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REPORT

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Title:
Results of analytical tests on FFI 2004 sediment cores

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Summary:
Nine gravity cores collected by FFI in the summer of 2004 have been profiled with the X-ray inspection system (XRI) and logged for P-wave velocity, bulk density and magnetic susceptibility using multi-sensor core logger (MSCL). Sediment cores were opened after these non-destructive analyses, sedimentologically described and undrained shear strength was measured on selected intervals. The cores were also subsampled for determining water content, wet density, dry density and grain-size characteristics.

Keywords: Marine geology	Seabed sediments	Sedimentology
Grain size	Sediment density	Geotechnical properties
Physical properties		

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1 INTRODUCTION AND MATERIALS

This report presents results of analytical tests undertaken on 9 sediment cores collected by FFI. The objective of these analyses is to provide sedimentologic characteristics and sediment physical properties criteria, which can potentially be related and/or correlated with the acoustic parameters of sediments.

2 METHODS AND RESULTS

The laboratory procedures with the sediment cores involved (i) stratigraphic profiling with an X-ray inspection system, (ii) stratigraphic profiling for P-wave velocity, sediment bulk density and magnetic susceptibility using a multi sensor core logger (MSCL), (iii) lithostratigraphic description, (iv) grain-size analysis, (v) determination of geotechnical and physical properties of sediments. Descriptions of methods/procedures are given below. Figures 1-9 in Appendix 1 show compilations of all obtained results and illustrate the down-core variations of studied parameters. All tests were carried out at NGU except the MSCL logging that was undertaken at the University of Bergen.

2.1 X-ray inspection system (XRI)

The images of the XRI system reflect variable X-ray absorption (transparency) of different sediment components. The XRI system consists of an X-ray tube and an image intensifier that converts invisible X-rays into visible light. A CCD camera is used to capture the visible image. The size of an XRI image depends upon specific settings, typically covering 10-15 cm long sediment intervals. The sediment core is placed between the X-ray tube and the image intensifier; different core sections can be inspected by sliding the assembled X-ray tube and image intensifier along the core. X-ray transparency of a sediment is strongly influenced by the grain-size and the images are generally lighter for the fine-grained sediments and darker for coarse-grained sediments. XRI is a handy, non-destructive method to study the texture and structure of sediments, to characterize the distribution of gas pockets, shells, wood fragments and clasts, and to interpret the disturbances caused by bioturbation, gas escape or shear. The possibility to rotate the core simultaneously with imaging facilitates detailed geometric analyses of specific structural features.

In Appendix 1, the XRI documentation is given as sequences of digital images where each individual image corresponds to ca. 13 cm sediment intervals. The scale at the side of the images shows the depth in centimetres from the sediment surface or from the core section top in case of multiple sections. Individual images from all cores have been montaged to provide a complete XRI sequence.

2.2 Multi sensor core logger (MSCL)

The GEOTEK manufactured Multi Sensor Core Logger (MSCL) at the University of Bergen was used to study physical properties of sediments by means of gamma-ray density, P-wave velocity and magnetic susceptibility. The MSCL consists of a conveyor system, a central unit assembly including three sensors, a microprocessor and a computer. The conveyor system has two track sections, mounted and aligned on either side of the central unit, and a belt driven pusher block which is driven in either direction by a stepper motor and gear box assembly. The central unit assembly incorporates a compressional wave (P-Wave) logger, a gamma ray attenuation logger and a magnetic susceptibility loop. Automation is achieved through the use of an internal processor, interfaced with the rack-mounted computer that controls the entire running process and stores data.

Up to 140 cm long core sections are placed on the right hand track with the top located at the reference position. A conveyor system automatically pushes each core section through the sensor array (incrementally past gamma ray attenuation logger, the p-wave logger and through the magnetic susceptibility coil) with measurements being taken at spatial increments as defined by the user; 1 cm step-sizes were used in this study. The computer controlling the conveyor also controls the sensors, so that all data are automatically correlated. Adjacent core sections are loaded on to the conveyor by the user when prompted by the software commands. In this way a complete core can be logged in a continuous process while the raw and processed data are displayed graphically in real time on the monitor. Complete control of the graphic display is provided, both in terms of the presentation and processing protocols. Both raw and processed data are saved in formats suitable for exporting to other software environments for further data manipulation or data presentation.

2.2.1 Gamma ray density

Density is determined by measuring the attenuation of gamma rays through the cores. The gamma ray attenuation unit comprises a 10 millicurie Cesium-137 capsule (housed in a 150 mm diameter primary lead shield) with both 2.5 and a 5.0 mm collimators and a sodium iodide scintillation detector (housed in a 150 mm diameter collimated lead shielding to minimize any background radiation). A density resolution of better than 1% depending upon counting time used and core condition is normally achieved. The source and detector are mounted diametrically across the diameter of the core.

A narrow (pencil size) beam of gamma rays with energies principally at 0.662 MeV is emitted from the Cesium -137 source and passes through the diameter of the sediment core. At these energy levels Compton scattering is the primary mechanism for the attenuation of the gamma rays in most sedimentary material. The incident photons are scattered by collision with electrons encountered in the core and there is a partial energy loss. This attenuated gamma beam is measured by the Sodium Iodide detector. The Compton scattering of the photons is directly related to the number of electrons in the path of the gamma ray beam. The bulk density of the sediment is calculated by comparing the attenuation of gamma rays through the sediment core to the attenuation of the gamma rays through a standard of aluminium density calibration billet, mounted into the liner of exactly the same type as the sediment core.

However, the plastic liner used to obtain the studied sediment cores had unusually small diameter to fit any of calibrations billets supplied by the MSCL manufacturer. In order to be able to run the calibration this particular liner, a special aluminium billet was designed.

2.2.2 Magnetic susceptibility

The magnetic susceptibility Bartington loop (150 mm) sensor (MS2B) is used in the MSCL system. A low intensity non-saturating alternating magnetic field is produced by an oscillator circuit in the sensor loop. Changes in the oscillator frequency caused by the sediment in the sensor loop are measured and converted into volume specific magnetic susceptibility values (SI units). The magnitude of the magnetic susceptibility values is dependent on the type of sediment, content of magnetic minerals and the volume of sediment within the coil. Identical cores of varying diameters will give different magnetic susceptibility values but will show the same down core profile. The calibration of the magnetic susceptibility loop, performed using a standard of known magnetic susceptibility, gives 5% calibration accuracy.

Density and magnetic susceptibility profiles shown in Appendix 1 display a general correspondence of these two parameters. However, density signal is obtained from thinner (< 1 cm) sediment interval compared to magnetic susceptibility (4-6 cm thick interval) hence the density logs have proven to be more specific and useful defining stratigraphic boundaries.

2.2.3 P-Wave velocity

The P-Wave logger system consists of two rolling compressional wave transducers (PWT), with soft couplings and a centre frequency around 220 kHz. These PWT's are spring-located on either side of the core to generate and detect short ultrasonic pulses. A short 220 kHz compressional wave pulse is produced at the transmitting transducer at a repetition rate of 1 kHz. This wave pulse travels through the core and is detected by the receiving transducer and the time of flight of the wave pulse is measured. Timing measurements have an accuracy of 50 ns providing velocity accuracy of about 0.2%, depending on core thickness and condition. Calibration can be achieved using a length of core line filled with distilled water of known temperature and velocity. The p-wave travel time is corrected for the P-wave travel time delay caused by the core liner and the electronics of the system.

P-wave velocity logs given in Appendix 1 show that most of the velocity values cluster around ca. 1600 m/s, consistent with the expected values for clayey-silty sediments. However, some parts of cores, most frequently the upper portions, show occasionally scattered profiles and sequences with low values. These abrupt jumps on P-wave velocity profiles are evidently not controlled by changes in the sediment character, but most probably reflect bad contact and/or open, air-filled spaces in the sediment liner (air-filled spaces were often observed in between liner wall and core sample) that blunder the measurement.

2.3 Lithostratigraphic description

Lithostratigraphic description given in Appendix 1 was undertaken on split cores that were obtained by cutting through the liner plastic lengthwise and pulling a steel wire through the sediment. The stratigraphic logging focused upon sedimentary structures and texture.

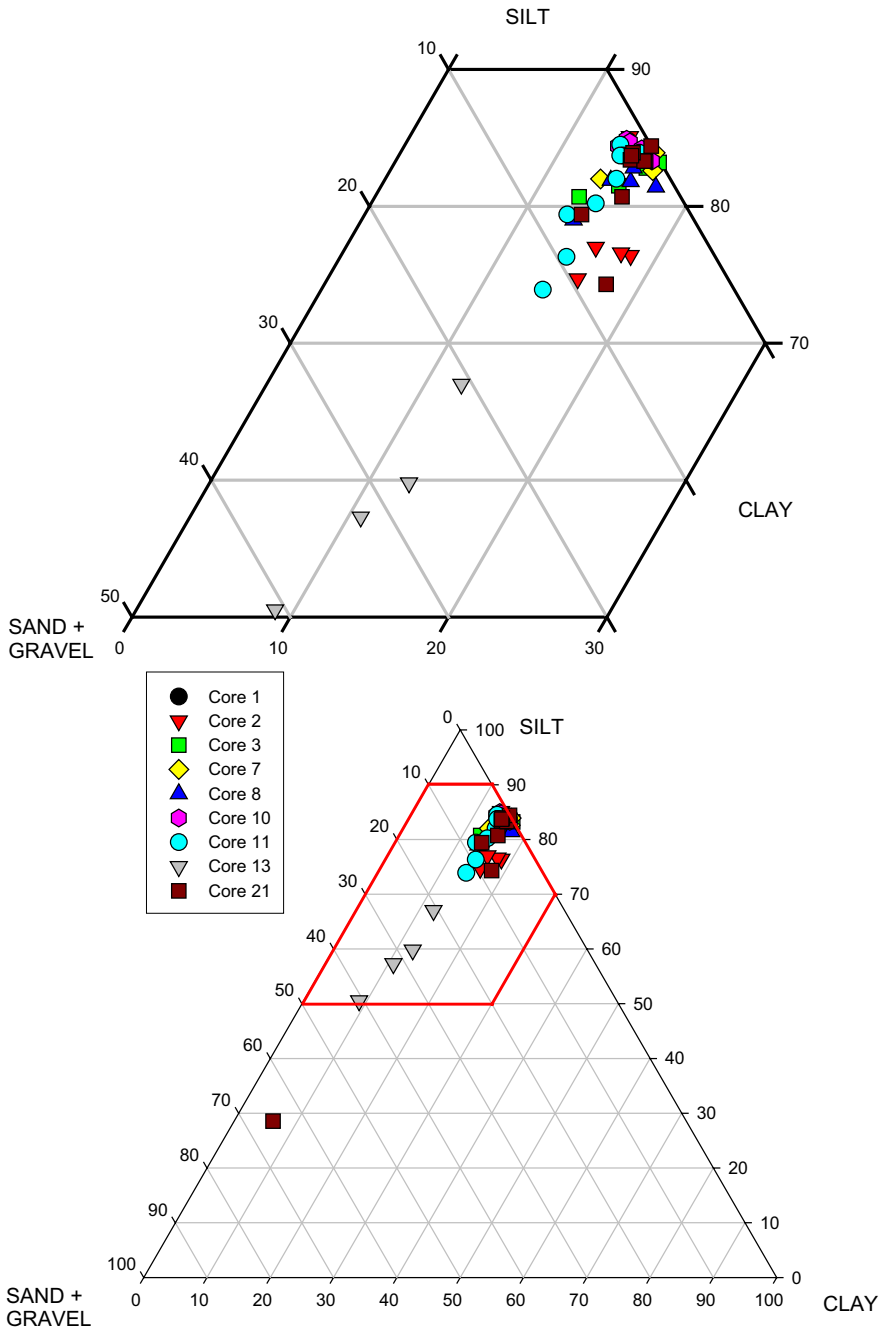


Fig. 1. Ternary plot of all grain size analyses. Upper diagram is a close-up of the plot area with the majority of data points (area within red polygon).

2.4 Grain-size analyses

For grain size analyses ca. 2 cm thick sediment slices were typically obtained from the following sediment depths depending upon the core length; 10, 25, 50, 75 100, 125, 150, 175, 200 and 225 cm. Up to 5 cm deviations from this sampling scheme were occasionally allowed if the desired sampling interval overlapped with the stratigraphic boundary. Altogether 59 samples were analysed using sieving for fractions coarser than 2 mm and Coulter LS 200 laser diffraction technique for fractions finer than 2 mm. Samples were oxidised with H_2O_2 to remove organic matter prior to analyses. The sample suspensions used in Coulter LS 200 were dispersed in ultrasonic bath.

Figure 1 shows the distribution of all grain size results on the ternary plot of clay (<2 μm), silt (2-63 μm) and sand-gravel (>63 μm). Stratigraphic variations of median grain size are given in Appendix 1. Complete sets of obtained grain size characteristics are found in Appendix 2.

2.5 Determination of geotechnical and physical properties of sediments

The sampling scheme (10 cm, 25 cm, 50 cm etc.) deployed for grain size analyses was also used to study the geotechnical and physical properties of sediments and the down-core trends of these parameters.

2.5.1 Undrained shear strength

The Falling Cone apparatus was used to measure sediment shear strength. The split core was placed underneath the cone holder with the tip of the cone touching the sample. The penetration depth of the cone into the sediment after releasing the cone is proportional to the undrained shear strength. Note that the values of undrained shear stress may bear a systematic error due to compaction and dewatering during transport and storage prior to analyses.

2.5.2 Water content, wet density and dry density

These parameters were determined with the aid of a thin-wall steel cylinder with known volume and weight. This cylinder was inserted into the sediment and known volumes of wet, undisturbed sediments were subsampled. Weights of wet and dry (drying at 105 ºC for 24 hours) subsamples, combined with the known volume, allowed calculating water content, wet density and dry density according to the following formulas:

Water content = Weight of pore water / Weight of dry sediment

Wet density = Weight of wet sample / Volume of wet sample

Dry density = Weight of dry sample / Volume of wet sample

APPENDIX 1

Stratigraphic profiles of X-ray images (XRI), P-wave velocity, bulk density, magnetic susceptibility, water content, wet density, dry density, undrained shear strength, and median grain size

CORE 1

Lithology

0-0.04 m
silty sand, with
shell fragnets

0.04-1.07 m
homogeneous,
bioturbated
clayey silt,
random gravel,
cm-scale clasts at
0.2, 0.47, 0.52 and
0.58 m; sediments
at the bottom of
the core (ca. 0.15
m) appear
deformed

depth (m)

0,0
0,5
1,0
1,5
2,0

XRI

PW velocity (m/s)
(MSCL)
1200 1600 2000

Density (g/cm^3)
(MSCL)
1,0 1,4 1,8 2,2

Magnetic susceptibility
(MSCL)
0 10 20

Water content (%)
(weight of pore water / weight of dry sediment)
0 25 50 75 100
80,34
91,75
82,24
80,37
83,11

Wet density (g/cm^3)
(weight of wet sample / volume of wet sample)
1,5 2,0 2,5
1,65
1,66
1,67
1,65
1,69

Dry density (g/cm^3)
(weight of dry sample / volume of wet sample)
0,5 1,0 1,5 2,0
0,91
0,87
0,92
0,92
0,92

Undrained shear strength (KPa)
(falling cone)
5 10 15 20
3,50
3,80
3,90
4,90

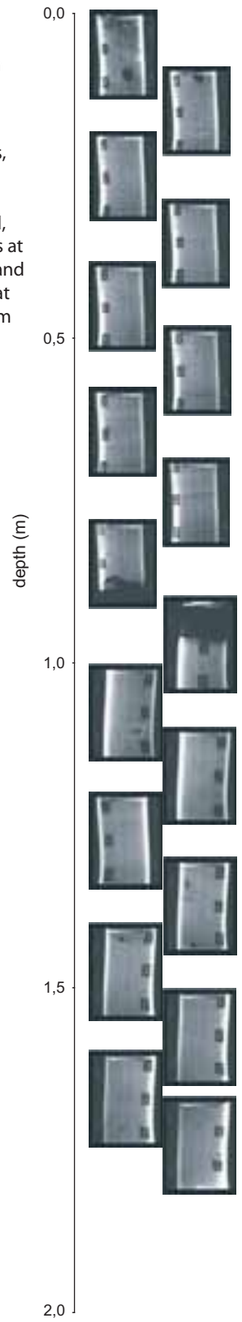
Median grain-size (μm)
(Coulter counter)
0 25 50
5,79
5,00
5,43
4,90
4,98

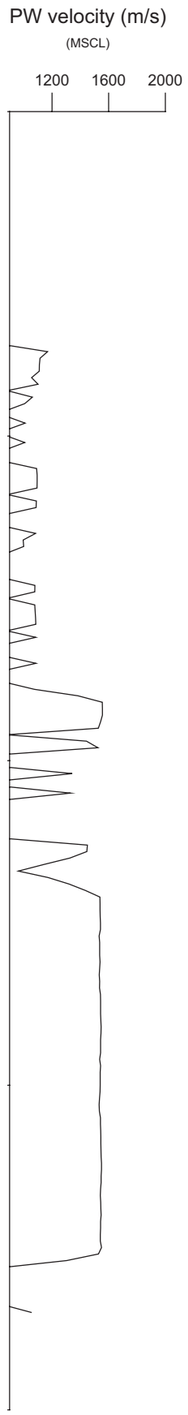
CORE 2

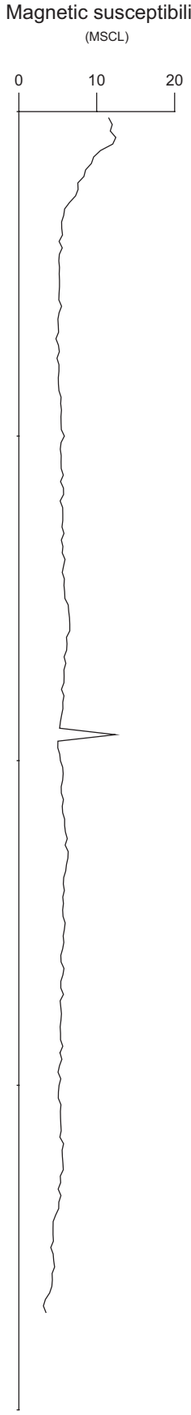
Lithology

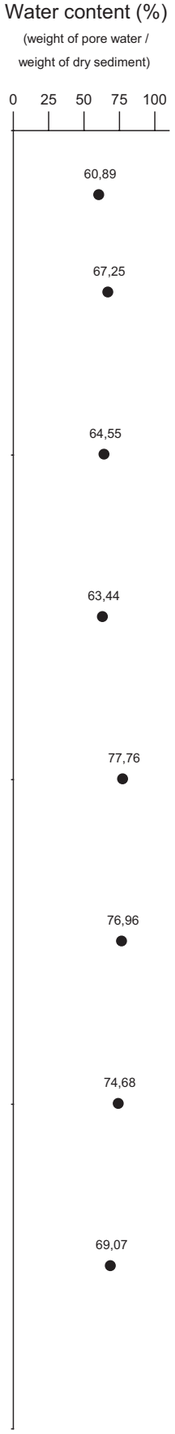
0-0.03 m
silty sand, with
minor gravel

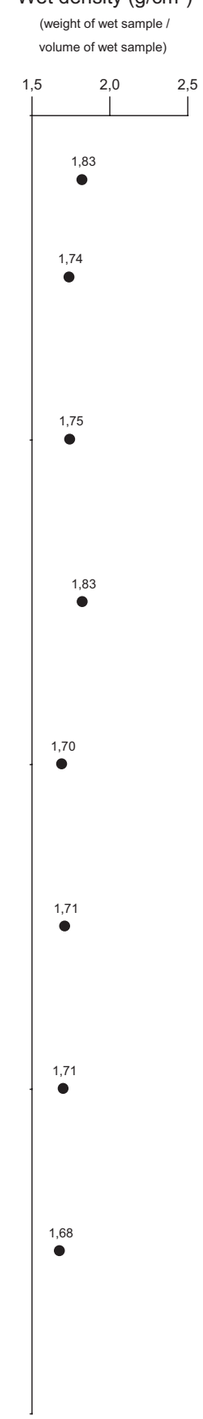
0.03-1.85 m
homonegeous,
bioturbated
clayey silt,
random gravel,
cm-scale clasts at
0.1, 1.12, 1.37 and
1.46 m, shells at
0.23 and 0.37 m

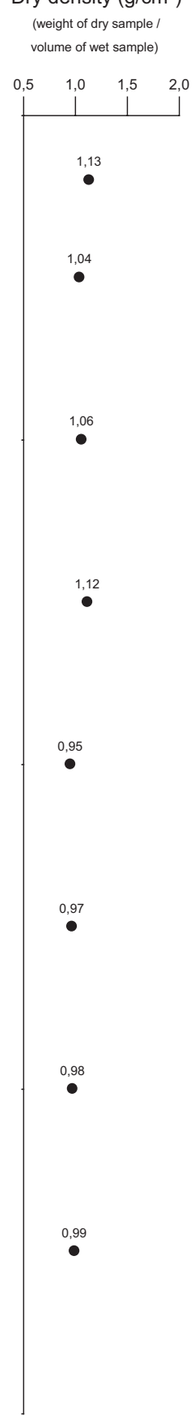


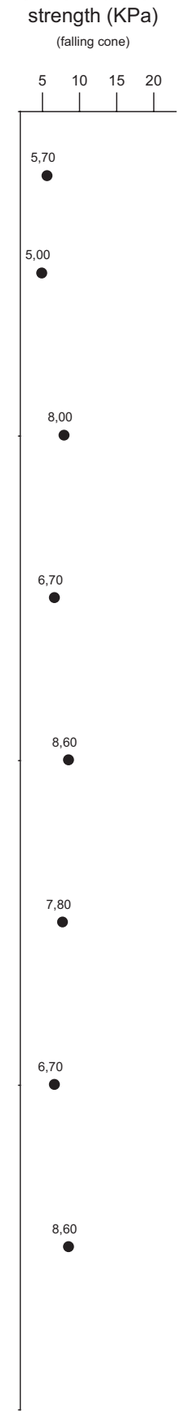


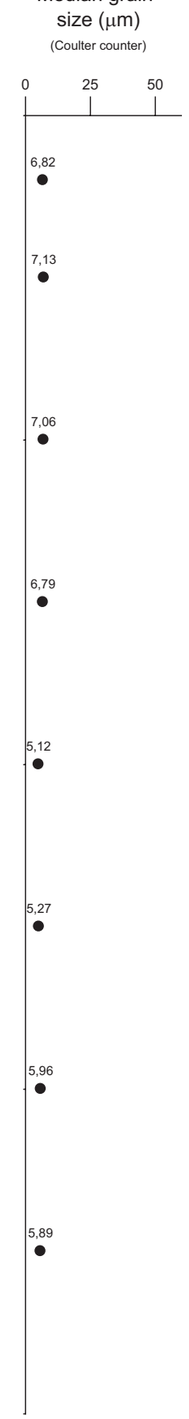












CORE 3

Lithology

0-1.16 m
homogeneous
clayey silt

depth (m)

0,0
0,5
1,0
1,5
2,0

PW velocity (m/s)
(MSCL)

1200 1600 2000

Density (g/cm^3)
(MSCL)

1,0 1,4 1,8 2,2

Magnetic susceptibility
(MSCL)

0 10 20

Water content (%)
(weight of pore water /
weight of dry sediment)

0 25 50 75 100

76,64
83,58
81,70
76,83
76,96

Wet density (g/cm^3)
(weight of wet sample /
volume of wet sample)

1,5 2,0 2,5

1,70
1,71
1,71
1,73
1,75

Dry density (g/cm^3)
(weight of dry sample /
volume of wet sample)

0,5 1,0 1,5 2,0

0,96
0,93
0,94
0,98
0,99

Undrained shear
strength (KPa)
(falling cone)

5 10 15 20

17,00
5,70
9,20
10,00
5,70

Median grain-
size (μm)
(Coulter counter)

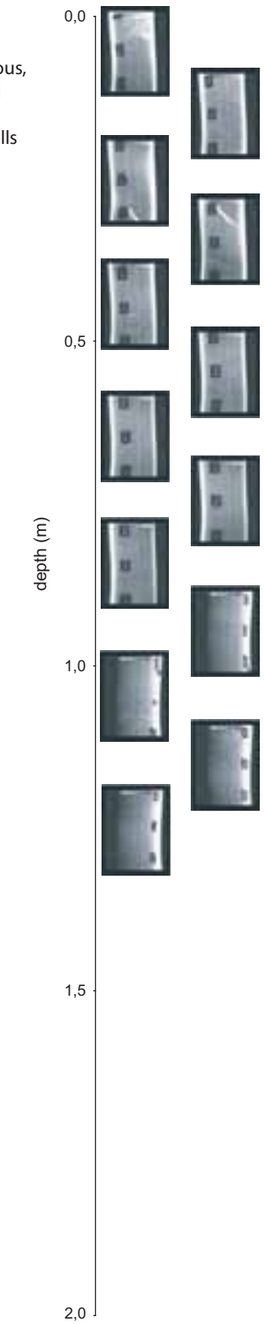
0 25 50

7,83
6,31
5,68
5,47
5,60

CORE 7

Lithology

0-1.41 m homogeneous, bioturbated clayey silt, random shells



depth (m)

0,0
0,5
1,0
1,5
2,0

PW velocity (m/s)
(MSCL)

1200 1600 2000

Density (g/cm^3)
(MSCL)

1,0 1,4 1,8 2,2

Magnetic susceptibility
(MSCL)

0 10 20

Water content (%)
(weight of pore water / weight of dry sediment)

0 25 50 75 100

91,36
87,92
83,26
90,09
80,81
74,59

Wet density (g/cm^3)
(weight of wet sample / volume of wet sample)

1,5 2,0 2,5

1,62
1,66
1,69
1,70
1,69
1,65

Dry density (g/cm^3)
(weight of dry sample / volume of wet sample)

0,5 1,0 1,5 2,0

0,85
0,88
0,92
0,89
0,94
0,95

Undrained shear strength (KPa)
(falling cone)

5 10 15 20

8,60
4,60
9,20
4,30
6,70
9,50

Median grain-size (μm)
(Coulter counter)

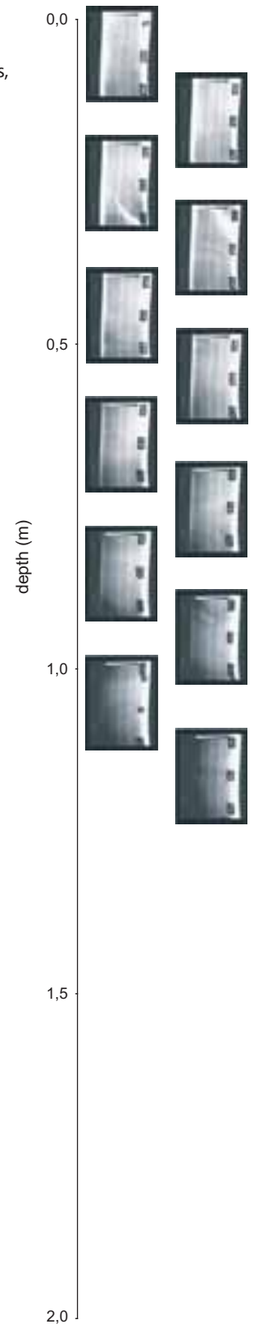
0 25 50

7,20
6,88
5,94
5,55
5,58
6,00

CORE 8

Lithology

0-1.32 m homogeneous, in places bioturbated clayey silt, diffuse lamination between 1.1 and 1.32 m



depth (m)

0,0
0,5
1,0
1,5
2,0

PW velocity (m/s)
(MSCL)

1200 1600 2000

Density (g/cm^3)
(MSCL)

1,0 1,4 1,8 2,2

Magnetic susceptibility
(MSCL)

0 10 20

Water content (%)
(weight of pore water / weight of dry sediment)

0 25 50 75 100

100,70
111,62
100,34
99,83
96,88
86,18

Wet density (g/cm^3)
(weight of wet sample / volume of wet sample)

1,5 2,0 2,5

1,62
1,61
1,65
1,64
1,68
1,68

Dry density (g/cm^3)
(weight of dry sample / volume of wet sample)

0,5 1,0 1,5 2,0

0,81
0,76
0,82
0,82
0,85
0,90

Undrained shear strength (KPa)
(falling cone)

5 10 15 20

6,30
4,30
3,70
4,00
3,80
4,90

Median grain-size (μm)
(Coulter counter)

0 25 50

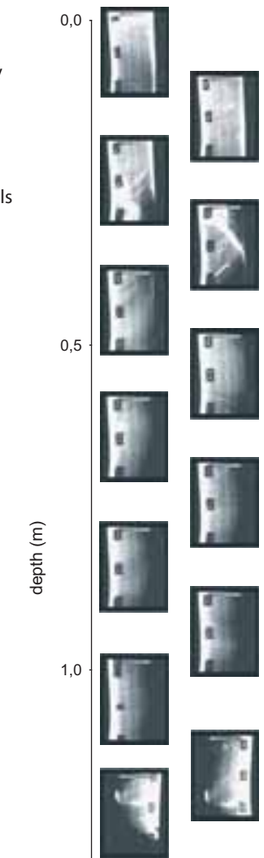
7,51
5,87
6,72
6,10
6,13
5,37

CORE 10

Lithology

0-0.08 m clayey sandy silt

0.08-1.32 m bioturbated clayey silt, random shells



depth (m)

0,0 | 0,5 | 1,0 | 1,5 | 2,0

PW velocity (m/s) (MSCL)

1200 1600 2000

Density (g/cm^3) (MSCL)

1,0 1,4 1,8 2,2

Magnetic susceptibility (MSCL)

0 10 20

Water content (%) (weight of pore water / weight of dry sediment)

0 25 50 75 100

98,19
103,92
96,99
87,31
84,17
77,00

Wet density (g/cm^3) (weight of wet sample / volume of wet sample)

1,5 2,0 2,5

1,54
1,54
1,56
1,58
1,60
1,64

Dry density (g/cm^3) (weight of dry sample / volume of wet sample)

0,5 1,0 1,5 2,0

0,78
0,75
0,79
0,84
0,87
0,93

Undrained shear strength (KPa) (falling cone)

5 10 15 20

6,70
3,90
3,00
5,70
4,90
8,10

Median grain-size (μm) (Coulter counter)

0 25 50

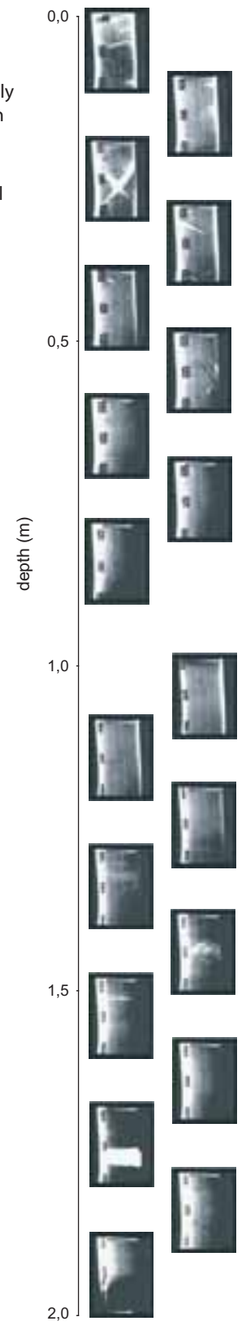
7,32
6,35
7,11
6,92
6,21
5,72

CORE 11

Lithology

0-0.09 m
clayey silt,
pocket of shelly
sand at 0.05 m

0.09-2.02 m
clayey silt,
random gravel

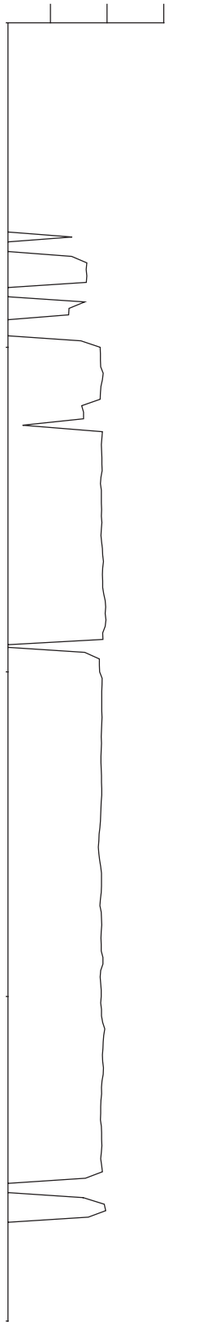


depth (m)

