



Dartis Classification Suite

User Manual Help  
2022

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## Overview

This software is part of Dartis Soil Lab and designed for processing multiple Geotechnical tests and reporting. Main purpose of this software is classification of soil.

Although all efforts have been undertaken to ensure that this software is of the highest possible quality and that the results obtained are correct, the authors do not warrant the functions contained in the program will meet your requirements or that the operation of the program will be uninterrupted or error-free. The authors are not responsible and assume no liability for any results or any use made thereof, nor for any damages or litigation that may result from the use of the software for any purpose. All results to be verified independently by user.

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[Program's web page](#)

[Bug report / Feature request](#)

Test	ASTM Standard
Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass	D-2216
Specific Gravity of Soil Solids by Water Pycnometer	D-854 , C-157
Particle-size Analysis of Soils	D-422
Liquid Limit, Plastic Limit	D-4318
Classification of Soils and Soil-aggregate Mixtures for Highway Construction Purposes (AASHTO)	D-3282
Classification of Soils and Soil-aggregate Mixtures for Engineering Purposes (Unified Soil Classification System)	D-2487

## 1. Licensing

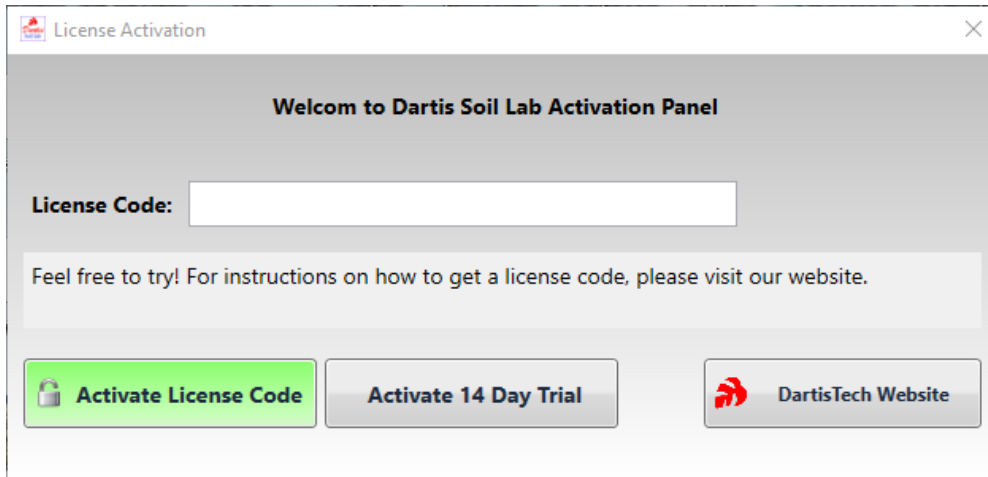
## 1.1. License Agreement

Visit our online [End User License Agreement](#)

