

Manual Verder Liquids

Verder Liquids Manual

Pages

Step 1. Data used in all calculations

On this page you declare two things.

- all the global variables, which will be used throughout the calculations.
- the type of system based on the pump (hydraulic / diaphragm / peristaltic / lobe)

Read more by clicking on the link below:

→ [Step 1. Data used in all calculations](#)

</steps/step-1.-data-used-in-all-calculations>

Step 2. Main calculation

The main calculation consists of two sections.

On the left you have "suction line" and on the right the "discharge line". You can swipe on them to open these sections.



Note: if you swipe from too far on the left or right, this triggers a browser setting where it will try to load the previous/next page in your history. Therefore this swipe gesture works best in the app itself since you have an empty browser history in the app.

Read more by clicking on the link below:

→ [Step 2. Main Calculation](#)

</steps/step-2.-main-calculation>

Step 3. Results

This page has all the results based on the inputs you gave in steps one and two, with an export to PDF function.

Read more by clicking on the link below:

[→ Step 3. Results](#)

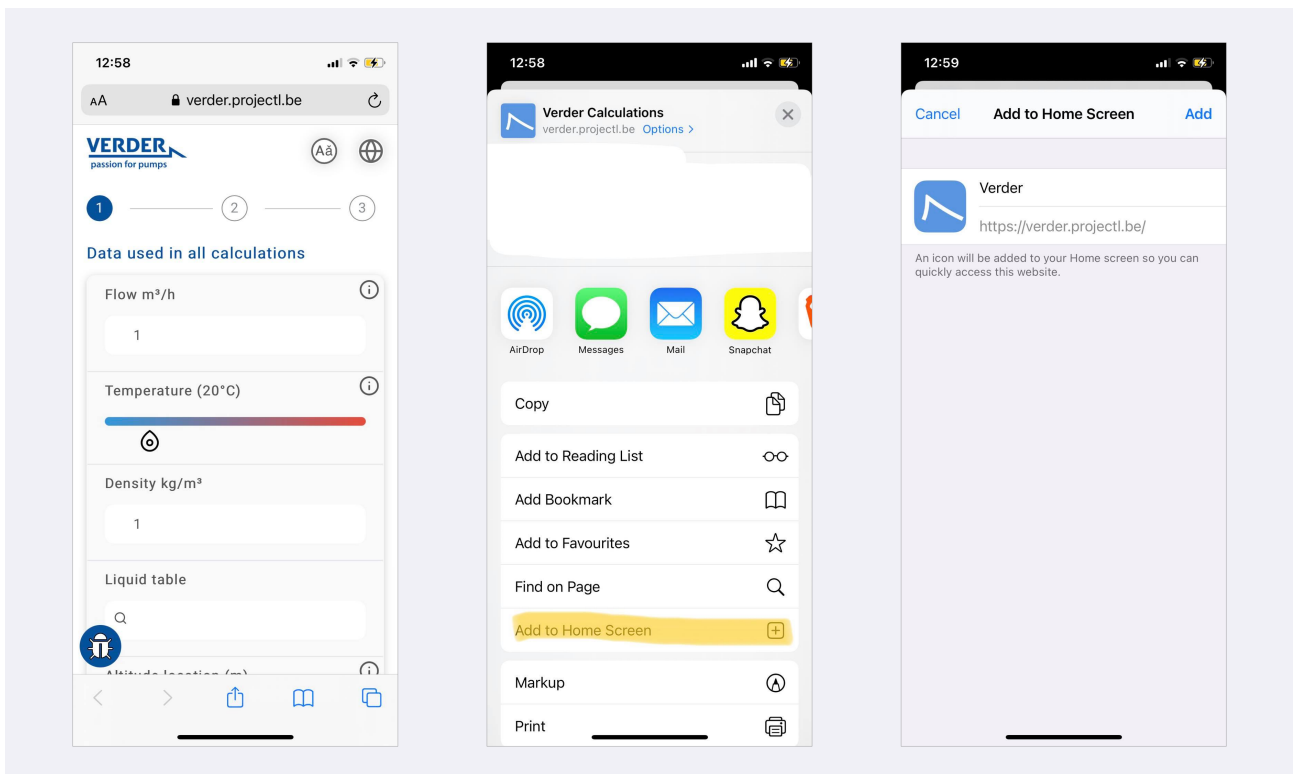
[/steps/step-3.-results](#)