0,0
0,5
1,0
1,5
2,0

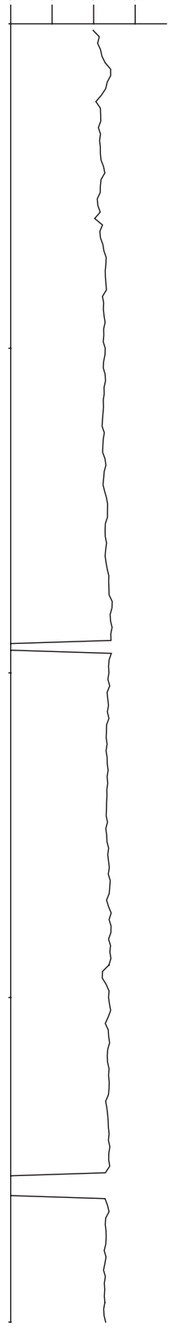
PW velocity (m/s)
(MSCL)

1200 1600 2000



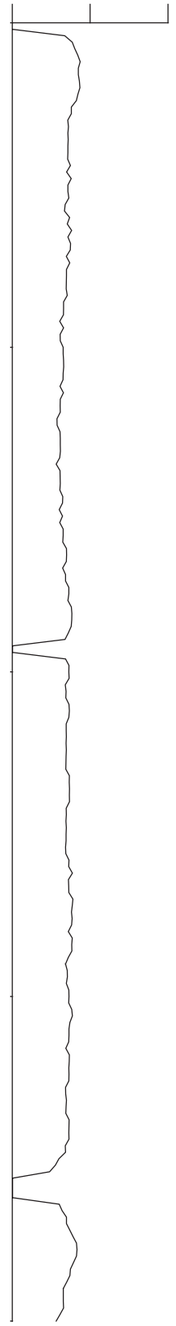
Density (g/cm^3)
(MSCL)

1,0 1,4 1,8 2,2



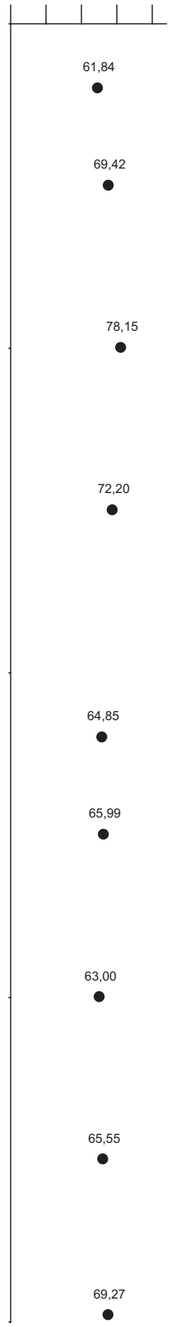
Magnetic susceptibility
(MSCL)

0 10 20



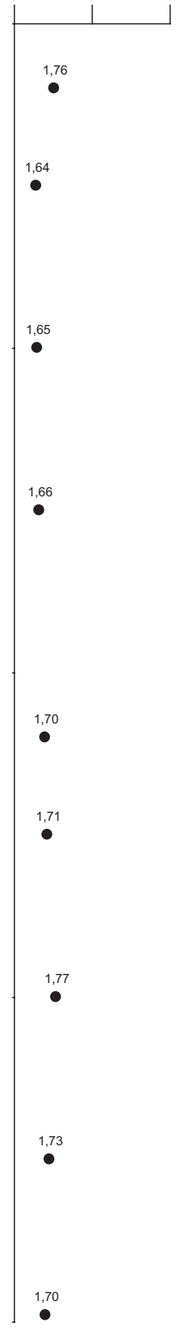
Water content (%)
(weight of pore water /
weight of dry sediment)

0 25 50 75 100



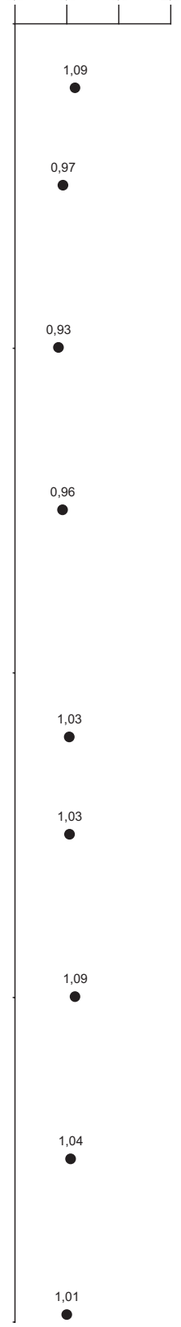
Wet density (g/cm^3)
(weight of wet sample /
volume of wet sample)

1,5 2,0 2,5



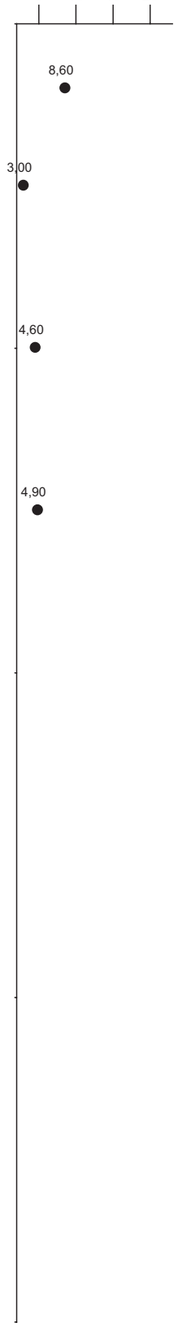
Dry density (g/cm^3)
(weight of dry sample /
volume of wet sample)

0,5 1,0 1,5 2,0



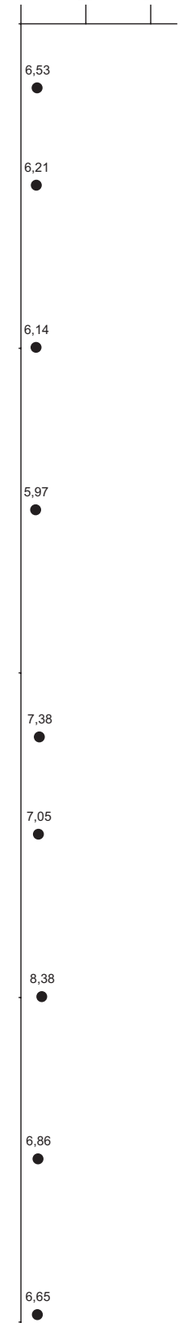
Undrained shear
strength (KPa)
(falling cone)

5 10 15 20

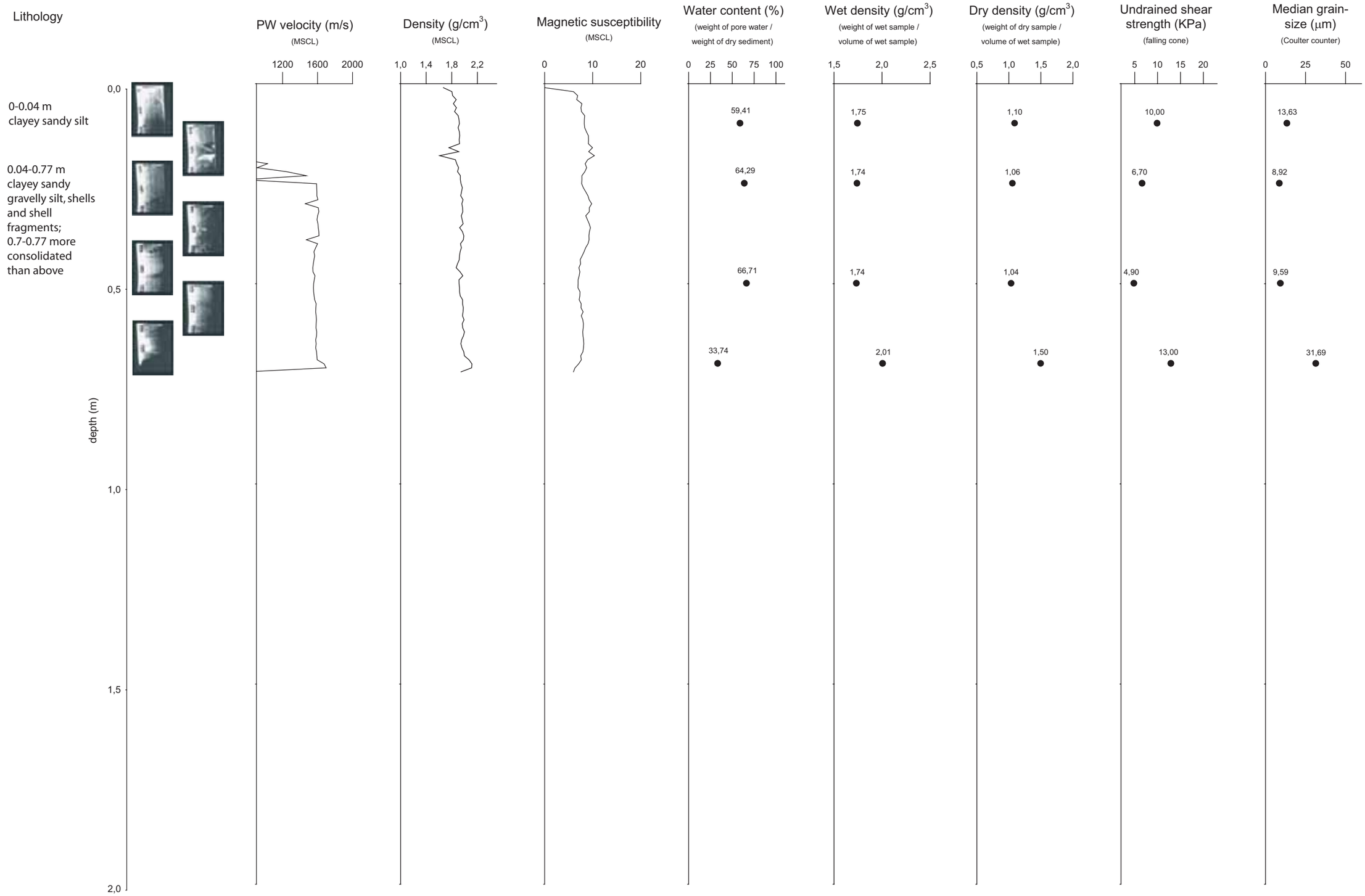


Median grain-
size (μm)
(Coulter counter)

0 25 50



CORE 13


Lithology
0-0.04 m
clayey sandy silt
0.04-0.77 m
clayey sandy
gravelly silt, shells
and shell
fragments;
0.7-0.77 more
consolidated
than above
depth (m)
0,0
0,5
1,0
1,5
2,0
PW velocity (m/s)
(MSCL)
1200 1600 2000
Density (g/cm3)
(MSCL)
1,0 1,4 1,8 2,2
Magnetic susceptibility
(MSCL)
0 10 20
Water content (%)
(weight of pore water /
weight of dry sediment)
0 25 50 75 100
59,41
64,29
66,71
33,74
Wet density (g/cm3)
(weight of wet sample /
volume of wet sample)
1,5 2,0 2,5
1,75
1,74
1,74
2,01
Dry density (g/cm3)
(weight of dry sample /
volume of wet sample)
0,5 1,0 1,5 2,0
1,10
1,06
1,04
1,50
Undrained shear
strength (KPa)
(falling cone)
5 10 15 20
10,00
6,70
4,90
13,00
Median grain-
size (μm)
(Coulter counter)
0 25 50
13,63
8,92
9,59
31,69

CORE 21

Lithology

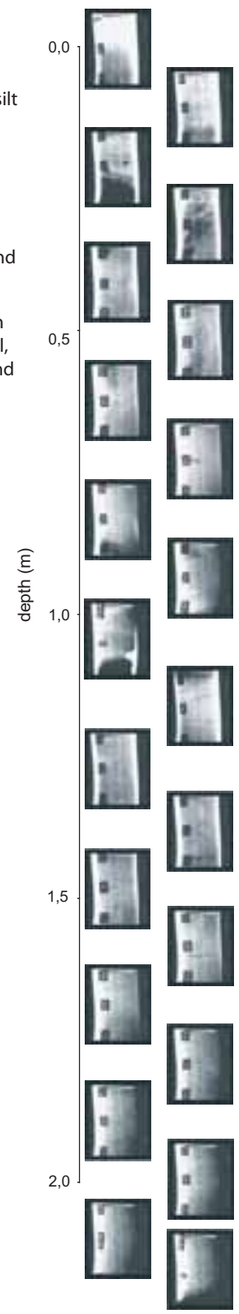
0-0.27 m
clayey sandy silt

0.27-0.37 m
clayey silty sand

0.37-2.26 m
clayey silt with
random gravel,
shells at 1.6 and
1,85 m

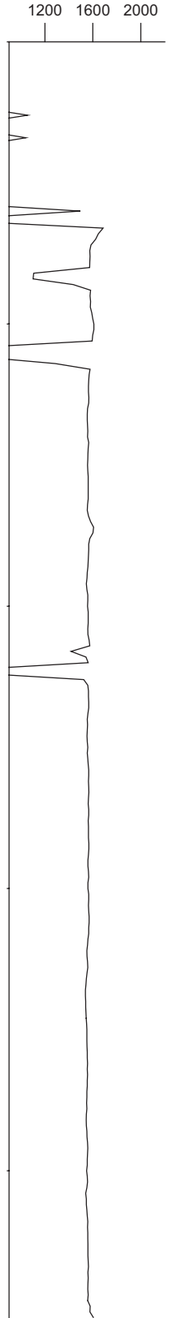
depth (m)

0,0
0,5
1,0
1,5
2,0



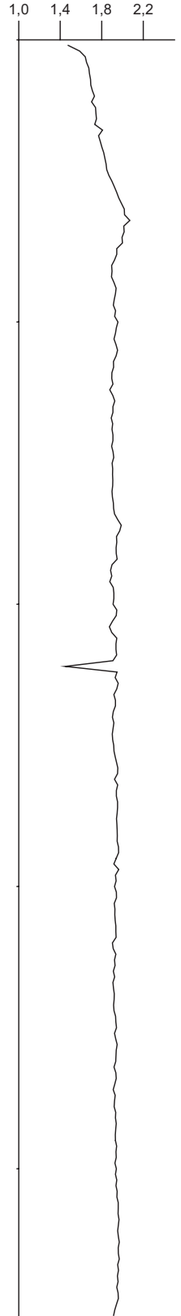
PW velocity (m/s)
(MSCL)

1200 1600 2000



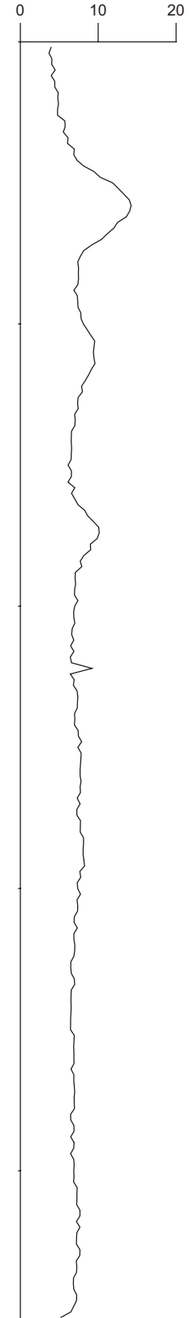
Density (g/cm^3)
(MSCL)

1,0 1,4 1,8 2,2



Magnetic susceptibility
(MSCL)

0 10 20



Water content (%)
(weight of pore water /
weight of dry sediment)

0 25 50 75 100

109,01
52,95
76,06
81,89
75,84
66,98
70,86
72,99
68,40
73,44

Wet density (g/cm^3)
(weight of wet sample /
volume of wet sample)

1,50 1,75 2,00

1,56
1,82
1,69
1,65
1,69
1,73
1,70
1,69
1,73
1,68

Dry density (g/cm^3)
(weight of dry sample /
volume of wet sample)

0,5 1,0 1,5 2,0

0,75
1,19
0,96
0,91
0,96
1,04
0,99
0,98
1,03
0,97

Undrained shear
strength (KPa)
(falling cone)

5 10 15 20

4,30
4,90
3,00
3,60
5,50
8,60
9,20
5,20
6,70
6,30

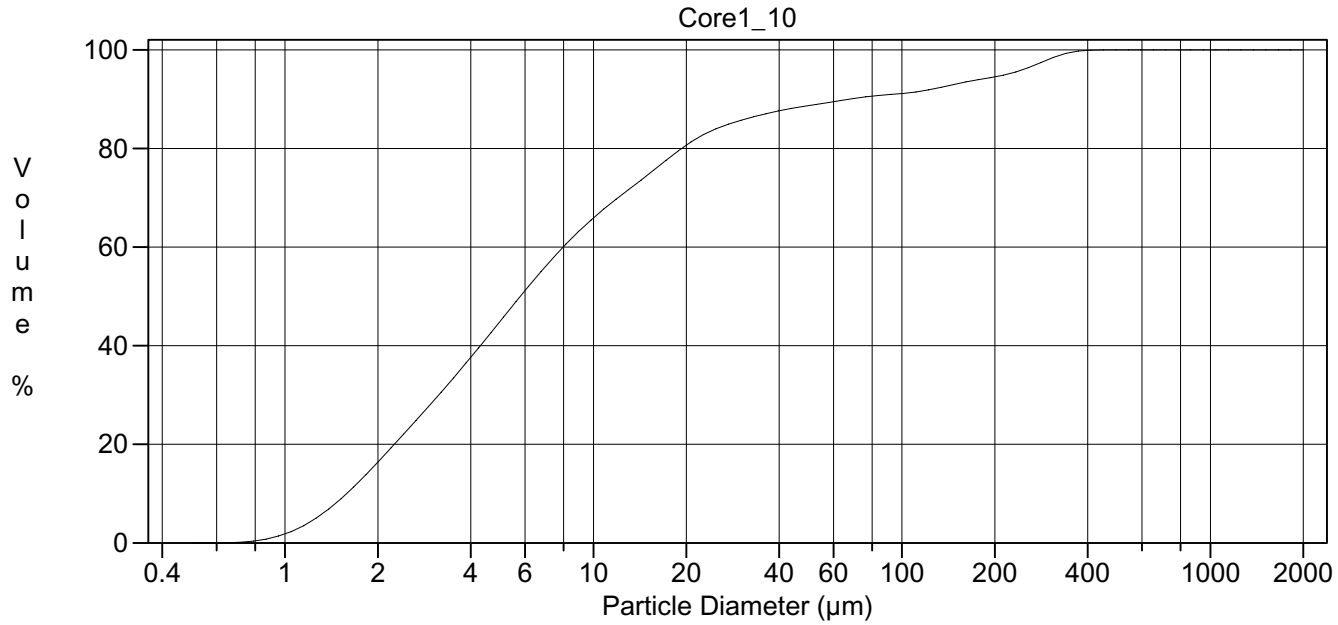
Median grain-
size (μm)
(Coulter counter)

0 25 50 75 100 125

4,81
132,30
5,77
5,90
6,52
6,10
6,05
6,63
6,65
7,17

APPENDIX 2

Cumulative grain-size distribution plots and statistical characteristics of individual samples. Note that sample IDs show the core numbers and subsampling depths, i.e. sample Core 1_10 stands for a subsample collected from 10 cm depth of Core 1



Volume Statistics (Arithmetic) 022159#.$02

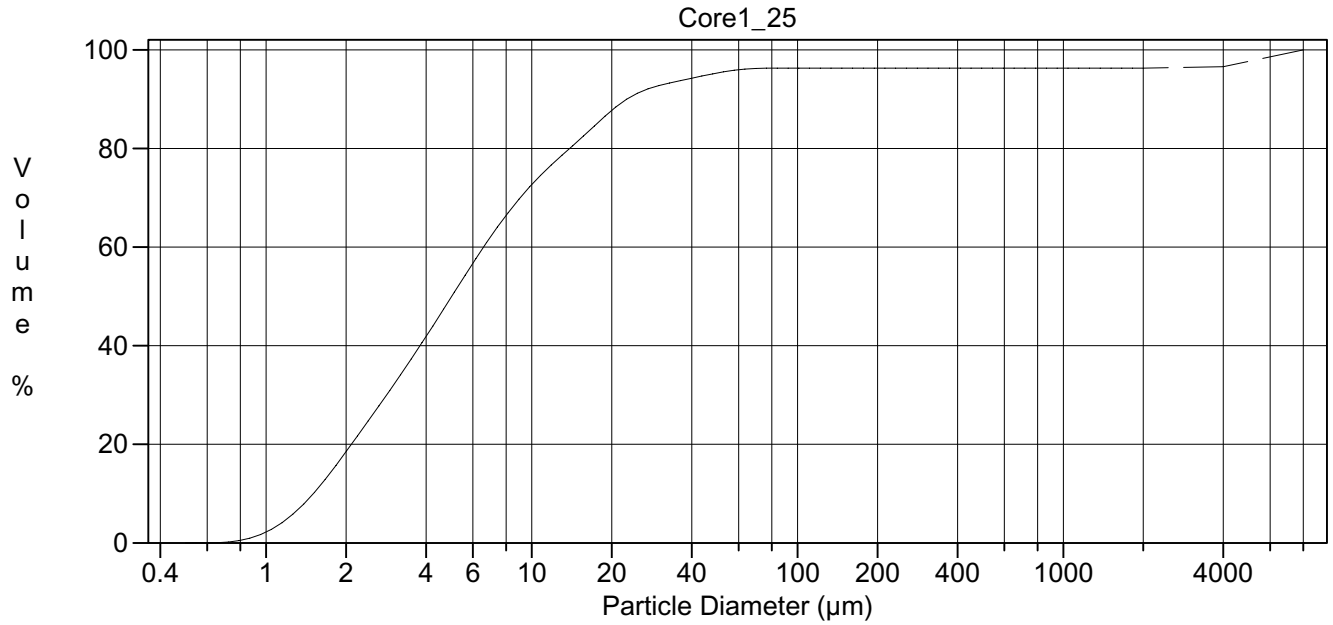
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	29.15 µm	95% Conf. Limits:	0-162.2 µm
Median:	5.793 µm	S.D.:	67.91 µm
D(3,2):	3.871 µm	Variance:	4612 µm^2
Mean/Median Ratio:	5.031	C.V.:	233%
Mode:	5.355 µm	Skewness:	3.317 Right skewed
d_{10}:	1.584 µm	Kurtosis:	10.45 Leptokurtic
d_{50}:	5.793 µm		
d_{90}:	67.38 µm		
Specific Surf. Area	15501 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.584	2.674	7.982	15.24	67.38

022159#.$02

Particle Diameter µm	Volume %
1.000	14.6
2.000	28.7
5.000	20.9
10.00	8.73
15.00	6.01
20.00	3.37
25.00	4.69
50.00	0.78
60.00	0.22
63.00	0.45
70.00	0.76
90.00	1.10
125.0	4.12
250.0	3.86
500.0	0
1000	0



Volume Statistics (Arithmetic) 022160a.$02

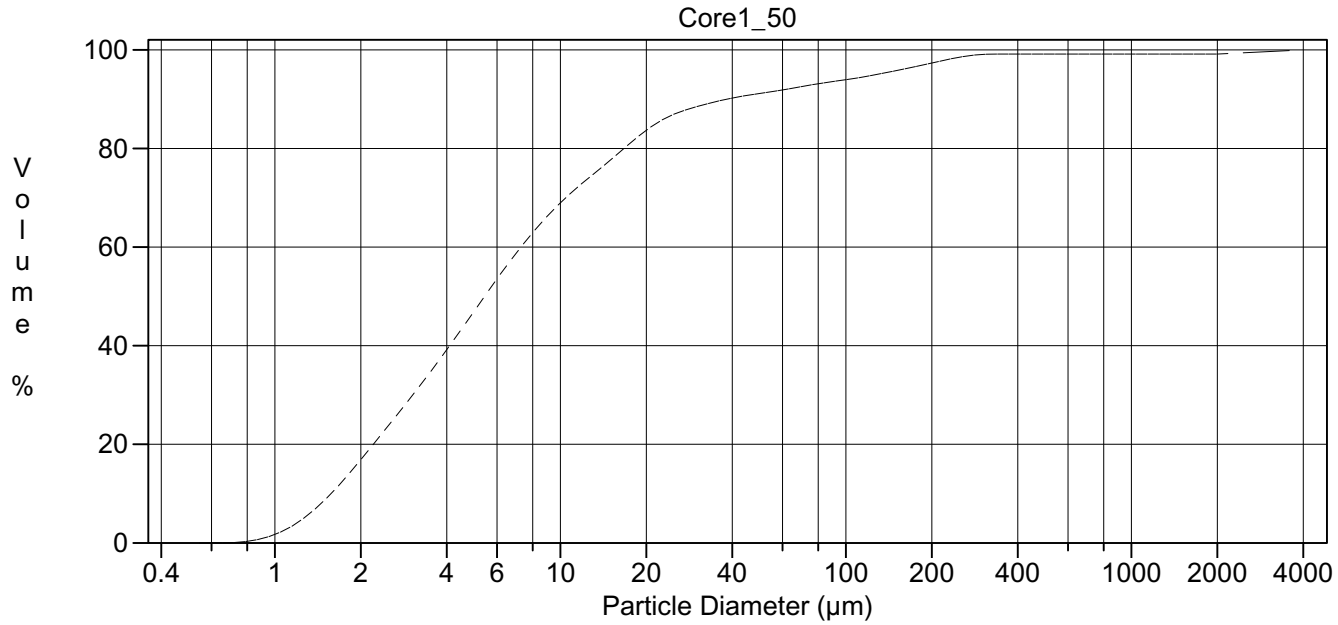
Calculations from 0.375 µm to 8000 µm

Volume	100.0%		
Mean:	208.1 µm	95% Conf. Limits:	0-2231 µm
Median:	4.999 µm	S.D.:	1032 µm
D(3,2):	3.494 µm	Variance:	1065655 µm^2
Mean/Median Ratio:	41.62	C.V.:	496%
Mode:	4.878 µm	Skewness:	5.027 Right skewed
d_{10}:	1.506 µm	Kurtosis:	23.44 Leptokurtic
d_{50}:	4.999 µm		
d_{90}:	22.73 µm		
Specific Surf. Area	17174 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.506	2.443	6.586	11.00	22.73

022160a.$02

Particle Diameter µm	Volume %
1.000	16.3
2.000	31.5
5.000	22.7
10.00	8.93
15.00	6.10
20.00	3.51
25.00	4.09
50.00	0.65
60.00	0.13
63.00	0.15
70.00	0.052
90.00	0.00013
125.0	0
250.0	0
500.0	0
1000	3.69



Volume Statistics (Arithmetic) 022161a.$02

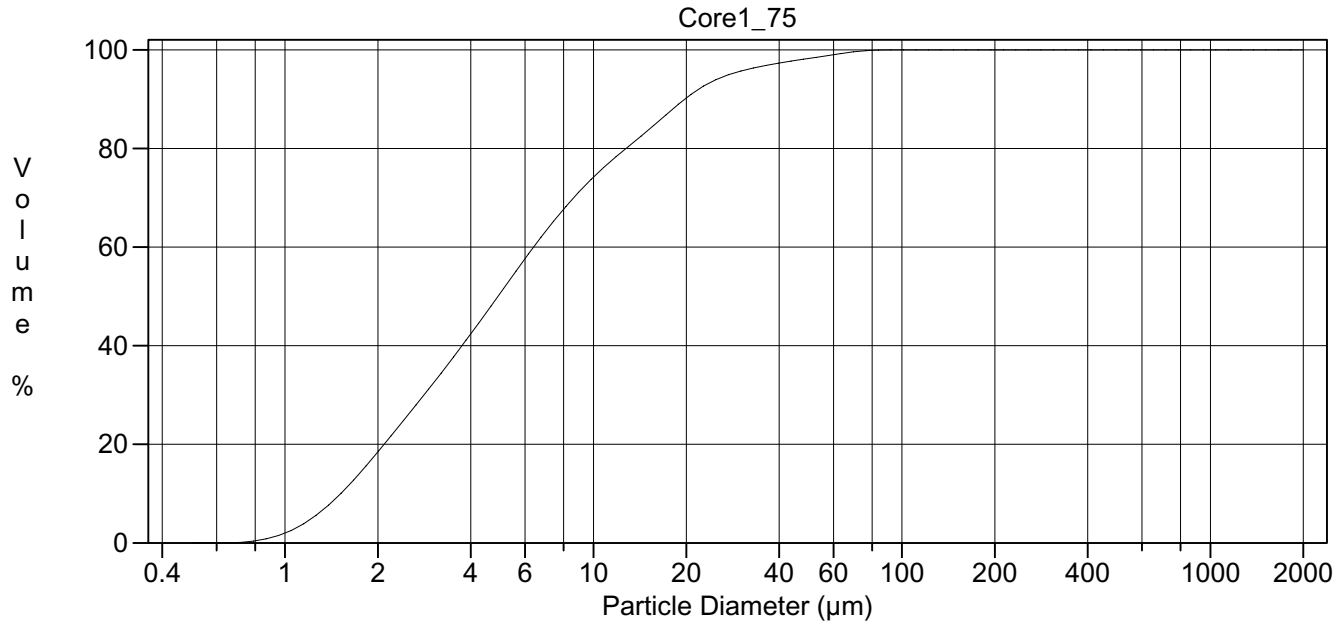
Calculations from 0.375 µm to 4000 µm

Volume	100.0%		
Mean:	41.66 µm	95% Conf. Limits:	0-545.1 µm
Median:	5.428 µm	S.D.:	256.9 µm
D(3,2):	3.748 µm	Variance:	65976 µm^2
Mean/Median Ratio:	7.675	C.V.:	617%
Mode:	5.355 µm	Skewness:	10.48 Right skewed
d_{10}:	1.574 µm	Kurtosis:	110.6 Leptokurtic
d_{50}:	5.428 µm		
d_{90}:	38.26 µm		
Specific Surf. Area	16008 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.574	2.599	7.276	13.17	38.26

022161a.$02

Particle Diameter µm	Volume %
1.000	15.2
2.000	30.2
5.000	21.9
10.00	8.74
15.00	5.99
20.00	3.29
25.00	4.21
50.00	0.69
60.00	0.21
63.00	0.47
70.00	1.05
90.00	1.30
125.0	3.64
250.0	0.65
500.0	0
1000	0.82



Volume Statistics (Arithmetic) 022162.$02

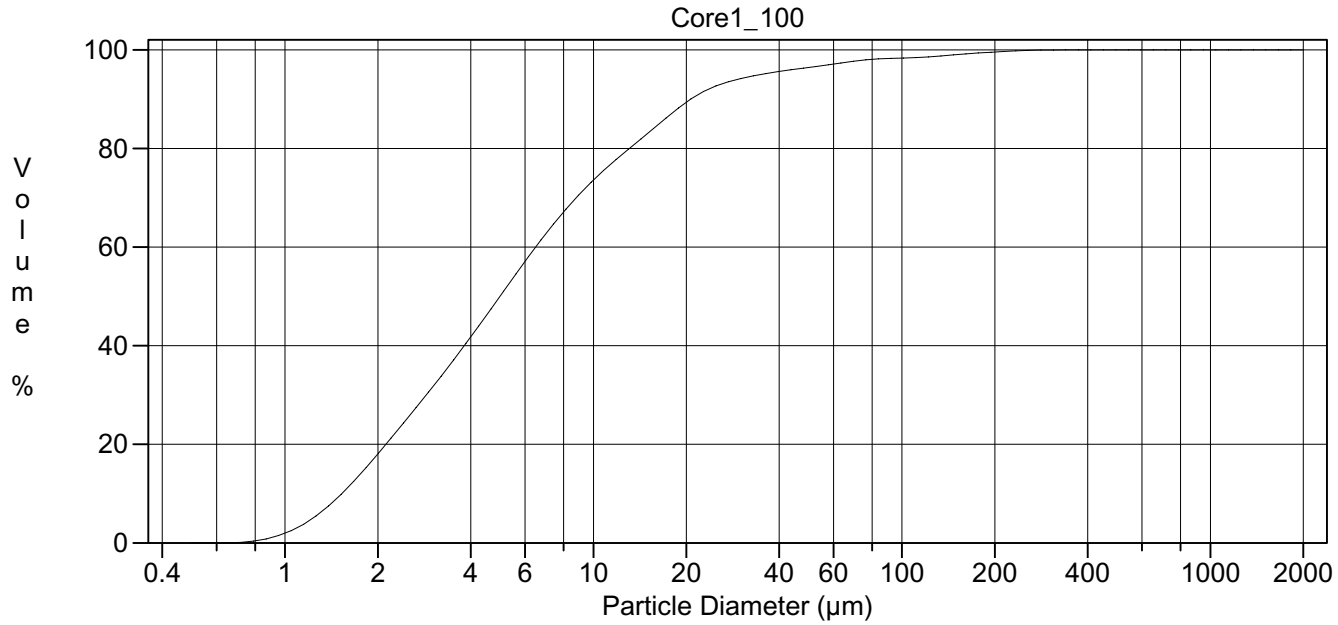
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	8.651 µm	95% Conf. Limits:	0-29.61 µm
Median:	4.904 µm	S.D.:	10.69 µm
D(3,2):	3.458 µm	Variance:	114.4 µm^2
Mean/Median Ratio:	1.764	C.V.:	124%
Mode:	5.355 µm	Skewness:	3.125 Right skewed
d_{10}:	1.516 µm	Kurtosis:	12.44 Leptokurtic
d_{50}:	4.904 µm		
d_{90}:	19.79 µm		
Specific Surf. Area	17351 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.516	2.433	6.401	10.32	19.79