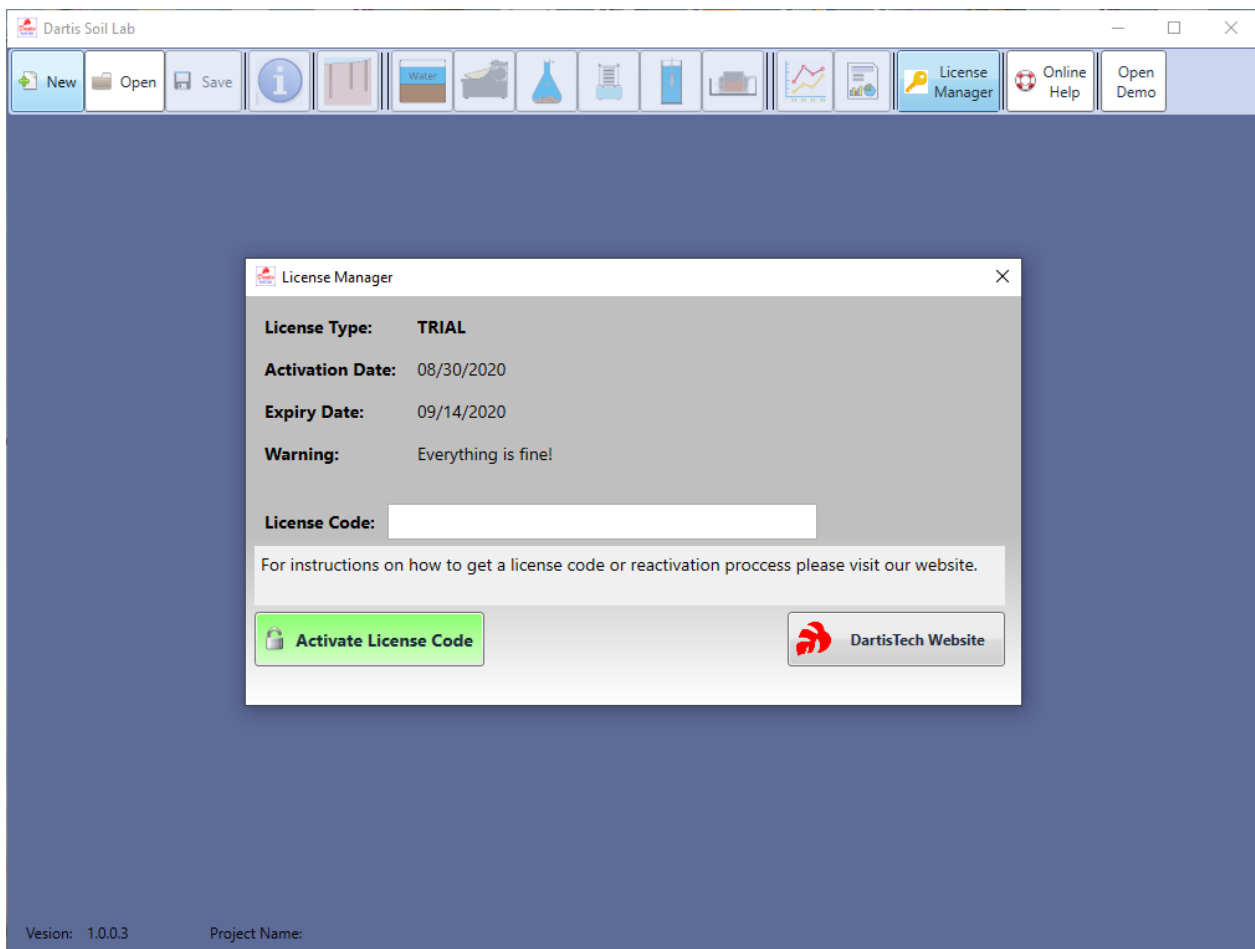
## 1.2. Licensing

There are two types of license available for this product; **Trial** and **Full** license.

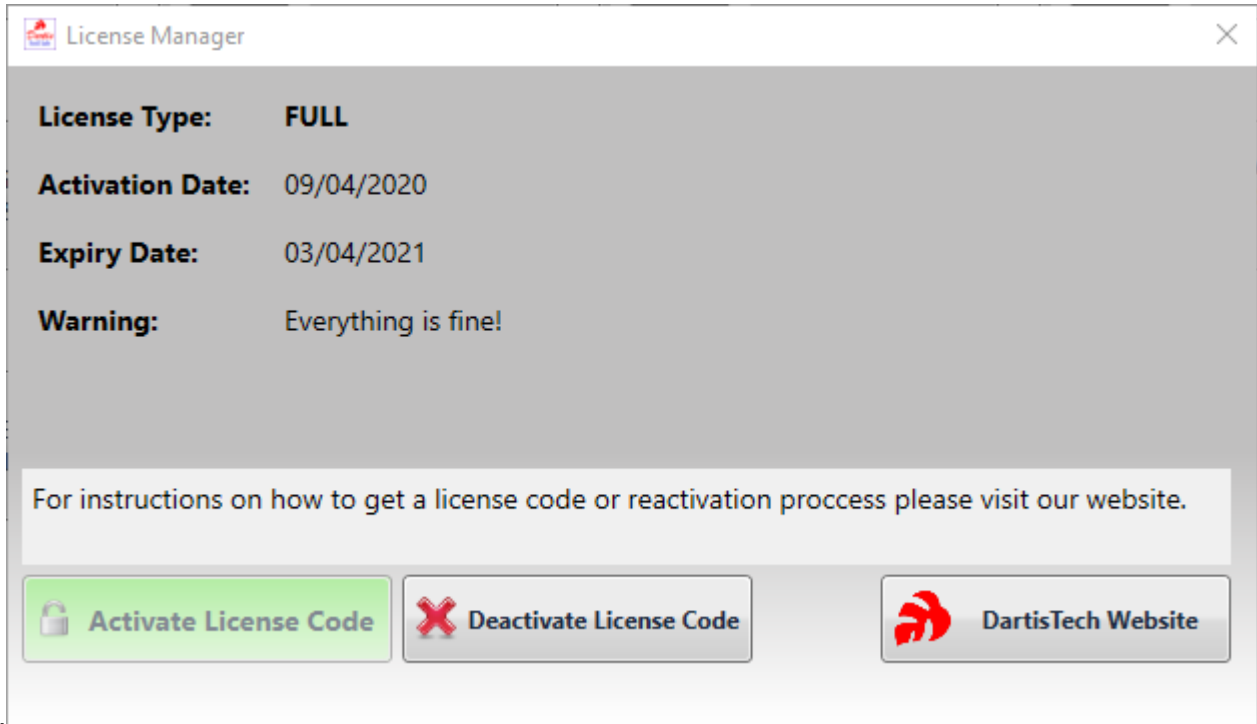
**Trial**: is limited and for evaluation purpose only. You may activate 14 days trial on first application startup (if you have a license code please paste it in license code textbox and click activate license code to get Full version).



In trial version you can create a project and check all capabilities of program in action. You may always check your license status from license manager tab. In case of a trial license; by purchasing and recieving a license code, you can activate Full version in this tab.



**Full:** is full featured version of this product. With free updates and support while you have a valid license



code.

**Important Note 1 :** for each purchased license code, two computers can be activated with full license (the same license code); and for each computer device two reactivations are allowed in 30 days (in case of deactivation). Two computer devices can be activated with full license at a same time. "Reactivation amount is number of times that a license code is used successfully"

**Important Note 2:** in case of mandatory license check, Warning message will show you a period of time (5 days) in which you need to get online for validation purpose.

### 1.3. How to get license code

After the purchase process fulfillment, You will receive an email in few minutes including your license code.



## 2. Unit System

This version of Dartis Soil Lab supports the following unit systems:


- Metric units (kg, m, cm)
- US Customary units (lb, ft, in) available for some tests.