☐ **General**

Installation

iOS (iPhone, iPad)

- ☐ Open the website in safari (<https://verder.projectl.be>)
- ☐ Click on the share icon (on iPhone this is at the center bottom, on iPad the top right corner)
- ☐ Click on "Add to Home Screen"
- ☐ Confirm by clicking on "Add"

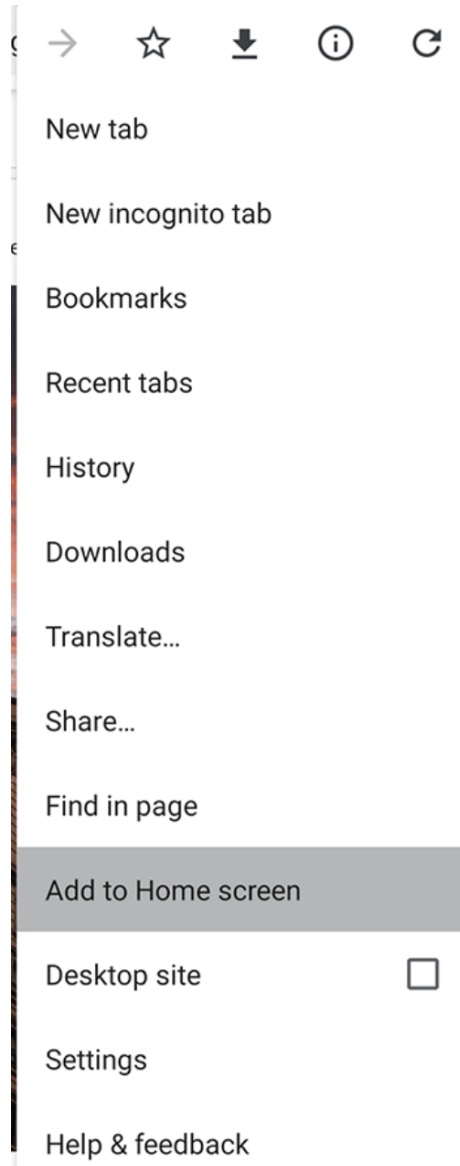


Android

- ☐ Open <https://verder.projectl.be> in your default browser
- ☐ Click the three vertical dots in the top right corner
- ☐ A dropdown menu will open, select "Add to Home screen"



Three vertical dots



Windows / MacOS

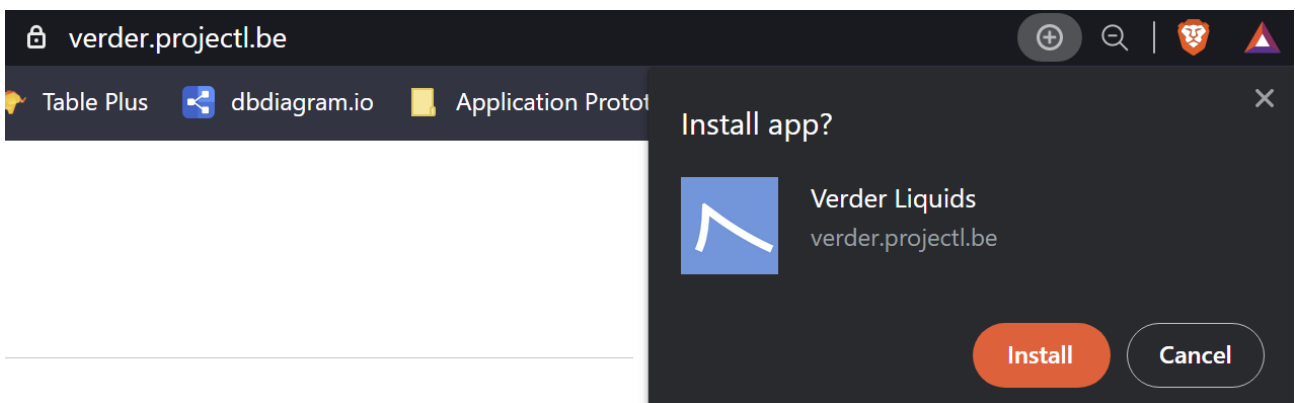
On windows / MacOS the process to install the web application is the same:

- ☐ Open <https://verder.projectl.be> in google chrome

- ☐ In the URL bar you'll see a "+" icon on the right if your browser is supported. If not you should update your browser first.
- ☐ Click the "+" icon
- ☐ Confirm the installation



Note the "+" icon on the right



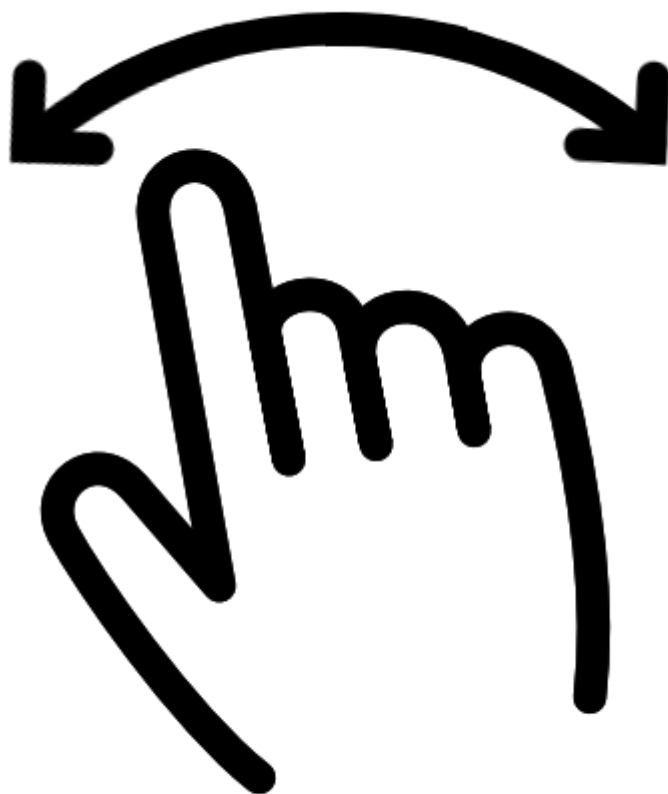
Confirm by clicking "install"

Icons

Some icons are used throughout the application and indicate a specific action can be taken. In this page you'll find an overview of these icons.

Swipe Icon

The icon below is used to demonstrate you can swipe in the direction specified by the arrow. (if the arrow goes in both directions, you can also swipe both directions)



☐ Steps

Step 1. Data used in all calculations

1. Input fields

Data used in all calculations

Flow m³/h

1

Temperature (20°C)

Density kg/m³

1

Altitude location (m)

1

Viscosity (cP)

1

Liquid table

Overview of the input fields

Below you will find a table with the fields and their properties. if there is no min/max value it's represented as a dash. E.g. min: 0 with no maximum value would be: 0/- or vice versa.

Field	Description	Min/max value	Metric	Imperial
Flow	Volume displacement in time	0/-	m³/h	gal/m
Temperature	Liquid temperature	0°C/140°C	°C	°F

Density	Mass / volume ratio	0/-	kg/m ³	lb(m)/ft ³
Altitude	Height location above sea level	-/-	m	ft
Viscosity	Thickness of the fluid "measure of it's resistance to deformation at a given rate"	-/-	cP	lb(f)s/ft ²

2. Liquid table

The section "Liquid table" can be used to compare how liquids would interact with certain materials.