022162.$02

Particle Diameter µm	Volume %
1.000	16.5
2.000	32.3
5.000	23.4
10.00	9.46
15.00	6.58
20.00	3.77
25.00	4.28
50.00	0.75
60.00	0.21
63.00	0.40
70.00	0.36
90.00	0.0084
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022163.$02

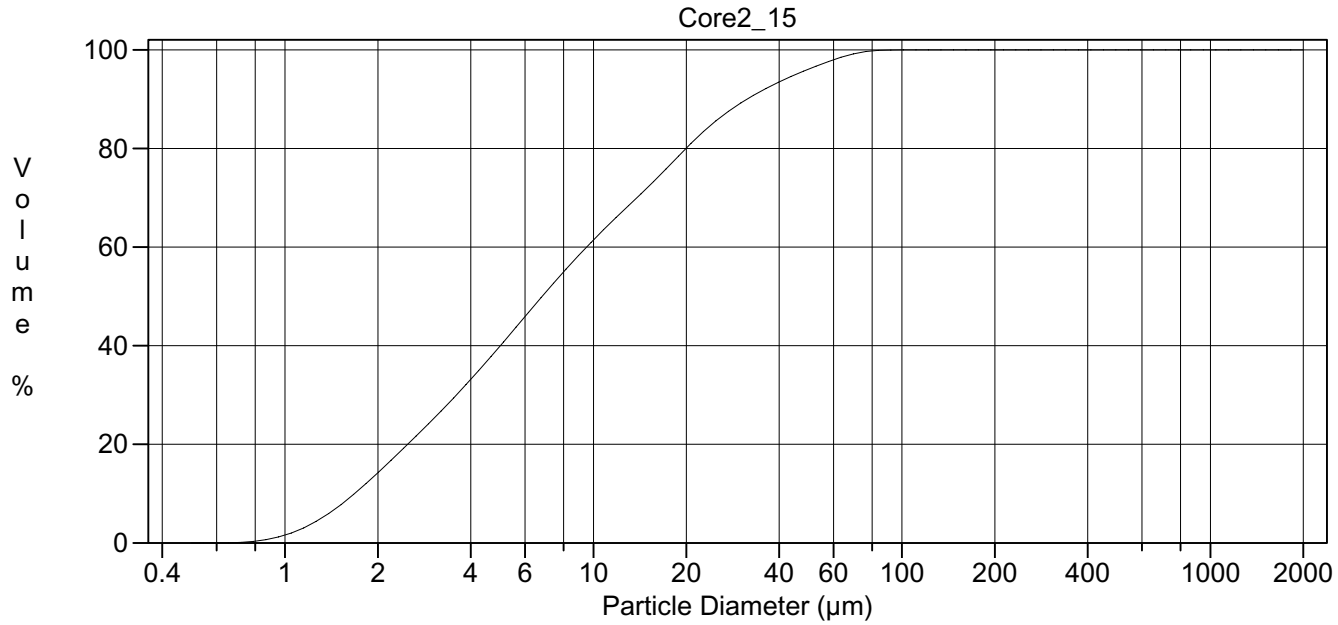
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	11.28 µm	95% Conf. Limits:	0-58.46 µm
Median:	4.977 µm	S.D.:	24.07 µm
D(3,2):	3.508 µm	Variance:	579.5 µm^2
Mean/Median Ratio:	2.266	C.V.:	213%
Mode:	5.355 µm	Skewness:	6.318 Right skewed
d_{10}:	1.528 µm	Kurtosis:	48.38 Leptokurtic
d_{50}:	4.977 µm		
d_{90}:	20.64 µm		
Specific Surf. Area	17106 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.528	2.473	6.497	10.56	20.64

022163.$02

Particle Diameter µm	Volume %
1.000	16.1
2.000	32.1
5.000	23.4
10.00	9.46
15.00	6.30
20.00	3.34
25.00	3.75
50.00	0.67
60.00	0.20
63.00	0.40
70.00	0.54
90.00	0.38
125.0	1.23
250.0	0.12
500.0	0
1000	0



Volume Statistics (Arithmetic) 022151#.$02

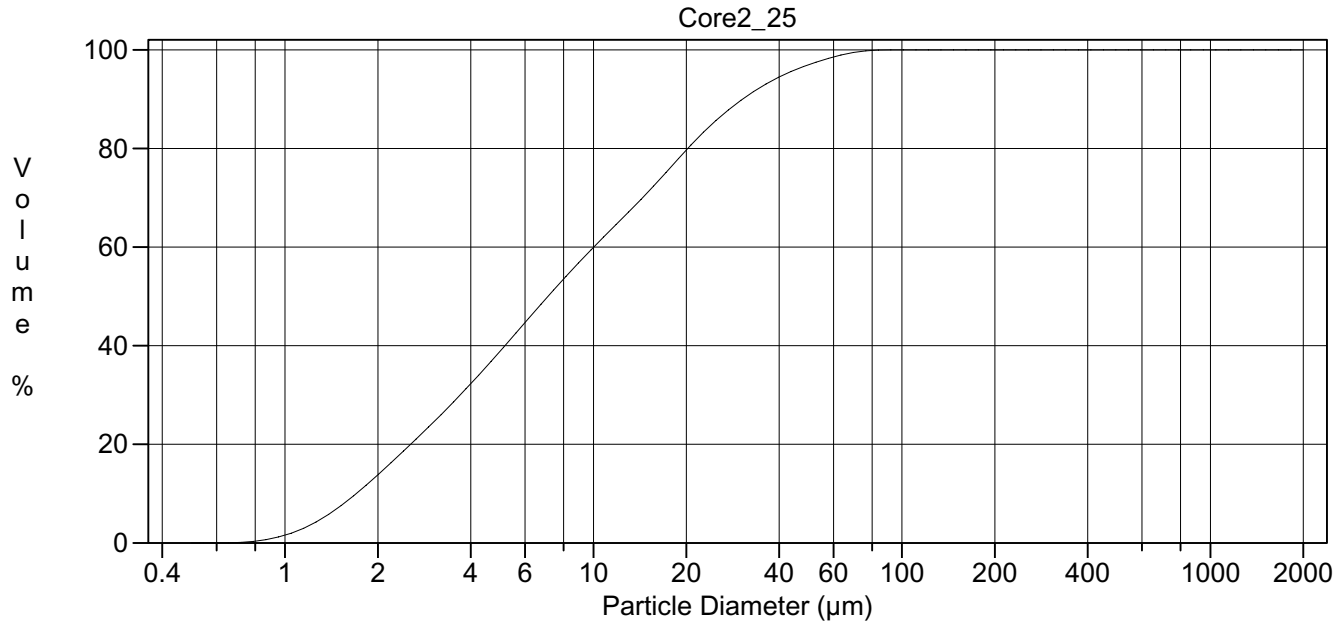
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	12.56 µm	95% Conf. Limits:	0-40.86 µm
Median:	6.818 µm	S.D.:	14.44 µm
D(3,2):	4.193 µm	Variance:	208.4 µm^2
Mean/Median Ratio:	1.843	C.V.:	115%
Mode:	5.878 µm	Skewness:	2.099 Right skewed
d_{10}:	1.681 µm	Kurtosis:	4.684 Leptokurtic
d_{50}:	6.818 µm		
d_{90}:	31.47 µm		
Specific Surf. Area	14308 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.681	3.011	9.502	16.67	31.47

022151#.$02

Particle Diameter µm	Volume %
1.000	12.6
2.000	25.8
5.000	21.4
10.00	10.7
15.00	7.93
20.00	5.60
25.00	10.5
50.00	1.86
60.00	0.46
63.00	0.79
70.00	0.73
90.00	0.028
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022152.$02

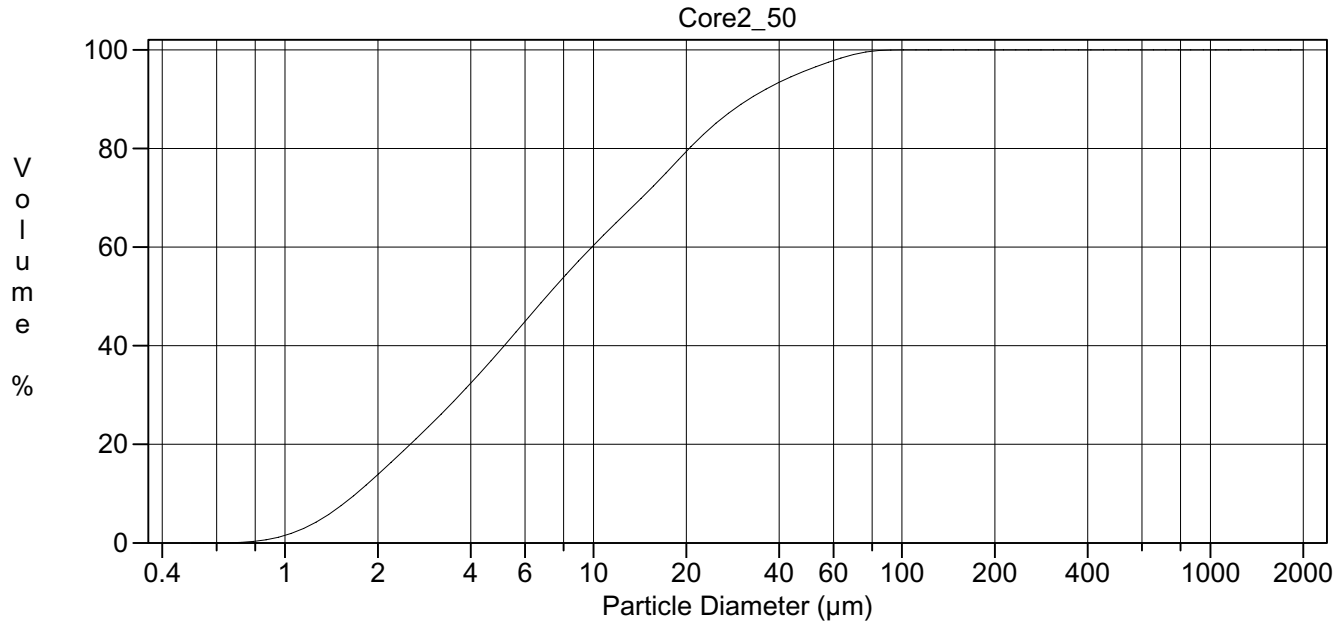
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	12.43 µm	95% Conf. Limits:	0-39.03 µm
Median:	7.126 µm	S.D.:	13.57 µm
D(3,2):	4.276 µm	Variance:	184.1 µm^2
Mean/Median Ratio:	1.745	C.V.:	109%
Mode:	5.878 µm	Skewness:	1.990 Right skewed
d_{10}:	1.703 µm	Kurtosis:	4.391 Leptokurtic
d_{50}:	7.126 µm		
d_{90}:	30.44 µm		
Specific Surf. Area	14031 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.703	3.090	10.02	17.10	30.44

022152.$02

Particle Diameter µm	Volume %
1.000	12.2
2.000	25.2
5.000	20.9
10.00	11.2
15.00	8.56
20.00	6.06
25.00	11.3
50.00	1.53
60.00	0.36
63.00	0.60
70.00	0.48
90.00	0.010
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022153.$02

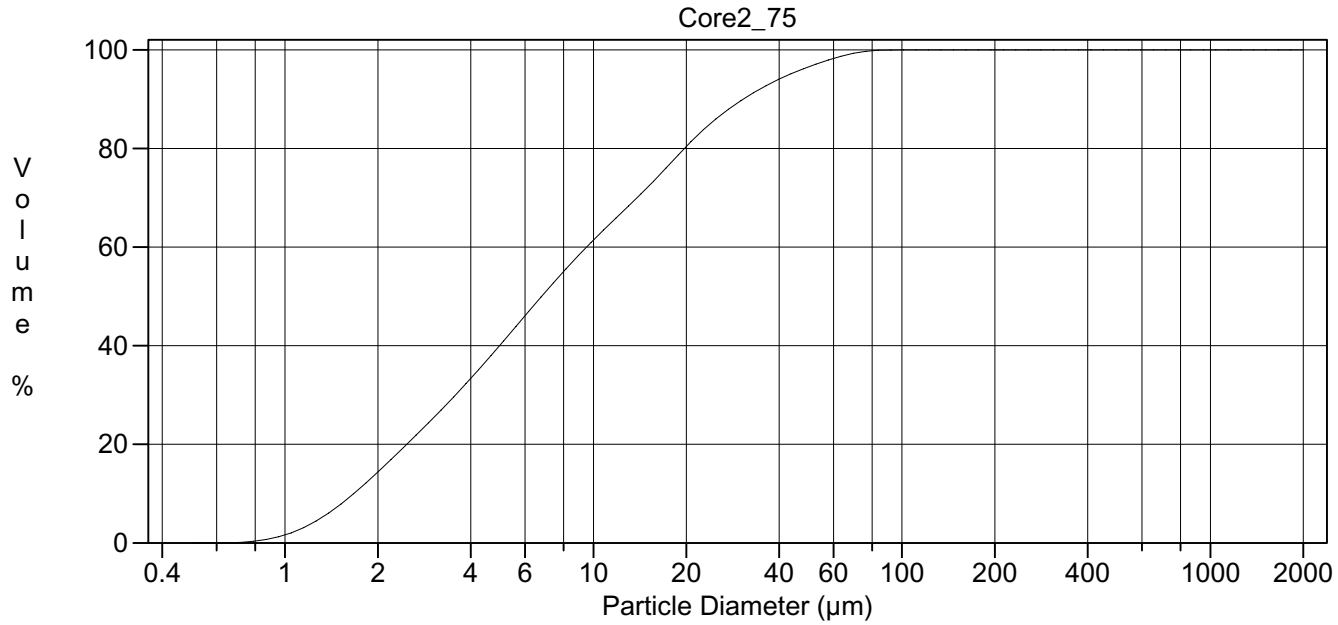
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	12.84 µm	95% Conf. Limits:	0-41.58 µm
Median:	7.056 µm	S.D.:	14.66 µm
D(3,2):	4.273 µm	Variance:	214.9 µm^2
Mean/Median Ratio:	1.820	C.V.:	114%
Mode:	5.878 µm	Skewness:	2.104 Right skewed
d_{10}:	1.701 µm	Kurtosis:	4.809 Leptokurtic
d_{50}:	7.056 µm		
d_{90}:	31.93 µm		
Specific Surf. Area	14042 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.701	3.079	9.869	17.14	31.93

022153.$02

Particle Diameter µm	Volume %
1.000	12.3
2.000	25.3
5.000	21.2
10.00	10.9
15.00	8.16
20.00	5.79
25.00	10.9
50.00	1.78
60.00	0.44
63.00	0.80
70.00	0.87
90.00	0.048
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022154.$02

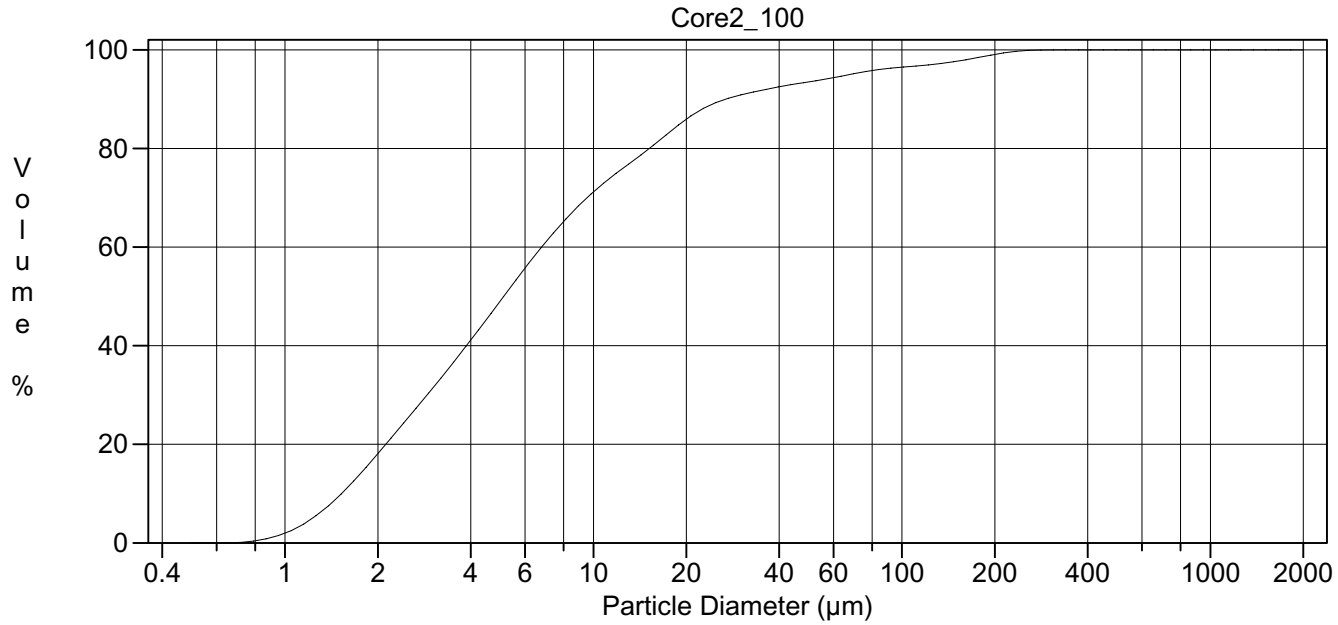
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	12.33 µm	95% Conf. Limits:	0-39.76 µm
Median:	6.785 µm	S.D.:	13.99 µm
D(3,2):	4.169 µm	Variance:	195.8 μm^2
Mean/Median Ratio:	1.818	C.V.:	113%
Mode:	5.878 µm	Skewness:	2.098 Right skewed
d_{10}:	1.671 µm	Kurtosis:	4.825 Leptokurtic
d_{50}:	6.785 µm		
d_{90}:	30.60 µm		
Specific Surf. Area	14392 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.671	2.990	9.499	16.58	30.60

022154.$02

Particle Diameter µm	Volume %
1.000	12.8
2.000	25.8
5.000	21.2
10.00	10.7
15.00	8.22
20.00	5.67
25.00	10.5
50.00	1.66
60.00	0.40
63.00	0.69
70.00	0.63
90.00	0.023
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022155#.$02

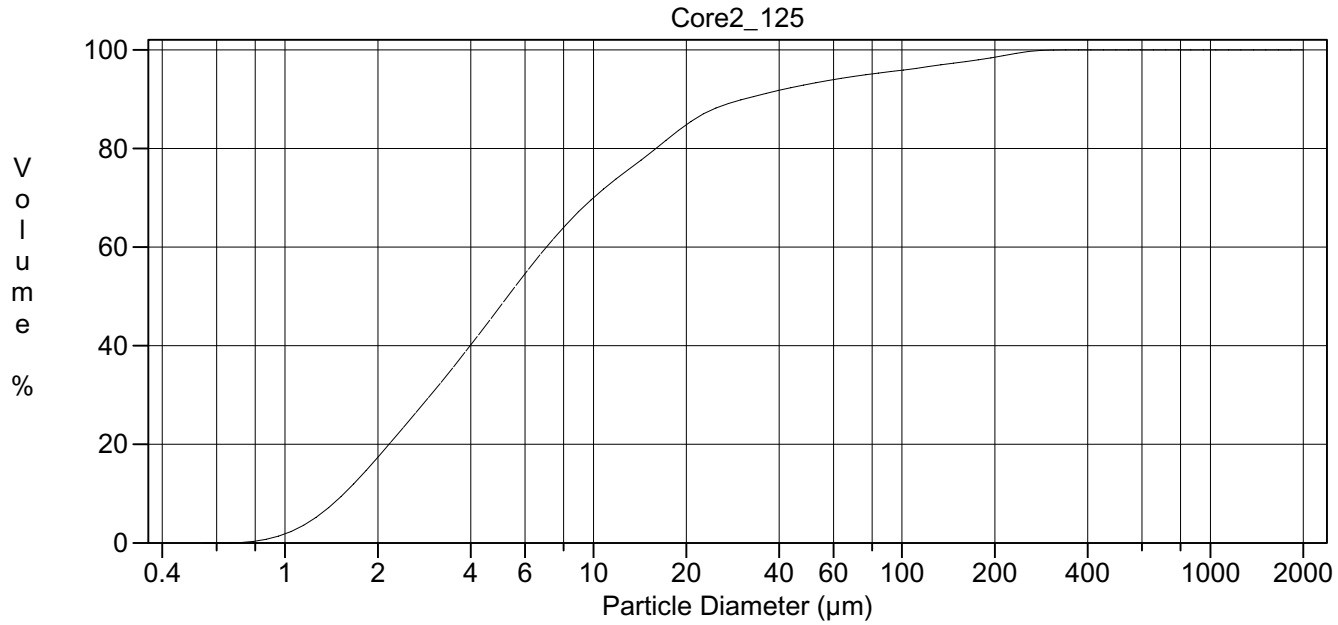
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	15.22 µm	95% Conf. Limits:	0-81.00 µm
Median:	5.115 µm	S.D.:	33.56 µm
D(3,2):	3.571 µm	Variance:	1126 µm^2
Mean/Median Ratio:	2.976	C.V.:	220%
Mode:	4.878 µm	Skewness:	4.479 Right skewed
d_{10}:	1.524 µm	Kurtosis:	21.77 Leptokurtic
d_{50}:	5.115 µm		
d_{90}:	26.78 µm		
Specific Surf. Area	16801 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.524	2.479	6.787	11.85	26.78

022155#.$02

Particle Diameter µm	Volume %
1.000	16.1
2.000	31.0
5.000	22.1
10.00	8.57
15.00	6.16
20.00	3.43
25.00	4.18
50.00	0.83
60.00	0.25
63.00	0.56
70.00	1.06
90.00	0.80
125.0	2.80
250.0	0.15
500.0	0
1000	0



Volume Statistics (Arithmetic) 022156.$02

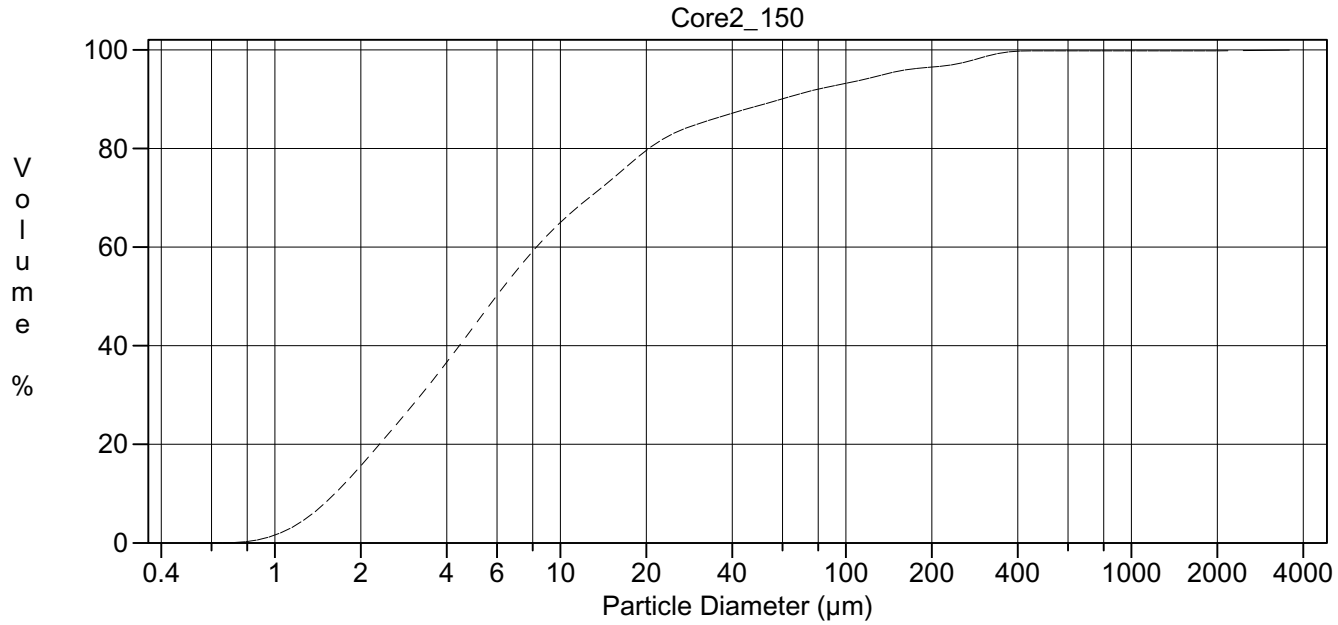
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	16.67 µm	95% Conf. Limits:	0-90.22 µm
Median:	5.274 µm	S.D.:	37.53 µm
D(3,2):	3.664 µm	Variance:	1408 μm^2
Mean/Median Ratio:	3.160	C.V.:	225%
Mode:	4.878 µm	Skewness:	4.429 Right skewed
d_{10}:	1.554 µm	Kurtosis:	21.23 Leptokurtic
d_{50}:	5.274 µm		
d_{90}:	30.58 µm		
Specific Surf. Area	16377 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.554	2.544	7.046	12.54	30.58

022156.$02

Particle Diameter µm	Volume %
1.000	15.6
2.000	30.7
5.000	21.9
10.00	8.68
15.00	6.11
20.00	3.44
25.00	4.83
50.00	0.87
60.00	0.23
63.00	0.45
70.00	0.89
90.00	1.19
125.0	2.85
250.0	0.43
500.0	0
1000	0



Volume Statistics (Arithmetic) 022157a.$02

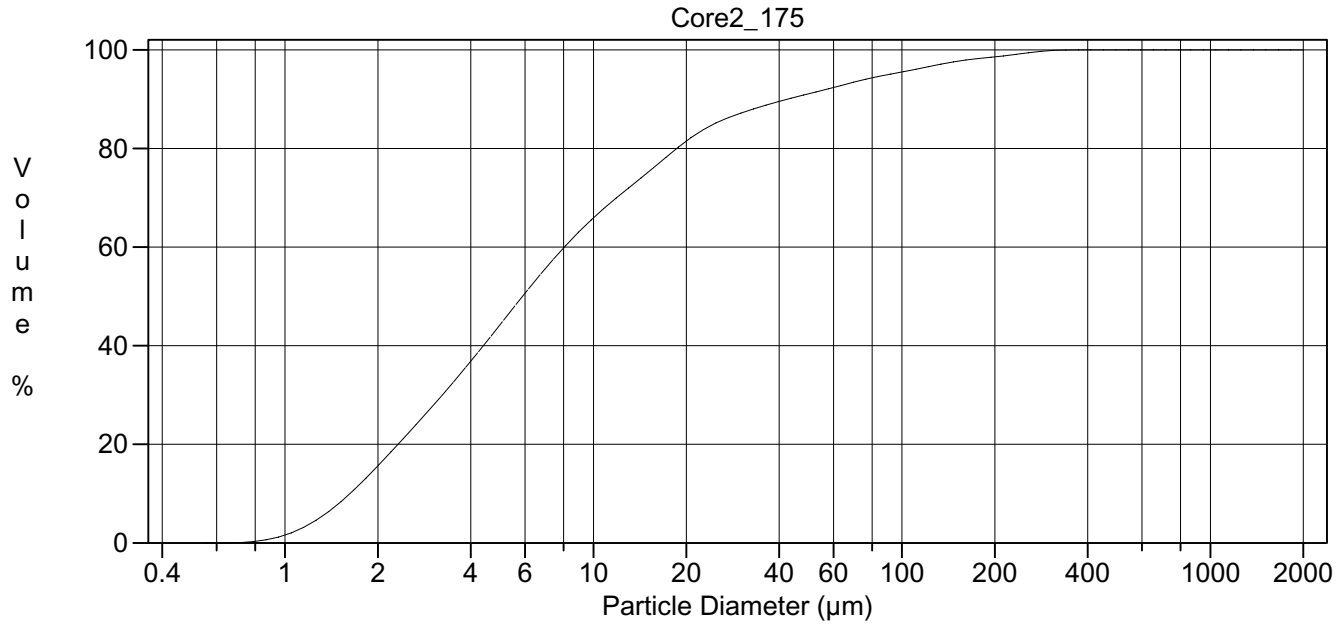
Calculations from 0.375 µm to 4000 µm

Volume	100.0%		
Mean:	30.07 µm	95% Conf. Limits:	0-294.1 µm
Median:	5.964 µm	S.D.:	134.7 µm
D(3,2):	3.981 µm	Variance:	18147 µm^2
Mean/Median Ratio:	5.041	C.V.:	448%
Mode:	5.355 µm	Skewness:	17.31 Right skewed
d_{10}:	1.622 µm	Kurtosis:	351.4 Leptokurtic
d_{50}:	5.964 µm		
d_{90}:	59.31 µm		
Specific Surf. Area	15071 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.622	2.757	8.245	16.06	59.31

022157a.$02

Particle Diameter µm	Volume %
1.000	14.1
2.000	28.4
5.000	20.9
10.00	8.56
15.00	6.04
20.00	3.52
25.00	5.67
50.00	1.30
60.00	0.36
63.00	0.75
70.00	1.49
90.00	1.79
125.0	2.80
250.0	2.53
500.0	0
1000	0.19



Volume Statistics (Arithmetic) 022158.$02

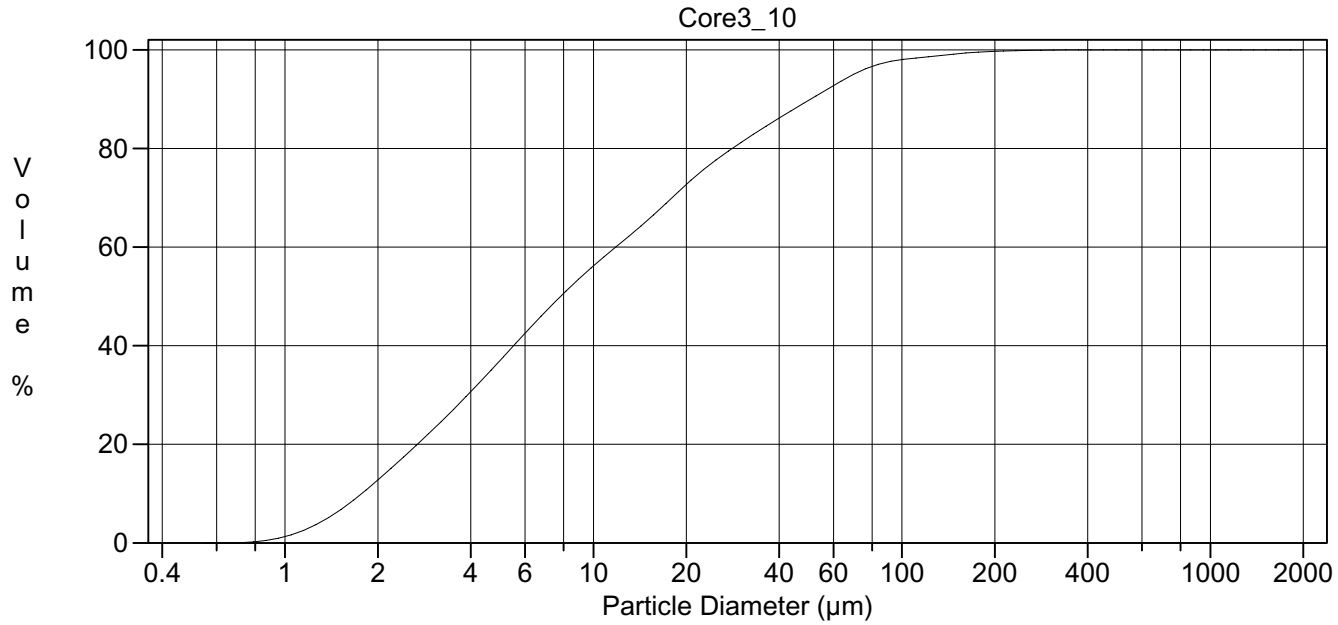
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	18.68 µm	95% Conf. Limits:	0-95.37 µm
Median:	5.892 µm	S.D.:	39.13 µm
D(3,2):	3.941 µm	Variance:	1531 μm^2
Mean/Median Ratio:	3.171	C.V.:	209%
Mode:	5.355 µm	Skewness:	4.277 Right skewed
d_{10}:	1.624 µm	Kurtosis:	21.05 Leptokurtic
d_{50}:	5.892 µm		
d_{90}:	42.47 µm		
Specific Surf. Area	15226 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.624	2.753	8.050	14.90	42.47