### 3. Contents

### 3.1. Entering data

### 3.1.1. Useful tips on entering data manually

Most of test data are entered in table's. Here are some tips on how to work with table's

Sample ID	Sample Name*	Depth, (m)	Discription	Del	
1	S				

efficiently:

**Tip 1:** color of column's in which you may enter data is gray.

**Tip 2:** if a table row is for example representing a sample's data and there is a delete button defined, you may use this button to remove all related data of that sample (including all test data).



Note: if you want to edit a row data, simply click on any cell and change data

**Tip 3:** for navigation in table cells you can just click on desired cell. To move to next cell in a row you can press **Tab key** on your keyboard.

**Tip 4:** when you are finished entering a row's data press **ENTER** on your keyboard. This will check if entered data is correct (in format and if required in logic) and adds a new empty row for entering data.

**Tip 5:** in case of format or logic error an icon " !" appears. By moving mouse cursor on it an error message is shown which helps you correct it.

BH 1

Sample ID	Sample Name*	Depth, (m)	Discription	Del	
1	S				
! 2	S				

Column 'sample' is constrained to be unique. Value 'S' is already present.

\*Required (must be unique). Note: Deleting a sample will delete all data related to that sample.

**Tip 6:** You can use keyboard arrows to move between datatable cells.

### 3.1.2. Importing from Excel

Paste Button 1

Oven dried method Report

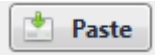
Borehole Name S USCS: NAN, AASHTO: NAN Paste lb Select a date 15

mass of container and moist specimen, (lb)	mass of container and oven dry specimen, (lb)	mass of container, (lb)	mass of water, (lb)	mass of oven dry specimen, (lb)	water content, (%)	Del
						X

Results

Average water content, (%):

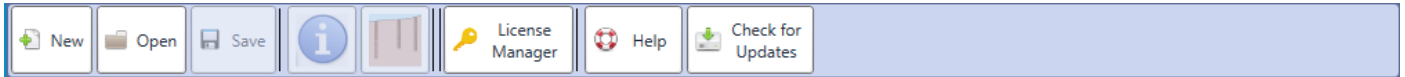
#### 1 Paste Button



Use paste button to import copied data columns from Excel to a table. Number of copied columns from Excel should match number of columns in datatable.

## 3.2. Tabs and Tests

### 3.2.1. Toolbar

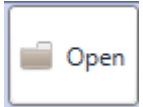


#### 1 New button



Creates a new project: by clicking on 'New' button, a dialogue will open. Choose the location where you want the project to be saved. Files are saved with \*.DLab extension.

#### 2 Open button



Opens a previously created project file: by clicking on Open button, an open dialogue will show up. Choose the save file on your local hard. Files are stored with \*.DLab extension.

#### 3 Save button



Saves currently open project: saves current project's information on currently open save file.

#### 4 button



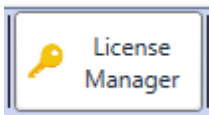
Opens project information tab. More information is provided [here](#).

#### 5 button



Opens Borehole and sample Manager tab. More information is provided [here](#).

#### 6 License Manager button



Opens License Manager window.

#### 7 Help button



Opens current help manual.

