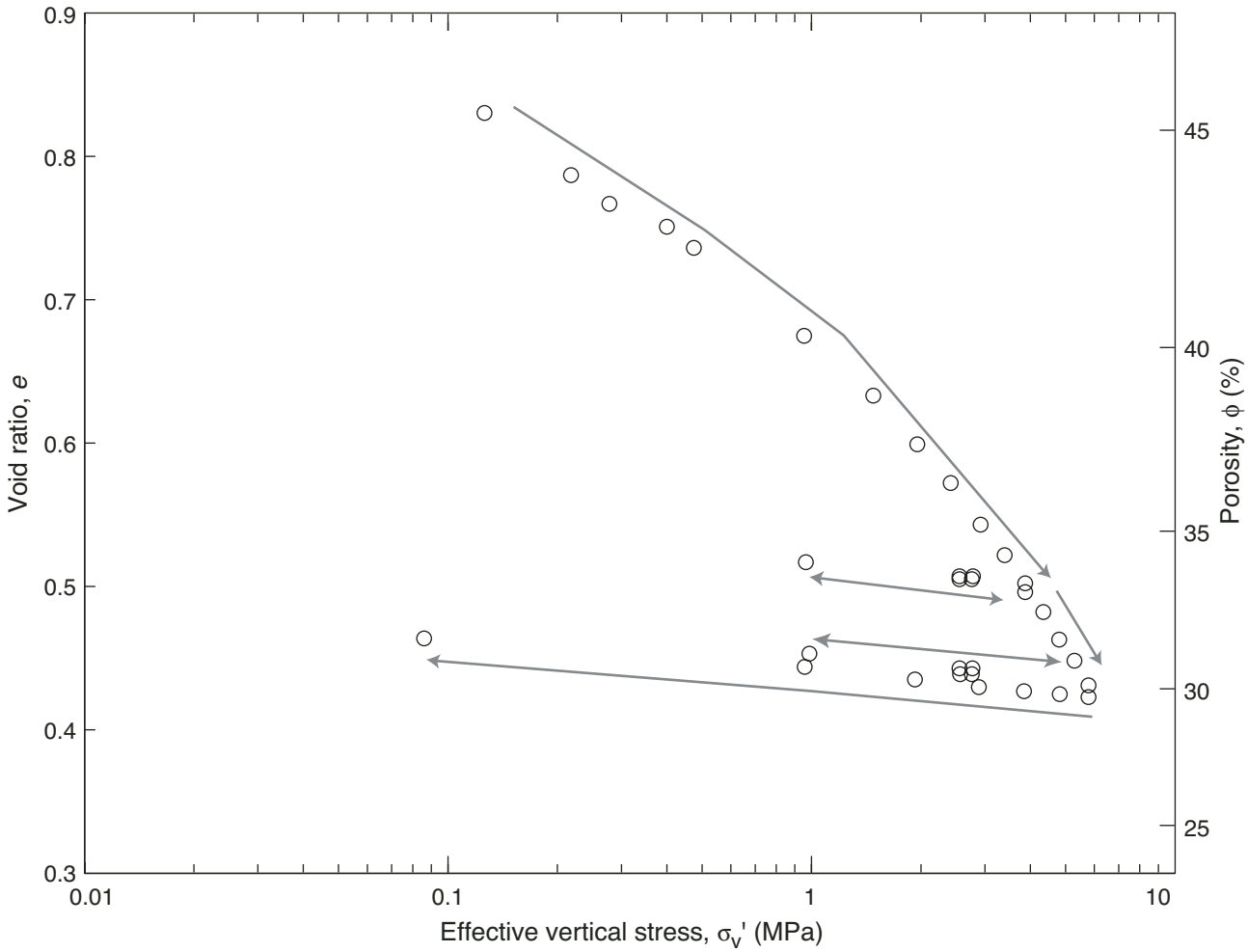


Table T1. Samples used in consolidation experiments.

Core, section, interval (cm)	Age	Depth (mbsf)	Initial porosity (%)
194-1194A-			
5H-3, 135–137	Pliocene	37.55	42.6
8H-3, 135–137	late Miocene	66.05	41.2
8H-3, 138–140	late Miocene	66.08	44.8
8H-3, 142–144	late Miocene	66.12	43.4
11H-3, 135–137	late Miocene	94.55	37.7
194-1198A-			
13H-3, 135–137	Pliocene	113.85	44.4
13H-3, 139–141	Pliocene	113.89	38.2
15H-3, 135–137	Pliocene	132.85	37.8
18H-3, 135–137	Pliocene	161.35	37.9
21H-3, 140–142	Pliocene	189.90	45.3

Table T2. Nomenclature.

Variable	Definition	Dimensions	SI unit
c_c	Compression index	Dimensionless	—
c_e	Expansion index	Dimensionless	—
c_v	Coefficient of consolidation	L^2/T	m^2/s
d_{10}	Grain size at which 10% of sample is finer	L	µm
d_{50}	Grain size at which 50% of sample is finer	L	µm
d_{90}	Grain size at which 90% of sample is finer	L	µm
e	Void ratio	Dimensionless	—
e_o	Initial void ratio	Dimensionless	—
Δe	Change in void ratio	Dimensionless	—
k	Permeability	L^2	m^2
m	Sample mass	M	kg
m_v	Coefficient of volume compressibility	LT^2/M	1/Pa
V	Sample volume	L^3	m^3
ϕ	Porosity	Dimensionless	—
ϕ_o	Initial porosity	Dimensionless	—
ρ_b	Bulk density	M/L^3	kg/m^3
ρ_s	Grain density	M/L^3	kg/m^3
ρ_w	Fluid density	M/L^3	kg/m^3
µ	Dynamic viscosity	M/LT	Pa·s
$\Delta\sigma_v'$	Effective vertical stress increment	M/LT^2	Pa
σ_v'	Effective vertical (axial) stress	M/LT^2	Pa

Note: L = length, T = time, M = mass.

Table T3. Summary of consolidation and grain size results.

Core, section, interval (cm)	Depth (mbsf)	c_c	c_e	Permeability (m^2)		Grain size (μm)		
				Maximum	Minimum	d_{10}	d_{50}	d_{90}
194-1194A-								
5H-3, 135–137	37.55	0.31	0.023	4.2×10^{-17}	4.2×10^{-18}	0.2	2.8	89.5
8H-3, 135–137	66.05	0.26	0.026	1.3×10^{-16}	2.4×10^{-17}			
8H-3, 138–140	66.08	0.32	0.025	2.0×10^{-17}	9.4×10^{-17}			
8H-3, 142–144	66.12	0.24	0.022	1.6×10^{-16}	3.8×10^{-18}	0.3	2.5	18.6
11H-3, 135–137	94.55	0.19	0.022	1.2×10^{-16}	2.2×10^{-17}	1.3	1.7	8.6
194-1198A-								
13H-3, 135–137	113.85	0.26	0.023	2.2×10^{-16}	3.7×10^{-18}			
13H-3, 139–141	113.89	0.28	0.020	2.1×10^{-16}	2.8×10^{-18}	0.4	54.3	216.3
15H-3, 135–137	132.85	0.22	0.022	5.4×10^{-16}	1.9×10^{-18}	0.3	3.0	174.4
18H-3, 135–137	161.35	0.22	0.022	8.4×10^{-17}	3.1×10^{-18}	0.3	2.7	68.9
21H-3, 140–142	189.90	0.37	0.029	1.4×10^{-16}	4.2×10^{-18}	0.3	3.7	194.1

Note: c_c = compression index, c_e = expansion index. d_{10} = grain size at which 10% of sample is finer, d_{50} = grain size at which 50% of sample is finer, d_{90} = grain size at which 90% of sample is finer.

Table T4. Stress and porosity measurements from Sample 194-1194A-5H-3, 135–137 cm.