022158.$02

Particle Diameter µm	Volume %
1.000	14.0
2.000	28.7
5.000	21.5
10.00	9.21
15.00	6.35
20.00	3.73
25.00	5.91
50.00	1.25
60.00	0.35
63.00	0.75
70.00	1.52
90.00	1.74
125.0	2.60
250.0	0.67
500.0	0
1000	0



Volume Statistics (Arithmetic) 022164.$02

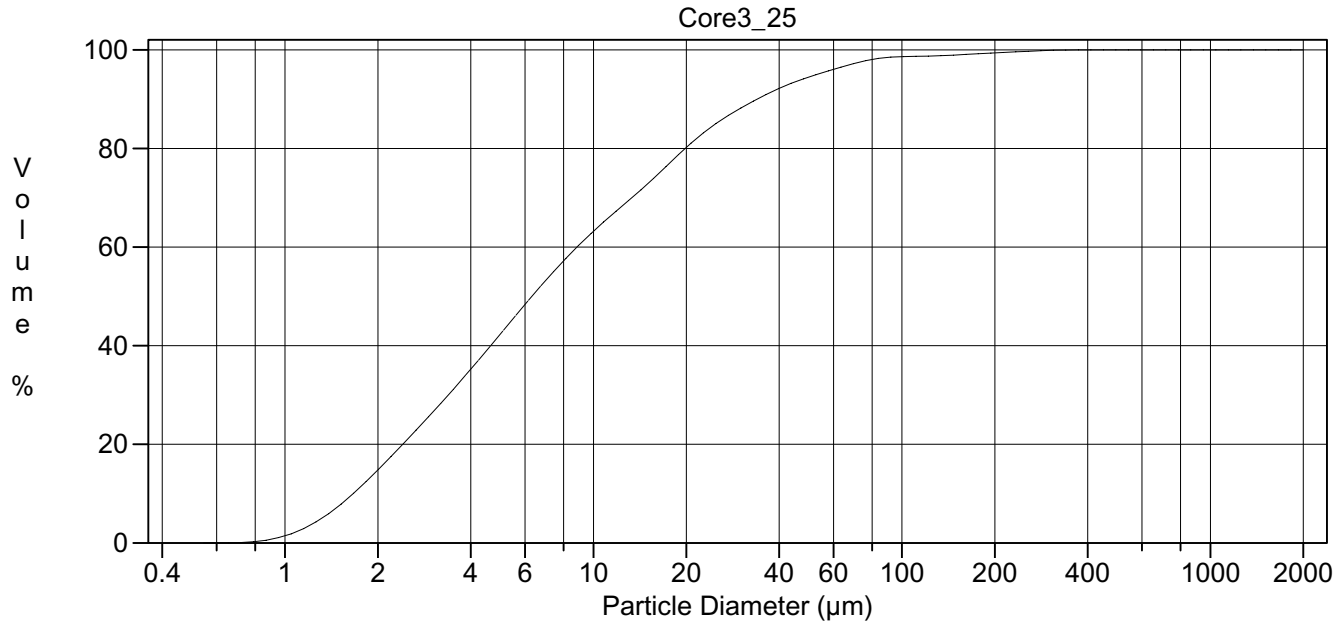
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	18.67 µm	95% Conf. Limits:	0-72.84 µm
Median:	7.830 µm	S.D.:	27.63 µm
D(3,2):	4.590 µm	Variance:	763.6 µm^2
Mean/Median Ratio:	2.385	C.V.:	148%
Mode:	5.355 µm	Skewness:	3.620 Right skewed
d_{10}:	1.773 µm	Kurtosis:	19.68 Leptokurtic
d_{50}:	7.830 µm		
d_{90}:	50.57 µm		
Specific Surf. Area	13072 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.773	3.257	11.79	22.05	50.57

022164.$02

Particle Diameter µm	Volume %
1.000	11.5
2.000	24.3
5.000	19.1
10.00	9.28
15.00	7.21
20.00	5.04
25.00	12.1
50.00	2.93
60.00	0.79
63.00	1.56
70.00	2.45
90.00	1.14
125.0	1.21
250.0	0.10
500.0	0
1000	0



Volume Statistics (Arithmetic) 022165.$02

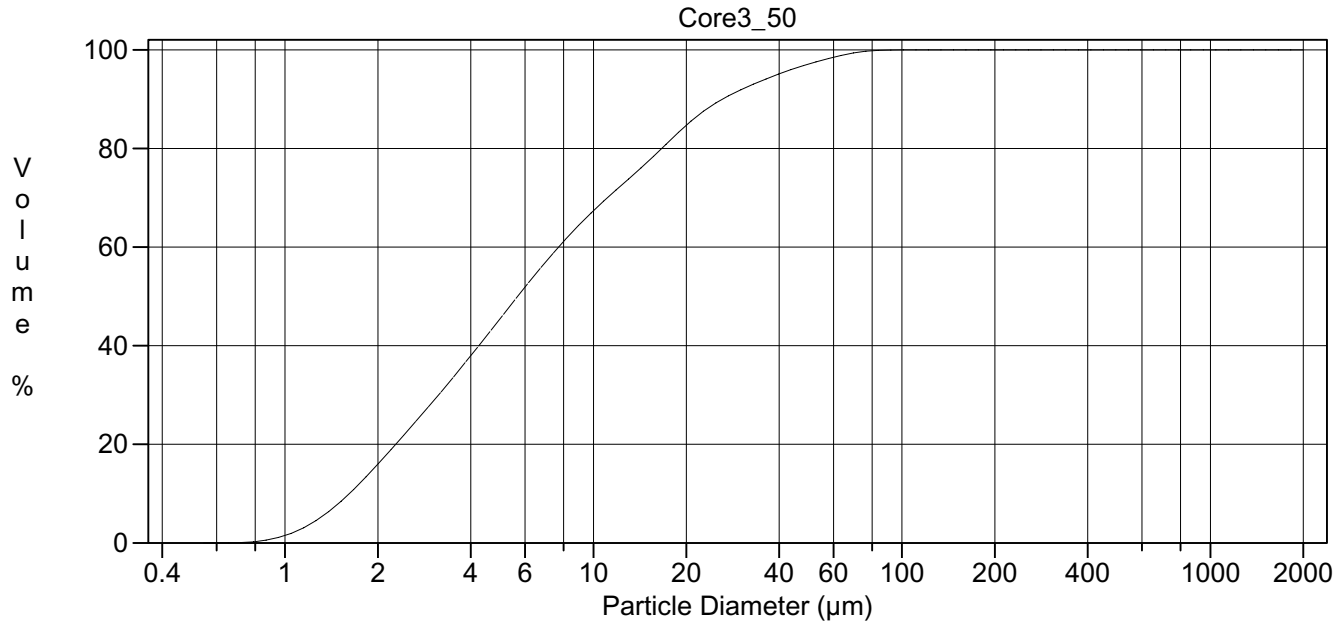
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	14.84 µm	95% Conf. Limits:	0-68.27 µm
Median:	6.314 µm	S.D.:	27.26 µm
D(3,2):	4.086 µm	Variance:	743.2 µm^2
Mean/Median Ratio:	2.349	C.V.:	184%
Mode:	5.355 µm	Skewness:	5.927 Right skewed
d_{10}:	1.664 µm	Kurtosis:	47.25 Leptokurtic
d_{50}:	6.314 µm		
d_{90}:	33.90 µm		
Specific Surf. Area	14684 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.664	2.863	8.844	16.32	33.90

022165.$02

Particle Diameter µm	Volume %
1.000	13.4
2.000	27.6
5.000	20.8
10.00	9.66
15.00	7.33
20.00	4.90
25.00	9.40
50.00	1.55
60.00	0.40
63.00	0.81
70.00	1.22
90.00	0.28
125.0	0.93
250.0	0.30
500.0	0
1000	0



Volume Statistics (Arithmetic) 022166#.$02

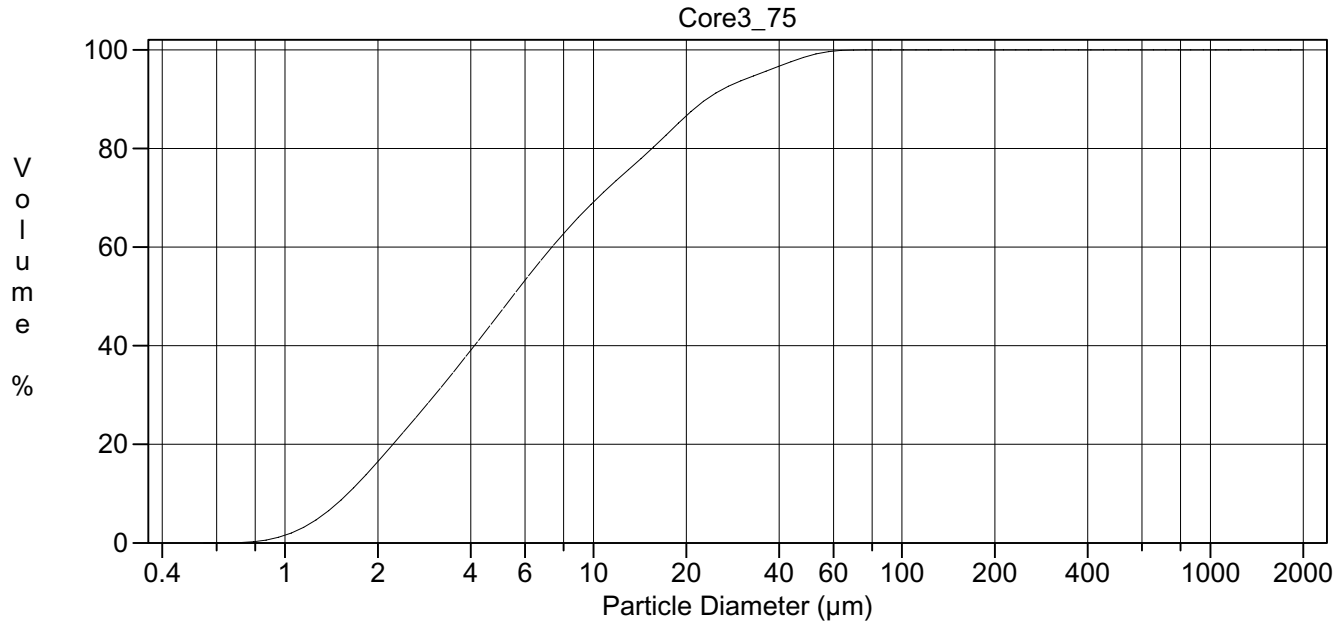
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	10.79 µm	95% Conf. Limits:	0-36.44 µm
Median:	5.677 µm	S.D.:	13.09 µm
D(3,2):	3.839 µm	Variance:	171.3 µm^2
Mean/Median Ratio:	1.900	C.V.:	121%
Mode:	5.355 µm	Skewness:	2.466 Right skewed
d_{10}:	1.617 µm	Kurtosis:	6.963 Leptokurtic
d_{50}:	5.677 µm		
d_{90}:	26.19 µm		
Specific Surf. Area	15628 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.617	2.686	7.715	13.65	26.19

022166#.$02

Particle Diameter µm	Volume %
1.000	14.5
2.000	29.6
5.000	21.8
10.00	9.94
15.00	7.38
20.00	4.60
25.00	7.85
50.00	1.34
60.00	0.33
63.00	0.58
70.00	0.57
90.00	0.027
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022167.$02

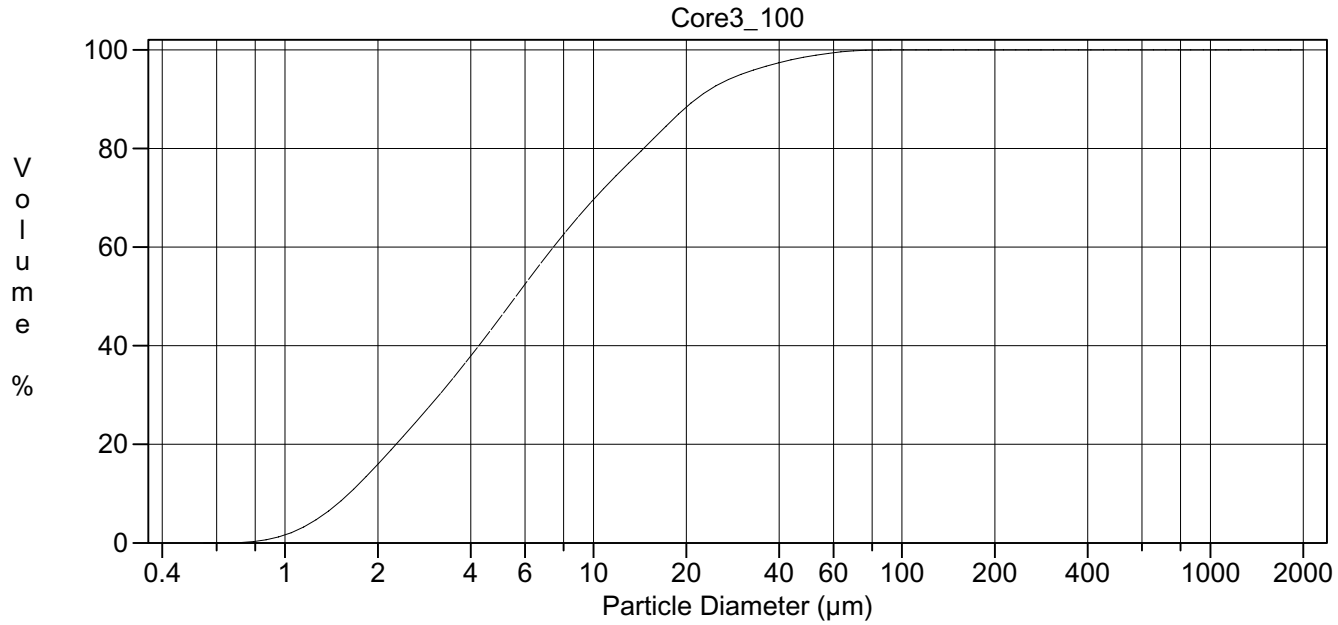
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	9.687 µm	95% Conf. Limits:	0-30.83 µm
Median:	5.468 µm	S.D.:	10.79 µm
D(3,2):	3.744 µm	Variance:	116.3 µm^2
Mean/Median Ratio:	1.772	C.V.:	111%
Mode:	5.355 µm	Skewness:	2.145 Right skewed
d_{10}:	1.597 µm	Kurtosis:	4.984 Leptokurtic
d_{50}:	5.468 µm		
d_{90}:	23.28 µm		
Specific Surf. Area	16025 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.597	2.622	7.335	12.62	23.28

022167.$02

Particle Diameter µm	Volume %
1.000	14.9
2.000	30.3
5.000	22.3
10.00	10.1
15.00	7.41
20.00	4.69
25.00	7.49
50.00	0.96
60.00	0.13
63.00	0.099
70.00	0.014
90.00	0
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022168.$02

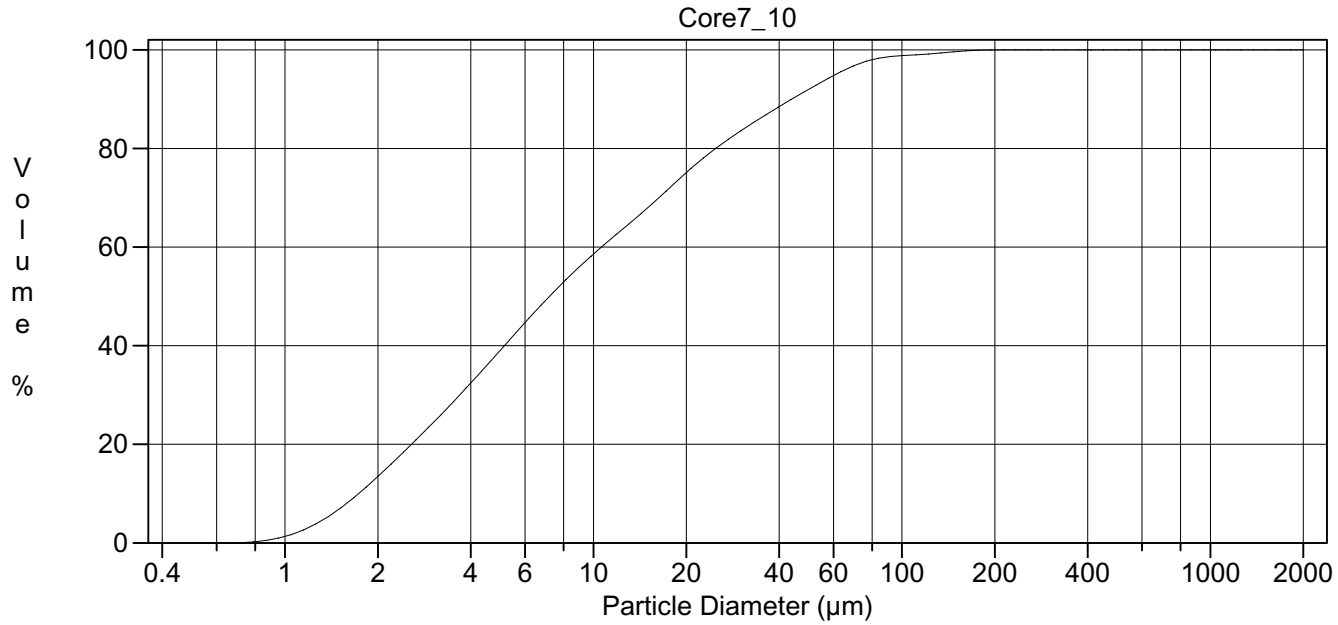
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	9.371 µm	95% Conf. Limits:	0-29.84 µm
Median:	5.604 µm	S.D.:	10.44 µm
D(3,2):	3.780 µm	Variance:	109.1 μm^2
Mean/Median Ratio:	1.672	C.V.:	111%
Mode:	5.355 µm	Skewness:	2.562 Right skewed
d_{10}:	1.611 µm	Kurtosis:	8.498 Leptokurtic
d_{50}:	5.604 µm		
d_{90}:	21.52 µm		
Specific Surf. Area	15874 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.611	2.698	7.412	12.06	21.52

022168.$02

Particle Diameter µm	Volume %
1.000	14.3
2.000	29.8
5.000	23.8
10.00	11.2
15.00	7.53
20.00	4.39
25.00	5.94
50.00	0.73
60.00	0.16
63.00	0.25
70.00	0.17
90.00	0.0025
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022169.$02

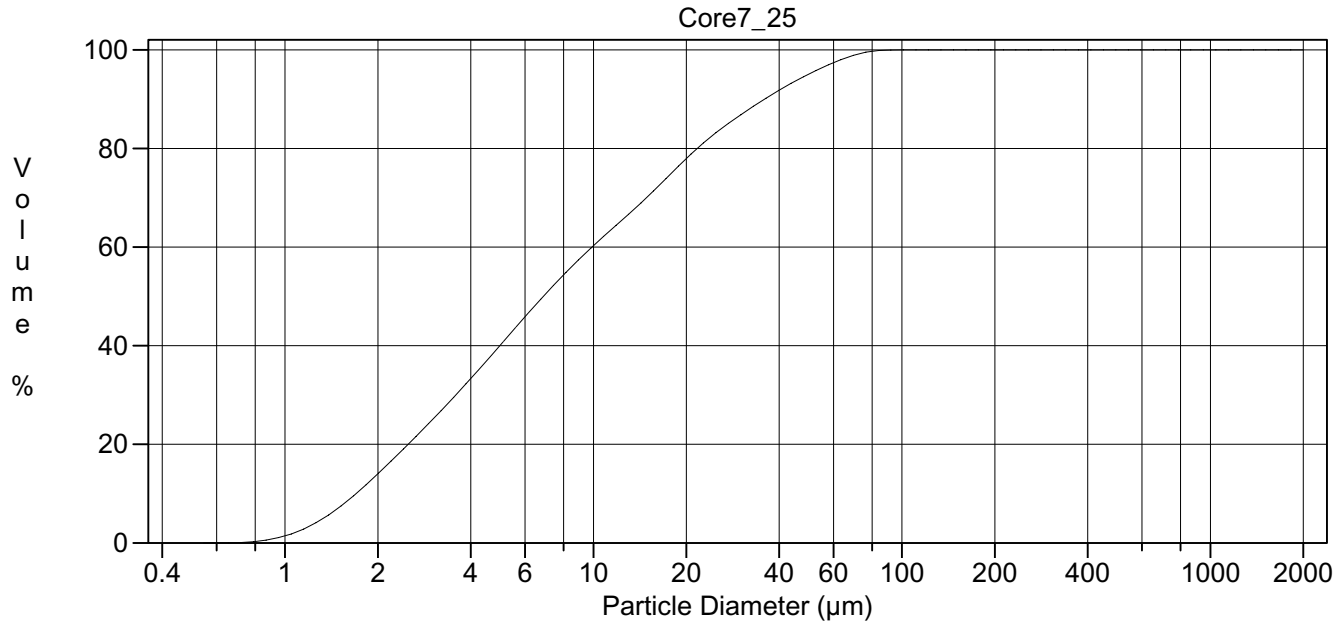
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	16.19 µm	95% Conf. Limits:	0-59.47 µm
Median:	7.204 µm	S.D.:	22.09 µm
D(3,2):	4.396 µm	Variance:	487.8 µm^2
Mean/Median Ratio:	2.247	C.V.:	136%
Mode:	5.355 µm	Skewness:	2.956 Right skewed
d_{10}:	1.733 µm	Kurtosis:	12.02 Leptokurtic
d_{50}:	7.204 µm		
d_{90}:	43.83 µm		
Specific Surf. Area	13649 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.733	3.092	10.61	19.91	43.83

022169.$02

Particle Diameter µm	Volume %
1.000	12.1
2.000	25.7
5.000	19.5
10.00	9.41
15.00	7.11
20.00	5.00
25.00	11.9
50.00	2.74
60.00	0.71
63.00	1.33
70.00	1.77
90.00	0.64
125.0	0.76
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022170#.$02

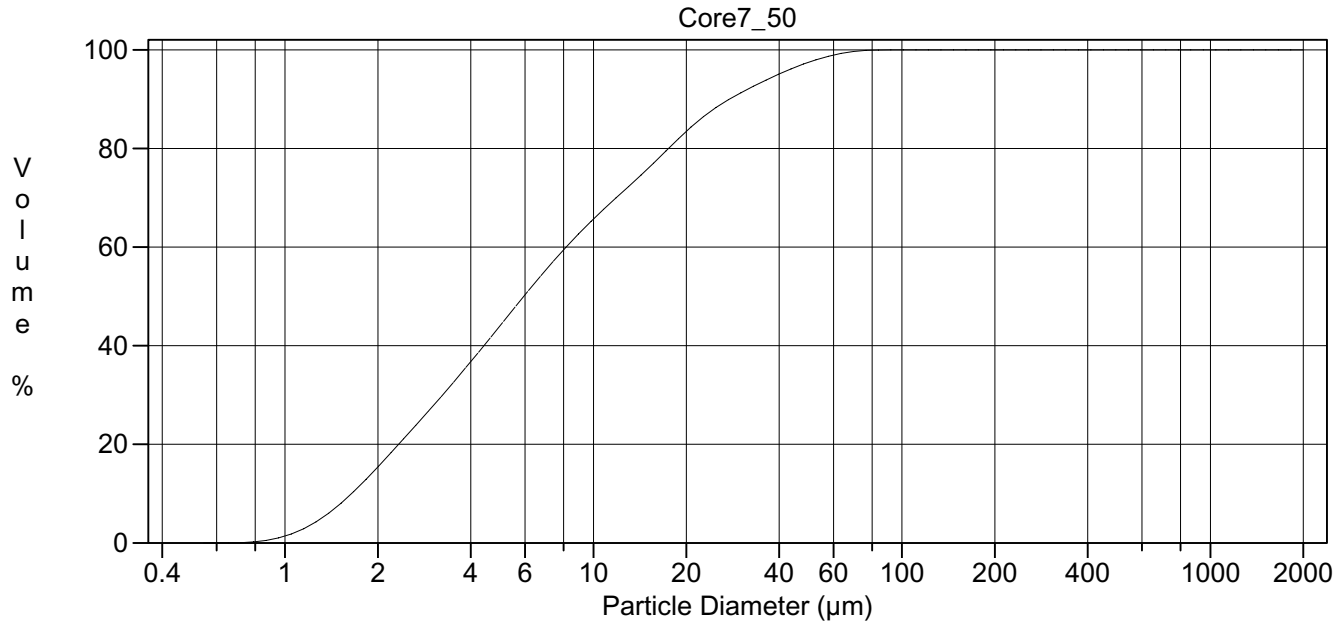
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	13.48 µm	95% Conf. Limits:	0-44.21 µm
Median:	6.879 µm	S.D.:	15.68 µm
D(3,2):	4.256 µm	Variance:	245.8 µm^2
Mean/Median Ratio:	1.960	C.V.:	116%
Mode:	5.355 µm	Skewness:	1.954 Right skewed
d_{10}:	1.701 µm	Kurtosis:	3.730 Leptokurtic
d_{50}:	6.879 µm		
d_{90}:	35.81 µm		
Specific Surf. Area	14098 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.701	3.007	9.881	17.91	35.81

022170#.$02

Particle Diameter µm	Volume %
1.000	12.6
2.000	26.2
5.000	20.1
10.00	9.98
15.00	7.68
20.00	5.30
25.00	11.9
50.00	2.29
60.00	0.56
63.00	0.99
70.00	0.99
90.00	0.048
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022171.$02

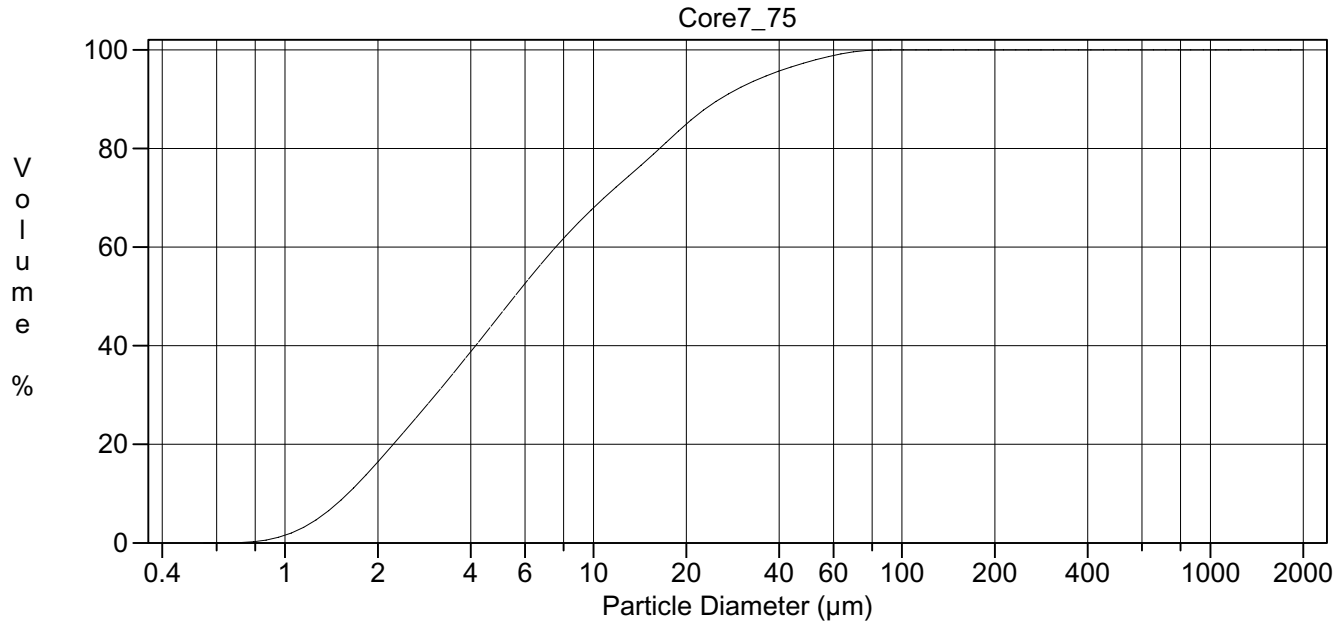
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	11.05 µm	95% Conf. Limits:	0-36.04 µm
Median:	5.946 µm	S.D.:	12.75 µm
D(3,2):	3.945 µm	Variance:	162.6 µm^2
Mean/Median Ratio:	1.858	C.V.:	115%
Mode:	5.355 µm	Skewness:	2.181 Right skewed
d_{10}:	1.644 µm	Kurtosis:	5.212 Leptokurtic
d_{50}:	5.946 µm		
d_{90}:	27.56 µm		
Specific Surf. Area	15208 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.644	2.759	8.151	14.48	27.56

022171.$02

Particle Diameter µm	Volume %
1.000	14.0
2.000	28.7
5.000	21.5
10.00	10.2
15.00	7.56
20.00	4.88
25.00	9.17
50.00	1.42
60.00	0.30
63.00	0.46
70.00	0.30
90.00	0.0047
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022172.$02

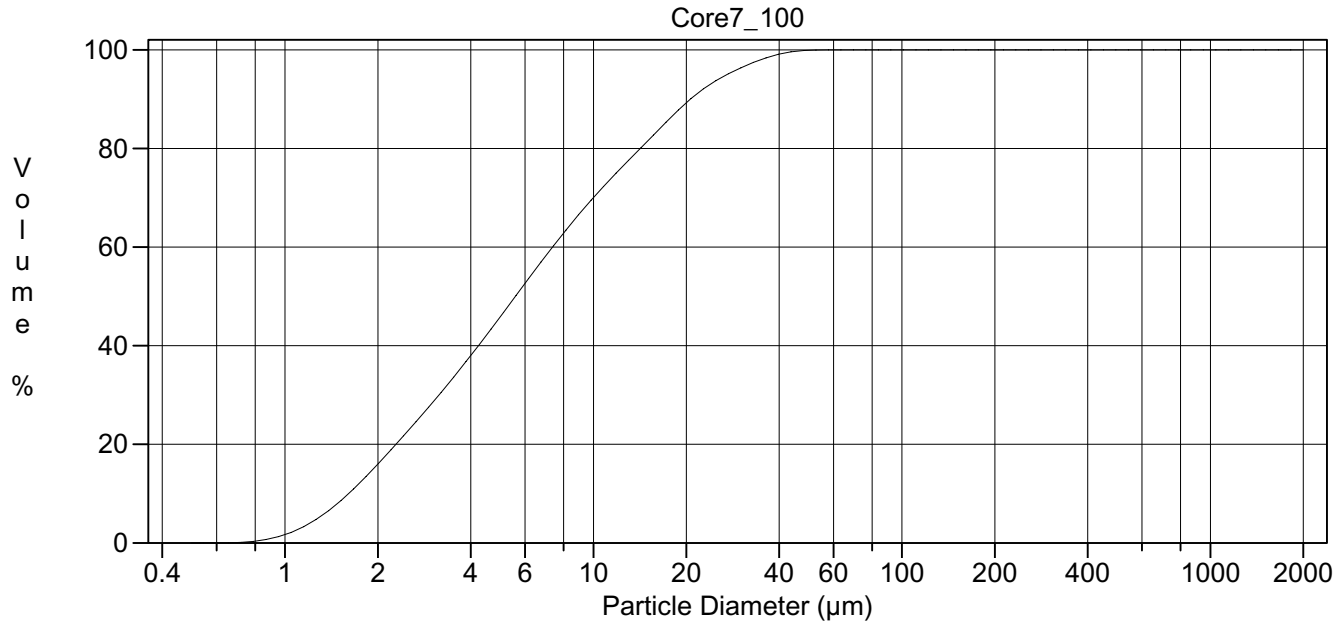
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	10.45 µm	95% Conf. Limits:	0-34.78 µm
Median:	5.552 µm	S.D.:	12.41 µm
D(3,2):	3.779 µm	Variance:	154.1 µm^2
Mean/Median Ratio:	1.881	C.V.:	119%
Mode:	4.878 µm	Skewness:	2.383 Right skewed
d_{10}:	1.599 µm	Kurtosis:	6.518 Leptokurtic
d_{50}:	5.552 µm		
d_{90}:	25.63 µm		
Specific Surf. Area	15878 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.599	2.630	7.548	13.34	25.63

022172.$02

Particle Diameter µm	Volume %
1.000	14.9
2.000	29.9
5.000	21.6
10.00	9.83
15.00	7.13
20.00	4.66
25.00	8.03
50.00	1.24
60.00	0.29
63.00	0.47
70.00	0.35
90.00	0.0070
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022173.$02