8

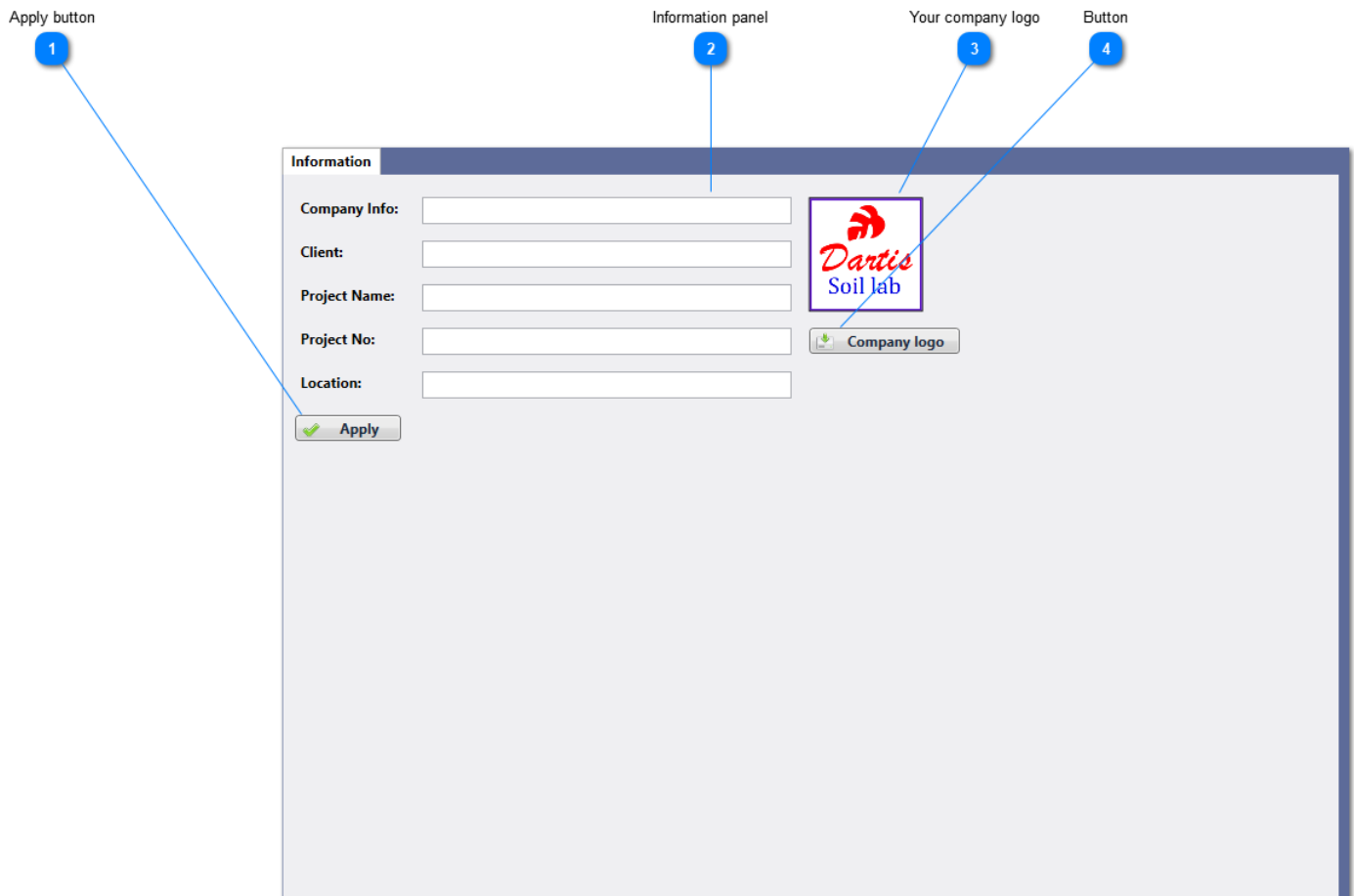
## Check for Updates button



Checks for available updates.



## 3.2.2. Project information



### 1 Apply button



Applies entered information

### 2 Information panel

A close-up of the information panel, showing five input fields with labels: "Company Info:", "Client:", "Project Name:", "Project No:", and "Location:". Each label is followed by a white rectangular input field.

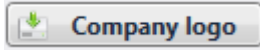
You may enter project's information here

### 3 Your company logo



4

## Button



Opens a selection dialogue. You may choose your company logo image path whitin dialogue.

### 3.2.3. Borehole and sample Manager

**Boreholes and Samples** Report

Borehole	GWL(m)	Fill Material(m)	Depth(m)	Type	X:	Y:	Z:	Del
BH1	2.5	0.6	7	mud rotary	456783	257899	0.9	<input checked="" type="checkbox"/>

Sample ID	Sample Name*	Depth, (m)	Description	USCS Group Name	Del
1	BH01	2	Sandy clay	Sandy lean clay	<input checked="" type="checkbox"/>
2	BH01/3	3	Sandy clay	Sandy lean clay	<input checked="" type="checkbox"/>

Sample ID	Sample Name	Passing No.4	Passing No.10	Passing No.40	Passing No.200	Liquid limit, ll*	Plastic limit, pl*	Cu	Cc	USCS	AASH TO
1	BH01	100.00	100.00	100.00	52.63	27.68	10.06			CL	A-6
2	BH01/3	100.00	100.00	100.00	58.82	26.58	9.58			CL	A-6

\*Required (must be unique). Note: Deleting a sample will delete all data related to that sample.

\*Based on fraction passing U.S. No. 40 sieve

Version: 2.1.3.0      Project Name: Sample Project

1. enter borehole name and properties and click add
2. select required borehole from combobox
3. complete a table row to assign new sample to that borehole and press ENTER to create a new row ( you can use TAB KEY to go to next cell).

#### classification table

data in this table is automatically retrieved from particle size and index tests results while checkbox is checked.

also you can complete this table manually and click on classify samples.

Sample ID	Sample Name	Passing No.4	Passing No.10	Passing No.40	Passing No.200	Liquid limit, ll*	Plastic limit, pl*	Cu	Cc	USCS	AASH TO
2	Sample	100.00	91.93	56.85	1.75	35.28	17.93	5.11	0.87	SP	A-2-6



### 3.2.4. Water content

This page is used for data entry of moisture content determination test and to view / print the results

1. select the borehole and then sample
2. complete the table. data may be entered manually or by importing from Excel using paste button.

The screenshot shows the 'Dartis Soil Lab Pro' software interface. The main window is titled 'Oven dried method' and 'Report'. The 'General' tab is active, showing 'Borehole Name' and 'Sample' dropdowns, and a 'USCS: SP, AASHTO: A-2-6' classification. A 'Paste' button and a unit dropdown set to 'gr' are visible. The 'Water content' section contains a table with columns for 'mass of container and moist specimen, (gr)', 'mass of container and oven dry specimen, (gr)', 'mass of container, (gr)', 'mass of water, (gr)', 'mass of oven dry specimen, (gr)', 'water content, (%)', and 'Del'. The table has three rows of data. To the right, the 'Results' section displays 'Average water content, (%)' as 34.15. The bottom status bar shows 'Version: 1.3.0' and 'Project Name: Demo Project'.