Time (s)	Effective vertical stress (MPa)	Sample height (mm)	Porosity (%)	Void ratio
0.000	0.128	17.11	42.6	0.741
10.000	0.227	16.96	42.1	0.726
20.000	0.229	16.88	41.8	0.718
30.000	0.230	16.82	41.6	0.712
40.000	0.230	16.77	41.4	0.707
50.000	0.200	16.73	41.3	0.703
60.000	0.219	16.70	41.2	0.700
70.000	0.225	16.67	41.1	0.697
80.000	0.213	16.65	41.0	0.695
90.000	0.209	16.64	41.0	0.694
96.400	0.212	16.63	40.9	0.693
97.400	0.213	16.63	40.9	0.693
98.400	0.213	16.62	40.9	0.692
99.400	0.214	16.62	40.9	0.692
100.400	0.214	16.62	40.9	0.692
101.400	0.221	16.62	40.9	0.692
102.400	0.213	16.62	40.9	0.692
103.400	0.194	16.62	40.9	0.692
104.401	0.186	16.62	40.9	0.692
105.401	0.194	16.62	40.9	0.692
106.401	0.200	16.62	40.9	0.692
107.401	0.205	16.62	40.9	0.691
108.401	0.207	16.61	40.9	0.691
109.401	0.211	16.61	40.9	0.691
110.401	0.212	16.61	40.9	0.691
111.401	0.214	16.61	40.9	0.691
112.401	0.214	16.61	40.9	0.691
113.401	0.214	16.61	40.8	0.691
114.401	0.215	16.61	40.8	0.690
115.401	0.216	16.60	40.8	0.690
116.401	0.217	16.60	40.8	0.690
117.401	0.217	16.60	40.8	0.690
118.401	0.217	16.60	40.8	0.690
119.401	0.219	16.60	40.8	0.690
120.401	0.218	16.60	40.8	0.690
121.402	0.219	16.60	40.8	0.689
122.402	0.219	16.59	40.8	0.689
123.402	0.221	16.59	40.8	0.689
124.402	0.221	16.59	40.8	0.689
125.402	0.221	16.59	40.8	0.689
126.402	0.221	16.59	40.8	0.689
127.402	0.221	16.59	40.8	0.689
128.402	0.221	16.59	40.8	0.689
129.402	0.221	16.59	40.8	0.688
130.402	0.221	16.58	40.8	0.688
131.402	0.221	16.58	40.8	0.688
132.402	0.221	16.58	40.8	0.688
133.402	0.222	16.58	40.8	0.688
134.402	0.221	16.58	40.8	0.688
135.402	0.223	16.58	40.8	0.688
136.402	0.223	16.58	40.7	0.688
137.403	0.224	16.58	40.7	0.688
138.403	0.223	16.58	40.7	0.687
139.403	0.224	16.57	40.7	0.687
140.403	0.223	16.57	40.7	0.687
141.403	0.224	16.57	40.7	0.687
142.403	0.224	16.57	40.7	0.687
143.403	0.224	16.57	40.7	0.687
144.403	0.224	16.57	40.7	0.687
145.403	0.224	16.57	40.7	0.687
146.403	0.224	16.57	40.7	0.687
147.403	0.225	16.57	40.7	0.686
148.403	0.223	16.57	40.7	0.686
149.403	0.223	16.56	40.7	0.686
150.403	0.222	16.56	40.7	0.686
151.403	0.223	16.56	40.7	0.686
152.403	0.221	16.56	40.7	0.686
153.404	0.227	16.56	40.7	0.686
154.404	0.198	16.56	40.7	0.686
155.404	0.190	16.56	40.7	0.686
156.404	0.202	16.56	40.7	0.686
157.404	0.212	16.56	40.7	0.686
158.404	0.218	16.56	40.7	0.686
159.404	0.223	16.56	40.7	0.686
160.404	0.225	16.56	40.7	0.686
161.404	0.226	16.56	40.7	0.685
162.404	0.228	16.55	40.7	0.685
163.404	0.228	16.55	40.7	0.685
164.404	0.228	16.55	40.7	0.685
165.404	0.228	16.55	40.7	0.685
166.404	0.228	16.55	40.6	0.685
167.404	0.229	16.55	40.6	0.685
168.404	0.229	16.55	40.6	0.685
169.404	0.230	16.55	40.6	0.685
170.405	0.229	16.55	40.6	0.685
171.405	0.229	16.55	40.6	0.684
172.405	0.229	16.55	40.6	0.684
173.405	0.229	16.54	40.6	0.684
174.405	0.230	16.54	40.6	0.684
175.405	0.225	16.54	40.6	0.684
176.405	0.185	16.55	40.6	0.685
177.405	0.221	16.54	40.6	0.684
178.405	0.227	16.54	40.6	0.684
179.405	0.214	16.54	40.6	0.684
180.405	0.205	16.54	40.6	0.684
181.405	0.199	16.54	40.6	0.684
182.405	0.195	16.54	40.6	0.684
183.405	0.191	16.54	40.6	0.684
184.405	0.191	16.55	40.6	0.684
185.405	0.190	16.55	40.6	0.684
186.406	0.191	16.54	40.6	0.684
187.406	0.190	16.54	40.6	0.684
188.406	0.191	16.54	40.6	0.684
189.406	0.190	16.54	40.6	0.684
190.406	0.192	16.54	40.6	0.684
191.406	0.190	16.54	40.6	0.684
192.406	0.192	16.54	40.6	0.684
193.406	0.190	16.54	40.6	0.684
194.406	0.192	16.54	40.6	0.684
195.406	0.190	16.54	40.6	0.684
196.406	0.191	16.54	40.6	0.684
197.406	0.190	16.54	40.6	0.684
198.406	0.192	16.54	40.6	0.684
199.406	0.191	16.54	40.6	0.684
200.406	0.191	16.54	40.6	0.684
201.406	0.192	16.54	40.6	0.684
202.406	0.191	16.54	40.6	0.684
203.407	0.191	16.54	40.6	0.684
204.407	0.191	16.54	40.6	0.684
205.407	0.191	16.54	40.6	0.684
206.407	0.192	16.54	40.6	0.684
207.407	0.191	16.54	40.6	0.684
208.407	0.192	16.54	40.6	0.684
209.407	0.191	16.54	40.6	0.684
210.407	0.192	16.54	40.6	0.684
211.407	0.191	16.54	40.6	0.684
212.407	0.193	16.54	40.6	0.684
213.407	0.192	16.54	40.6	0.684
214.407	0.193	16.54	40.6	0.684
215.407	0.194	16.54	40.6	0.684
216.407	0.194	16.54	40.6	0.684
217.407	0.194	16.54	40.6	0.684
218.407	0.194	16.54	40.6	0.684
219.408	0.194	16.54	40.6	0.684
220.408	0.194	16.54	40.6	0.684

Note: Only a portion of this table appears here. The complete table is available in **ASCII**.

Table T5. Stress and porosity measurements from Sample 194-1194A-8H-3, 135–137 cm.

Time (s)	Effective vertical stress (MPa)	Sample height (mm)	Porosity (%)	Void ratio
0.000	0.699	17.37	41.2	0.702
10.000	1.175	17.25	40.8	0.691
20.000	1.176	17.19	40.6	0.684
30.000	1.176	17.15	40.5	0.680
40.000	1.176	17.12	40.4	0.678
50.000	1.176	17.10	40.3	0.676
60.000	1.176	17.08	40.3	0.674
70.000	1.176	17.07	40.2	0.673
80.000	1.176	17.06	40.2	0.672
90.000	1.176	17.05	40.2	0.671
100.000	1.176	17.04	40.1	0.670
110.000	1.176	17.04	40.1	0.670
120.000	1.176	17.03	40.1	0.669
130.000	1.176	17.03	40.1	0.669
140.000	1.176	17.03	40.1	0.668
150.000	1.176	17.02	40.1	0.668
160.000	1.176	17.02	40.0	0.668
170.000	1.176	17.02	40.0	0.668
180.000	1.176	17.01	40.0	0.667
190.000	1.176	17.01	40.0	0.667
200.000	1.176	17.01	40.0	0.667
210.000	1.176	17.01	40.0	0.667
220.000	1.176	17.01	40.0	0.667
230.000	1.176	17.00	40.0	0.666
240.000	1.177	17.00	40.0	0.666
250.000	1.176	17.00	40.0	0.666
260.000	1.177	17.00	40.0	0.666
270.000	1.176	17.00	40.0	0.666
280.000	1.176	17.00	40.0	0.666
290.000	1.177	17.00	40.0	0.665
296.400	1.175	16.99	40.0	0.665
297.400	1.177	16.99	40.0	0.665
298.399	1.176	16.99	40.0	0.665
299.399	1.176	16.99	40.0	0.665
300.399	1.177	16.99	40.0	0.665
301.399	1.176	16.99	40.0	0.665
302.398	1.176	16.99	40.0	0.665
303.398	1.178	16.99	40.0	0.665
304.398	1.177	16.99	40.0	0.665
305.398	1.177	16.99	40.0	0.665
306.397	1.224	16.99	39.9	0.665
307.397	1.320	16.99	39.9	0.664
308.397	1.415	16.98	39.9	0.664
309.397	1.511	16.97	39.9	0.663
310.396	1.603	16.95	39.8	0.661
311.396	1.659	16.94	39.8	0.660
312.396	1.661	16.93	39.7	0.659
313.396	1.660	16.92	39.7	0.658
314.396	1.660	16.92	39.7	0.658
315.395	1.661	16.91	39.7	0.657
316.395	1.660	16.90	39.6	0.657
317.395	1.659	16.90	39.6	0.656
318.395	1.660	16.89	39.6	0.656
319.394	1.659	16.89	39.6	0.655
320.394	1.660	16.89	39.6	0.655
321.394	1.661	16.88	39.6	0.654
322.394	1.659	16.88	39.5	0.654
323.393	1.660	16.87	39.5	0.654
324.393	1.661	16.87	39.5	0.653
325.393	1.660	16.87	39.5	0.653
326.393	1.660	16.86	39.5	0.653
327.392	1.660	16.86	39.5	0.652
328.392	1.659	16.86	39.5	0.652
329.392	1.659	16.85	39.5	0.652
330.392	1.661	16.85	39.4	0.651
331.391	1.660	16.85	39.4	0.651
332.391	1.660	16.85	39.4	0.651
333.391	1.661	16.84	39.4	0.651
334.391	1.660	16.84	39.4	0.650
335.390	1.661	16.84	39.4	0.650
336.390	1.660	16.84	39.4	0.650
337.390	1.660	16.83	39.4	0.650
338.390	1.660	16.83	39.4	0.649
339.389	1.660	16.83	39.4	0.649
340.389	1.660	16.83	39.4	0.649
341.389	1.660	16.83	39.4	0.649
342.389	1.661	16.82	39.3	0.649
343.388	1.660	16.82	39.3	0.648
344.388	1.661	16.82	39.3	0.648
345.388	1.661	16.82	39.3	0.648
346.388	1.660	16.82	39.3	0.648
347.387	1.661	16.81	39.3	0.648
348.387	1.660	16.81	39.3	0.648
349.387	1.660	16.81	39.3	0.647
350.387	1.660	16.81	39.3	0.647
351.386	1.660	16.81	39.3	0.647
352.386	1.660	16.81	39.3	0.647
353.386	1.661	16.81	39.3	0.647
354.386	1.662	16.80	39.3	0.647
355.385	1.660	16.80	39.3	0.647
356.385	1.661	16.80	39.3	0.646
357.385	1.660	16.80	39.3	0.646
358.385	1.659	16.80	39.3	0.646
359.385	1.661	16.80	39.2	0.646
360.384	1.660	16.80	39.2	0.646
361.384	1.660	16.79	39.2	0.646
362.384	1.661	16.79	39.2	0.646
363.384	1.660	16.79	39.2	0.646
364.383	1.660	16.79	39.2	0.645
365.383	1.661	16.79	39.2	0.645
366.383	1.661	16.79	39.2	0.645
367.383	1.660	16.79	39.2	0.645
371.982	1.660	16.78	39.2	0.645
381.982	1.661	16.77	39.2	0.644
391.982	1.660	16.77	39.1	0.643
401.982	1.661	16.76	39.1	0.643
411.982	1.661	16.76	39.1	0.642
421.982	1.660	16.75	39.1	0.642
431.982	1.661	16.75	39.1	0.641
441.982	1.661	16.74	39.1	0.641
451.982	1.661	16.74	39.0	0.640
461.982	1.661	16.74	39.0	0.640
471.982	1.661	16.73	39.0	0.640
481.982	1.661	16.73	39.0	0.640
491.982	1.661	16.73	39.0	0.639
501.982	1.661	16.73	39.0	0.639
511.982	1.661	16.72	39.0	0.639
521.982	1.661	16.72	39.0	0.639
531.982	1.661	16.72	39.0	0.639
541.982	1.661	16.72	39.0	0.638
551.982	1.661	16.72	39.0	0.638
561.982	1.661	16.72	39.0	0.638
571.982	1.661	16.71	38.9	0.638
581.982	1.661	16.71	38.9	0.638
591.982	1.661	16.71	38.9	0.638
601.982	1.661	16.71	38.9	0.637
611.982	1.717	16.71	38.9	0.637
615.682	2.111	16.67	38.8	0.634
616.682	2.138	16.67	38.8	0.633
617.682	2.138	16.66	38.8	0.633
618.682	2.138	16.66	38.7	0.632
619.681	2.139	16.65	38.7	0.632
620.681	2.139	16.65	38.7	0.631
621.681	2.138	16.64	38.7	0.631
622.681	2.139	16.64	38.7	0.631