2.1. Selecting the liquids

First of all you have to select the liquids you want to compare you can do this by following these steps:

- ☐ Click on the search bar.
- ☐ Enter a search query. (in the example we use "acid")
- ☐ The search results will now load as soon as you stop typing.
- ☐ Add/remove liquids by clicking on them (if it's highlighted it's added to the comparison)

After these steps you should have something similar to this:

×

Liquid table

Q acid

4

Acetic Acid

🗑️

Acetic Acid — 20%

⊕

Acetic Acid — 30%

🗑️

Acetic Acid — 50%

🗑️

Acetic Acid — 80%

⊕

Acetic Acid — Glacial

⊕

NEXT

Search results for query "acid"

2.2. The comparison table

Now you can just click on "next" and the comparison table will be displayed. If it doesn't fit the screen, you can scroll both horizontally (for more liquids) and vertically (for more materials).

× Liquid table

Material	Acetic Acid	Acetic Acid – 30%	Acetic Acid – 50%
Aluminum	B	D	D
Carbon Steel	D	n	n
Cast/Ductile Iron	D	A	A
17-4 Stainless	n	n	n
304 Stainless	D	A	A
316 Stainless	B	n	n
Hastelloy C	A	C	C
Acetal	D	B	B
CSM (Hypalon)	C	n	n
EPR, EPDM	A	A	A
(FKM) FLUOROCARBO...	n	D	C
Fluoroelastomer (Viton)	B	n	n

BACK

Comparison table for Acetic Acid, Acetic Acid - 30% and Acetic Acid - 50%

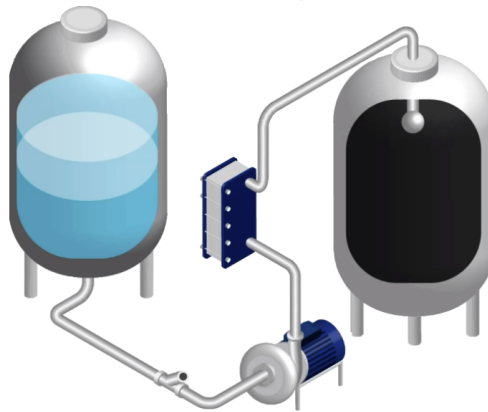
Selecting the pump type / schema

As indicated by the [Swipe Icon](#) (see [Icons](#) for more) you can swipe horizontally on the image, by doing so the schema shown in step 2 will change to the selected one.

Pump type



Centrifugal



Step 2. Main Calculation

Overview

When you get to the main calculations step, you are first presented with an animation of the schema. You can stop/replay this animation by tapping or clicking on it.

You can either click on / pull the gray rectangle on the side to open the settings.

On the top you have the steps, you can click on "Data used in all calculations" or "Results" to go to that step.



Suction/Discharge settings

The settings consist of two pages:

- General inputs
- Losses in other components

You can navigate between pages by swiping as indicated by the [Swipe Icon](#).