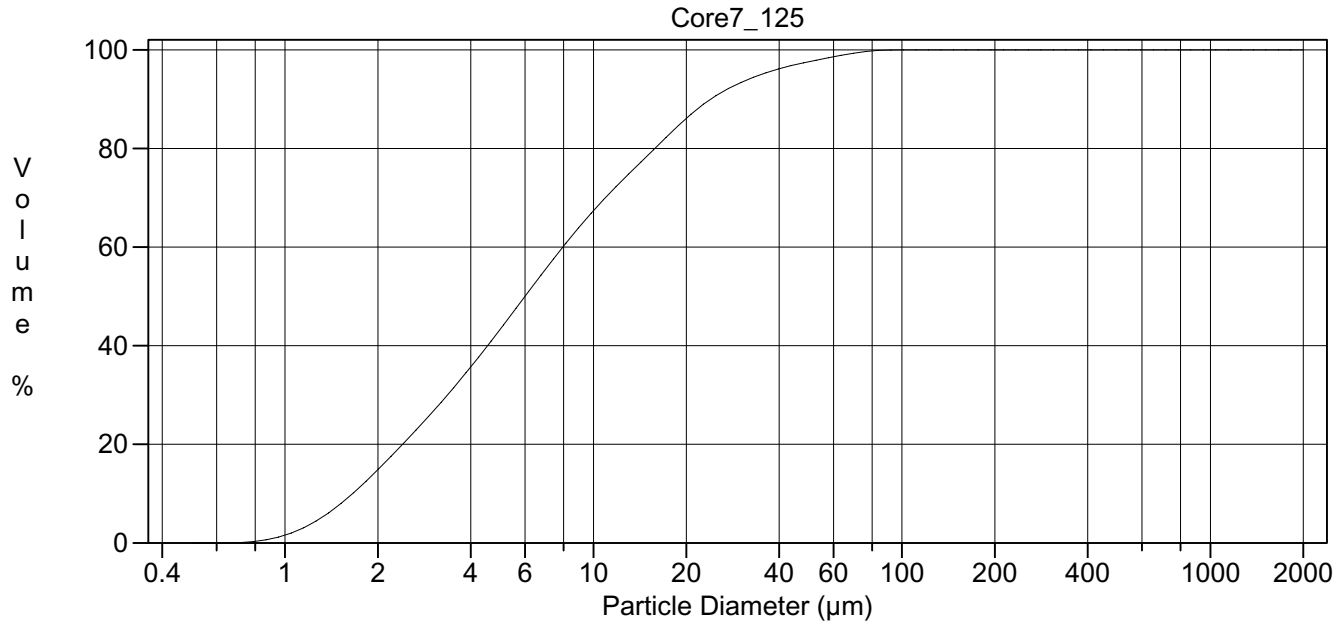
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	8.733 µm	95% Conf. Limits:	0-25.40 µm
Median:	5.582 µm	S.D.:	8.505 µm
D(3,2):	3.758 µm	Variance:	72.33 µm^2
Mean/Median Ratio:	1.565	C.V.:	97.4%
Mode:	5.355 µm	Skewness:	1.772 Right skewed
d_{10}:	1.608 µm	Kurtosis:	3.241 Leptokurtic
d_{50}:	5.582 µm		
d_{90}:	20.59 µm		
Specific Surf. Area	15967 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.608	2.696	7.366	11.83	20.59

022173.$02

Particle Diameter µm	Volume %
1.000	14.3
2.000	30.0
5.000	24.1
10.00	11.5
15.00	7.73
20.00	4.55
25.00	6.12
50.00	0.066
60.00	0.00056
63.00	0.000076
70.00	0
90.00	0
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022174.$02

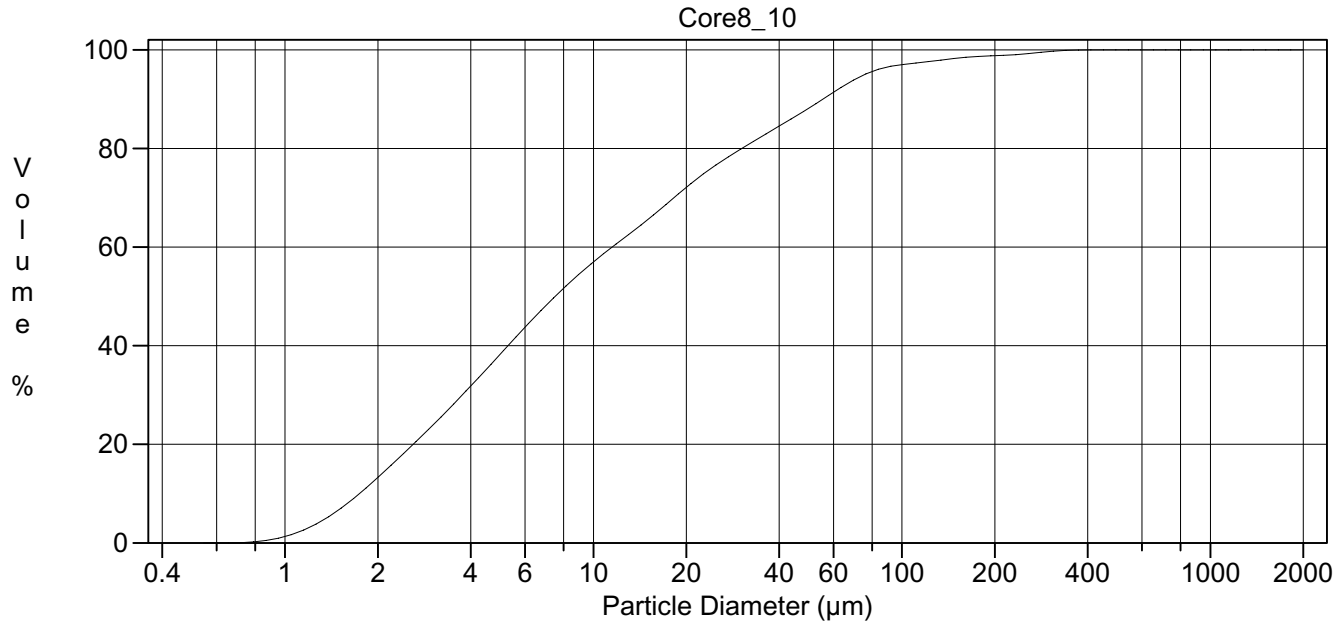
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	10.44 µm	95% Conf. Limits:	0-34.60 µm
Median:	5.998 µm	S.D.:	12.33 µm
D(3,2):	3.952 µm	Variance:	152.0 µm^2
Mean/Median Ratio:	1.740	C.V.:	118%
Mode:	5.878 µm	Skewness:	2.705 Right skewed
d_{10}:	1.656 µm	Kurtosis:	9.061 Leptokurtic
d_{50}:	5.998 µm		
d_{90}:	24.02 µm		
Specific Surf. Area	15184 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.656	2.858	7.961	13.09	24.02

022174.$02

Particle Diameter µm	Volume %
1.000	13.3
2.000	28.6
5.000	24.0
10.00	11.2
15.00	7.49
20.00	4.66
25.00	6.86
50.00	0.99
60.00	0.26
63.00	0.50
70.00	0.60
90.00	0.038
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022175.$02

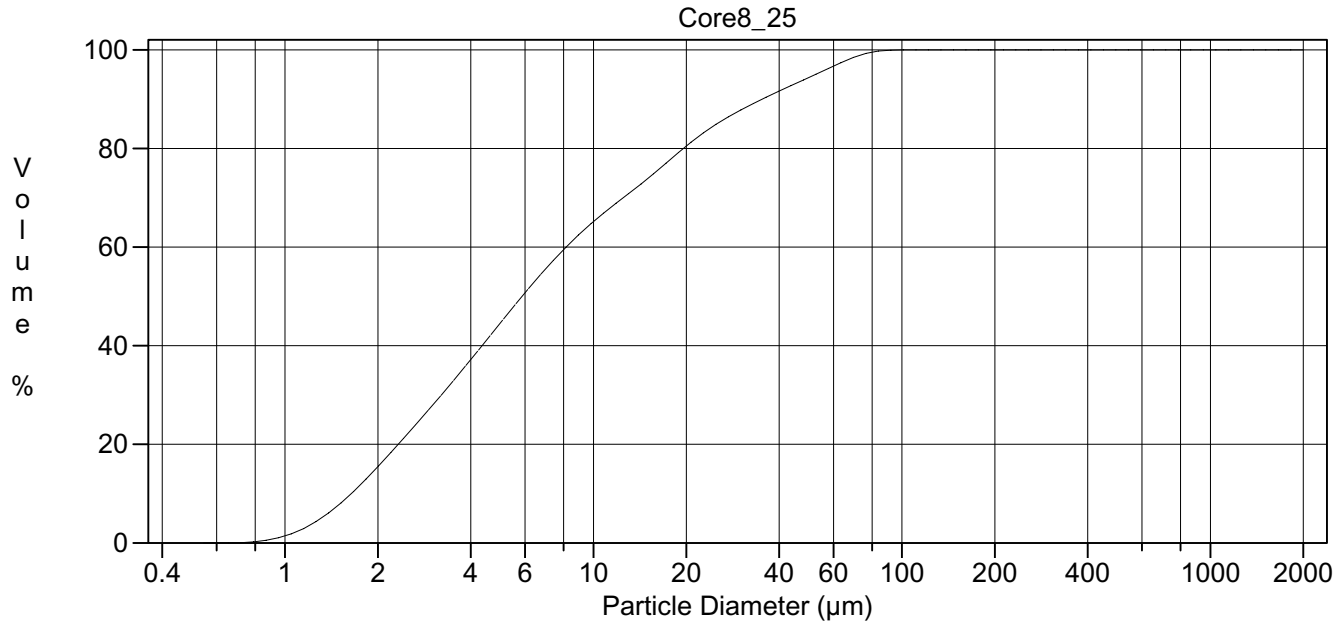
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	21.26 µm	95% Conf. Limits:	0-95.44 µm
Median:	7.510 µm	S.D.:	37.85 µm
D(3,2):	4.502 µm	Variance:	1432 µm^2
Mean/Median Ratio:	2.831	C.V.:	178%
Mode:	5.355 µm	Skewness:	4.570 Right skewed
d_{10}:	1.744 µm	Kurtosis:	27.31 Leptokurtic
d_{50}:	7.510 µm		
d_{90}:	55.43 µm		
Specific Surf. Area	13328 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.744	3.141	11.49	22.89	55.43

022175.$02

Particle Diameter µm	Volume %
1.000	12.0
2.000	25.1
5.000	18.6
10.00	8.59
15.00	6.52
20.00	4.59
25.00	11.5
50.00	3.16
60.00	0.86
63.00	1.70
70.00	2.58
90.00	1.18
125.0	1.48
250.0	0.81
500.0	0
1000	0



Volume Statistics (Arithmetic) 022176.$02

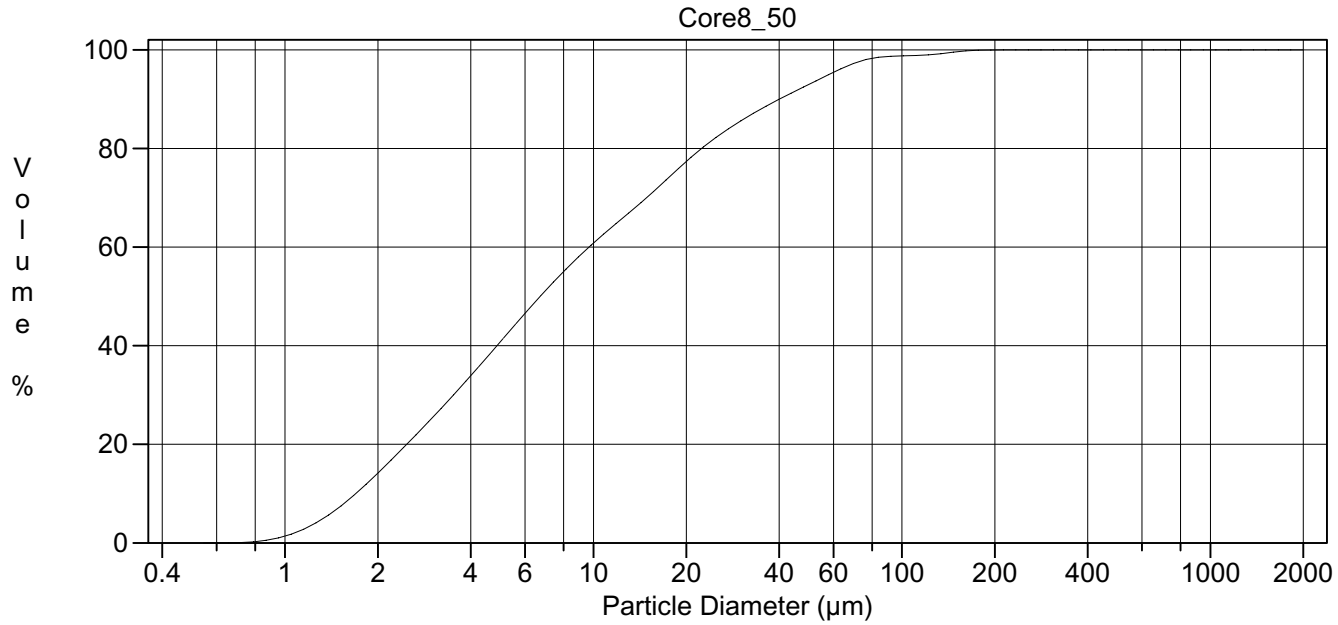
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	12.78 µm	95% Conf. Limits:	0-44.68 µm
Median:	5.870 µm	S.D.:	16.28 µm
D(3,2):	3.957 µm	Variance:	264.9 µm^2
Mean/Median Ratio:	2.177	C.V.:	127%
Mode:	4.878 µm	Skewness:	2.182 Right skewed
d_{10}:	1.640 µm	Kurtosis:	4.594 Leptokurtic
d_{50}:	5.870 µm		
d_{90}:	35.19 µm		
Specific Surf. Area	15163 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.640	2.742	8.150	15.74	35.19

022176.$02

Particle Diameter µm	Volume %
1.000	14.1
2.000	29.2
5.000	20.5
10.00	8.74
15.00	6.58
20.00	4.44
25.00	9.49
50.00	2.29
60.00	0.62
63.00	1.19
70.00	1.40
90.00	0.087
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022177.$02

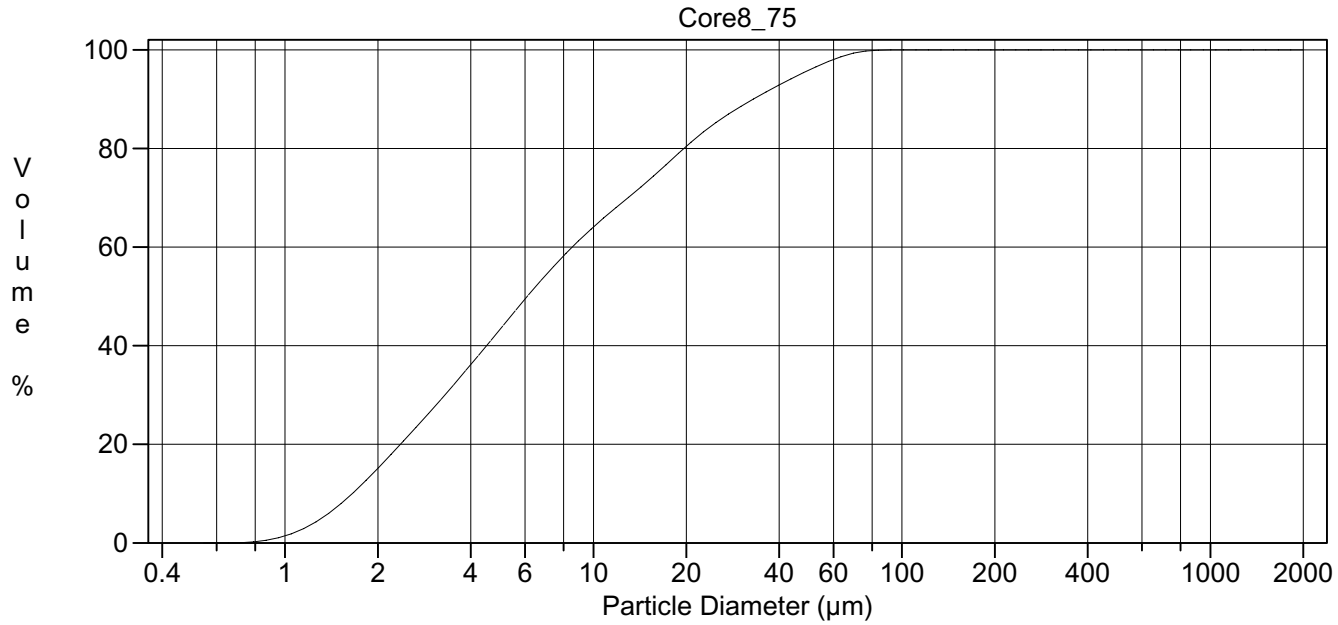
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	15.18 µm	95% Conf. Limits:	0-57.70 µm
Median:	6.715 µm	S.D.:	21.69 µm
D(3,2):	4.234 µm	Variance:	470.5 µm^2
Mean/Median Ratio:	2.261	C.V.:	143%
Mode:	5.355 µm	Skewness:	3.328 Right skewed
d_{10}:	1.696 µm	Kurtosis:	15.07 Leptokurtic
d_{50}:	6.715 µm		
d_{90}:	39.95 µm		
Specific Surf. Area	14170 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.696	2.964	9.672	18.18	39.95

022177.$02

Particle Diameter µm	Volume %
1.000	12.8
2.000	26.7
5.000	20.0
10.00	9.42
15.00	7.11
20.00	4.94
25.00	10.7
50.00	2.43
60.00	0.65
63.00	1.21
70.00	1.38
90.00	0.38
125.0	0.94
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022178.$02

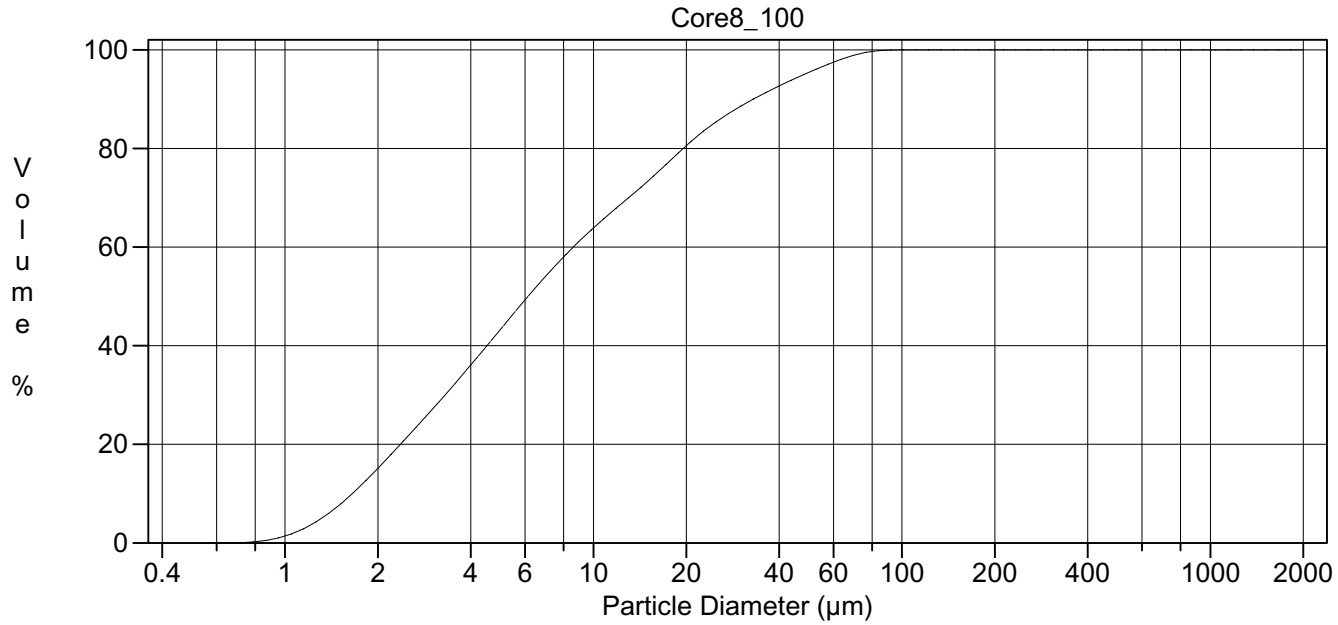
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	12.31 µm	95% Conf. Limits:	0-41.05 µm
Median:	6.099 µm	S.D.:	14.66 µm
D(3,2):	4.020 µm	Variance:	215.0 µm^2
Mean/Median Ratio:	2.018	C.V.:	119%
Mode:	4.878 µm	Skewness:	2.041 Right skewed
d_{10}:	1.653 µm	Kurtosis:	4.078 Leptokurtic
d_{50}:	6.099 µm		
d_{90}:	32.90 µm		
Specific Surf. Area	14925 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.653	2.803	8.544	16.04	32.90

022178.$02

Particle Diameter µm	Volume %
1.000	13.7
2.000	28.3
5.000	20.6
10.00	9.30
15.00	7.04
20.00	4.89
25.00	10.6
50.00	2.14
60.00	0.50
63.00	0.82
70.00	0.61
90.00	0.012
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022179#.$02

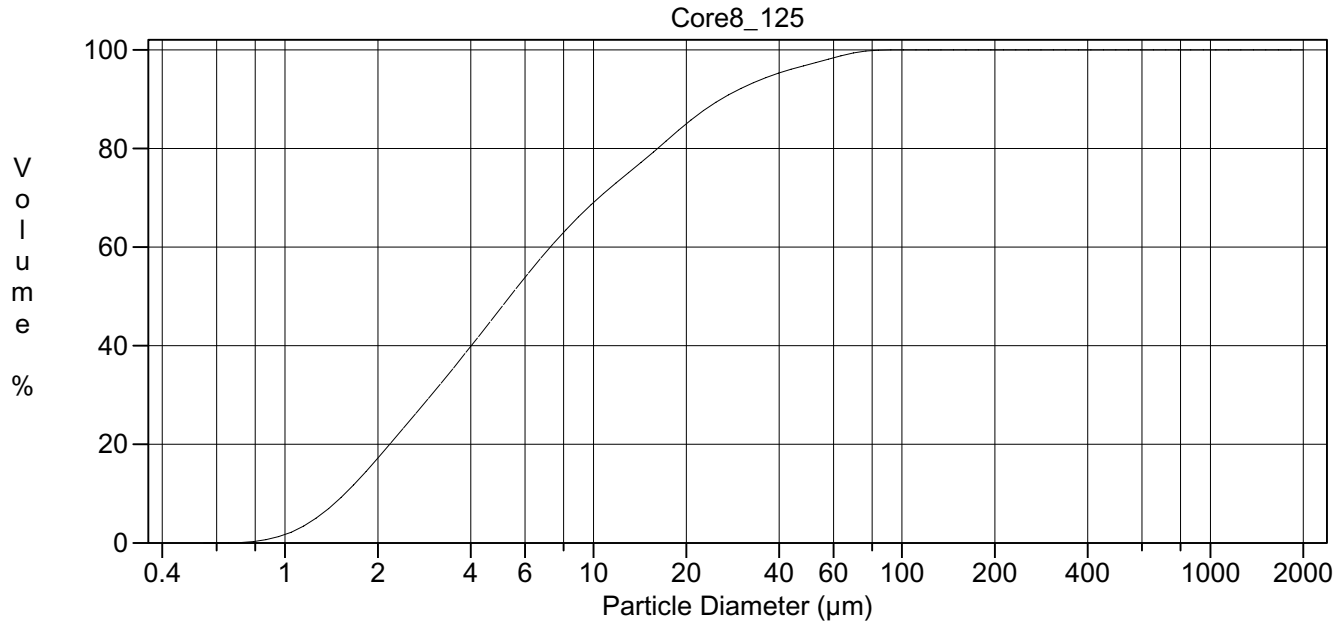
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	12.50 µm	95% Conf. Limits:	0-42.39 µm
Median:	6.130 µm	S.D.:	15.25 µm
D(3,2):	4.027 µm	Variance:	232.6 µm^2
Mean/Median Ratio:	2.039	C.V.:	122%
Mode:	4.878 µm	Skewness:	2.167 Right skewed
d_{10}:	1.653 µm	Kurtosis:	4.795 Leptokurtic
d_{50}:	6.130 µm		
d_{90}:	32.94 µm		
Specific Surf. Area	14899 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.653	2.804	8.608	16.03	32.94

022179#.$02

Particle Diameter µm	Volume %
1.000	13.7
2.000	28.2
5.000	20.6
10.00	9.47
15.00	7.20
20.00	4.88
25.00	10.0
50.00	2.03
60.00	0.51
63.00	0.93
70.00	1.00
90.00	0.056
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022180.$02

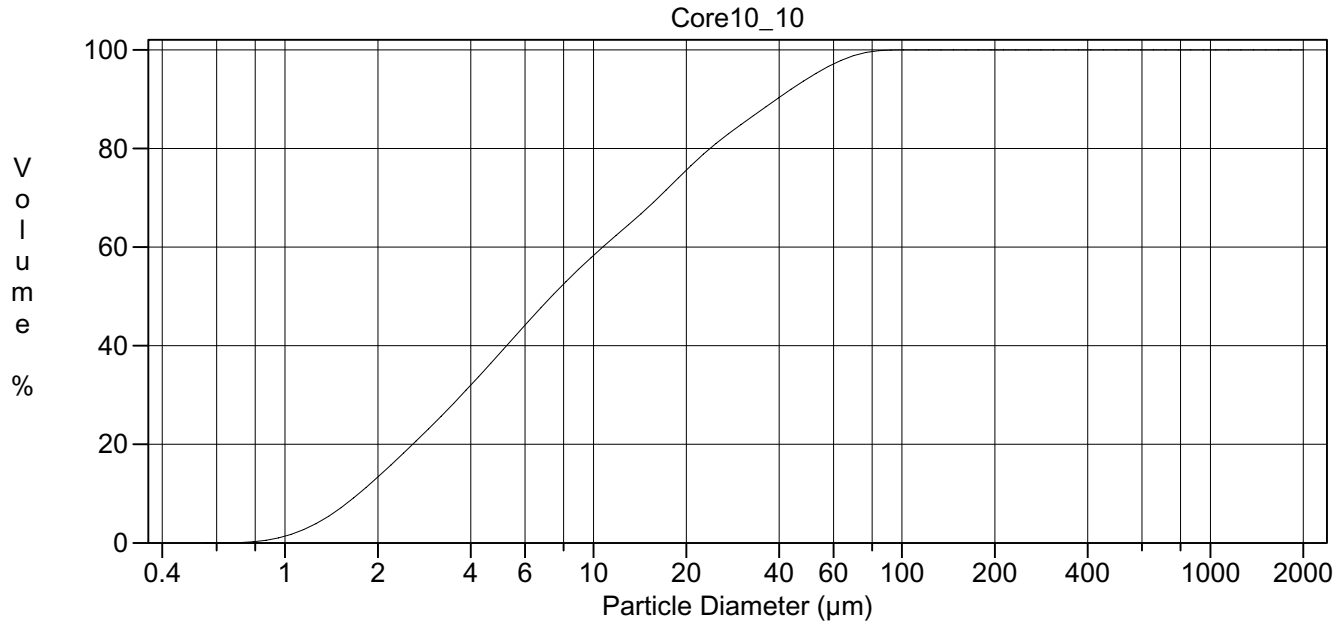
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	10.50 µm	95% Conf. Limits:	0-36.10 µm
Median:	5.365 µm	S.D.:	13.06 µm
D(3,2):	3.686 µm	Variance:	170.7 µm^2
Mean/Median Ratio:	1.957	C.V.:	124%
Mode:	4.878 µm	Skewness:	2.508 Right skewed
d_{10}:	1.566 µm	Kurtosis:	7.082 Leptokurtic
d_{50}:	5.365 µm		
d_{90}:	25.94 µm		
Specific Surf. Area	16277 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.566	2.556	7.250	12.93	25.94

022180.$02

Particle Diameter µm	Volume %
1.000	15.5
2.000	30.3
5.000	21.5
10.00	9.28
15.00	6.70
20.00	4.42
25.00	7.64
50.00	1.34
60.00	0.36
63.00	0.65
70.00	0.57
90.00	0.014
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022181.$02

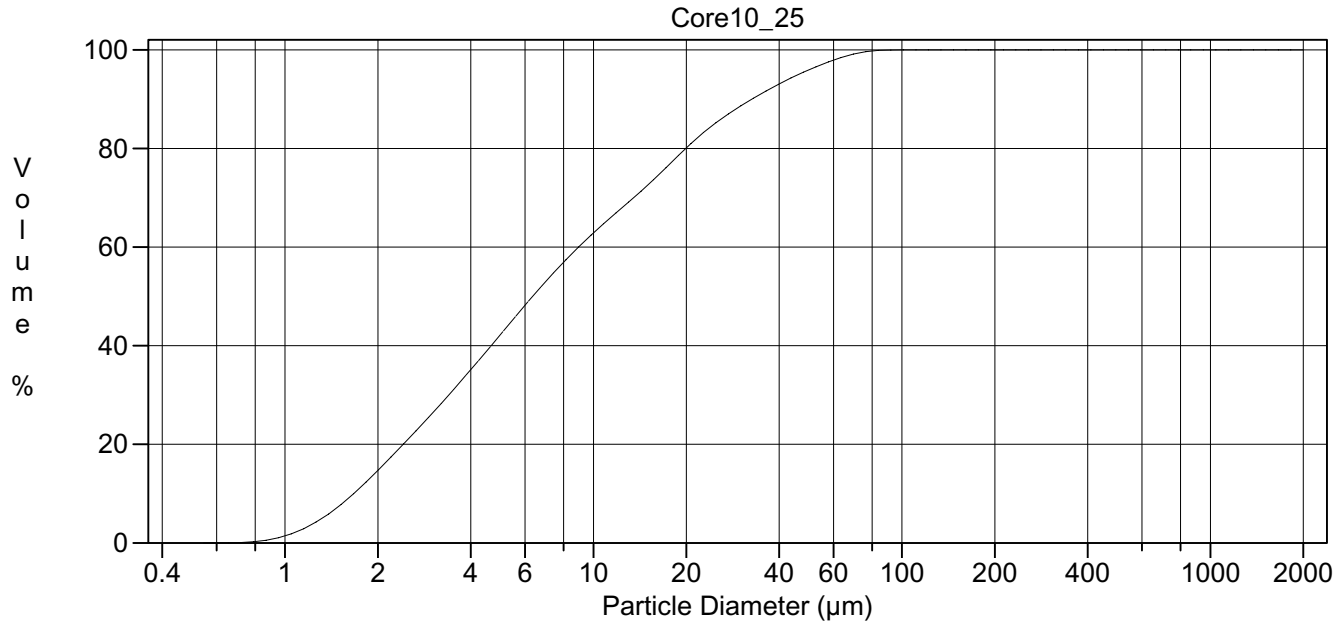
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	14.41 µm	95% Conf. Limits:	0-46.58 µm
Median:	7.316 µm	S.D.:	16.41 µm
D(3,2):	4.406 µm	Variance:	269.3 µm^2
Mean/Median Ratio:	1.970	C.V.:	114%
Mode:	5.355 µm	Skewness:	1.786 Right skewed
d_{10}:	1.736 µm	Kurtosis:	2.871 Leptokurtic
d_{50}:	7.316 µm		
d_{90}:	39.22 µm		
Specific Surf. Area	13618 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.736	3.129	10.71	19.55	39.22

022181.$02

Particle Diameter µm	Volume %
1.000	12.0
2.000	25.3
5.000	19.7
10.00	9.70
15.00	7.59
20.00	5.45
25.00	13.3
50.00	2.76
60.00	0.65
63.00	1.09
70.00	1.07
90.00	0.056
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022182.$02