Note: Only a portion of this table appears here. The complete table is available in **ASCII**.

Table T6. Stress and porosity measurements from Sample 194-1194A-8H-3, 138–140 cm.

Time (s)	Effective vertical stress (MPa)	Sample height (mm)	Porosity (%)	Void+ ratio
0.000	0.051	18.82	44.8	0.811
10.000	0.087	18.76	44.6	0.806
20.000	0.093	18.70	44.4	0.800
30.000	0.095	18.66	44.3	0.797
40.000	0.094	18.64	44.3	0.794
50.000	0.096	18.61	44.2	0.791
60.000	0.094	18.59	44.1	0.789
70.000	0.095	18.56	44.0	0.787
80.000	0.096	18.54	44.0	0.785
90.000	0.096	18.52	43.9	0.783
100.000	0.092	18.51	43.9	0.781
110.000	0.095	18.49	43.8	0.780
120.000	0.095	18.48	43.8	0.778
130.000	0.096	18.46	43.7	0.777
140.000	0.094	18.45	43.7	0.776
150.000	0.095	18.44	43.7	0.775
160.000	0.098	18.42	43.6	0.774
170.000	0.095	18.41	43.6	0.773
180.000	0.095	18.41	43.6	0.772
190.000	0.095	18.40	43.5	0.771
200.000	0.095	18.39	43.5	0.770
210.000	0.094	18.38	43.5	0.770
220.000	0.094	18.38	43.5	0.769
230.000	0.093	18.37	43.5	0.768
240.000	0.093	18.37	43.4	0.768
250.000	0.186	18.29	43.2	0.761
260.000	0.184	18.25	43.1	0.757
270.000	0.185	18.22	43.0	0.754
280.000	0.185	18.19	42.9	0.751
290.000	0.183	18.17	42.8	0.749
300.000	0.189	18.15	42.8	0.747
310.000	0.186	18.13	42.7	0.746
320.000	0.186	18.12	42.7	0.744
330.000	0.185	18.11	42.6	0.743
340.000	0.184	18.10	42.6	0.742
350.000	0.185	18.09	42.6	0.741
360.000	0.186	18.08	42.5	0.740
370.000	0.185	18.07	42.5	0.739
380.000	0.185	18.06	42.5	0.739
390.000	0.186	18.06	42.5	0.738
400.000	0.185	18.05	42.5	0.738
410.000	0.185	18.05	42.4	0.737
420.000	0.184	18.04	42.4	0.737
430.000	0.186	18.04	42.4	0.736
440.000	0.185	18.04	42.4	0.736
450.000	0.186	18.03	42.4	0.736
460.000	0.187	18.03	42.4	0.735
470.000	0.187	18.03	42.4	0.735
480.000	0.187	18.02	42.4	0.735
490.000	0.189	18.02	42.4	0.735
500.000	0.190	18.02	42.3	0.734
510.000	0.189	18.02	42.3	0.734
520.000	0.190	18.01	42.3	0.734
530.000	0.190	18.01	42.3	0.734
540.000	0.189	18.01	42.3	0.734
550.000	0.295	17.96	42.2	0.729
560.000	0.299	17.92	42.0	0.725
570.000	0.297	17.90	42.0	0.723
580.000	0.298	17.88	41.9	0.721
590.000	0.295	17.86	41.8	0.720
600.000	0.293	17.85	41.8	0.719
610.000	0.294	17.84	41.8	0.718
620.000	0.296	17.83	41.8	0.717
630.000	0.295	17.83	41.7	0.716
640.000	0.301	17.82	41.7	0.715
650.000	0.301	17.81	41.7	0.715
660.000	0.300	17.81	41.7	0.714
670.000	0.303	17.80	41.6	0.714
680.000	0.299	17.80	41.6	0.713
690.000	0.298	17.80	41.6	0.713
700.000	0.301	17.79	41.6	0.713
710.000	0.302	17.79	41.6	0.712
720.000	0.304	17.79	41.6	0.712
730.000	0.301	17.78	41.6	0.712
740.000	0.299	17.78	41.6	0.712
750.000	0.298	17.78	41.6	0.711
760.000	0.302	17.78	41.6	0.711
770.000	0.303	17.78	41.6	0.711
780.000	0.301	17.77	41.6	0.711
790.000	0.301	17.77	41.5	0.711
800.000	0.299	17.77	41.5	0.711
810.000	0.299	17.77	41.5	0.711
820.000	0.298	17.77	41.5	0.710
830.000	0.299	17.77	41.5	0.710
840.000	0.298	17.77	41.5	0.710
850.000	0.389	17.74	41.4	0.708
860.000	0.384	17.72	41.4	0.706
870.000	0.384	17.71	41.4	0.705
880.000	0.381	17.71	41.3	0.704
890.000	0.380	17.70	41.3	0.704
900.000	0.381	17.69	41.3	0.703
910.000	0.382	17.69	41.3	0.703
920.000	0.382	17.68	41.3	0.702
930.000	0.381	17.68	41.2	0.702
940.000	0.384	17.67	41.2	0.701
950.000	0.381	17.67	41.2	0.701
960.000	0.381	17.67	41.2	0.701
970.000	0.382	17.67	41.2	0.701
980.000	0.380	17.66	41.2	0.700
990.000	0.381	17.66	41.2	0.700
1000.000	0.383	17.66	41.2	0.700
1010.000	0.385	17.66	41.2	0.700
1020.000	0.387	17.66	41.2	0.699
1030.000	0.413	17.65	41.1	0.699
1040.000	0.411	17.64	41.1	0.698
1050.000	0.412	17.64	41.1	0.698
1060.000	0.415	17.64	41.1	0.698
1070.000	0.413	17.63	41.1	0.697
1080.000	0.415	17.63	41.1	0.697
1090.000	0.414	17.63	41.1	0.697
1100.000	0.413	17.63	41.1	0.697
1110.000	0.411	17.62	41.1	0.696
1120.000	0.409	17.62	41.1	0.696
1130.000	0.401	17.62	41.0	0.696
1140.000	0.402	17.62	41.0	0.696
1150.000	0.705	17.56	40.8	0.690
1160.000	0.880	17.40	40.3	0.675
1170.000	0.887	17.33	40.1	0.668
1180.000	0.888	17.28	39.9	0.664
1190.000	0.889	17.25	39.8	0.660
1200.000	0.891	17.22	39.7	0.658
1210.000	0.896	17.20	39.6	0.656
1220.000	0.889	17.19	39.6	0.654
1230.000	0.888	17.17	39.5	0.653
1240.000	0.887	17.16	39.5	0.652
1250.000	0.886	17.16	39.4	0.651
1260.000	0.885	17.15	39.4	0.651
1270.000	0.885	17.14	39.4	0.650
1280.000	0.886	17.14	39.4	0.650
1290.000	0.886	17.14	39.4	0.649
1300.000	0.886	17.13	39.4	0.649
1310.000	0.886	17.13	39.3	0.649
1320.000	0.884	17.13	39.3	0.649
1330.000	0.884	17.12	39.3	0.648
1340.000	0.884	17.12	39.3	0.648

Note: Only a portion of this table appears here. The complete table is available in **ASCII**.

Table T7. Stress and porosity measurements from Sample 194-1194A-8H-3, 142–144 cm.