Settings for the suction line

Length (m) ⓘ

1 + -

Number of bends ⓘ

0 + -

Ø (millimeter) ⓘ

32 + -

Height of liquid (m) ⓘ

1 + -

Suction Line Settings

1. Input Fields

Suction line

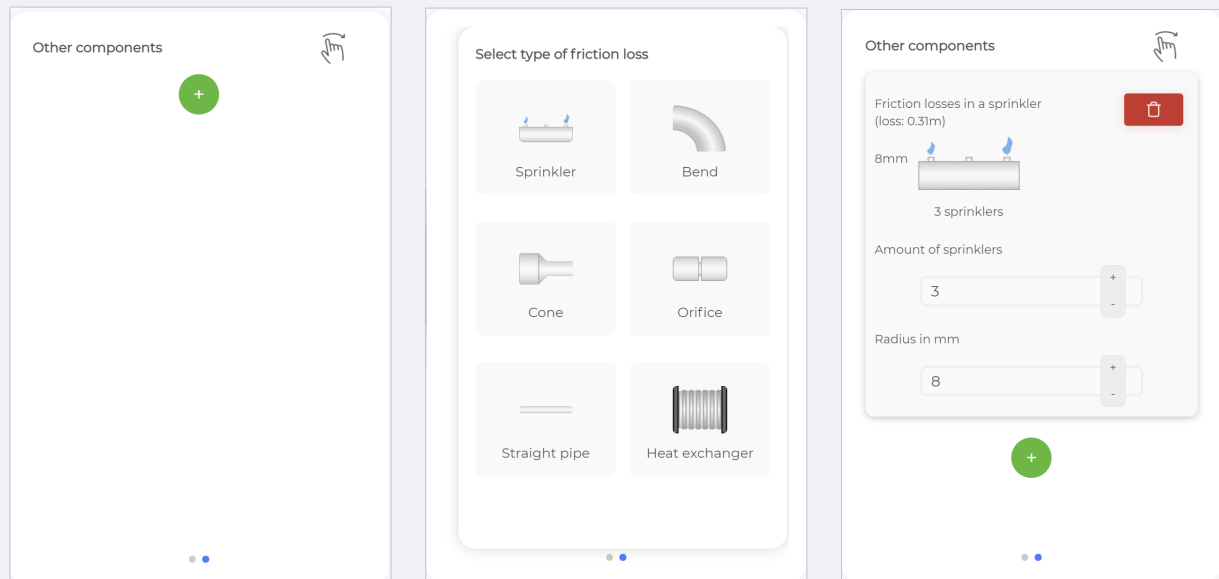
Field	Description	Metric	Imperial
Length	Horizontal and vertical length	m	ft
Bends	Number of bends		
Ø	Inside diameter of the piping	mm	inch
Height Liquid	Height from tank-outlet level up to liquid level	m	ft
Height	Height of bottom vessel above suction of the pump	m	ft
R/Ø	Radius to diameter ratio, value determines pressure losses in bends.		
Pressure	Relative static pressure on the liquid level in the suctionvessel (0 = atmospheric)	bar	lbs(f)/ft²

Discharge line

Field	Description	Metric	Imperial
Length	Horizontal and vertical length	m	ft
Bends	Number of bends		
Ø	Inside diameter of the piping	mm	inch
Height	Height of bottom vessel above suction of the pump	m	ft
R/Ø	Radius to diameter ratio, value determines pressure losses in bends.		
Pressure	Relative static pressure on the liquid level in the suctionvessel (0 = atmospheric)	bar	lbs(f)/ft

2. Losses in other components

You can add components by clicking on the "+" button, this will then present you a menu of what kind of component you would like to add.



If you no longer want a specific component you can just click the trash icon.

Step 3. Results

Vortexes

The program will automatically tell you if there's a risk a vortex will be created.



There is a risk there will be a vortex created in the suctionvessel. Increase the level in the vessel to prevent a vortex.

If you get this warning, you should increase the "Height of liquid" in [Main Calculations / Suction Line](#)




Step 2. Main Calculation

</steps/step-2.-main-calculation>

General Results

At the top you will see some general values:

Results

Total friction losses (m)	<input type="text" value="0.6"/>	
Diff. height (m)	<input type="text" value="-5.00"/>	
Difference in static pressure (m)	<input type="text" value="0.00"/>	
Total required head of the pump (m)	<input type="text" value="-4.40"/>	
NPSH available (m) (for water only)	<input type="text" value="-21.25"/>	

Example results

Suction / Discharge line results

At the bottom there's a section for the suction line and discharge line results, you can swipe between the two.