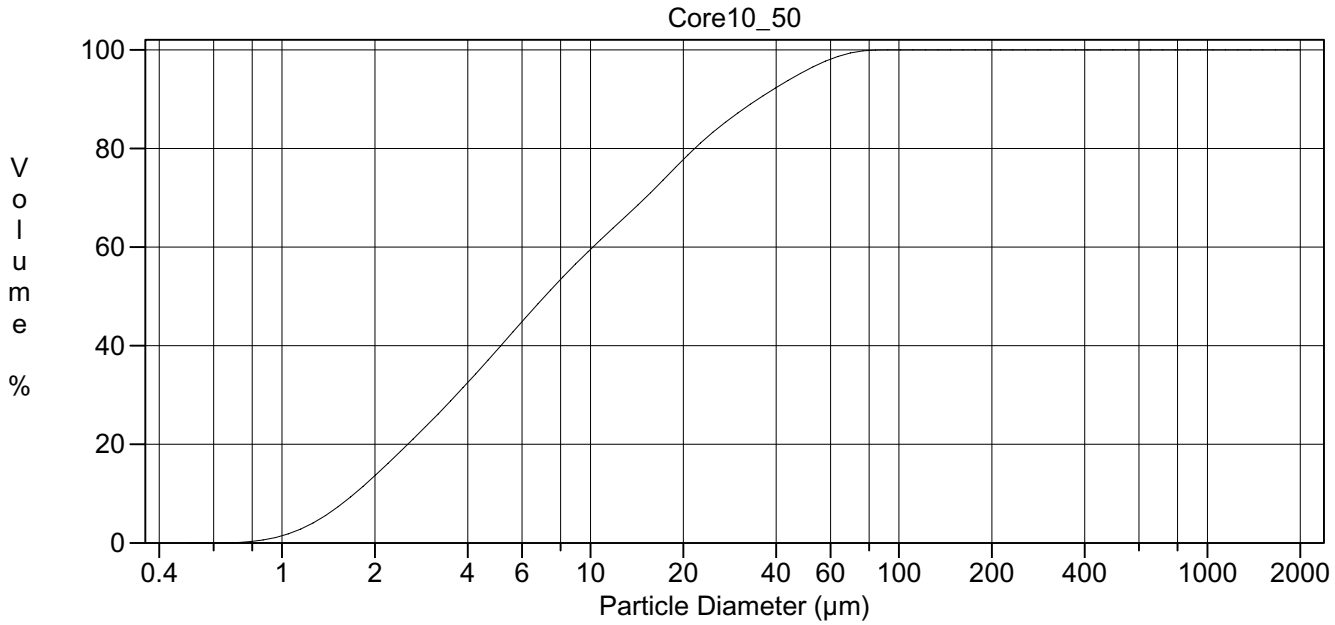
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	12.50 µm	95% Conf. Limits:	0-41.41 µm
Median:	6.353 µm	S.D.:	14.75 µm
D(3,2):	4.096 µm	Variance:	217.6 µm^2
Mean/Median Ratio:	1.967	C.V.:	118%
Mode:	5.355 µm	Skewness:	2.087 Right skewed
d_{10}:	1.670 µm	Kurtosis:	4.501 Leptokurtic
d_{50}:	6.353 µm		
d_{90}:	32.61 µm		
Specific Surf. Area	14647 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.670	2.874	8.939	16.48	32.61

022182.$02

Particle Diameter µm	Volume %
1.000	13.3
2.000	27.6
5.000	20.6
10.00	9.71
15.00	7.52
20.00	5.17
25.00	10.7
50.00	1.95
60.00	0.47
63.00	0.81
70.00	0.78
90.00	0.034
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022183.$02

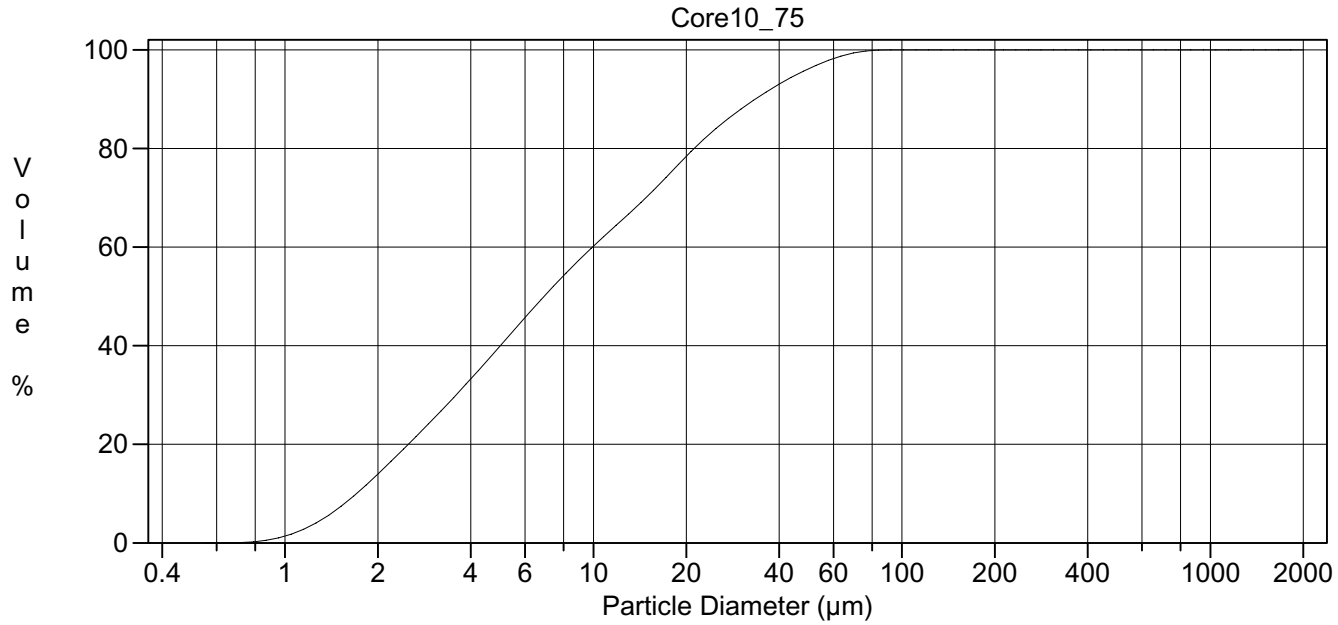
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	13.30 µm	95% Conf. Limits:	0-42.45 µm
Median:	7.113 µm	S.D.:	14.87 µm
D(3,2):	4.318 µm	Variance:	221.1 μm^2
Mean/Median Ratio:	1.870	C.V.:	112%
Mode:	5.355 µm	Skewness:	1.838 Right skewed
d_{10}:	1.720 µm	Kurtosis:	3.212 Leptokurtic
d_{50}:	7.113 µm		
d_{90}:	34.92 µm		
Specific Surf. Area	13895 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.720	3.078	10.18	18.10	34.92

022183.$02

Particle Diameter µm	Volume %
1.000	12.2
2.000	25.6
5.000	20.3
10.00	10.3
15.00	7.86
20.00	5.61
25.00	12.5
50.00	2.29
60.00	0.51
63.00	0.80
70.00	0.57
90.00	0.011
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022184.$02

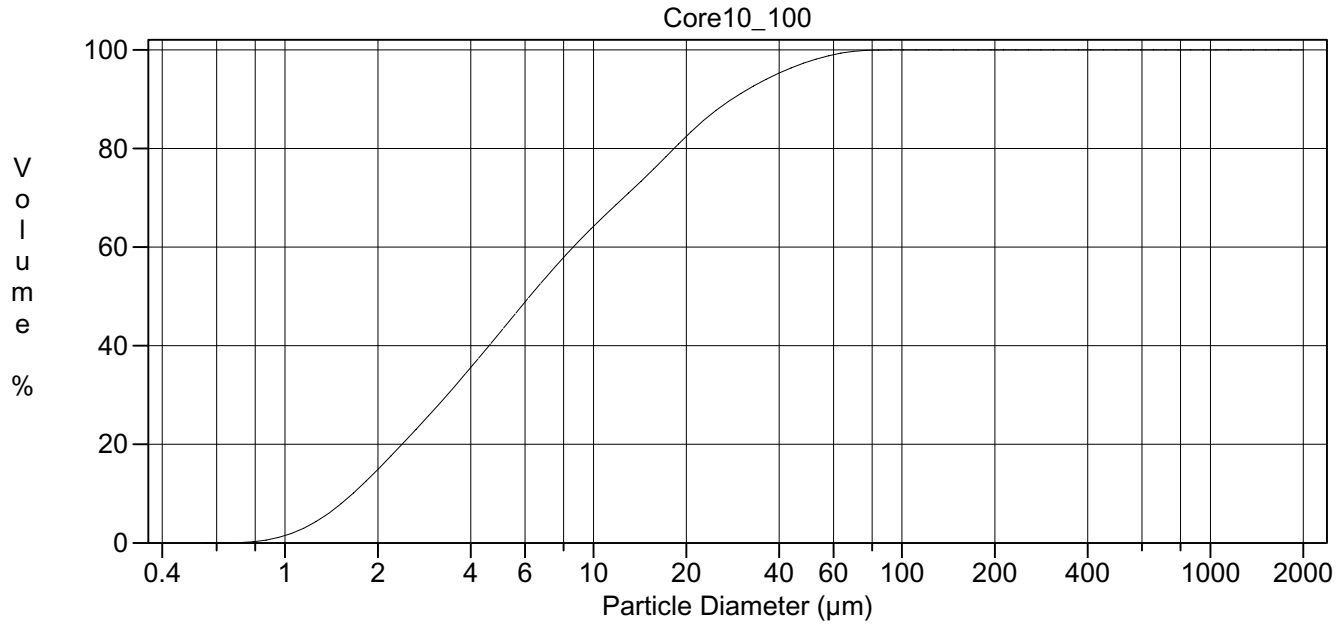
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	12.95 µm	95% Conf. Limits:	0-41.39 µm
Median:	6.920 µm	S.D.:	14.51 µm
D(3,2):	4.261 µm	Variance:	210.6 µm^2
Mean/Median Ratio:	1.872	C.V.:	112%
Mode:	5.355 µm	Skewness:	1.894 Right skewed
d_{10}:	1.705 µm	Kurtosis:	3.581 Leptokurtic
d_{50}:	6.920 µm		
d_{90}:	33.43 µm		
Specific Surf. Area	14080 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.705	3.011	9.924	17.73	33.43

022184.$02

Particle Diameter µm	Volume %
1.000	12.6
2.000	26.1
5.000	20.1
10.00	10.2
15.00	8.01
20.00	5.72
25.00	12.1
50.00	2.02
60.00	0.46
63.00	0.74
70.00	0.56
90.00	0.011
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022185.$02

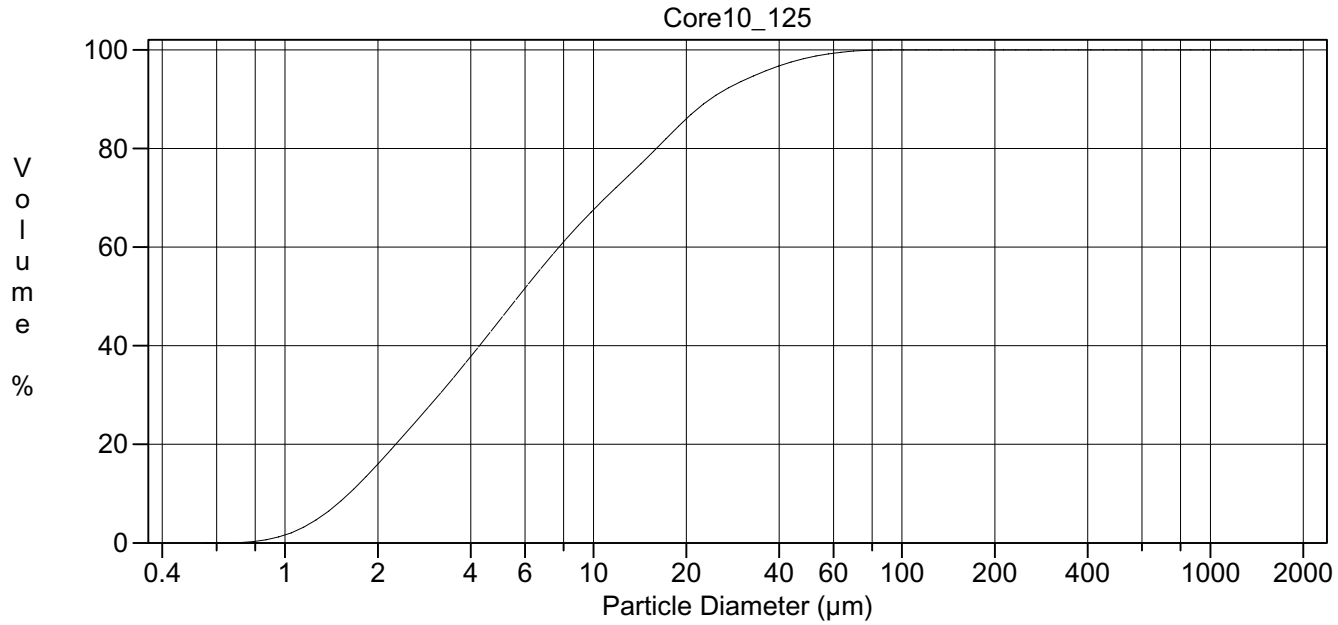
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	11.29 µm	95% Conf. Limits:	0-36.11 µm
Median:	6.210 µm	S.D.:	12.66 µm
D(3,2):	4.026 µm	Variance:	160.4 µm^2
Mean/Median Ratio:	1.818	C.V.:	112%
Mode:	5.355 µm	Skewness:	2.084 Right skewed
d_{10}:	1.659 µm	Kurtosis:	4.807 Leptokurtic
d_{50}:	6.210 µm		
d_{90}:	28.10 µm		
Specific Surf. Area	14905 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.659	2.844	8.605	15.19	28.10

022185.$02

Particle Diameter µm	Volume %
1.000	13.4
2.000	27.9
5.000	21.4
10.00	10.5
15.00	7.79
20.00	5.32
25.00	9.89
50.00	1.35
60.00	0.28
63.00	0.42
70.00	0.27
90.00	0.0043
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022186.$02

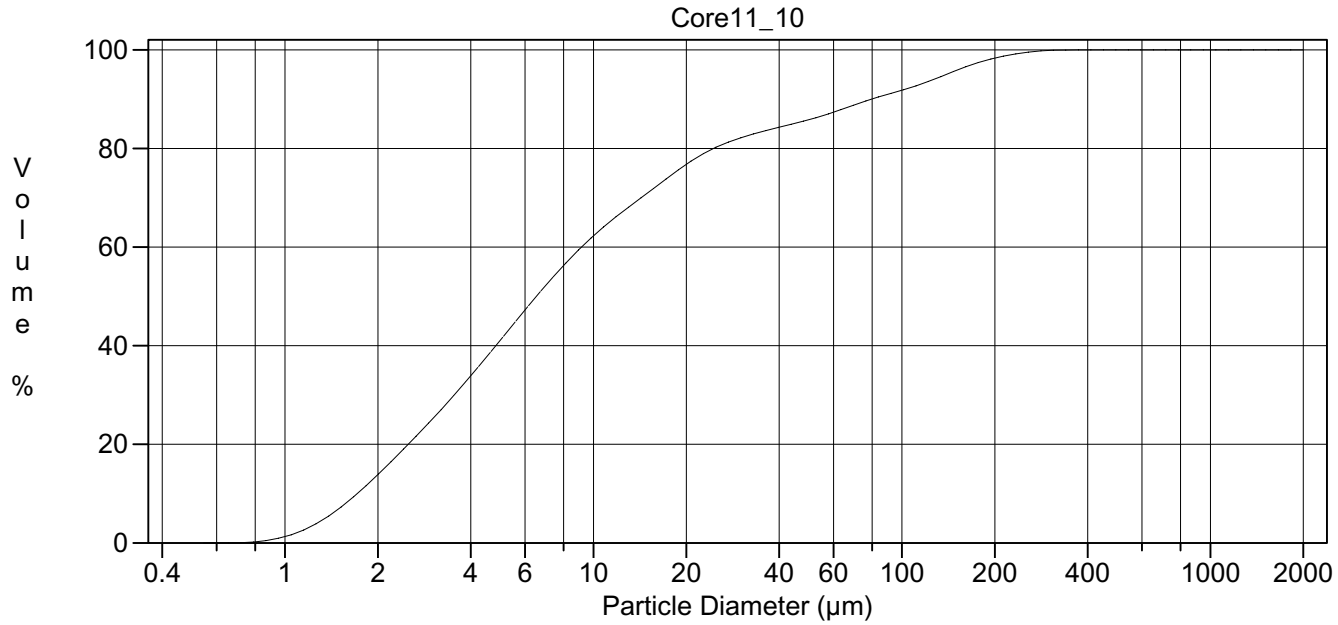
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	10.04 µm	95% Conf. Limits:	0-32.17 µm
Median:	5.716 µm	S.D.:	11.29 µm
D(3,2):	3.822 µm	Variance:	127.4 µm^2
Mean/Median Ratio:	1.757	C.V.:	112%
Mode:	5.355 µm	Skewness:	2.335 Right skewed
d_{10}:	1.612 µm	Kurtosis:	6.690 Leptokurtic
d_{50}:	5.716 µm		
d_{90}:	23.92 µm		
Specific Surf. Area	15699 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.612	2.690	7.741	13.25	23.92

022186.$02

Particle Diameter µm	Volume %
1.000	14.4
2.000	29.4
5.000	22.2
10.00	10.7
15.00	7.76
20.00	4.83
25.00	7.61
50.00	0.87
60.00	0.18
63.00	0.28
70.00	0.20
90.00	0.0038
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022187#.$02

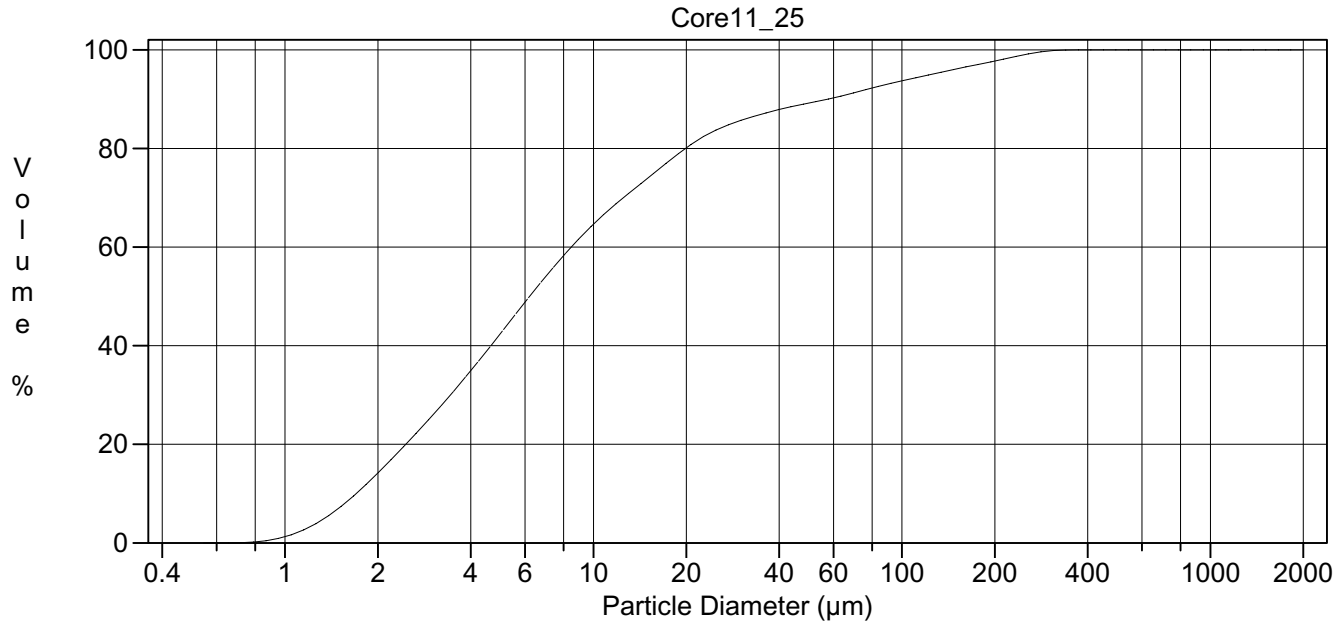
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	24.94 µm	95% Conf. Limits:	0-116.2 µm
Median:	6.531 µm	S.D.:	46.57 µm
D(3,2):	4.279 µm	Variance:	2169 µm^2
Mean/Median Ratio:	3.819	C.V.:	187%
Mode:	5.355 µm	Skewness:	2.973 Right skewed
d_{10}:	1.716 µm	Kurtosis:	9.250 Leptokurtic
d_{50}:	6.531 µm		
d_{90}:	79.55 µm		
Specific Surf. Area	14022 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.716	2.993	9.153	18.23	79.55

022187#.$02

Particle Diameter µm	Volume %
1.000	12.6
2.000	27.3
5.000	21.1
10.00	8.74
15.00	5.77
20.00	3.50
25.00	5.57
50.00	1.51
60.00	0.46
63.00	1.02
70.00	2.16
90.00	2.87
125.0	5.59
250.0	0.53
500.0	0
1000	0



Volume Statistics (Arithmetic) 022188.$02

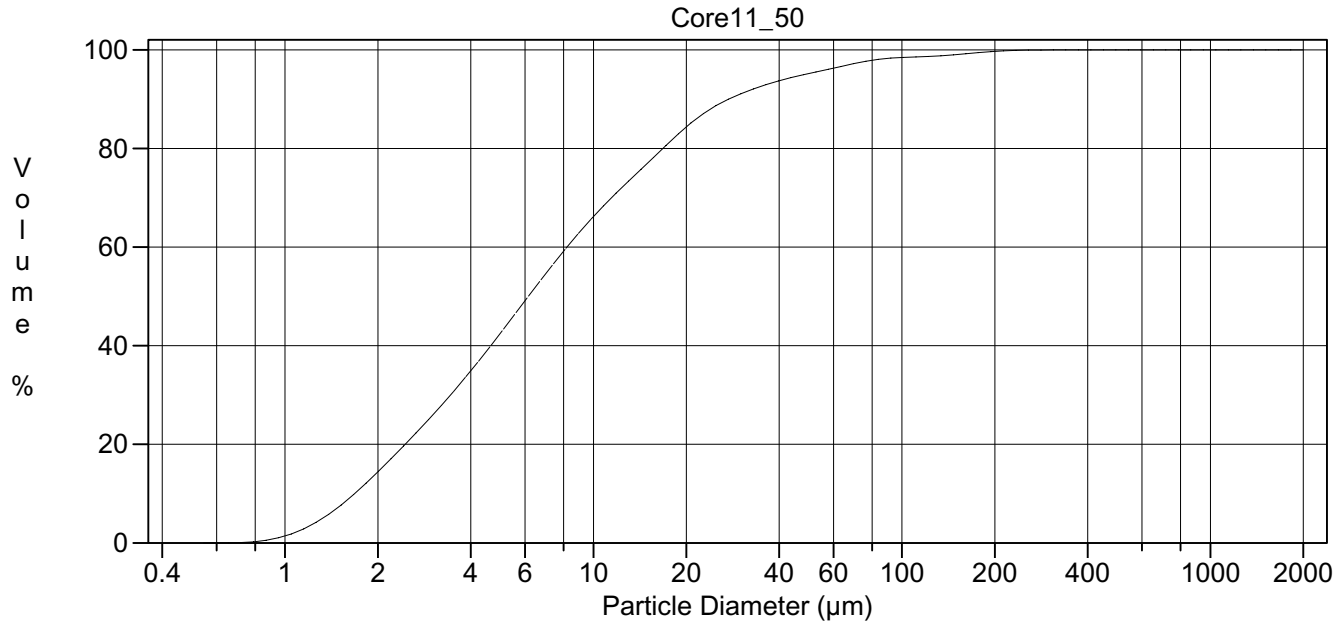
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	22.21 µm	95% Conf. Limits:	0-113.1 µm
Median:	6.207 µm	S.D.:	46.37 µm
D(3,2):	4.153 µm	Variance:	2150 µm^2
Mean/Median Ratio:	3.579	C.V.:	209%
Mode:	5.355 µm	Skewness:	3.642 Right skewed
d_{10}:	1.701 µm	Kurtosis:	14.11 Leptokurtic
d_{50}:	6.207 µm		
d_{90}:	57.34 µm		
Specific Surf. Area	14446 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.701	2.921	8.482	15.69	57.34

022188.$02

Particle Diameter µm	Volume %
1.000	12.9
2.000	28.3
5.000	22.2
10.00	9.35
15.00	6.13
20.00	3.65
25.00	5.45
50.00	1.05
60.00	0.31
63.00	0.73
70.00	1.76
90.00	1.98
125.0	3.99
250.0	0.94
500.0	0
1000	0



Volume Statistics (Arithmetic) 022189.$02

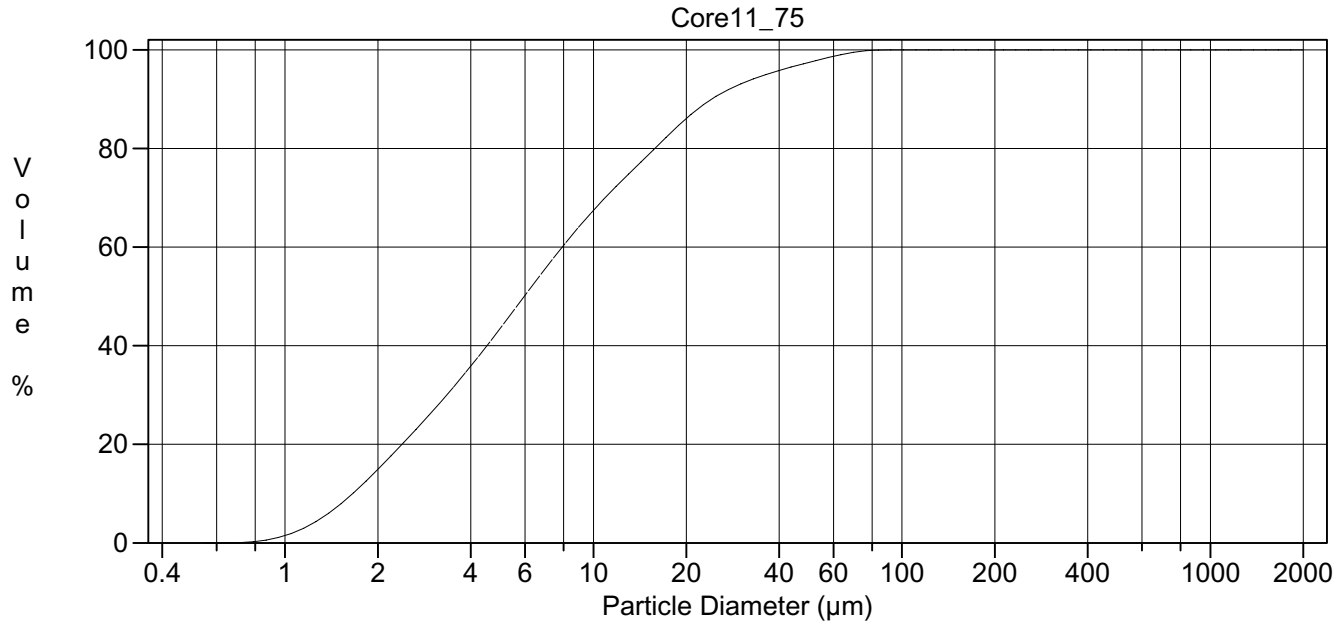
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	13.34 µm	95% Conf. Limits:	0-60.24 µm
Median:	6.144 µm	S.D.:	23.93 µm
D(3,2):	4.053 µm	Variance:	572.6 µm^2
Mean/Median Ratio:	2.172	C.V.:	179%
Mode:	5.878 µm	Skewness:	5.211 Right skewed
d_{10}:	1.682 µm	Kurtosis:	34.51 Leptokurtic
d_{50}:	6.144 µm		
d_{90}:	27.35 µm		
Specific Surf. Area	14805 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.682	2.917	8.205	13.84	27.35

022189.$02

Particle Diameter µm	Volume %
1.000	13.0
2.000	28.2
5.000	23.6
10.00	10.9
15.00	7.28
20.00	4.37
25.00	6.49
50.00	1.08
60.00	0.30
63.00	0.64
70.00	1.04
90.00	0.43
125.0	1.24
250.0	0.046
500.0	0
1000	0



Volume Statistics (Arithmetic) 022190.$02

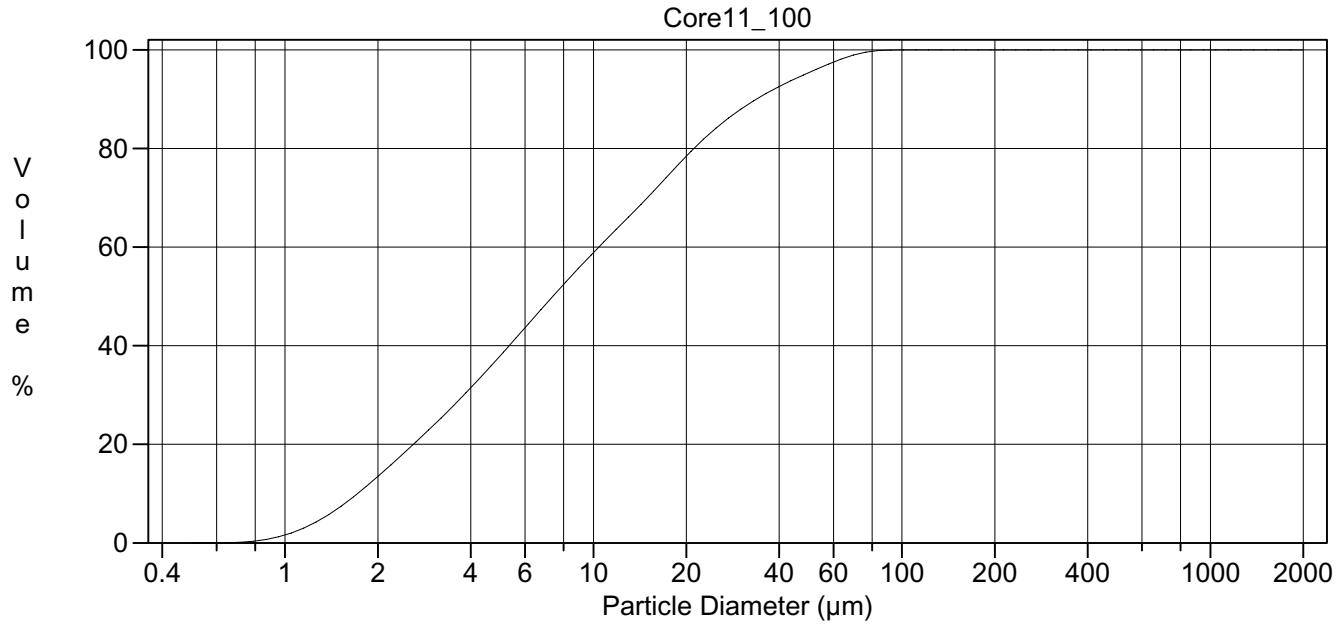
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	10.46 µm	95% Conf. Limits:	0-34.56 µm
Median:	5.967 µm	S.D.:	12.30 µm
D(3,2):	3.951 µm	Variance:	151.2 µm^2
Mean/Median Ratio:	1.753	C.V.:	118%
Mode:	5.878 µm	Skewness:	2.563 Right skewed
d_{10}:	1.657 µm	Kurtosis:	7.738 Leptokurtic
d_{50}:	5.967 µm		
d_{90}:	24.16 µm		
Specific Surf. Area	15188 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.657	2.844	7.927	13.08	24.16

022190.$02

Particle Diameter µm	Volume %
1.000	13.4
2.000	28.7
5.000	23.9
10.00	11.1
15.00	7.47
20.00	4.55
25.00	6.87
50.00	1.21
60.00	0.31
63.00	0.54
70.00	0.44
90.00	0.0093
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022191.$02