Time (s)	Effective vertical stress (MPa)	Sample height (mm)	Porosity (%)	Void ratio
0.000	0.113	18.43	43.4	0.766
8.200	0.208	18.31	43.0	0.754
9.200	0.209	18.30	43.0	0.754
10.200	0.208	18.29	42.9	0.753
11.200	0.210	18.28	42.9	0.752
12.200	0.210	18.27	42.9	0.751
13.200	0.209	18.26	42.9	0.750
14.200	0.209	18.25	42.8	0.750
15.200	0.208	18.25	42.8	0.749
16.200	0.209	18.24	42.8	0.748
17.200	0.209	18.23	42.8	0.747
18.200	0.209	18.22	42.7	0.747
19.200	0.210	18.22	42.7	0.746
20.200	0.209	18.21	42.7	0.745
21.200	0.209	18.20	42.7	0.745
22.200	0.210	18.20	42.7	0.744
23.200	0.209	18.19	42.6	0.743
24.200	0.209	18.18	42.6	0.743
25.200	0.210	18.18	42.6	0.742
26.200	0.208	18.17	42.6	0.742
27.200	0.207	18.17	42.6	0.741
28.200	0.209	18.16	42.5	0.740
29.200	0.209	18.15	42.5	0.740
30.200	0.210	18.15	42.5	0.739
31.190	0.210	18.14	42.5	0.739
32.190	0.210	18.14	42.5	0.738
33.190	0.212	18.13	42.5	0.738
34.190	0.211	18.12	42.4	0.737
35.190	0.212	18.12	42.4	0.737
36.190	0.212	18.11	42.4	0.736
37.190	0.209	18.11	42.4	0.736
38.190	0.210	18.10	42.4	0.735
39.190	0.210	18.10	42.3	0.735
40.190	0.208	18.09	42.3	0.734
41.190	0.211	18.09	42.3	0.734
42.190	0.212	18.08	42.3	0.733
43.190	0.212	18.08	42.3	0.733
44.190	0.209	18.07	42.3	0.732
45.190	0.199	18.07	42.3	0.732
46.190	0.195	18.06	42.2	0.731
47.190	0.194	18.06	42.2	0.731
48.190	0.192	18.06	42.2	0.731
49.190	0.192	18.05	42.2	0.730
50.190	0.192	18.05	42.2	0.730
51.190	0.190	18.05	42.2	0.730
52.190	0.192	18.04	42.2	0.729
53.190	0.192	18.04	42.2	0.729
54.190	0.193	18.04	42.2	0.729
55.190	0.194	18.03	42.1	0.728
56.190	0.193	18.03	42.1	0.728
57.190	0.193	18.02	42.1	0.728
58.190	0.195	18.02	42.1	0.727
59.190	0.196	18.02	42.1	0.727
60.190	0.198	18.01	42.1	0.727
61.190	0.199	18.01	42.1	0.726
62.190	0.198	18.01	42.1	0.726
63.190	0.199	18.00	42.0	0.725
64.190	0.200	18.00	42.0	0.725
65.190	0.201	18.00	42.0	0.725
66.190	0.203	17.99	42.0	0.724
67.190	0.203	17.99	42.0	0.724
68.190	0.203	17.98	42.0	0.724
69.190	0.205	17.98	42.0	0.723
70.190	0.206	17.98	42.0	0.723
71.190	0.207	17.97	41.9	0.723
72.180	0.209	17.97	41.9	0.722
73.180	0.208	17.97	41.9	0.722
74.180	0.208	17.96	41.9	0.722
75.180	0.210	17.96	41.9	0.721
76.180	0.210	17.96	41.9	0.721
77.180	0.212	17.95	41.9	0.721
78.180	0.213	17.95	41.9	0.720
79.180	0.213	17.94	41.9	0.720
80.180	0.215	17.94	41.8	0.720
81.180	0.215	17.94	41.8	0.719
82.180	0.217	17.93	41.8	0.719
83.180	0.219	17.93	41.8	0.719
84.180	0.218	17.93	41.8	0.718
85.180	0.219	17.92	41.8	0.718
86.180	0.220	17.92	41.8	0.718
87.180	0.220	17.92	41.8	0.717
88.180	0.223	17.91	41.8	0.717
89.180	0.223	17.91	41.7	0.717
90.180	0.221	17.91	41.7	0.716
91.180	0.221	17.90	41.7	0.716
92.180	0.221	17.90	41.7	0.716
93.180	0.219	17.90	41.7	0.715
94.180	0.221	17.89	41.7	0.715
95.180	0.221	17.89	41.7	0.715
96.180	0.221	17.89	41.7	0.715
97.180	0.222	17.89	41.7	0.714
98.180	0.221	17.88	41.7	0.714
99.180	0.221	17.88	41.6	0.714
100.180	0.223	17.88	41.6	0.713
101.180	0.220	17.88	41.6	0.713
102.180	0.222	17.87	41.6	0.713
103.180	0.221	17.87	41.6	0.713
104.180	0.219	17.87	41.6	0.713
105.180	0.222	17.87	41.6	0.712
106.180	0.222	17.86	41.6	0.712
107.180	0.221	17.86	41.6	0.712
108.180	0.222	17.86	41.6	0.712
109.180	0.221	17.86	41.6	0.711
110.180	0.221	17.85	41.6	0.711
111.180	0.222	17.85	41.6	0.711
112.180	0.222	17.85	41.5	0.711
113.170	0.222	17.85	41.5	0.711
114.170	0.222	17.84	41.5	0.710
115.170	0.220	17.84	41.5	0.710
116.170	0.222	17.84	41.5	0.710
117.170	0.223	17.84	41.5	0.710
118.170	0.222	17.84	41.5	0.710
119.170	0.223	17.83	41.5	0.709
120.170	0.222	17.83	41.5	0.709
121.170	0.221	17.83	41.5	0.709
122.170	0.223	17.83	41.5	0.709
123.170	0.223	17.83	41.5	0.709
124.170	0.222	17.83	41.5	0.708
125.170	0.222	17.82	41.5	0.708
126.170	0.219	17.82	41.5	0.708
127.170	0.219	17.82	41.5	0.708
128.170	0.219	17.82	41.4	0.708
129.170	0.188	17.82	41.5	0.708
130.170	0.182	17.82	41.5	0.708
131.170	0.158	17.83	41.5	0.709
132.170	0.174	17.82	41.5	0.708
133.170	0.192	17.82	41.5	0.708
134.170	0.202	17.82	41.4	0.708
135.170	0.208	17.82	41.4	0.708
136.170	0.201	17.82	41.4	0.708
137.170	0.194	17.82	41.4	0.708
138.170	0.189	17.82	41.4	0.708
139.170	0.188	17.82	41.4	0.708
140.170	0.185	17.82	41.4	0.708
141.170	0.184	17.82	41.4	0.708

Note: Only a portion of this table appears here. The complete table is available in **ASCII**.

Table T8. Stress and porosity measurements from Sample 194-1194A-11H-3, 135–137 cm.