Suction line



Liquid speed in suction line (m/s)



0.3

Reynolds number



11052

Friction losses in suction line (m)



0.04



Discharge line



Liquid speed in discharge line (m/s)



0.6

Reynolds number



14737

Friction losses in discharge line (m)

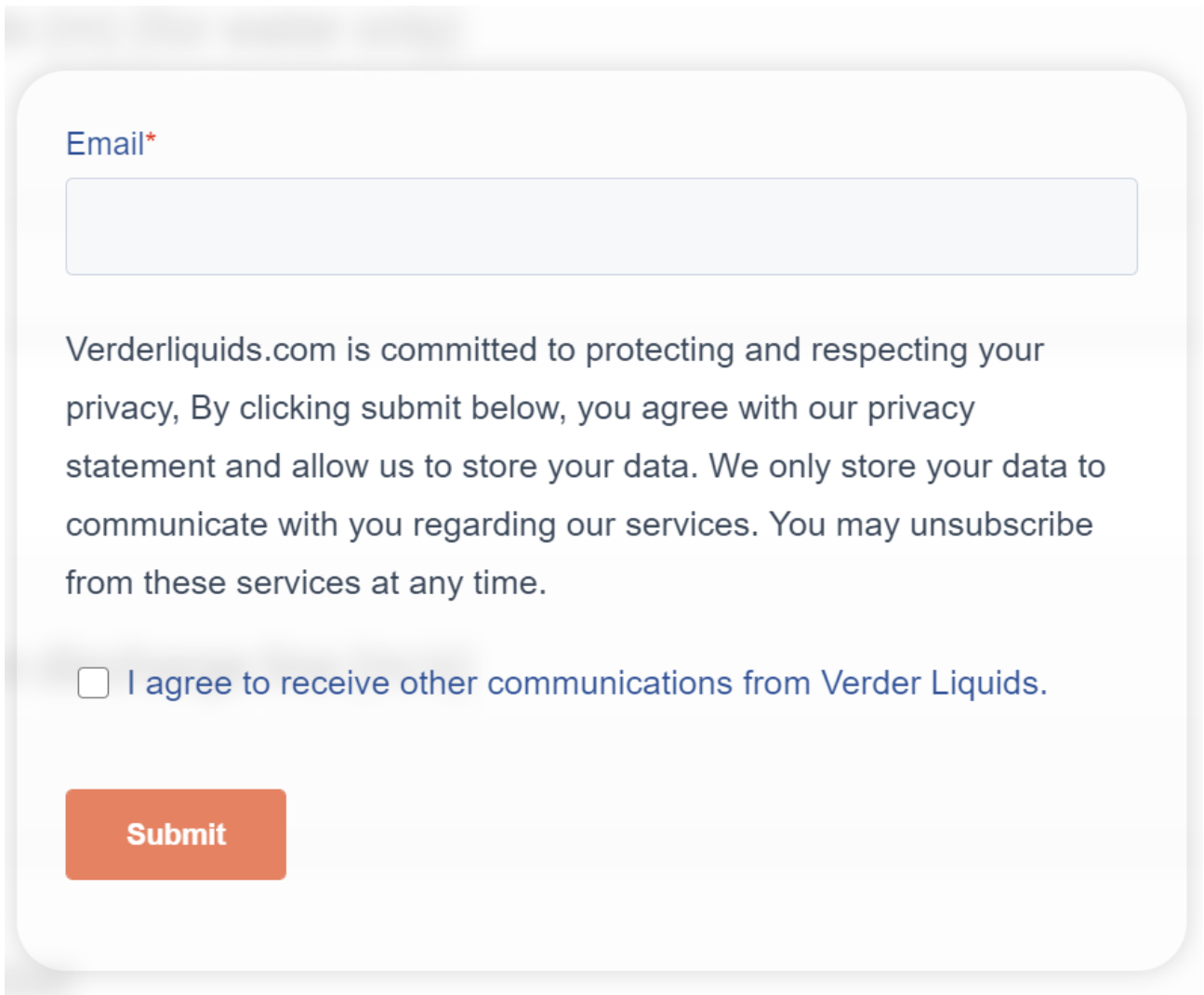


0.55



Export to PDF

When you're done with the calculations and want to export the results, you can simply click "Export to PDF", enter your e-mail address and agree to the terms.