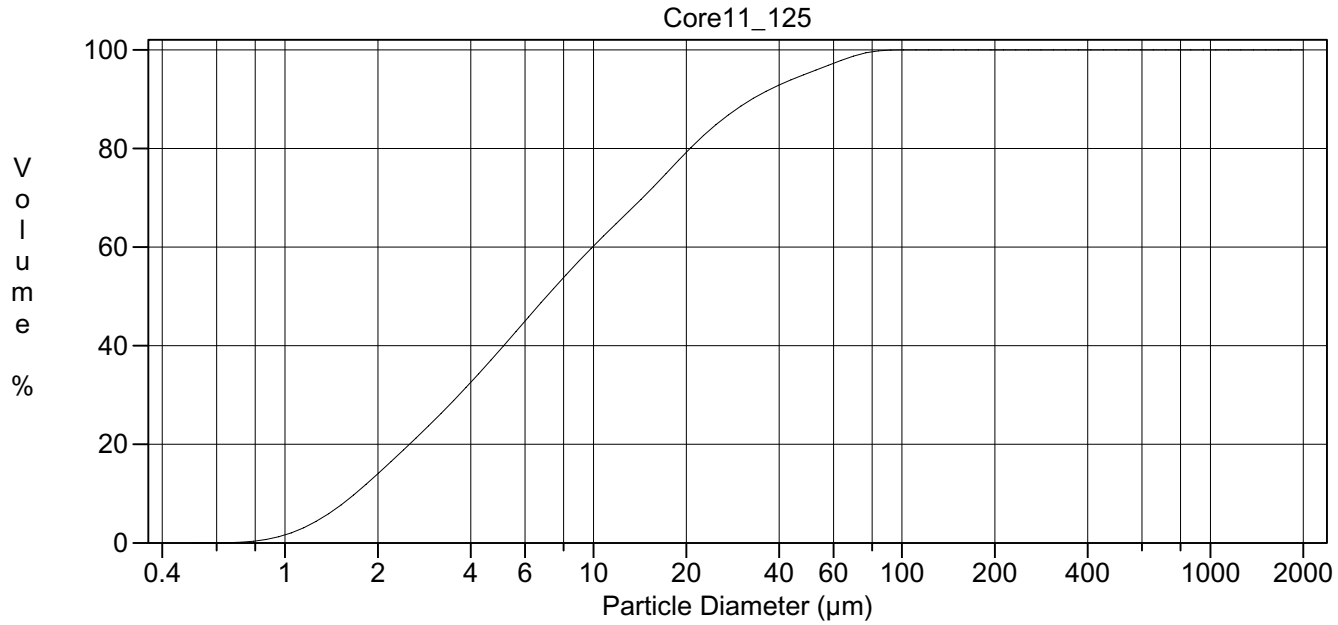
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	13.39 µm	95% Conf. Limits:	0-43.21 µm
Median:	7.379 µm	S.D.:	15.21 µm
D(3,2):	4.354 µm	Variance:	231.5 µm^2
Mean/Median Ratio:	1.814	C.V.:	114%
Mode:	5.878 µm	Skewness:	2.021 Right skewed
d_{10}:	1.718 µm	Kurtosis:	4.215 Leptokurtic
d_{50}:	7.379 µm		
d_{90}:	33.72 µm		
Specific Surf. Area	13781 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.718	3.165	10.41	17.76	33.72

022191.$02

Particle Diameter µm	Volume %
1.000	11.9
2.000	24.5
5.000	20.9
10.00	11.2
15.00	8.32
20.00	5.77
25.00	11.2
50.00	2.10
60.00	0.53
63.00	0.95
70.00	0.96
90.00	0.045
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022192.$02

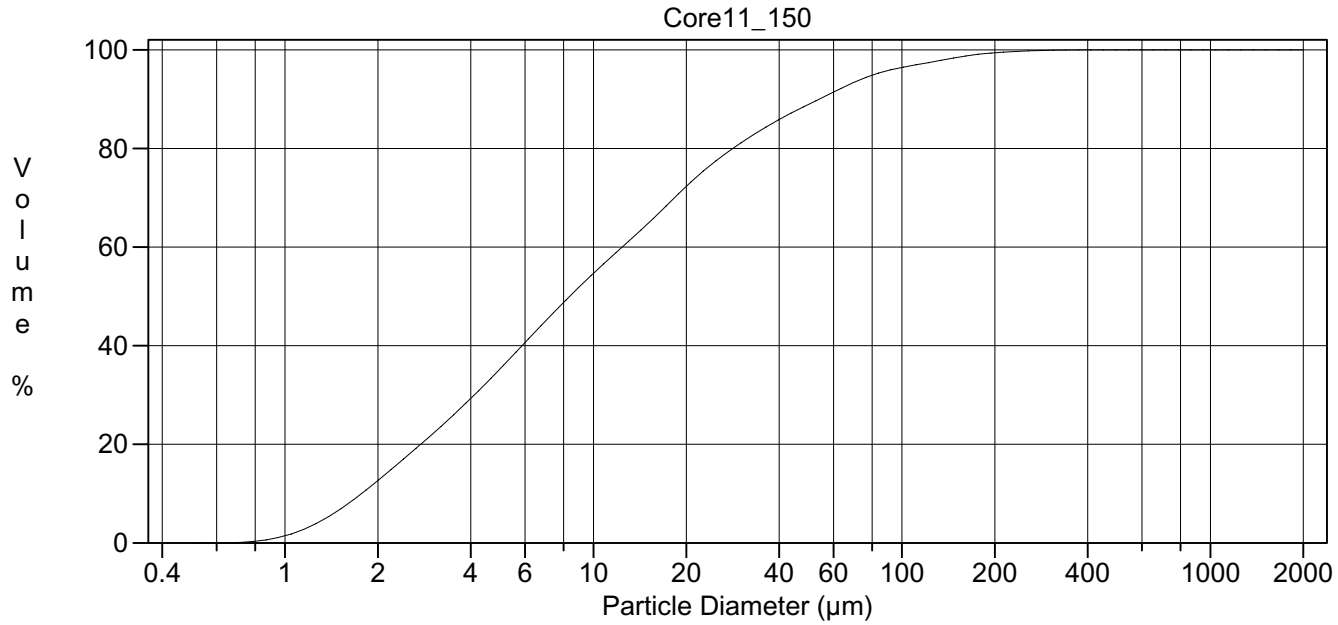
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	13.12 µm	95% Conf. Limits:	0-43.18 µm
Median:	7.054 µm	S.D.:	15.33 µm
D(3,2):	4.251 µm	Variance:	235.1 μm^2
Mean/Median Ratio:	1.860	C.V.:	117%
Mode:	5.878 µm	Skewness:	2.145 Right skewed
d_{10}:	1.690 µm	Kurtosis:	4.866 Leptokurtic
d_{50}:	7.054 µm		
d_{90}:	32.64 µm		
Specific Surf. Area	14114 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.690	3.060	9.919	17.23	32.64

022192.$02

Particle Diameter µm	Volume %
1.000	12.4
2.000	25.3
5.000	20.9
10.00	10.8
15.00	8.16
20.00	5.68
25.00	10.5
50.00	1.90
60.00	0.51
63.00	0.98
70.00	1.16
90.00	0.071
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022193.$02

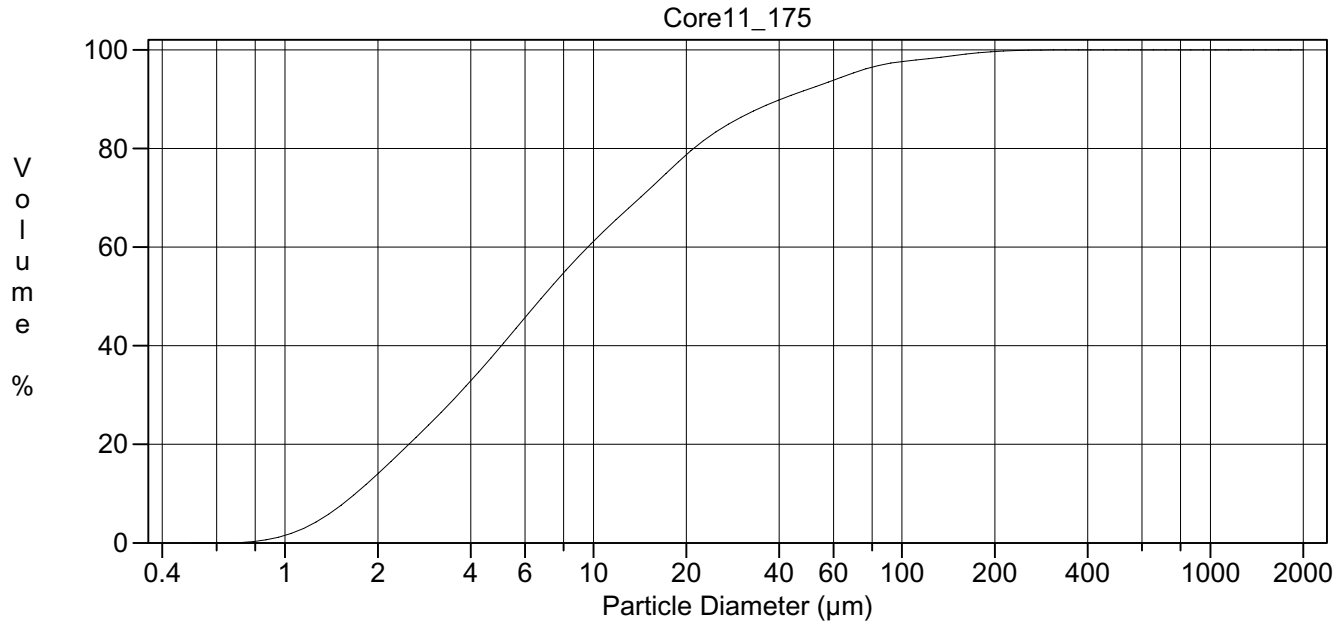
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	20.69 µm	95% Conf. Limits:	0-85.85 µm
Median:	8.376 µm	S.D.:	33.24 µm
D(3,2):	4.669 µm	Variance:	1105 µm^2
Mean/Median Ratio:	2.470	C.V.:	161%
Mode:	5.878 µm	Skewness:	3.707 Right skewed
d_{10}:	1.770 µm	Kurtosis:	18.40 Leptokurtic
d_{50}:	8.376 µm		
d_{90}:	53.86 µm		
Specific Surf. Area	12850 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.770	3.387	12.39	22.31	53.86

022193.$02

Particle Diameter µm	Volume %
1.000	11.2
2.000	22.7
5.000	19.3
10.00	10.1
15.00	7.55
20.00	5.26
25.00	11.4
50.00	2.43
60.00	0.66
63.00	1.34
70.00	2.38
90.00	1.74
125.0	2.22
250.0	0.23
500.0	0
1000	0



Volume Statistics (Arithmetic) 022194#.$02

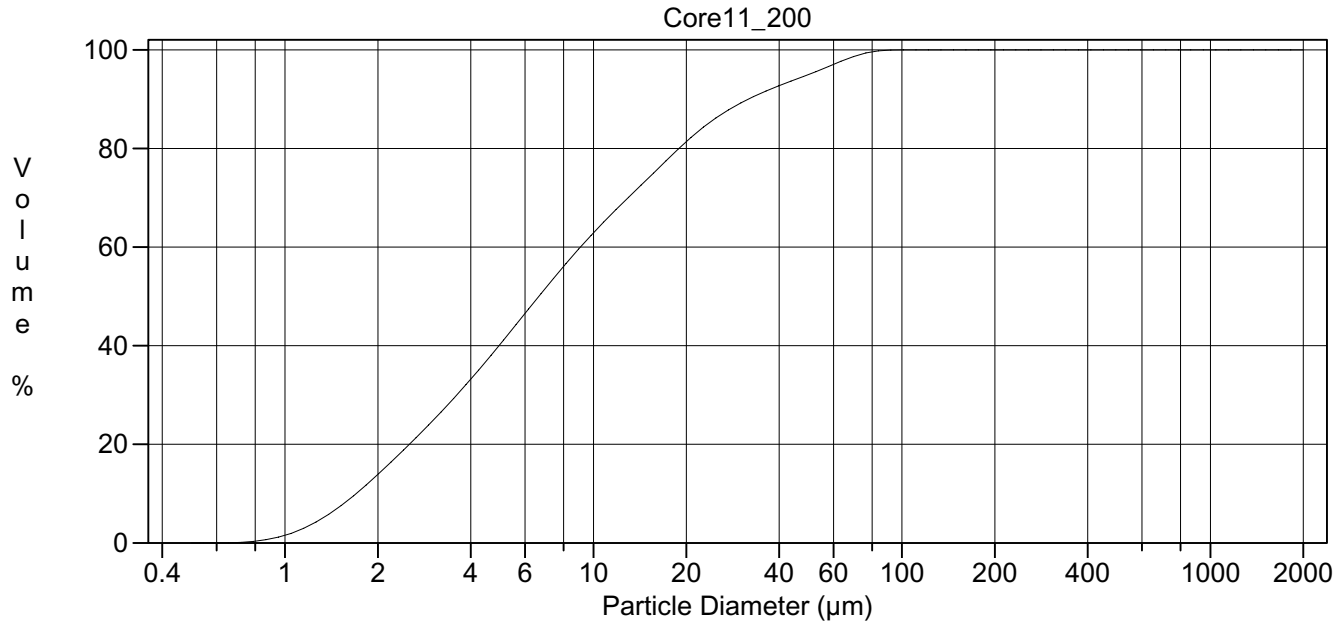
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	16.59 µm	95% Conf. Limits:	0-71.20 µm
Median:	6.859 µm	S.D.:	27.86 µm
D(3,2):	4.253 µm	Variance:	776.3 μm^2
Mean/Median Ratio:	2.419	C.V.:	168%
Mode:	5.878 µm	Skewness:	4.061 Right skewed
d_{10}:	1.692 µm	Kurtosis:	21.39 Leptokurtic
d_{50}:	6.859 µm		
d_{90}:	40.45 µm		
Specific Surf. Area	14107 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.692	3.043	9.586	17.21	40.45

022194#.$02

Particle Diameter µm	Volume %
1.000	12.5
2.000	25.7
5.000	21.4
10.00	10.3
15.00	7.27
20.00	4.71
25.00	8.65
50.00	1.76
60.00	0.50
63.00	1.04
70.00	1.83
90.00	1.10
125.0	1.61
250.0	0.076
500.0	0
1000	0



Volume Statistics (Arithmetic) 022195.$02

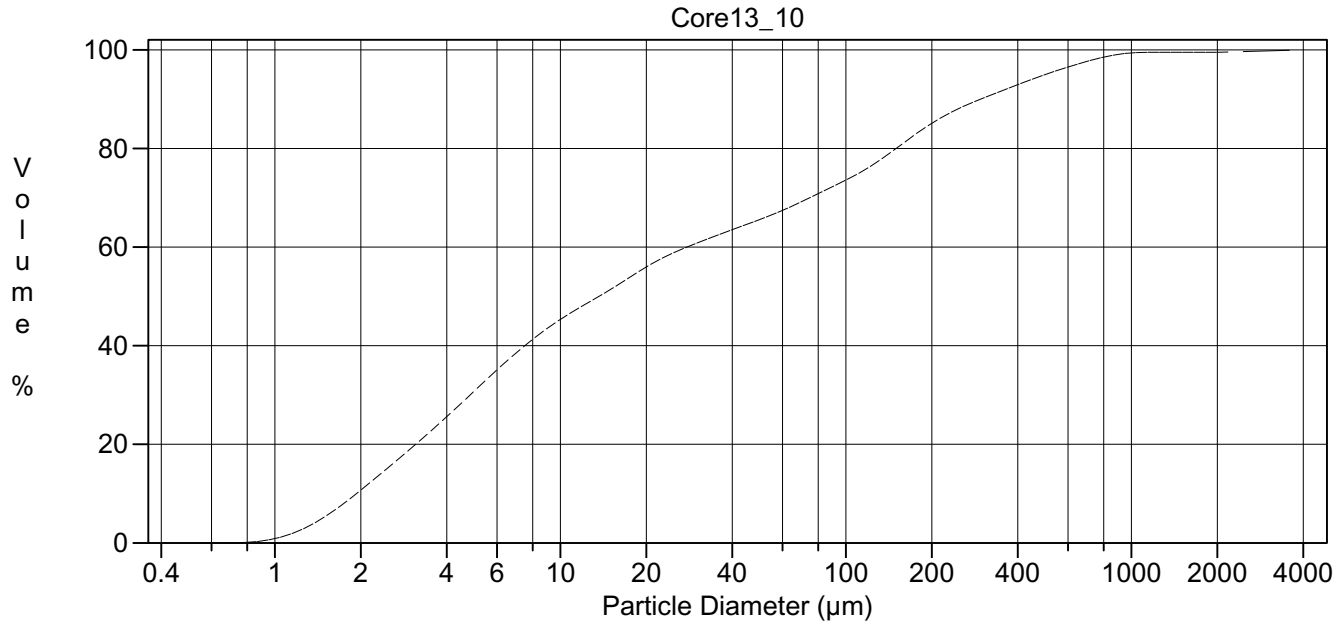
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	12.66 µm	95% Conf. Limits:	0-42.89 µm
Median:	6.650 µm	S.D.:	15.42 µm
D(3,2):	4.190 µm	Variance:	237.9 µm^2
Mean/Median Ratio:	1.904	C.V.:	122%
Mode:	5.878 µm	Skewness:	2.285 Right skewed
d_{10}:	1.701 µm	Kurtosis:	5.374 Leptokurtic
d_{50}:	6.650 µm		
d_{90}:	31.76 µm		
Specific Surf. Area	14320 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.701	3.038	9.075	15.63	31.76

022195.$02

Particle Diameter µm	Volume %
1.000	12.3
2.000	26.5
5.000	22.5
10.00	11.0
15.00	7.49
20.00	4.88
25.00	8.80
50.00	2.01
60.00	0.56
63.00	1.07
70.00	1.23
90.00	0.073
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022196a.$02

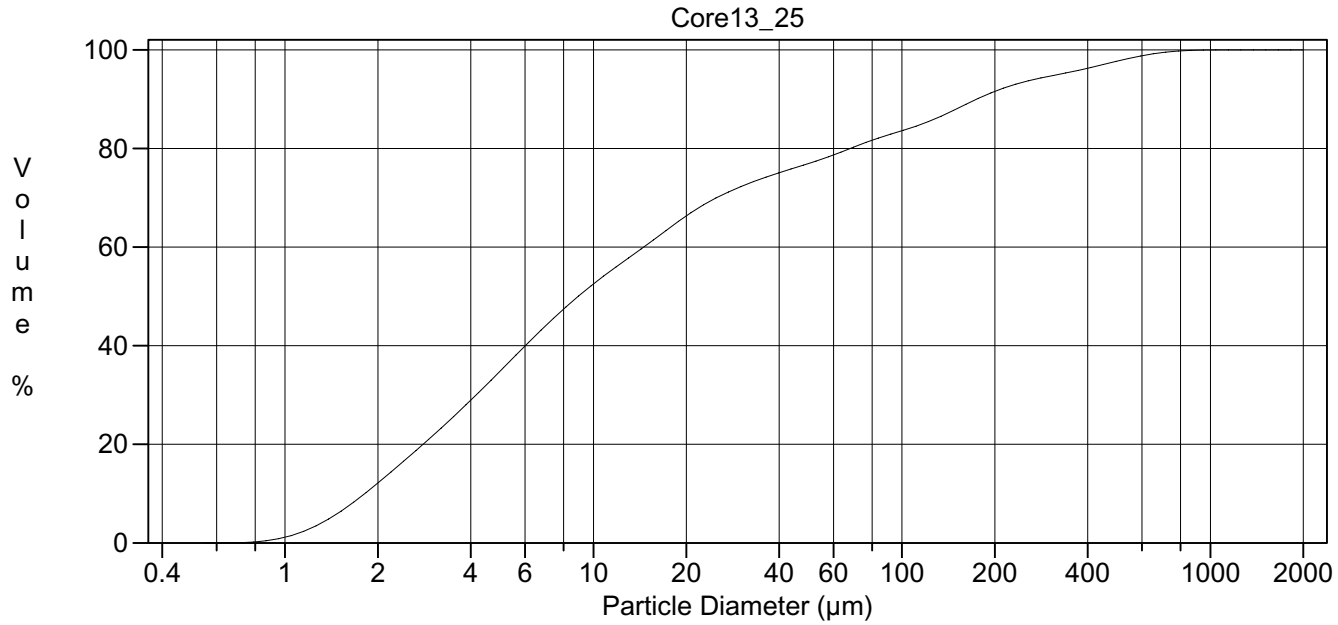
Calculations from 0.375 µm to 4000 µm

Volume	100.0%		
Mean:	104.5 µm	95% Conf. Limits:	0-592.3 µm
Median:	13.63 µm	S.D.:	248.9 µm
D(3,2):	5.681 µm	Variance:	61941 µm^2
Mean/Median Ratio:	7.661	C.V.:	238%
Mode:	4.878 µm	Skewness:	6.783 Right skewed
d_{10}:	1.932 µm	Kurtosis:	65.08 Leptokurtic
d_{50}:	13.63 µm		
d_{90}:	296.1 µm		
Specific Surf. Area	10562 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.932	3.896	27.69	111.1	296.1

022196a.$02

Particle Diameter µm	Volume %
1.000	9.83
2.000	20.1
5.000	14.5
10.00	6.11
15.00	4.52
20.00	2.96
25.00	6.70
50.00	1.84
60.00	0.55
63.00	1.24
70.00	3.05
90.00	4.51
125.0	11.4
250.0	6.86
500.0	4.36
1000	0.61



Volume Statistics (Arithmetic) 022197.$02

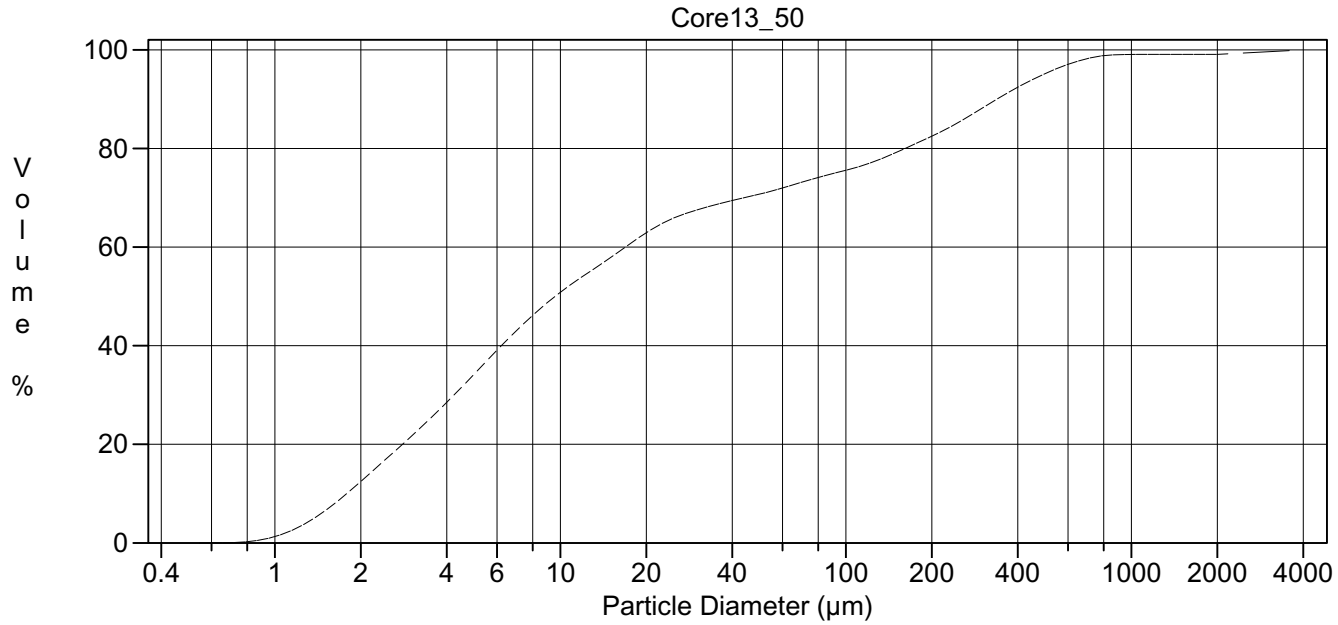
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	57.70 µm	95% Conf. Limits:	0-297.2 µm
Median:	8.918 µm	S.D.:	122.2 µm
D(3,2):	4.940 µm	Variance:	14934 μm^2
Mean/Median Ratio:	6.470	C.V.:	212%
Mode:	5.355 µm	Skewness:	3.398 Right skewed
d_{10}:	1.814 µm	Kurtosis:	12.90 Leptokurtic
d_{50}:	8.918 µm		
d_{90}:	174.5 µm		
Specific Surf. Area	12146 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.814	3.435	14.55	39.54	174.5

022197.$02

Particle Diameter µm	Volume %
1.000	11.0
2.000	22.8
5.000	17.6
10.00	8.08
15.00	5.73
20.00	3.67
25.00	6.98
50.00	1.71
60.00	0.51
63.00	1.12
70.00	2.40
90.00	3.03
125.0	7.80
250.0	4.20
500.0	2.24
1000	0.0079



Volume Statistics (Arithmetic) 022198a.$02

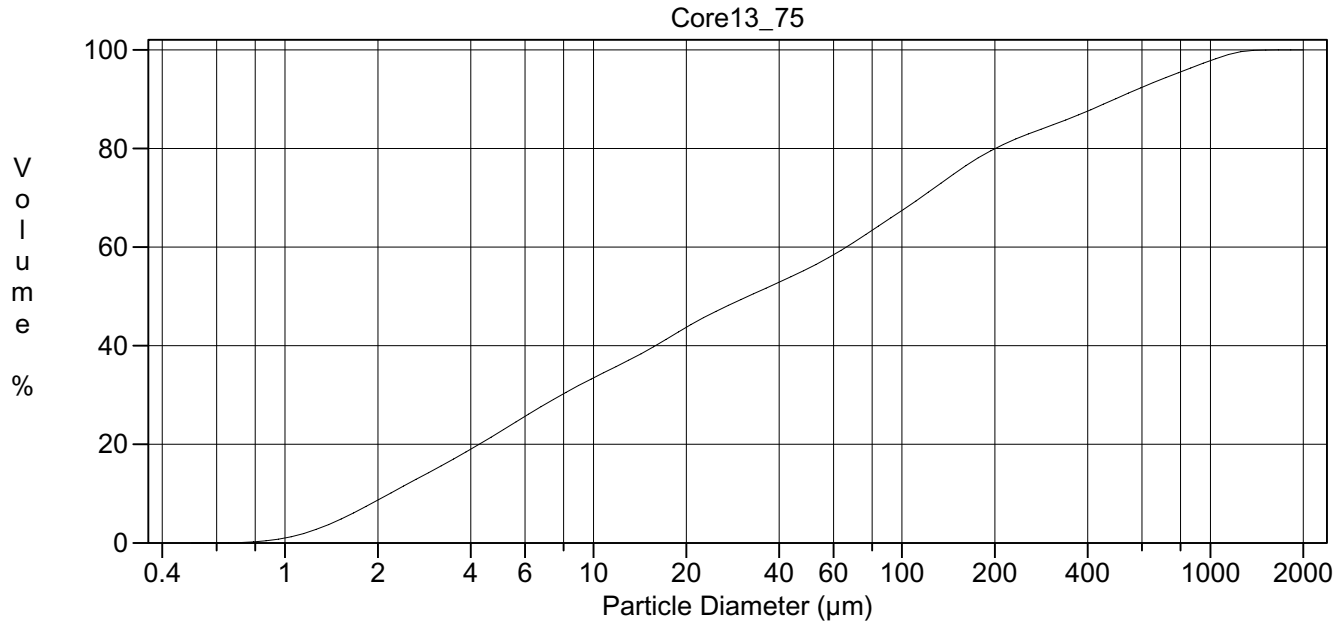
Calculations from 0.375 µm to 4000 µm

Volume	100.0%		
Mean:	111.0 µm	95% Conf. Limits:	0-704.1 µm
Median:	9.589 µm	S.D.:	302.6 µm
D(3,2):	5.028 µm	Variance:	91563 µm^2
Mean/Median Ratio:	11.58	C.V.:	273%
Mode:	5.355 µm	Skewness:	6.772 Right skewed
d_{10}:	1.786 µm	Kurtosis:	56.02 Leptokurtic
d_{50}:	9.589 µm		
d_{90}:	337.6 µm		
Specific Surf. Area	11932 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.786	3.468	16.89	91.14	337.6

022198a.$02

Particle Diameter µm	Volume %
1.000	11.2
2.000	21.8
5.000	16.6
10.00	7.05
15.00	5.03
20.00	3.02
25.00	4.85
50.00	1.21
60.00	0.36
63.00	0.81
70.00	1.76
90.00	2.41
125.0	8.11
250.0	9.79
500.0	3.88
1000	0.91



Volume Statistics (Arithmetic) 022199#.$02

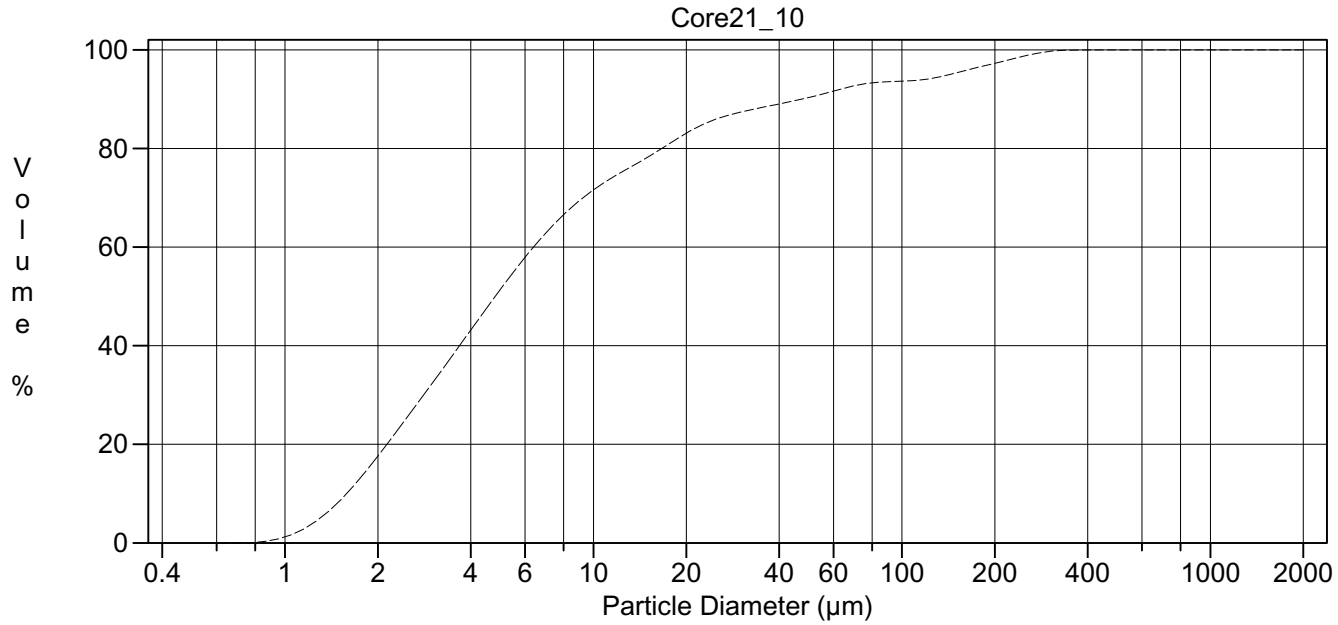
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	145.7 µm	95% Conf. Limits:	0-637.3 µm
Median:	31.69 µm	S.D.:	250.8 µm
D(3,2):	7.163 µm	Variance:	62907 µm^2
Mean/Median Ratio:	4.599	C.V.:	172%
Mode:	127.6 µm	Skewness:	2.458 Right skewed
d_{10}:	2.184 µm	Kurtosis:	5.849 Leptokurtic
d_{50}:	31.69 µm		
d_{90}:	488.9 µm		
Specific Surf. Area	8377 cm^2/ml		

% <	10	25	60	75	90
Size µm	2.184	5.766	65.97	148.6	488.9

022199#.$02

Particle Diameter µm	Volume %
1.000	7.69
2.000	13.9
5.000	10.9
10.00	5.65
15.00	4.60
20.00	3.27
25.00	8.78
50.00	2.67
60.00	0.79
63.00	1.79
70.00	4.49
90.00	6.11
125.0	11.0
250.0	7.62
500.0	7.55
1000	2.18