Time (s)	Effective vertical stress (MPa)	Sample height (mm)	Porosity (%)	Void ratio
0.000	0.094	17.95	37.7	0.604
1.000	0.188	17.93	37.6	0.602
2.000	0.196	17.91	37.5	0.600
2.999	0.197	17.90	37.5	0.599
3.999	0.197	17.89	37.4	0.599
4.999	0.196	17.88	37.4	0.598
5.999	0.196	17.88	37.4	0.598
6.998	0.197	17.87	37.4	0.597
7.998	0.194	17.87	37.4	0.597
8.998	0.192	17.86	37.4	0.596
9.998	0.192	17.86	37.4	0.596
10.997	0.194	17.86	37.3	0.596
11.997	0.195	17.85	37.3	0.596
12.997	0.196	17.85	37.3	0.595
13.997	0.196	17.85	37.3	0.595
14.996	0.197	17.84	37.3	0.595
15.996	0.198	17.84	37.3	0.594
16.996	0.197	17.84	37.3	0.594
17.996	0.196	17.84	37.3	0.594
18.995	0.196	17.83	37.3	0.594
19.995	0.196	17.83	37.2	0.593
20.995	0.196	17.83	37.2	0.593
21.995	0.196	17.83	37.2	0.593
22.994	0.197	17.82	37.2	0.593
23.994	0.197	17.82	37.2	0.593
24.994	0.196	17.82	37.2	0.593
25.994	0.195	17.82	37.2	0.592
26.993	0.196	17.82	37.2	0.592
27.993	0.197	17.81	37.2	0.592
28.993	0.197	17.81	37.2	0.592
29.993	0.198	17.81	37.2	0.592
30.992	0.197	17.81	37.2	0.591
31.992	0.197	17.81	37.2	0.591
32.992	0.197	17.80	37.2	0.591
33.992	0.197	17.80	37.2	0.591
34.991	0.198	17.80	37.1	0.591
35.991	0.198	17.80	37.1	0.591
36.991	0.197	17.80	37.1	0.591
37.991	0.197	17.80	37.1	0.591
38.990	0.198	17.80	37.1	0.590
39.990	0.199	17.80	37.1	0.590
40.990	0.198	17.79	37.1	0.590
41.990	0.197	17.79	37.1	0.590
42.990	0.195	17.79	37.1	0.590
43.989	0.195	17.79	37.1	0.590
44.989	0.195	17.79	37.1	0.590
45.989	0.196	17.79	37.1	0.590
46.989	0.197	17.79	37.1	0.590
47.988	0.197	17.79	37.1	0.590
48.988	0.196	17.79	37.1	0.590
49.988	0.195	17.79	37.1	0.589
50.988	0.197	17.78	37.1	0.589
51.987	0.198	17.78	37.1	0.589
52.987	0.199	17.78	37.1	0.589
53.987	0.197	17.78	37.1	0.589
54.987	0.198	17.78	37.1	0.589
55.986	0.197	17.78	37.1	0.589
56.986	0.197	17.78	37.1	0.589
57.986	0.197	17.78	37.1	0.589
58.986	0.196	17.78	37.1	0.589
59.985	0.195	17.78	37.1	0.589
60.985	0.194	17.78	37.1	0.589
61.985	0.192	17.78	37.1	0.589
62.985	0.192	17.78	37.1	0.589
63.984	0.192	17.78	37.1	0.589
64.984	0.192	17.78	37.0	0.589
65.984	0.192	17.77	37.0	0.588
66.984	0.191	17.77	37.0	0.588
67.983	0.190	17.77	37.0	0.588
68.983	0.191	17.77	37.0	0.588
69.983	0.192	17.77	37.0	0.588
70.983	0.192	17.77	37.0	0.588
71.982	0.191	17.77	37.0	0.588
72.982	0.190	17.77	37.0	0.588
73.982	0.188	17.77	37.0	0.588
74.982	0.188	17.77	37.0	0.588
75.981	0.187	17.77	37.0	0.588
76.981	0.188	17.77	37.0	0.588
77.981	0.186	17.77	37.0	0.588
78.981	0.185	17.77	37.0	0.588
81.781	0.185	17.77	37.0	0.588
91.781	0.184	17.77	37.0	0.588
101.781	0.186	17.77	37.0	0.588
111.781	0.187	17.76	37.0	0.588
121.781	0.188	17.76	37.0	0.587
131.781	0.189	17.76	37.0	0.587
141.781	0.192	17.76	37.0	0.587
151.781	0.194	17.76	37.0	0.587
161.781	0.194	17.76	37.0	0.587
171.781	0.195	17.75	37.0	0.587
181.781	0.194	17.75	37.0	0.587
191.781	0.196	17.75	37.0	0.586
201.781	0.200	17.75	37.0	0.586
211.781	0.200	17.75	37.0	0.586
221.781	0.197	17.75	36.9	0.586
231.781	0.197	17.75	36.9	0.586
241.781	0.196	17.74	36.9	0.586
251.781	0.197	17.74	36.9	0.586
261.781	0.196	17.74	36.9	0.586
271.781	0.196	17.74	36.9	0.586
281.781	0.196	17.74	36.9	0.586
291.781	0.197	17.74	36.9	0.586
295.480	0.196	17.74	36.9	0.585
296.480	0.197	17.74	36.9	0.585
297.480	0.199	17.74	36.9	0.585
298.480	0.199	17.74	36.9	0.585
299.479	0.197	17.74	36.9	0.585
300.479	0.197	17.74	36.9	0.585
301.479	0.247	17.73	36.9	0.585
302.479	0.301	17.72	36.8	0.583
303.478	0.299	17.71	36.8	0.582
304.478	0.294	17.70	36.8	0.582
305.478	0.296	17.70	36.8	0.581
306.478	0.300	17.69	36.8	0.581
307.477	0.301	17.69	36.7	0.581
308.477	0.302	17.68	36.7	0.580
309.477	0.303	17.68	36.7	0.580
310.477	0.302	17.68	36.7	0.580
311.476	0.303	17.67	36.7	0.579
312.476	0.295	17.67	36.7	0.579
313.476	0.292	17.67	36.7	0.579
314.476	0.291	17.67	36.7	0.579
315.475	0.290	17.67	36.7	0.579
316.475	0.289	17.66	36.7	0.579
317.475	0.290	17.66	36.6	0.578
318.475	0.292	17.66	36.6	0.578
319.474	0.294	17.66	36.6	0.578
320.474	0.294	17.66	36.6	0.578
321.474	0.295	17.65	36.6	0.578
322.474	0.295	17.65	36.6	0.578
323.474	0.297	17.65	36.6	0.577
324.473	0.298	17.65	36.6	0.577
325.473	0.301	17.65	36.6	0.577
326.473	0.302	17.65	36.6	0.577
327.473	0.303	17.64	36.6	0.577

Note: Only a portion of this table appears here. The complete table is available in **ASCII**.

Table T9. Stress and porosity measurements from Sample 194-1198A-13H-3, 135–137 cm.

Time (s)	Effective vertical stress (MPa)	Sample height (mm)	Porosity (%)	Void ratio
0.000	0.117	18.07	44.4	0.797
1.000	0.194	18.05	44.3	0.795
2.000	0.206	18.03	44.2	0.793
3.000	0.207	18.02	44.2	0.792
4.000	0.207	18.01	44.2	0.791
5.000	0.208	18.00	44.1	0.790
6.000	0.208	17.99	44.1	0.789
7.000	0.207	17.98	44.1	0.788
8.000	0.208	17.98	44.1	0.788
9.001	0.209	17.97	44.0	0.787
10.001	0.208	17.96	44.0	0.787
11.001	0.209	17.96	44.0	0.786
12.001	0.208	17.95	44.0	0.786
13.001	0.209	17.95	44.0	0.785
14.001	0.209	17.94	44.0	0.785
15.001	0.210	17.94	44.0	0.784
16.001	0.210	17.94	43.9	0.784
17.001	0.209	17.93	43.9	0.783
18.001	0.209	17.93	43.9	0.783
19.001	0.210	17.93	43.9	0.783
20.001	0.211	17.92	43.9	0.782
21.001	0.211	17.92	43.9	0.782
22.001	0.211	17.92	43.9	0.782
23.001	0.210	17.91	43.9	0.782
24.001	0.210	17.91	43.9	0.781
25.002	0.210	17.91	43.9	0.781
26.002	0.210	17.91	43.8	0.781
27.002	0.210	17.91	43.8	0.781
28.002	0.210	17.90	43.8	0.781
29.002	0.210	17.90	43.8	0.780
30.002	0.211	17.90	43.8	0.780
31.002	0.211	17.90	43.8	0.780
32.002	0.210	17.90	43.8	0.780
33.002	0.210	17.89	43.8	0.780
34.002	0.210	17.89	43.8	0.779
35.002	0.210	17.89	43.8	0.779
36.002	0.210	17.89	43.8	0.779
37.002	0.210	17.89	43.8	0.779
38.002	0.210	17.89	43.8	0.779
39.002	0.210	17.89	43.8	0.779
40.002	0.210	17.88	43.8	0.779
41.003	0.211	17.88	43.8	0.778
42.003	0.210	17.88	43.8	0.778
43.003	0.211	17.88	43.8	0.778
44.003	0.211	17.88	43.8	0.778
45.003	0.211	17.88	43.8	0.778
46.003	0.211	17.88	43.8	0.778
47.003	0.212	17.88	43.7	0.778
48.003	0.211	17.87	43.7	0.778
49.003	0.210	17.87	43.7	0.777
50.003	0.211	17.87	43.7	0.777
51.003	0.211	17.87	43.7	0.777
52.003	0.211	17.87	43.7	0.777
53.003	0.210	17.87	43.7	0.777
54.003	0.211	17.87	43.7	0.777
55.003	0.211	17.87	43.7	0.777
56.003	0.211	17.87	43.7	0.777
57.003	0.211	17.87	43.7	0.777
58.004	0.211	17.87	43.7	0.777
59.004	0.211	17.86	43.7	0.777
60.004	0.211	17.86	43.7	0.777
61.004	0.211	17.86	43.7	0.776
62.004	0.210	17.86	43.7	0.776
63.004	0.210	17.86	43.7	0.776
64.004	0.210	17.86	43.7	0.776
65.004	0.211	17.86	43.7	0.776
66.004	0.209	17.86	43.7	0.776
67.004	0.210	17.86	43.7	0.776
68.004	0.210	17.86	43.7	0.776
69.004	0.210	17.86	43.7	0.776
70.004	0.209	17.86	43.7	0.776
71.004	0.211	17.86	43.7	0.776
72.004	0.210	17.86	43.7	0.776
73.004	0.210	17.86	43.7	0.776
74.005	0.211	17.85	43.7	0.776
75.005	0.212	17.85	43.7	0.776
76.005	0.211	17.85	43.7	0.776
77.005	0.210	17.85	43.7	0.775
78.005	0.211	17.85	43.7	0.775
79.005	0.211	17.85	43.7	0.775
80.005	0.210	17.85	43.7	0.775
81.005	0.210	17.85	43.7	0.775
82.005	0.210	17.85	43.7	0.775
83.005	0.210	17.85	43.7	0.775
84.005	0.210	17.85	43.7	0.775
85.005	0.211	17.85	43.7	0.775
86.005	0.211	17.85	43.7	0.775
87.005	0.211	17.85	43.7	0.775
88.005	0.210	17.85	43.7	0.775
89.005	0.211	17.85	43.7	0.775
90.005	0.210	17.85	43.7	0.775
91.006	0.210	17.85	43.7	0.775
92.006	0.210	17.85	43.7	0.775
93.006	0.210	17.85	43.7	0.775
94.006	0.210	17.84	43.7	0.775
95.006	0.210	17.84	43.6	0.775
96.006	0.211	17.84	43.6	0.775
97.006	0.210	17.84	43.6	0.775
98.006	0.210	17.84	43.6	0.774
99.006	0.210	17.84	43.6	0.774
100.006	0.210	17.84	43.6	0.774
101.006	0.210	17.84	43.6	0.774
102.006	0.209	17.84	43.6	0.774
103.006	0.210	17.84	43.6	0.774
104.006	0.210	17.84	43.6	0.774
105.006	0.210	17.84	43.6	0.774
106.006	0.211	17.84	43.6	0.774
107.007	0.210	17.84	43.6	0.774
108.007	0.210	17.84	43.6	0.774
109.007	0.211	17.84	43.6	0.774
110.007	0.212	17.84	43.6	0.774
111.007	0.211	17.84	43.6	0.774
112.007	0.211	17.84	43.6	0.774
113.007	0.212	17.84	43.6	0.774
114.007	0.212	17.84	43.6	0.774
115.007	0.211	17.84	43.6	0.774
116.007	0.211	17.84	43.6	0.774
117.007	0.210	17.84	43.6	0.774
118.007	0.210	17.84	43.6	0.774
119.007	0.210	17.84	43.6	0.774
120.007	0.210	17.84	43.6	0.774
121.007	0.208	17.84	43.6	0.774
122.007	0.208	17.84	43.6	0.774
123.008	0.208	17.84	43.6	0.774
124.008	0.208	17.83	43.6	0.774
125.008	0.208	17.83	43.6	0.774
126.008	0.207	17.83	43.6	0.774
127.008	0.208	17.83	43.6	0.774
128.008	0.208	17.83	43.6	0.774
129.008	0.208	17.83	43.6	0.774
130.008	0.209	17.83	43.6	0.773
131.008	0.209	17.83	43.6	0.773
132.008	0.209	17.83	43.6	0.773
133.008	0.209	17.83	43.6	0.773
134.008	0.210	17.83	43.6	0.773

Note: Only a portion of this table appears here. The complete table is available in **ASCII**.