mass of container and moist specimen, (gr)	mass of container and oven dry specimen, (gr)	mass of container, (gr)	mass of water, (gr)	mass of oven dry specimen, (gr)	water content, (%)	Del
48.3500	39.8600	16.1000	8.4900	23.7600	35.73	X
56.7800	47.6100	17.3200	9.1700	30.2900	30.27	X
43.2100	36.1300	16.7000	7.0800	19.4300	36.44	X

### 3.2.5. Liquid and plastic limit

This page is used for data entry of Liquid an Plastic limit tests and to view / print the results

#### Liquid Limit

1. Select a borehole and then sample
2. complete the table. data may be entered manually or by importing from Excel using paste button.
3. click on apply and calculate

Note: at least three test data is required to plot graph and calculate LL value;

The screenshot shows the 'Liquid Limit' tab in the software. The interface includes a menu bar with 'New', 'Open', 'Save', 'License Manager', and 'Help'. Below the menu, there are dropdowns for 'Borehole Name' and 'Sample', and a text field for 'USCS: SP, AASHTO: A-2-6'. A 'Paste' button and a unit dropdown set to 'gr' are also present. The main data table has the following columns: 'mass of container and moist specimen, (gr)', 'mass of container and oven dry specimen, (gr)', 'mass of container, (gr)', 'Cranks, (N)', 'mass of water, (gr)', 'mass of oven dry specimen, (gr)', 'water content, (%)', and 'Del'. Three rows of data are entered, each with a red 'X' in the 'Del' column. Below the table is a graph titled 'Sample' showing 'w(%)' on the y-axis (0 to 40) and 'Number of Drops' on the x-axis (10 to 100). The graph contains three blue data points and an orange 'Auto Fitting Line'. The results panel on the right shows 'Results' with a green checkmark, an 'Apply and Calculate' button, and the calculated 'LL: 35.28'. A note below the results states: 'Note: At least three test data is required to calculate LL.' The bottom of the window shows 'Version: 1.3.0' and 'Project Name: Demo Project'.

mass of container and moist specimen, (gr)	mass of container and oven dry specimen, (gr)	mass of container, (gr)	Cranks, (N)	mass of water, (gr)	mass of oven dry specimen, (gr)	water content, (%)	Del
29.3000	25.8400	15.2600	35	3.4600	10.5800	32.70	X
31.5800	27.7200	17.0100	23	3.8600	10.7100	36.04	X
31.4500	26.9600	15.1700	17	4.4900	11.7900	38.08	X

#### Plastic Limit

1. Select a borehole and then sample
2. complete the table. data may be entered manually or by importing from Excel using paste button.
3. click on apply and calculate

- General
- BH Manager
- Water content
- LL, PL
- Proctor
- Specific gravity
- Particle Size
- Permeability
- Compression
- Direct Shear
- Consolidation

Liquid Limit
Plastic Limit
Report

Borehole Name: Sample
 USCS: SP, AASHTO: A-2-6
 

gr

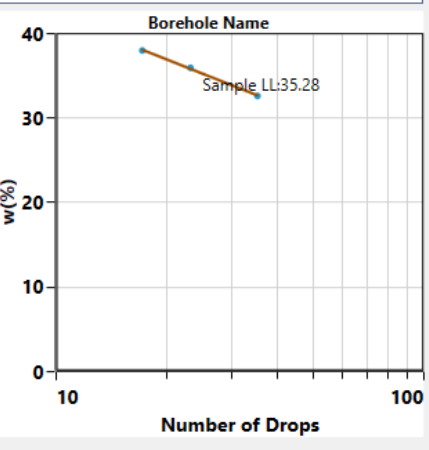
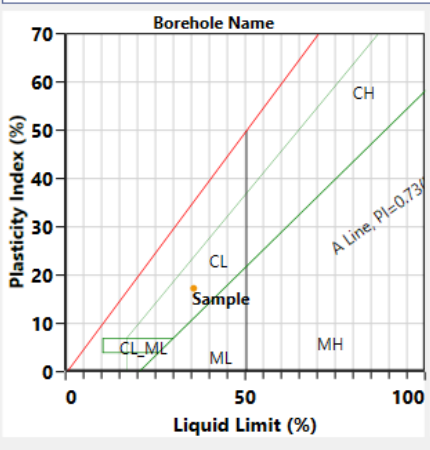
mass of container and moist specimen, (gr)	mass of container and oven dry specimen, (gr)	mass of container, (gr)	mass of water, (gr)	mass of oven dry specimen, (gr)	water content, (%)	Del
23.8600	22.2700	13.3300	1.5900	8.9400	17.79	✘
24.8100	23.1900	14.2300	1.6200	8.9600	18.08	✘
						✘

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**Results**

PL:	PI:
17.93	17.35
Activity:	Ll:
18.09	0.93

Note: Activity calculation needs sieve and hydrometer test results and LI calculation needs water content test result.



### 3.2.6. Specific gravity

This page is used for data entry of specific gravity test and to view / print the results

1. Select a borehole and then sample
2. complete the table. data may be entered manually or by importing from Excel using paste button.