Volume Statistics (Arithmetic) 022200.$02

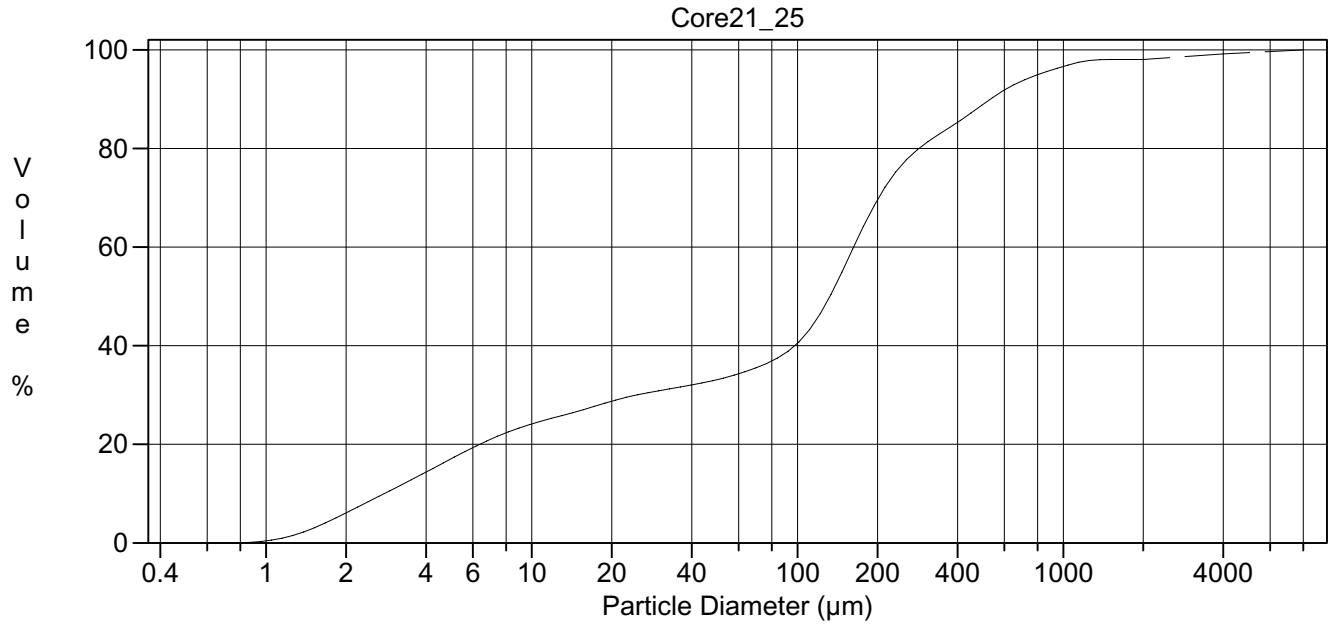
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	21.11 µm	95% Conf. Limits:	0-117.6 µm
Median:	4.805 µm	S.D.:	49.23 µm
D(3,2):	3.623 µm	Variance:	2423 μm^2
Mean/Median Ratio:	4.393	C.V.:	233%
Mode:	3.687 µm	Skewness:	3.745 Right skewed
d_{10}:	1.584 µm	Kurtosis:	14.30 Leptokurtic
d_{50}:	4.805 µm		
d_{90}:	47.18 µm		
Specific Surf. Area	16563 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.584	2.457	6.395	12.16	47.18

022200.$02

Particle Diameter µm	Volume %
1.000	16.4
2.000	33.8
5.000	20.2
10.00	6.63
15.00	4.84
20.00	2.90
25.00	4.37
50.00	1.28
60.00	0.37
63.00	0.71
70.00	0.83
90.00	0.68
125.0	4.54
250.0	1.22
500.0	0
1000	0



Volume Statistics (Arithmetic) 022201a.$02

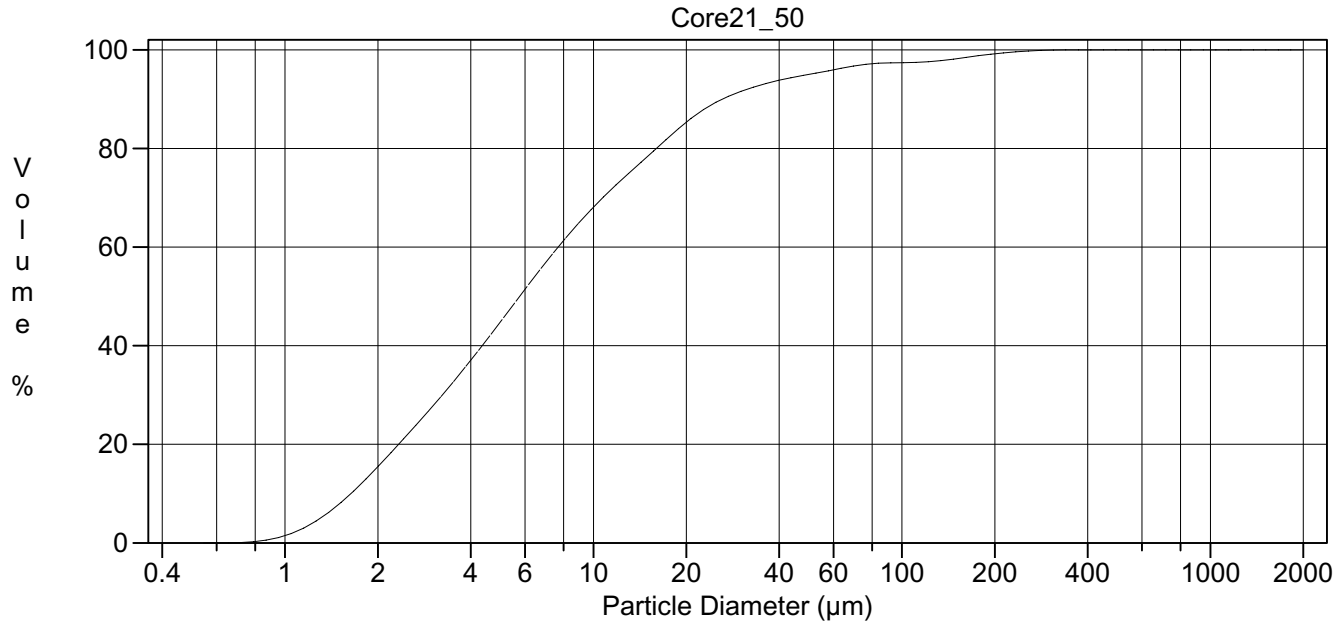
Calculations from 0.375 µm to 8000 µm

Volume	100.0%		
Mean:	255.8 µm	95% Conf. Limits:	0-1432 µm
Median:	132.3 µm	S.D.:	600.3 µm
D(3,2):	10.22 µm	Variance:	360352 µm^2
Mean/Median Ratio:	1.933	C.V.:	235%
Mode:	153.8 µm	Skewness:	6.709 Right skewed
d_{10}:	2.788 µm	Kurtosis:	52.73 Leptokurtic
d_{50}:	132.3 µm		
d_{90}:	531.5 µm		
Specific Surf. Area	5868 cm^2/ml		

% <	10	25	60	75	90
Size µm	2.788	11.37	162.6	232.5	531.5

022201a.$02

Particle Diameter µm	Volume %
1.000	5.68
2.000	11.0
5.000	7.02
10.00	2.60
15.00	2.01
20.00	1.30
25.00	3.08
50.00	1.17
60.00	0.37
63.00	0.87
70.00	2.96
90.00	9.06
125.0	29.4
250.0	12.0
500.0	7.66
1000	3.35



Volume Statistics (Arithmetic) 022202.$02

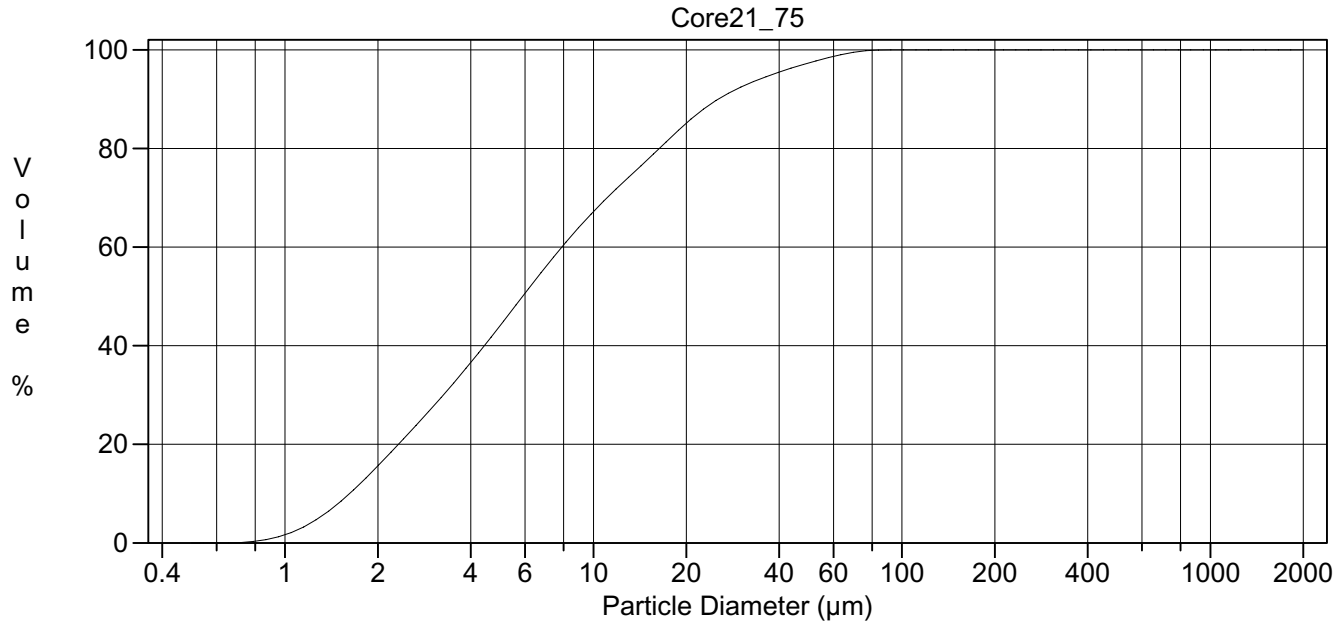
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	14.31 µm	95% Conf. Limits:	0-74.17 µm
Median:	5.765 µm	S.D.:	30.54 µm
D(3,2):	3.891 µm	Variance:	932.6 µm^2
Mean/Median Ratio:	2.482	C.V.:	213%
Mode:	5.355 µm	Skewness:	5.343 Right skewed
d_{10}:	1.636 µm	Kurtosis:	32.92 Leptokurtic
d_{50}:	5.765 µm		
d_{90}:	26.17 µm		
Specific Surf. Area	15421 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.636	2.759	7.688	13.02	26.17

022202.$02

Particle Diameter µm	Volume %
1.000	14.0
2.000	29.4
5.000	23.2
10.00	10.3
15.00	6.90
20.00	4.09
25.00	5.63
50.00	0.92
60.00	0.26
63.00	0.52
70.00	0.62
90.00	0.30
125.0	2.08
250.0	0.25
500.0	0
1000	0



Volume Statistics (Arithmetic) 022203.$02

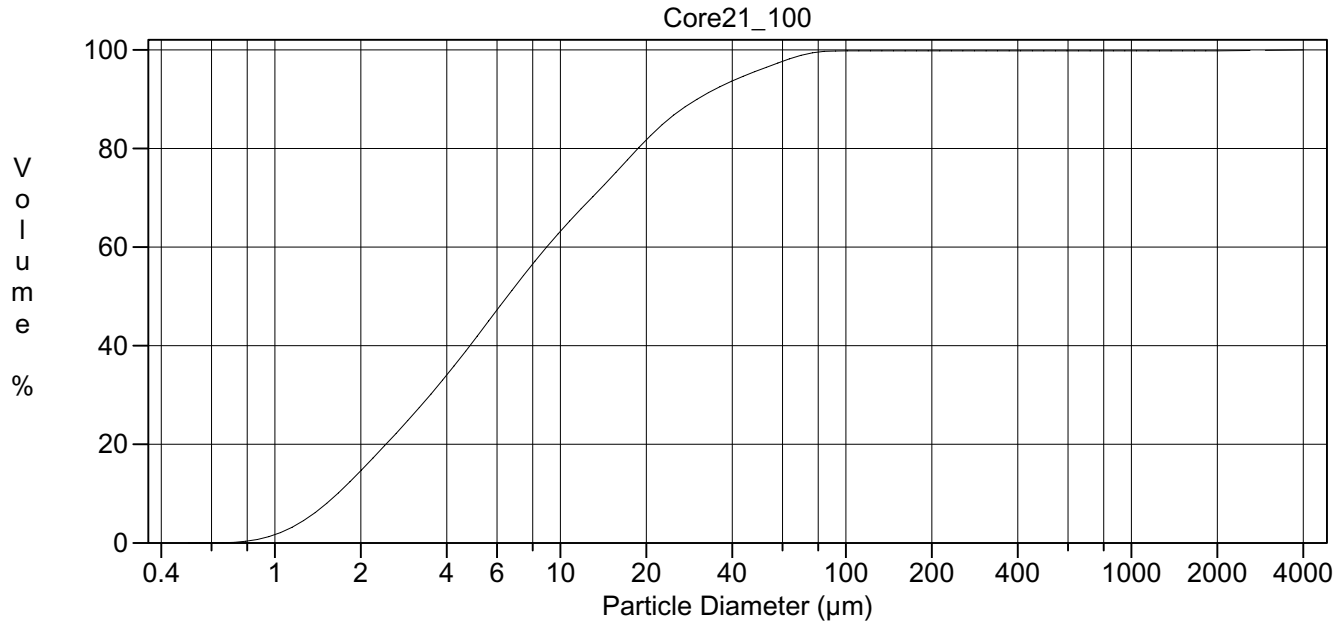
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	10.65 µm	95% Conf. Limits:	0-35.36 µm
Median:	5.895 µm	S.D.:	12.61 µm
D(3,2):	3.883 µm	Variance:	158.9 µm^2
Mean/Median Ratio:	1.807	C.V.:	118%
Mode:	5.355 µm	Skewness:	2.450 Right skewed
d_{10}:	1.619 µm	Kurtosis:	6.911 Leptokurtic
d_{50}:	5.895 µm		
d_{90}:	25.36 µm		
Specific Surf. Area	15451 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.619	2.767	7.905	13.44	25.36

022203.$02

Particle Diameter µm	Volume %
1.000	14.0
2.000	28.6
5.000	23.0
10.00	10.6
15.00	7.34
20.00	4.66
25.00	7.59
50.00	1.31
60.00	0.32
63.00	0.54
70.00	0.44
90.00	0.0096
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022204a.$02

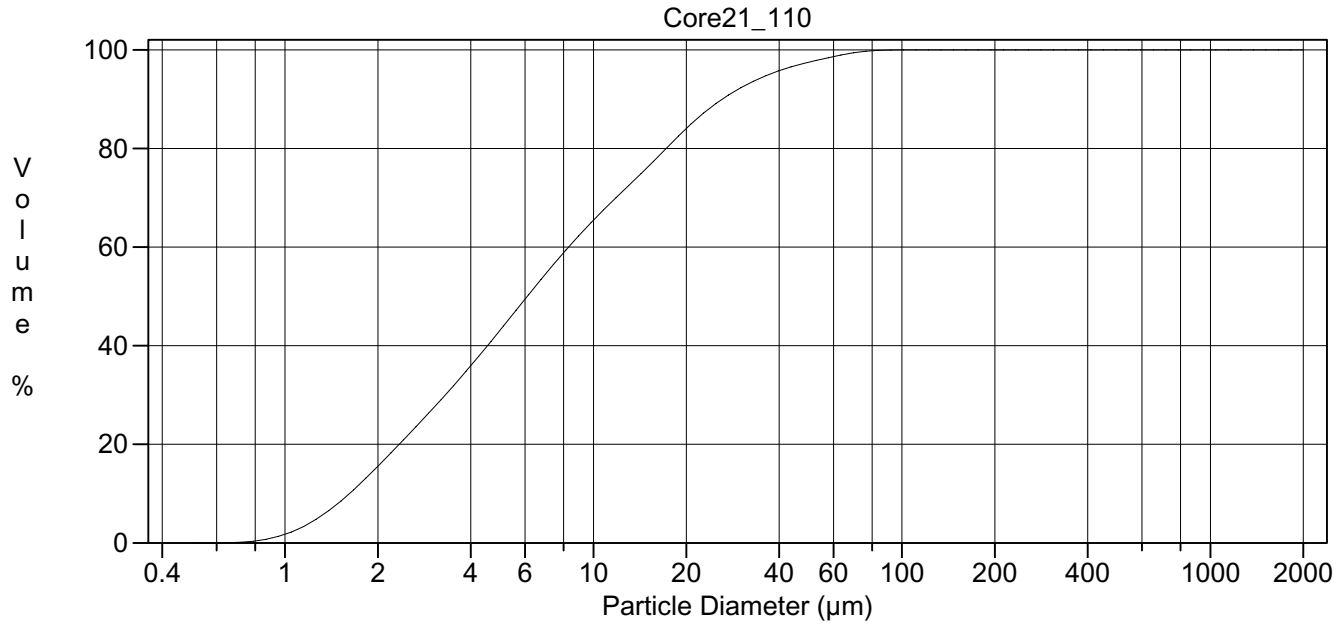
Calculations from 0.375 µm to 4000 µm

Volume	100.0%		
Mean:	17.42 µm	95% Conf. Limits:	0-259.4 µm
Median:	6.523 µm	S.D.:	123.5 µm
D(3,2):	4.095 µm	Variance:	15246 µm^2
Mean/Median Ratio:	2.671	C.V.:	709%
Mode:	5.878 µm	Skewness:	22.42 Right skewed
d_{10}:	1.659 µm	Kurtosis:	507.4 Leptokurtic
d_{50}:	6.523 µm		
d_{90}:	30.11 µm		
Specific Surf. Area	14651 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.659	2.940	8.952	15.55	30.11

022204a.$02

Particle Diameter µm	Volume %
1.000	13.0
2.000	26.5
5.000	22.0
10.00	10.8
15.00	7.73
20.00	5.08
25.00	9.16
50.00	1.72
60.00	0.45
63.00	0.81
70.00	0.82
90.00	0.038
125.0	0
250.0	0
500.0	0
1000	0.19



Volume Statistics (Arithmetic) 022205.$02

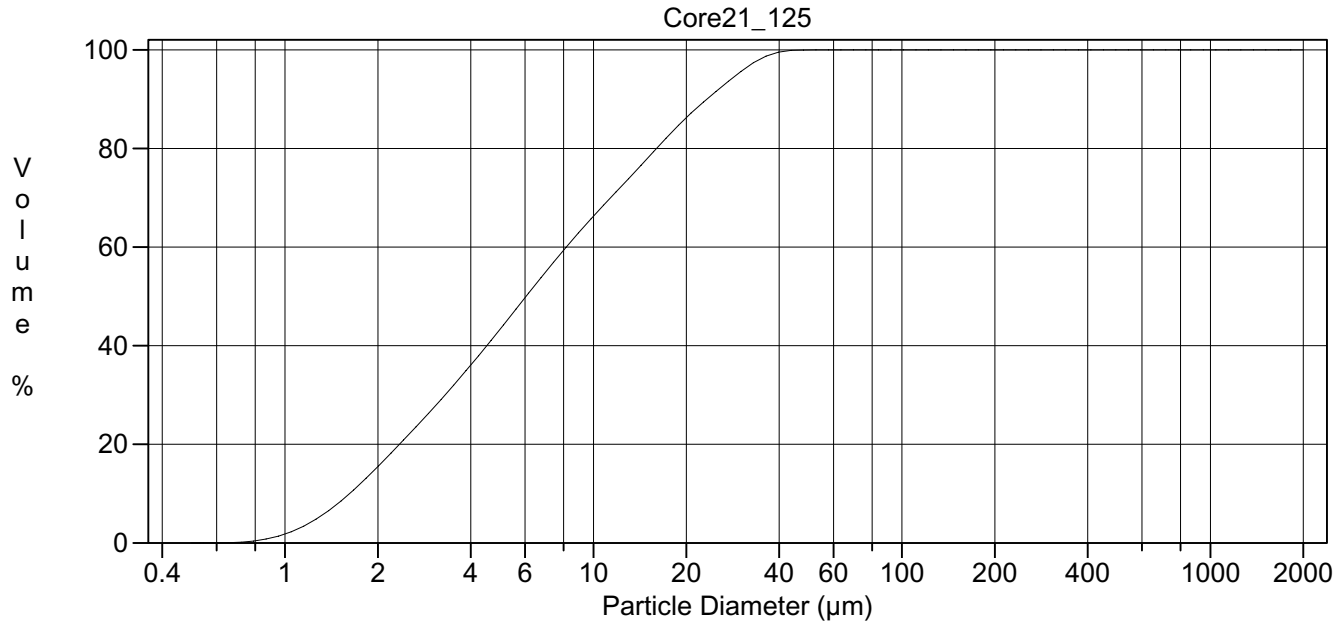
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	10.93 µm	95% Conf. Limits:	0-35.81 µm
Median:	6.097 µm	S.D.:	12.69 µm
D(3,2):	3.925 µm	Variance:	161.1 µm^2
Mean/Median Ratio:	1.793	C.V.:	116%
Mode:	5.355 µm	Skewness:	2.423 Right skewed
d_{10}:	1.617 µm	Kurtosis:	7.108 Leptokurtic
d_{50}:	6.097 µm		
d_{90}:	26.16 µm		
Specific Surf. Area	15288 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.617	2.795	8.308	14.31	26.16

022205.$02

Particle Diameter µm	Volume %
1.000	13.8
2.000	27.7
5.000	22.2
10.00	10.8
15.00	7.82
20.00	5.13
25.00	8.34
50.00	1.11
60.00	0.28
63.00	0.52
70.00	0.54
90.00	0.026
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022206#.$02

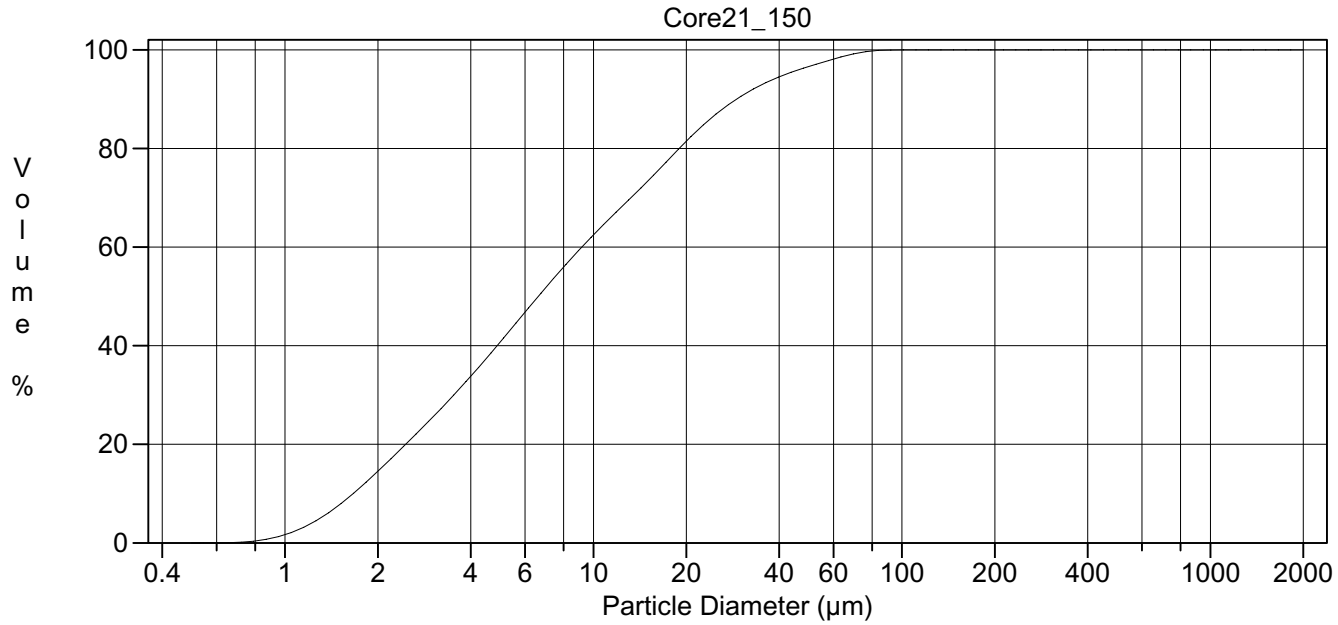
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	9.468 µm	95% Conf. Limits:	0-26.91 µm
Median:	6.047 µm	S.D.:	8.900 µm
D(3,2):	3.889 µm	Variance:	79.21 µm^2
Mean/Median Ratio:	1.566	C.V.:	94.0%
Mode:	5.355 µm	Skewness:	1.412 Right skewed
d_{10}:	1.619 µm	Kurtosis:	1.390 Leptokurtic
d_{50}:	6.047 µm		
d_{90}:	23.32 µm		
Specific Surf. Area	15430 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.619	2.797	8.161	13.52	23.32

022206#.$02

Particle Diameter µm	Volume %
1.000	13.7
2.000	28.0
5.000	22.8
10.00	11.8
15.00	8.19
20.00	5.37
25.00	8.38
50.00	0.0046
60.00	0
63.00	0
70.00	0
90.00	0
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022207.$02

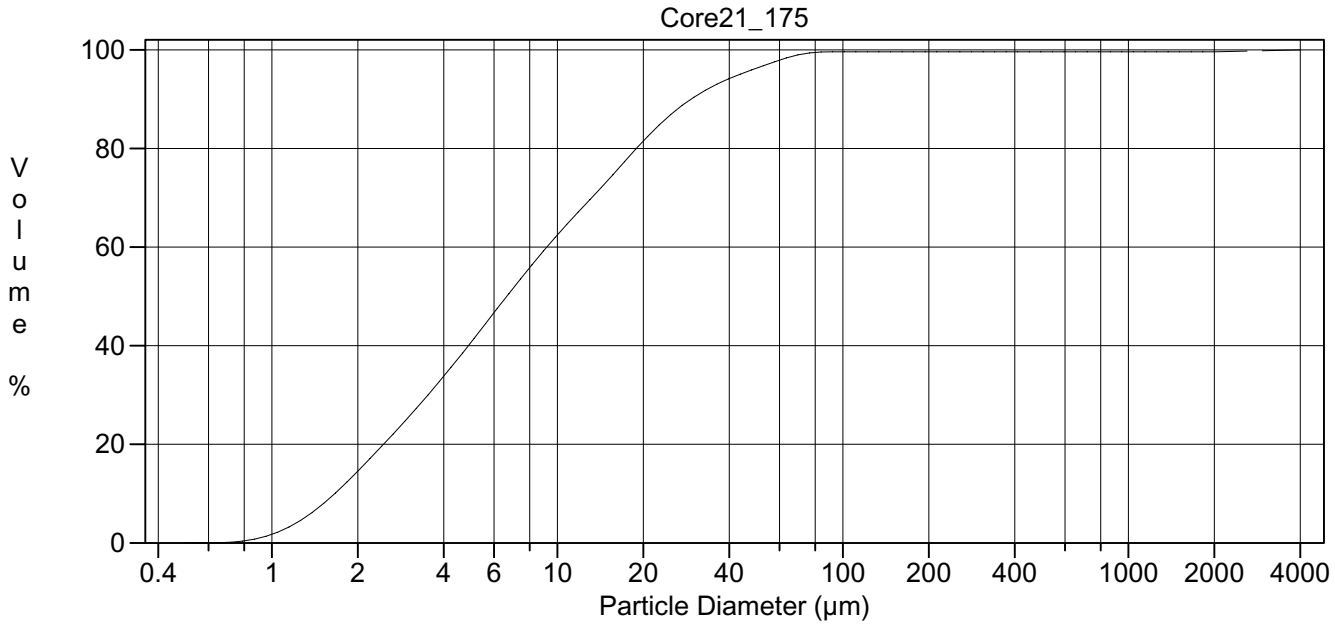
Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	12.00 µm	95% Conf. Limits:	0-39.15 µm
Median:	6.625 µm	S.D.:	13.85 µm
D(3,2):	4.117 µm	Variance:	191.9 µm^2
Mean/Median Ratio:	1.812	C.V.:	115%
Mode:	5.878 µm	Skewness:	2.251 Right skewed
d_{10}:	1.663 µm	Kurtosis:	5.754 Leptokurtic
d_{50}:	6.625 µm		
d_{90}:	29.13 µm		
Specific Surf. Area	14575 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.663	2.959	9.169	15.89	29.13

022207.$02

Particle Diameter µm	Volume %
1.000	12.9
2.000	26.3
5.000	21.7
10.00	10.9
15.00	8.08
20.00	5.56
25.00	9.63
50.00	1.49
60.00	0.39
63.00	0.71
70.00	0.73
90.00	0.033
125.0	0
250.0	0
500.0	0
1000	0



Volume Statistics (Arithmetic) 022208a.$02

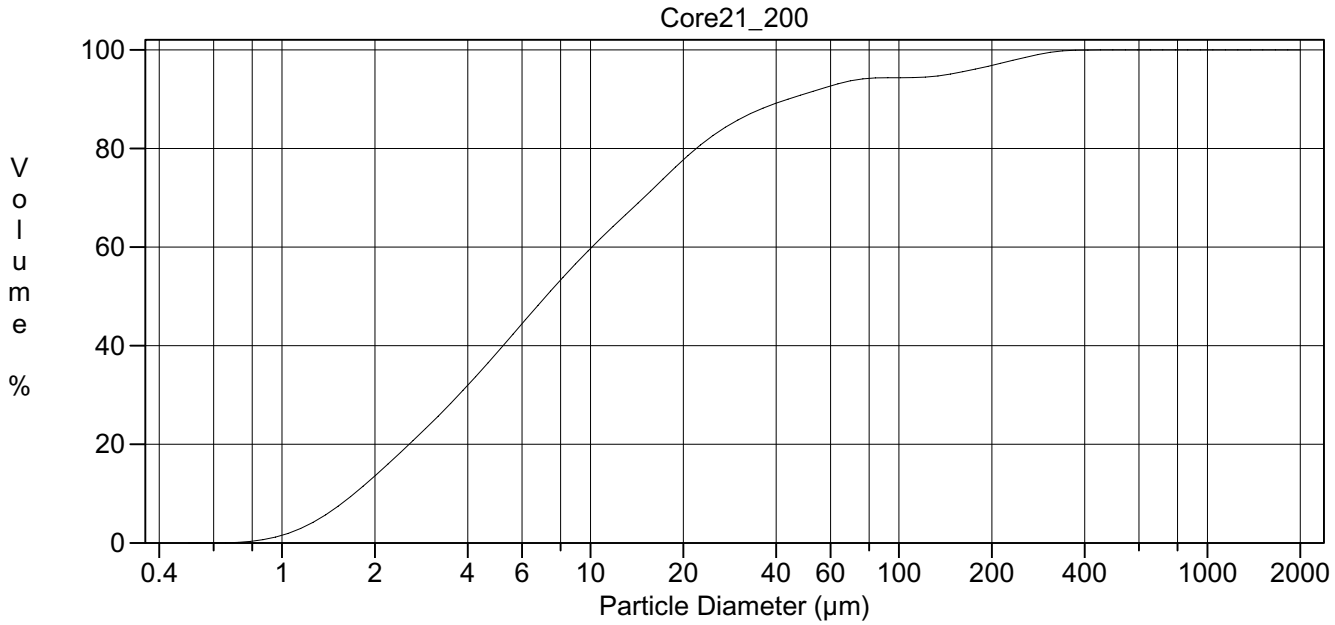
Calculations from 0.375 µm to 4000 µm

Volume	100.0%		
Mean:	22.58 µm	95% Conf. Limits:	0-363.3 µm
Median:	6.646 µm	S.D.:	173.8 µm
D(3,2):	4.113 µm	Variance:	30215 μm^2
Mean/Median Ratio:	3.398	C.V.:	770%
Mode:	5.878 µm	Skewness:	15.98 Right skewed
d_{10}:	1.661 µm	Kurtosis:	255.0 Leptokurtic
d_{50}:	6.646 µm		
d_{90}:	29.40 µm		
Specific Surf. Area	14589 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.661	2.956	9.193	15.82	29.40

022208a.$02

Particle Diameter µm	Volume %
1.000	12.8
2.000	26.2
5.000	21.7
10.00	11.1
15.00	8.00
20.00	5.44
25.00	9.38
50.00	1.60
60.00	0.41
63.00	0.71
70.00	0.57
90.00	0.012
125.0	0
250.0	0
500.0	0
1000	0.38



Volume Statistics (Arithmetic) 022209.$02

Calculations from 0.375 µm to 2000 µm

Volume	100.0%		
Mean:	23.37 µm	95% Conf. Limits:	0-124.1 µm
Median:	7.173 µm	S.D.:	51.38 µm
D(3,2):	4.350 µm	Variance:	2639 μm^2
Mean/Median Ratio:	3.258	C.V.:	220%
Mode:	5.878 µm	Skewness:	3.999 Right skewed
d_{10}:	1.715 µm	Kurtosis:	16.58 Leptokurtic
d_{50}:	7.173 µm		
d_{90}:	43.59 µm		
Specific Surf. Area	13794 cm^2/ml		

% <	10	25	60	75	90
Size µm	1.715	3.125	10.11	18.00	43.59

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Particle Diameter µm	Volume %
1.000	12.0
2.000	25.1
5.000	21.0
10.00	10.5
15.00	7.47
20.00	4.98
25.00	8.48
50.00	1.52
60.00	0.40
63.00	0.70
70.00	0.57
90.00	0.20
125.0	3.77
250.0	1.68
500.0	0
1000	0