Table T10. Stress and porosity measurements from Sample 194-1198A-13H-3, 139–141 cm.

Time (s)	Effective vertical stress (MPa)	Sample height (mm)	Porosity (%)	Void ratio
0.000	0.119	16.85	38.2	0.617
1.000	0.194	16.80	37.9	0.612
2.000	0.205	16.76	37.8	0.608
3.000	0.208	16.74	37.7	0.606
4.000	0.209	16.72	37.7	0.604
5.000	0.210	16.71	37.6	0.603
6.000	0.208	16.70	37.6	0.602
7.000	0.208	16.69	37.5	0.601
8.000	0.210	16.68	37.5	0.600
9.001	0.211	16.67	37.5	0.599
10.001	0.210	16.66	37.4	0.598
11.001	0.209	16.65	37.4	0.598
12.001	0.210	16.64	37.4	0.597
13.001	0.210	16.64	37.4	0.596
14.001	0.210	16.63	37.3	0.596
15.001	0.211	16.63	37.3	0.595
16.001	0.210	16.62	37.3	0.595
17.001	0.209	16.62	37.3	0.594
18.001	0.209	16.61	37.3	0.594
19.001	0.210	16.61	37.2	0.593
20.001	0.210	16.60	37.2	0.593
21.001	0.209	16.60	37.2	0.593
22.001	0.210	16.60	37.2	0.592
23.001	0.211	16.59	37.2	0.592
24.001	0.211	16.59	37.2	0.592
25.002	0.210	16.59	37.2	0.591
26.002	0.210	16.58	37.2	0.591
27.002	0.210	16.58	37.1	0.591
28.002	0.211	16.58	37.1	0.591
29.002	0.212	16.58	37.1	0.590
30.002	0.212	16.57	37.1	0.590
31.002	0.210	16.57	37.1	0.590
32.002	0.208	16.57	37.1	0.590
33.002	0.210	16.57	37.1	0.590
34.002	0.212	16.57	37.1	0.589
35.002	0.210	16.56	37.1	0.589
36.002	0.209	16.56	37.1	0.589
37.002	0.211	16.56	37.1	0.589
38.002	0.212	16.56	37.1	0.589
39.002	0.211	16.56	37.1	0.589
40.002	0.211	16.56	37.0	0.588
41.003	0.212	16.56	37.0	0.588
42.003	0.212	16.55	37.0	0.588
43.003	0.213	16.55	37.0	0.588
44.003	0.215	16.55	37.0	0.588
45.003	0.214	16.55	37.0	0.588
46.003	0.213	16.55	37.0	0.588
47.003	0.215	16.55	37.0	0.587
48.003	0.216	16.54	37.0	0.587
49.003	0.215	16.54	37.0	0.587
50.003	0.214	16.54	37.0	0.587
51.003	0.214	16.54	37.0	0.587
52.003	0.214	16.54	37.0	0.587
53.003	0.212	16.54	37.0	0.587
54.003	0.212	16.54	37.0	0.587
55.003	0.213	16.54	37.0	0.587
56.003	0.212	16.54	37.0	0.587
57.003	0.212	16.54	37.0	0.587
58.004	0.212	16.54	37.0	0.586
59.004	0.212	16.53	37.0	0.586
60.004	0.212	16.53	37.0	0.586
61.004	0.212	16.53	37.0	0.586
62.004	0.214	16.53	37.0	0.586
63.004	0.213	16.53	36.9	0.586
64.004	0.213	16.53	36.9	0.586
65.004	0.213	16.53	36.9	0.586
66.004	0.214	16.53	36.9	0.586
67.004	0.213	16.53	36.9	0.586
68.004	0.212	16.53	36.9	0.586
69.004	0.212	16.53	36.9	0.586
70.004	0.212	16.53	36.9	0.586
71.004	0.213	16.53	36.9	0.586
72.004	0.213	16.53	36.9	0.585
73.004	0.213	16.52	36.9	0.585
74.005	0.212	16.52	36.9	0.585
75.005	0.212	16.52	36.9	0.585
76.005	0.213	16.52	36.9	0.585
77.005	0.214	16.52	36.9	0.585
78.005	0.212	16.52	36.9	0.585
79.005	0.211	16.52	36.9	0.585
80.005	0.213	16.52	36.9	0.585
81.005	0.214	16.52	36.9	0.585
82.005	0.212	16.52	36.9	0.585
83.005	0.210	16.52	36.9	0.585
84.005	0.211	16.52	36.9	0.585
85.005	0.211	16.52	36.9	0.585
86.004	0.211	16.52	36.9	0.585
87.004	0.211	16.52	36.9	0.585
88.004	0.210	16.52	36.9	0.585
89.004	0.209	16.52	36.9	0.585
90.003	0.211	16.52	36.9	0.585
91.003	0.212	16.52	36.9	0.585
92.003	0.210	16.52	36.9	0.585
93.003	0.209	16.52	36.9	0.585
94.002	0.210	16.52	36.9	0.585
95.002	0.212	16.52	36.9	0.585
96.002	0.210	16.52	36.9	0.585
97.002	0.210	16.52	36.9	0.585
98.001	0.210	16.52	36.9	0.585
99.001	0.210	16.52	36.9	0.585
100.001	0.210	16.52	36.9	0.584
101.001	0.210	16.51	36.9	0.584
102.000	0.210	16.51	36.9	0.584
103.000	0.210	16.51	36.9	0.584
104.000	0.210	16.51	36.9	0.584
105.000	0.210	16.51	36.9	0.584
105.999	0.210	16.51	36.9	0.584
106.999	0.209	16.51	36.9	0.584
107.999	0.210	16.51	36.9	0.584
108.999	0.211	16.51	36.9	0.584
109.998	0.210	16.51	36.9	0.584
110.998	0.209	16.51	36.9	0.584
111.998	0.210	16.51	36.9	0.584
112.998	0.211	16.51	36.9	0.584
113.997	0.210	16.51	36.9	0.584
114.997	0.208	16.51	36.9	0.584
115.997	0.208	16.51	36.9	0.584
116.997	0.210	16.51	36.9	0.584
117.997	0.210	16.51	36.9	0.584
118.996	0.209	16.51	36.9	0.584
119.996	0.209	16.51	36.9	0.584
120.996	0.208	16.51	36.9	0.584
121.996	0.209	16.51	36.9	0.584
122.995	0.210	16.51	36.9	0.584
123.995	0.210	16.51	36.9	0.584
124.995	0.208	16.51	36.9	0.584
125.995	0.208	16.51	36.9	0.584
126.994	0.210	16.51	36.9	0.584
127.994	0.210	16.51	36.9	0.584
128.994	0.209	16.51	36.9	0.584
129.994	0.208	16.51	36.9	0.584
130.993	0.210	16.51	36.9	0.584
131.993	0.210	16.51	36.9	0.584
132.993	0.209	16.51	36.9	0.584
133.993	0.209	16.51	36.9	0.584

Note: Only a portion of this table appears here. The complete table is available in **ASCII**.

Table T11. Stress and porosity measurements from Sample 194-1198A-15H-3, 135–137 cm.