Dartis Soil Lab Pro
\_ □ ×

New Open Save ? 📄 License Manager 🛑 Help

General

BH Manager

Water content

LL, PL

Proctor

Specific gravity

Particle Size

Permeability

Compression

Direct Shear

Consolidation

**Water Pycnometer** Report

Borehole Name Sample USCS: SP, AASHTO: A-2-6 Paste

TestNo	Vp,(mL)	Mpw,t (g)	Ms,(g)	Mpws,t (g)	T,(°C)	A	C	R	Del
1	500.000	660.000	99.000	722.000	23.00	0.000	0.000	0.00	✖
2	500.000	674.000	103.000	738.300	23.00	0.000	0.000	0.00	✖
									✖

**Results**

Gs,avg Total@20°C:

2.667

TestNo	pw, (g/mL)	ps, (g/cm3)	K	Gs,t (-4.75 mm)	Gs,20°C (-4.75 mm)	Gs,20°C (+4.75 mm)	Gs,avg @20°C	P
1	0.998	2.669	0.9993	2.676	2.674	NaN	2.67	100.00
2	0.998	2.655	0.9993	2.661	2.660	NaN	2.66	100.00

Vp= the average calibrated volume of the pycnomete

Mpw,t= mass of the pycnometer and water at the test temperature (Tt)

pw= the density of water at the test temperature (Tt), g/mL or g/cm3

Ms= the mass of the oven dry soil solids (g)

Mpws,t= the mass of pycnometer, water, and soil solids at the test temperature, (Tt)

T= the test temperature in °C

A= mass of oven-dry test sample(+4.75mm) in air, g

C= apparent mass of saturated test sample(+4.75mm) in water, g

R= the percent of soil retained on the 4.75 mm sieve

ps = the density of the soil solids Mg/m3 or g/cm3

K= the temperature coefficient

P= the percent of soil passing the 4.75-mm sieve

Version: 1.3.0

Project Name: Demo Project



### 3.2.7. Particle size

This page is used for data entry of particle size test and to view / print the results

#### sieve manager

1. select required sieves from all sieves table, enter sieve set name and press add
2. select a previously created sieve set from sieve sets table
3. in sample's sieve set manager click assign. this will assign selected sieve set to that sample

The screenshot shows the 'Dartis Soil Lab Pro' software interface. The 'Sieve Manager' tab is active. The main workspace is divided into three sections:

- All sieves:** A table listing various sieve sizes and their diameters. The 'Use in set' column has checkboxes for each sieve.
- Sample's sieve set manager:** A table for assigning sieve sets to samples. The 'Assign' column has a checked checkbox.
- Sieve Sets:** A section for managing sieve sets, including a 'Custom Sieve' section with input fields for Sieve No. and D. (mm), and a 'Selected sieve set' section with a table of sieve sizes.

Sieve No.	D.(mm)	Use in set
4	4.75	<input checked="" type="checkbox"/>
5	4	<input type="checkbox"/>
6	3.35	<input type="checkbox"/>
7	2.8	<input type="checkbox"/>
8	2.36	<input type="checkbox"/>
10	2	<input checked="" type="checkbox"/>
12	1.7	<input type="checkbox"/>
14	1.4	<input type="checkbox"/>
16	1.18	<input type="checkbox"/>
18	1	<input type="checkbox"/>
20	0.85	<input checked="" type="checkbox"/>
25	0.71	<input type="checkbox"/>
30	0.6	<input checked="" type="checkbox"/>
35	0.5	<input type="checkbox"/>
40	0.425	<input checked="" type="checkbox"/>
45	0.355	<input type="checkbox"/>
50	0.3	<input type="checkbox"/>
60	0.25	<input checked="" type="checkbox"/>
70	0.212	<input type="checkbox"/>
80	0.18	<input type="checkbox"/>
100	0.15	<input type="checkbox"/>
120	0.125	<input type="checkbox"/>
140	0.106	<input checked="" type="checkbox"/>
170	0.09	<input type="checkbox"/>
200	0.075	<input checked="" type="checkbox"/>

BH	Sample	Assign	Sieve Set
Borehole Name	Sample	<input checked="" type="checkbox"/>	Sieve set 1

Sieve No.	D.(mm)
4	4.75
10	2
20	0.85
30	0.6
40	0.425
60	0.25
140	0.106
200	0.075

#### sieve analysis

1. Select a borehole and then sample
2. enter input data
3. complete the mass retained on each sieve row by row.
4. click on apply and calculate

Dartis Soil Lab Pro

New Open Save License Manager Help

General Sieve Manager Sieve Analysis **Hydrometer(152-H)** Grain Size Plot Grain Size Plot (BH) Report

BH Manager Borehole Name Sample USCS: SP, AASHTO: A-2-6

Sieve No.	opening, (mm)	Mass Retained, (g)	Mass Retained, (%)	Cumulative Retained, (%)	Finer, (%)
4	4.750	0.00	0.00	0.00	100.00
10	2.000	40.20	8.07	8.07	91.93
20	0.850	84.60	16.98	25.05	74.95
30	0.600	50.20	10.07	35.12	64.88
40	0.425	40.00	8.03	43.15	56.85
60	0.250	106.40	21.35	64.50	35.50
140	0.106	108.80	21.83	86.33	13.67
200	0.075	59.40	11.92	98.25	1.75
Pan		8.70	1.75		

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**Input**

Total mass of specimen, (g):  
500.00

**Results**

Total mass retained, (g): 498.300      Loss, (%): 0.340

Sample

Percent finer

Grain size D (mm)

Silt Fine Sand Med. Sand Coars... Fine Gravel Coarse Gravel

Vesion: 1.3.0 Project Name: Demo Project

## hydrometer

1. Select a borehole and then sample
2. enter input data
3. complete the table. data may be entered manually or by importing from Excel using paste button.
4. click on apply and calculate