A screenshot of a web form for exporting to PDF. It features a light gray rounded rectangle containing an email input field, a privacy policy paragraph, a checkbox for agreeing to communications, and an orange 'Submit' button.

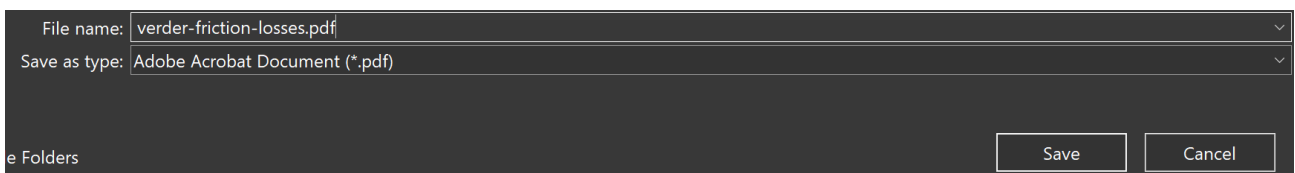
Email*

Verderliquids.com is committed to protecting and respecting your privacy, By clicking submit below, you agree with our privacy statement and allow us to store your data. We only store your data to communicate with you regarding our services. You may unsubscribe from these services at any time.

☐ I agree to receive other communications from Verder Liquids.

Submit

Enter your e-mail address and check the checkbox.


A screenshot of a 'Save As' dialog box with a dark gray background. It shows the file name 'verder-friction-losses.pdf' and the save type 'Adobe Acrobat Document (*.pdf)'. At the bottom, there are 'Save' and 'Cancel' buttons.

File name: verder-friction-losses.pdf

Save as type: Adobe Acrobat Document (*.pdf)

Save Cancel

Select where you would like to save the file and hit save.

 Depending on your browser settings, you may be asked to select a location to save the PDF. If not, the default location is in your downloads folder.

☐ Preferences

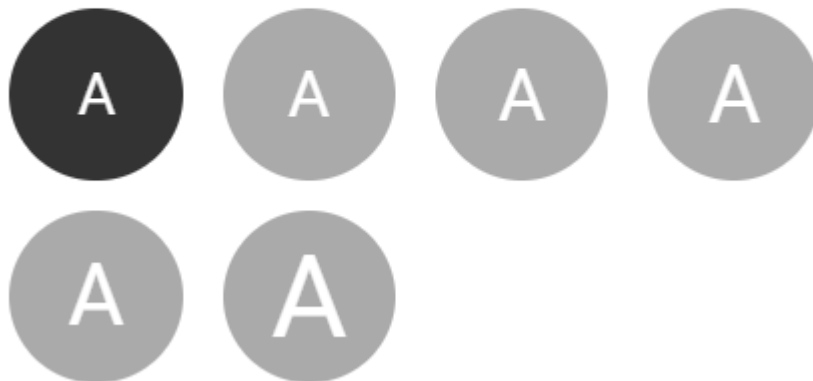
Font Size

If you think the font size is too small or too big, you can choose between some options by clicking the "Aa" icon on the top right.



This will open a list of options, you can choose one by clicking on it.

Font-size:



Language

You can choose a language by clicking on the globe on the top right.



CANCEL

Asia Pacific



中国大陆



대한민국



Россия

Europe



België



Belgique



Česko



Danmark



Deutschland



España



France



Italia



Nederland



Polska



România



Россия



United Kingdom

The United States and Canada



United States



Canada (English)



Canada (Français)



If you select "United States" the program changes all units to their Imperial counterparts, e.g. meter → feet