Time (s)	Effective vertical stress (MPa)	Sample height (mm)	Porosity (%)	Void ratio
0.000	0.149	17.56	37.8	0.608
1.000	0.228	17.52	37.7	0.604
2.000	0.239	17.48	37.5	0.601
3.000	0.243	17.46	37.5	0.599
4.000	0.244	17.45	37.4	0.598
5.000	0.244	17.44	37.4	0.597
6.000	0.243	17.43	37.3	0.596
7.000	0.243	17.42	37.3	0.595
8.000	0.244	17.42	37.3	0.594
9.000	0.246	17.41	37.3	0.594
10.000	0.245	17.40	37.2	0.593
11.000	0.246	17.40	37.2	0.593
12.000	0.246	17.39	37.2	0.592
13.000	0.245	17.39	37.2	0.592
14.000	0.247	17.38	37.2	0.591
15.000	0.245	17.38	37.1	0.591
16.000	0.243	17.37	37.1	0.591
17.000	0.243	17.37	37.1	0.590
18.000	0.242	17.37	37.1	0.590
19.000	0.244	17.36	37.1	0.590
20.000	0.243	17.36	37.1	0.589
21.000	0.245	17.36	37.1	0.589
22.000	0.243	17.35	37.1	0.589
23.000	0.244	17.35	37.0	0.588
24.000	0.246	17.35	37.0	0.588
25.000	0.247	17.34	37.0	0.588
26.000	0.247	17.34	37.0	0.588
27.000	0.245	17.34	37.0	0.587
28.000	0.245	17.34	37.0	0.587
29.000	0.245	17.33	37.0	0.587
30.000	0.245	17.33	37.0	0.587
31.000	0.246	17.33	37.0	0.587
32.000	0.246	17.33	37.0	0.586
33.000	0.246	17.33	37.0	0.586
34.000	0.246	17.32	37.0	0.586
35.000	0.247	17.32	36.9	0.586
36.000	0.247	17.32	36.9	0.586
37.000	0.247	17.32	36.9	0.586
38.000	0.248	17.32	36.9	0.585
39.000	0.245	17.32	36.9	0.585
40.000	0.247	17.31	36.9	0.585
41.000	0.245	17.31	36.9	0.585
42.001	0.247	17.31	36.9	0.585
43.001	0.246	17.31	36.9	0.585
44.001	0.245	17.31	36.9	0.585
45.001	0.247	17.31	36.9	0.585
46.001	0.246	17.31	36.9	0.584
47.001	0.247	17.30	36.9	0.584
48.001	0.247	17.30	36.9	0.584
49.001	0.247	17.30	36.9	0.584
50.001	0.247	17.30	36.9	0.584
51.001	0.246	17.30	36.9	0.584
52.001	0.249	17.30	36.9	0.584
53.001	0.247	17.30	36.9	0.584
54.001	0.248	17.30	36.8	0.584
55.001	0.249	17.29	36.8	0.583
56.001	0.249	17.29	36.8	0.583
57.001	0.249	17.29	36.8	0.583
58.002	0.248	17.29	36.8	0.583
59.002	0.250	17.29	36.8	0.583
60.002	0.248	17.29	36.8	0.583
61.002	0.248	17.29	36.8	0.583
62.002	0.248	17.29	36.8	0.583
63.002	0.248	17.29	36.8	0.583
64.002	0.248	17.29	36.8	0.583
65.002	0.247	17.29	36.8	0.583
66.002	0.249	17.29	36.8	0.583
67.002	0.246	17.29	36.8	0.583
68.002	0.247	17.29	36.8	0.583
69.002	0.247	17.28	36.8	0.582
70.002	0.245	17.28	36.8	0.582
71.002	0.246	17.28	36.8	0.582
72.002	0.244	17.28	36.8	0.582
73.002	0.247	17.28	36.8	0.582
74.002	0.245	17.28	36.8	0.582
75.003	0.245	17.28	36.8	0.582
76.003	0.246	17.28	36.8	0.582
77.003	0.245	17.28	36.8	0.582
78.003	0.246	17.28	36.8	0.582
79.003	0.245	17.28	36.8	0.582
80.003	0.246	17.28	36.8	0.582
81.003	0.245	17.28	36.8	0.582
82.003	0.245	17.28	36.8	0.582
83.003	0.246	17.28	36.8	0.582
84.003	0.246	17.28	36.8	0.582
85.003	0.247	17.28	36.8	0.582
86.003	0.246	17.28	36.8	0.582
87.003	0.247	17.28	36.8	0.582
88.003	0.247	17.28	36.8	0.582
89.003	0.246	17.28	36.8	0.582
90.003	0.247	17.28	36.8	0.582
91.004	0.247	17.27	36.8	0.582
92.004	0.247	17.27	36.8	0.582
93.004	0.247	17.27	36.8	0.581
94.004	0.248	17.27	36.8	0.581
95.004	0.247	17.27	36.8	0.581
96.004	0.246	17.27	36.8	0.581
97.004	0.247	17.27	36.8	0.581
98.004	0.246	17.27	36.8	0.581
99.004	0.245	17.27	36.8	0.581
100.004	0.245	17.27	36.8	0.581
101.004	0.245	17.27	36.8	0.581
102.004	0.246	17.27	36.8	0.581
103.004	0.243	17.27	36.8	0.581
104.004	0.245	17.27	36.8	0.581
105.004	0.244	17.27	36.8	0.581
106.004	0.245	17.27	36.8	0.581
107.004	0.245	17.27	36.8	0.581
108.005	0.245	17.27	36.8	0.581
109.005	0.246	17.27	36.8	0.581
110.005	0.244	17.27	36.7	0.581
111.005	0.246	17.27	36.7	0.581
112.005	0.245	17.27	36.7	0.581
113.005	0.245	17.27	36.7	0.581
114.005	0.246	17.27	36.7	0.581
115.005	0.245	17.27	36.7	0.581
116.005	0.246	17.27	36.7	0.581
117.005	0.245	17.27	36.7	0.581
118.005	0.246	17.27	36.7	0.581
119.005	0.246	17.27	36.7	0.581
120.005	0.245	17.27	36.7	0.581
121.005	0.246	17.27	36.7	0.581
122.005	0.245	17.27	36.7	0.581
123.005	0.246	17.27	36.7	0.581
124.006	0.245	17.27	36.7	0.581
125.006	0.245	17.27	36.7	0.581
126.006	0.245	17.27	36.7	0.581
127.006	0.244	17.27	36.7	0.581
128.006	0.245	17.26	36.7	0.581
129.006	0.244	17.26	36.7	0.581
130.006	0.245	17.26	36.7	0.581
131.006	0.244	17.26	36.7	0.581
132.006	0.243	17.26	36.7	0.581
133.006	0.244	17.26	36.7	0.581
134.006	0.242	17.26	36.7	0.581

Note: Only a portion of this table appears here. The complete table is available in **ASCII**.

Table T12. Stress and porosity measurements from Sample 194-1198A-18H-3, 135–137 cm.

Time (s)	Effective vertical stress (MPa)	Sample height (mm)	Porosity (%)	Void ratio
0.000	0.212	17.58	37.9	0.609
10.000	0.212	17.57	37.8	0.609
20.000	0.286	17.56	37.8	0.607
26.400	0.305	17.54	37.7	0.606
27.400	0.306	17.54	37.7	0.606
28.399	0.307	17.54	37.7	0.606
29.399	0.308	17.54	37.7	0.606
30.399	0.309	17.54	37.7	0.606
31.399	0.311	17.54	37.7	0.605
32.398	0.312	17.53	37.7	0.605
33.398	0.311	17.53	37.7	0.605
34.398	0.313	17.53	37.7	0.605
35.398	0.312	17.53	37.7	0.605
36.397	0.313	17.53	37.7	0.605
37.397	0.314	17.53	37.7	0.605
38.397	0.313	17.53	37.7	0.605
39.397	0.315	17.52	37.7	0.604
40.396	0.314	17.52	37.7	0.604
41.396	0.314	17.52	37.7	0.604
42.396	0.314	17.52	37.7	0.604
43.396	0.314	17.52	37.7	0.604
44.396	0.316	17.52	37.7	0.604
45.395	0.315	17.52	37.6	0.604
46.395	0.317	17.52	37.6	0.604
47.395	0.316	17.52	37.6	0.604
48.395	0.316	17.51	37.6	0.604
49.394	0.317	17.51	37.6	0.603
50.394	0.316	17.51	37.6	0.603
51.394	0.317	17.51	37.6	0.603
52.394	0.316	17.51	37.6	0.603
53.393	0.317	17.51	37.6	0.603
54.393	0.318	17.51	37.6	0.603
55.393	0.317	17.51	37.6	0.603
56.393	0.318	17.51	37.6	0.603
57.392	0.316	17.51	37.6	0.603
58.392	0.318	17.51	37.6	0.603
59.392	0.317	17.50	37.6	0.603
60.392	0.317	17.50	37.6	0.603
61.391	0.317	17.50	37.6	0.602
62.391	0.317	17.50	37.6	0.602
63.391	0.318	17.50	37.6	0.602
64.391	0.318	17.50	37.6	0.602
65.390	0.318	17.50	37.6	0.602
66.390	0.318	17.50	37.6	0.602
67.390	0.317	17.50	37.6	0.602
68.390	0.318	17.50	37.6	0.602
69.389	0.318	17.50	37.6	0.602
70.389	0.319	17.50	37.6	0.602
71.389	0.318	17.50	37.6	0.602
72.389	0.319	17.49	37.6	0.602
73.388	0.318	17.49	37.6	0.602
74.388	0.318	17.49	37.6	0.602
75.388	0.318	17.49	37.6	0.602
76.388	0.317	17.49	37.6	0.601
77.387	0.319	17.49	37.6	0.601
78.387	0.318	17.49	37.6	0.601
79.387	0.320	17.49	37.6	0.601
80.387	0.319	17.49	37.5	0.601
81.386	0.320	17.49	37.5	0.601
82.386	0.320	17.49	37.5	0.601
83.386	0.319	17.49	37.5	0.601
84.386	0.320	17.49	37.5	0.601
85.385	0.318	17.49	37.5	0.601
86.385	0.320	17.49	37.5	0.601
87.385	0.320	17.49	37.5	0.601
88.385	0.319	17.49	37.5	0.601
89.385	0.319	17.48	37.5	0.601
90.384	0.318	17.48	37.5	0.601
91.384	0.318	17.48	37.5	0.601
92.384	0.317	17.48	37.5	0.601
93.384	0.318	17.48	37.5	0.601
94.383	0.319	17.48	37.5	0.601
95.383	0.318	17.48	37.5	0.601
96.383	0.319	17.48	37.5	0.600
97.383	0.316	17.48	37.5	0.600
98.382	0.317	17.48	37.5	0.600
99.382	0.319	17.48	37.5	0.600
100.382	0.319	17.48	37.5	0.600
101.382	0.321	17.48	37.5	0.600
102.381	0.320	17.48	37.5	0.600
103.381	0.320	17.48	37.5	0.600
104.381	0.317	17.48	37.5	0.600
105.381	0.316	17.48	37.5	0.600
106.380	0.315	17.48	37.5	0.600
107.380	0.312	17.48	37.5	0.600
108.380	0.314	17.48	37.5	0.600
109.380	0.313	17.48	37.5	0.600
110.379	0.314	17.48	37.5	0.600
111.379	0.313	17.48	37.5	0.600
112.379	0.313	17.48	37.5	0.600
113.379	0.313	17.47	37.5	0.600
114.378	0.312	17.47	37.5	0.600
115.378	0.313	17.47	37.5	0.600
116.378	0.312	17.47	37.5	0.600
117.378	0.313	17.47	37.5	0.600
118.377	0.313	17.47	37.5	0.600
119.377	0.313	17.47	37.5	0.600
120.377	0.313	17.47	37.5	0.600
121.377	0.312	17.47	37.5	0.600
122.376	0.312	17.47	37.5	0.600
123.376	0.312	17.47	37.5	0.600
124.376	0.313	17.47	37.5	0.600
125.376	0.313	17.47	37.5	0.600
126.375	0.314	17.47	37.5	0.599
127.375	0.314	17.47	37.5	0.599
128.375	0.312	17.47	37.5	0.599
129.375	0.314	17.47	37.5	0.599
130.375	0.312	17.47	37.5	0.599
131.374	0.313	17.47	37.5	0.599
132.374	0.312	17.47	37.5	0.599
133.374	0.312	17.47	37.5	0.599
134.374	0.314	17.47	37.5	0.599
135.373	0.312	17.47	37.5	0.599
136.373	0.314	17.47	37.5	0.599
137.373	0.312	17.47	37.5	0.599
138.373	0.312	17.47	37.5	0.599
139.372	0.313	17.47	37.5	0.599
140.372	0.312	17.47	37.5	0.599
141.372	0.314	17.47	37.5	0.599
142.372	0.313	17.47	37.5	0.599
143.371	0.314	17.47	37.5	0.599
144.371	0.313	17.47	37.5	0.599
145.371	0.312	17.47	37.5	0.599
146.371	0.314	17.47	37.5	0.599
147.370	0.312	17.46	37.5	0.599
148.370	0.314	17.46	37.5	0.599
149.370	0.314	17.46	37.5	0.599
150.370	0.315	17.46	37.5	0.599
151.369	0.315	17.46	37.5	0.599
152.369	0.314	17.46	37.5	0.599
153.369	0.315	17.46	37.5	0.599
154.369	0.314	17.46	37.5	0.599
155.368	0.316	17.46	37.5	0.599
156.368	0.316	17.46	37.5	0.599
157.368	0.315	17.46	37.5	0.599