Dartis Soil Lab Pro

New Open Save i License Manager Help

General Sieve Manager Sieve Analysis Hydrometer(152-H) Grain Size Plot Grain Size Plot (BH) Report

BH Manager Borehole Name Sample USCS: SP, AASHTO: A-2-6 Paste

Time,(min)	Reading, R	T,(-C)	Rcp	Finer,(%)	Rcl	L,(cm)	A	D, (m)	Add	Del
0.25	51	28	46.50	90.99	52	7.82	0.0121	0.06	+	-
0.5	48	28	43.50	85.12	49	8.31	0.0121	0.04	+	-
1	47	28	42.50	83.17	48	8.48	0.0121	0.03	+	-
2	46	28	41.50	81.21	47	8.64	0.0121	0.02	+	-
4	45	28	40.50	79.25	46	8.80	0.0121	0.01	+	-
8	44	28	39.50	77.30	45	8.97	0.0121	0.01	+	-
15	43	28	38.50	75.34	44	9.13	0.0121	0.00	+	-
30	42	28	37.50	73.38	43	9.29	0.0121	0.00	+	-

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Input

Apply and Calculate

Gs: 2.75

Dry mass of soil Ms,(g): 50

Meniscus correction Fm: 1

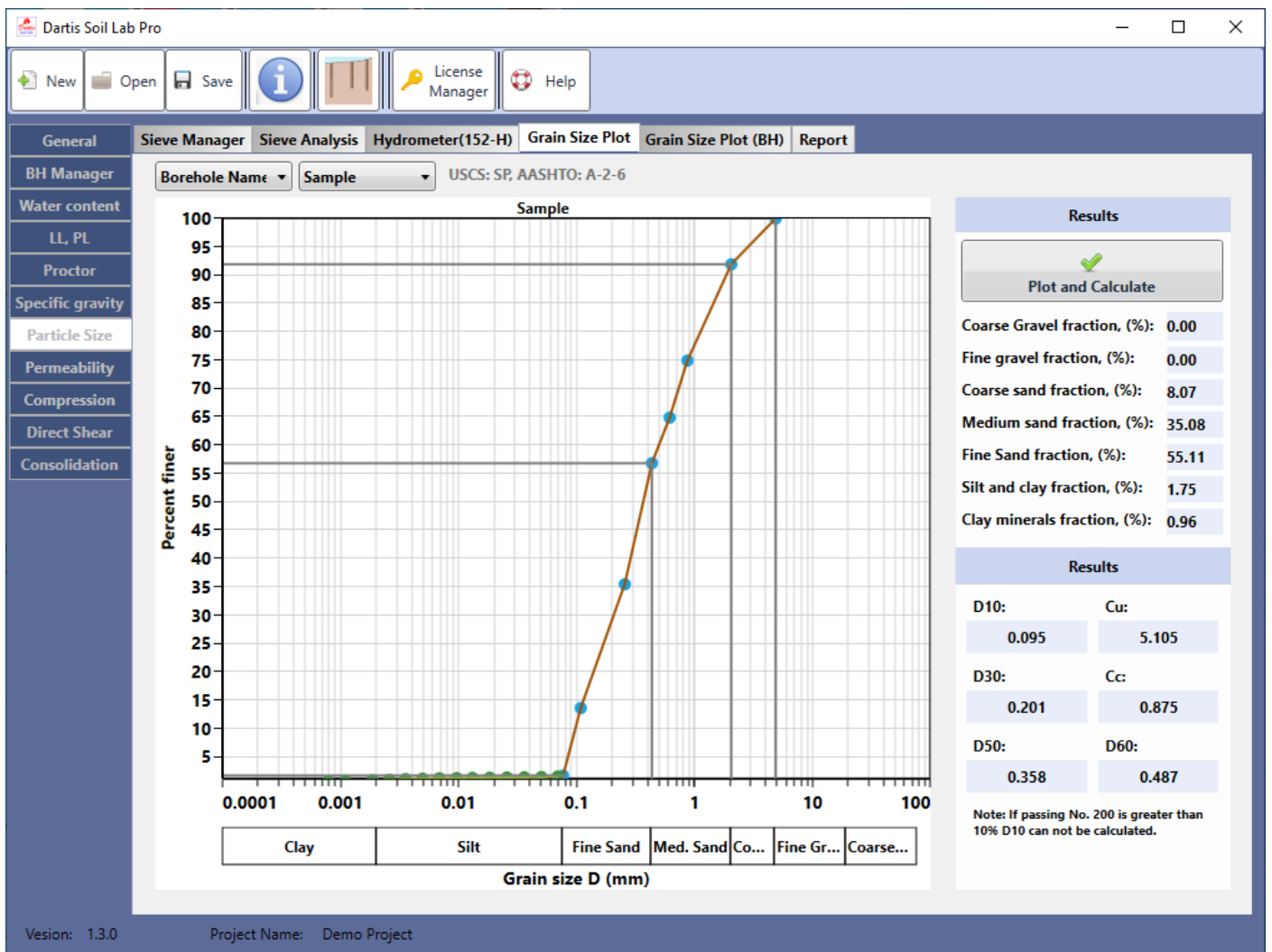
Zero correction Fz: 7

Sample

Version: 1.3.0 Project Name: Demo Project

## grain size plot

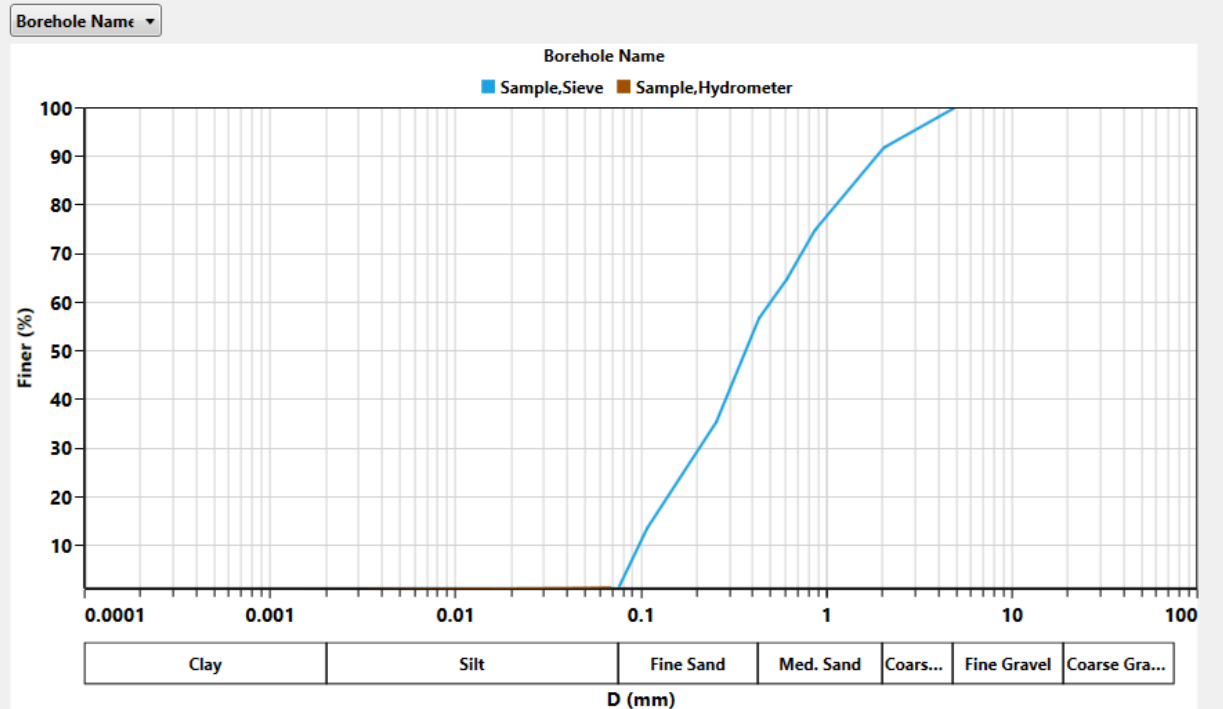
1. Select a borehole and then sample
2. click on plot and calculate



## borehole samples grain size

1. Select a borehole
2. click on plot graph

- BH Manager
- Water content
- LL, PL
- Proctor
- Specific gravity
- Particle Size
- Permeability
- Compression
- Direct Shear
- Consolidation



Plot graph

### 3.3. Reporting

For each test page there is a report tab defined. In report tab choose between available reports. The following shows a sample Hydrometer test report:

The screenshot displays the 'Report' tab for a 'Hydrometer(152-H)' test. The report header includes the company name 'Dartistech' and the title 'HYDROMETER TEST RESULTS (ASTM D-422)'. Project details are listed as 'Sample Project' (No: 45453334) and 'Sample Client' (Location: Sample Location). Test parameters include BH: BH1, Sample name: BH01, Sample depth: 2.00m, and USCS: CL AASHTO: A-6. Physical properties are Gs: 2.69, a: 0.99, Ms: 51.00, Fm: 1.00, and Fz: 4.00. The sample is described as 'Sandy clay'. A semi-logarithmic graph plots 'Percent finer' (5-100) against 'Grain size D (mm)' (0.0075-0.1). Below the graph is a data table:

Time, (min)	R	T,(C)	Rsp	Finer, (%)	Rol	L, (cm)	A	D, (mm)
0.25	10.0	27.0	16.00	31.08	11.0	14.61	0.0124	0.086
0.60	10.0	27.0	16.00	31.08	11.0	14.61	0.0124	0.087
1.00	8.0	27.0	16.00	28.16	10.0	14.87	0.0124	0.048

### Borehole list report

In BH Manager page choose Report tab and click on report button. This will show the following report:

The screenshot shows the 'Report' tab for the 'Boreholes and Samples' section. The report title is 'List of boreholes'. Project details are 'Sample Project' (No: 45453334) and 'Sample Client' (Location: Sample Location). A table lists the borehole data:

Title	GWL(m)	Fill Material(m)	Depth (m)	Type	X Coordinate:	Y Coordinate:	Z Coordinate:
BH1	2.50	0.60	7.00	mud rotary	456783	257899	0.9



## System Requirements

### **Minimal System Requirements:**

- Microsoft Windows 7/8/10/Vista
- 500 MHz processor
- 512 MB RAM
- At least 100 MB free hard drive space



## Contacts

**Product website:**

<http://www.dartistech.com>

**Support e-mail:**

support@dartistech.com