Note: Only a portion of this table appears here. The complete table is available in **ASCII**.

Table T13. Stress and porosity measurements from Sample 194-1198A-21H-3, 140–142 cm.

Time (s)	Effective vertical stress (MPa)	Sample height (mm)	Porosity (%)	Void ratio
0.000	0.126	17.65	45.3	0.830
1.000	0.196	17.60	45.2	0.824
2.000	0.215	17.55	45.0	0.819
3.000	0.219	17.53	45.0	0.817
4.000	0.219	17.51	44.9	0.816
5.000	0.221	17.50	44.9	0.814
6.000	0.218	17.49	44.9	0.813
7.000	0.221	17.48	44.8	0.812
8.000	0.221	17.47	44.8	0.812
9.001	0.221	17.47	44.8	0.811
10.001	0.221	17.46	44.7	0.810
11.001	0.220	17.45	44.7	0.809
12.001	0.219	17.45	44.7	0.809
13.001	0.221	17.44	44.7	0.808
14.001	0.221	17.43	44.7	0.807
15.001	0.223	17.43	44.6	0.807
16.001	0.220	17.42	44.6	0.806
17.001	0.221	17.42	44.6	0.806
18.001	0.220	17.41	44.6	0.805
19.001	0.222	17.41	44.6	0.805
20.001	0.222	17.40	44.6	0.804
21.001	0.222	17.40	44.6	0.804
22.001	0.221	17.40	44.5	0.803
23.001	0.222	17.39	44.5	0.803
24.001	0.221	17.39	44.5	0.803
25.002	0.222	17.38	44.5	0.802
26.002	0.222	17.38	44.5	0.802
27.002	0.223	17.38	44.5	0.802
28.002	0.221	17.37	44.5	0.801
29.002	0.223	17.37	44.5	0.801
30.002	0.223	17.37	44.5	0.801
31.002	0.224	17.37	44.5	0.800
32.002	0.222	17.36	44.4	0.800
33.002	0.222	17.36	44.4	0.800
34.002	0.220	17.36	44.4	0.800
35.002	0.219	17.36	44.4	0.799
36.002	0.219	17.35	44.4	0.799
37.002	0.220	17.35	44.4	0.799
38.002	0.220	17.35	44.4	0.799
39.002	0.221	17.35	44.4	0.798
40.002	0.222	17.34	44.4	0.798
41.003	0.223	17.34	44.4	0.798
42.003	0.223	17.34	44.4	0.798
43.003	0.223	17.34	44.4	0.797
44.003	0.222	17.34	44.4	0.797
45.003	0.221	17.33	44.4	0.797
46.003	0.222	17.33	44.3	0.797
47.003	0.221	17.33	44.3	0.797
48.003	0.222	17.33	44.3	0.796
49.003	0.221	17.33	44.3	0.796
50.003	0.222	17.33	44.3	0.796
51.003	0.223	17.32	44.3	0.796
52.003	0.224	17.32	44.3	0.796
53.003	0.223	17.32	44.3	0.796
54.003	0.223	17.32	44.3	0.795
55.003	0.222	17.32	44.3	0.795
56.003	0.222	17.32	44.3	0.795
57.003	0.221	17.31	44.3	0.795
58.004	0.222	17.31	44.3	0.795
59.004	0.221	17.31	44.3	0.795
60.004	0.223	17.31	44.3	0.795
61.004	0.223	17.31	44.3	0.794
62.004	0.224	17.31	44.3	0.794
63.004	0.223	17.31	44.3	0.794
64.004	0.223	17.31	44.3	0.794
65.004	0.221	17.31	44.3	0.794
66.004	0.222	17.30	44.3	0.794
67.004	0.220	17.30	44.3	0.794
68.004	0.220	17.30	44.3	0.794
69.004	0.219	17.30	44.2	0.794
70.004	0.219	17.30	44.2	0.794
71.004	0.218	17.30	44.2	0.793
72.004	0.219	17.30	44.2	0.793
73.004	0.217	17.30	44.2	0.793
74.005	0.218	17.30	44.2	0.793
75.005	0.217	17.30	44.2	0.793
76.005	0.217	17.30	44.2	0.793
77.005	0.215	17.30	44.2	0.793
78.005	0.216	17.30	44.2	0.793
79.005	0.216	17.30	44.2	0.793
80.005	0.217	17.29	44.2	0.793
81.005	0.216	17.29	44.2	0.793
82.005	0.216	17.29	44.2	0.793
83.005	0.215	17.29	44.2	0.793
84.005	0.216	17.29	44.2	0.793
85.005	0.215	17.29	44.2	0.793
86.005	0.217	17.29	44.2	0.793
87.005	0.215	17.29	44.2	0.792
88.005	0.216	17.29	44.2	0.792
89.005	0.215	17.29	44.2	0.792
90.005	0.215	17.29	44.2	0.792
91.006	0.214	17.29	44.2	0.792
92.006	0.214	17.29	44.2	0.792
93.006	0.214	17.29	44.2	0.792
94.006	0.214	17.29	44.2	0.792
95.006	0.214	17.29	44.2	0.792
96.006	0.215	17.29	44.2	0.792
97.006	0.215	17.29	44.2	0.792
98.006	0.215	17.28	44.2	0.792
99.006	0.217	17.28	44.2	0.792
100.006	0.216	17.28	44.2	0.792
101.006	0.217	17.28	44.2	0.792
102.006	0.214	17.28	44.2	0.792
103.006	0.213	17.28	44.2	0.792
104.006	0.211	17.28	44.2	0.792
105.006	0.211	17.28	44.2	0.792
106.006	0.210	17.28	44.2	0.792
107.007	0.211	17.28	44.2	0.792
108.007	0.210	17.28	44.2	0.792
109.007	0.212	17.28	44.2	0.792
110.007	0.211	17.28	44.2	0.791
111.007	0.213	17.28	44.2	0.791
112.007	0.212	17.28	44.2	0.791
113.007	0.212	17.28	44.2	0.791
114.007	0.210	17.28	44.2	0.791
115.007	0.211	17.28	44.2	0.791
116.007	0.210	17.28	44.2	0.791
117.007	0.211	17.28	44.2	0.791
118.007	0.211	17.28	44.2	0.791
119.007	0.212	17.28	44.2	0.791
120.007	0.212	17.28	44.2	0.791
121.007	0.214	17.28	44.2	0.791
122.007	0.213	17.28	44.2	0.791
123.007	0.214	17.28	44.2	0.791
124.008	0.214	17.28	44.2	0.791
125.008	0.213	17.28	44.2	0.791
126.008	0.212	17.28	44.2	0.791
127.008	0.213	17.28	44.2	0.791
128.008	0.212	17.28	44.2	0.791
129.008	0.212	17.27	44.2	0.791
130.008	0.212	17.27	44.2	0.791
131.008	0.213	17.27	44.2	0.791
132.008	0.214	17.27	44.2	0.791
133.008	0.214	17.27	44.2	0.791
134.008	0.214	17.27	44.2	0.791

Note: Only a portion of this table appears here. The complete table is available in **ASCII**.