

# ACO QuAD-VFC

VORTEX FLOW CONTROL DESIGN SOFTWARE – USER GUIDE

## Contents

	PAGE
1 Log in and Main Screen	2
2 Project Management	4
3 Head and Flow Rate	5
4 Chamber Information	5
5 Graph Display and Outputs	6
6 Results	8

## ACO QuAD-VFC User Guide

**ACO recommends this use of this guide alongside the ACO QuAD-VFC Vortex Flow Control Design Software.**

For more information on Q-Brake, Q-Plate and Q-Chamber, and brochures, installation drawings and BIM models please visit:

[www.aco.co.uk/products/q-brake-vortex](http://www.aco.co.uk/products/q-brake-vortex)

# 1. Log-in and Main Screen

## 1.1 Registration and Log-in

To use ACO QuAD-VFC, you will need to register on the ACO website. Registering with a password allows you to save and edit projects you are working on and ensures that no-one else will have access to your projects. Registration can be done by clicking the REGISTER button on the software landing page:

There is a common registration across the ACO software platform: if you are already registered for ACO QuAD hydraulic design software, ACO QuAD-VFC vortex flow control calculator or ACO StormBrixx Configurator, click LOGIN and log in with your registered email address and password.

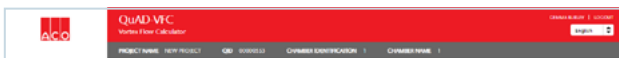
## 1.2 Main Screen



Once logged in, the software opens at the main screen, populated with the project and chamber that was last worked on. If a project has not yet been created, a default project will be shown with default data.

The main screen is split into several panels, described below.

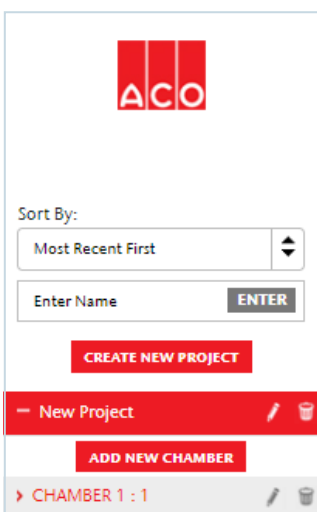
## 1.3 Header panel



The Header panel shows the following information

- Project Name, Design Identification Number (QID), Chamber number and Chamber Name currently loaded
- Name of the logged in user

## 1.4 Project Management panel



The Project Management panel displays a list of the projects created. It opens / collapses to show the individual chambers available within each project.

The Project Management panel supports the following functionality:

- The selection of a project and chamber to be the current ‘live’ option to be viewed and/or edited. When a project and chamber are selected that project and chamber become ‘live’ and are highlighted in red.
- The creation of new projects and chambers, and the editing / deletion of old projects and chambers.
- The sorting of projects alphabetically, based on date, or based on project name or QID search.

See section 2 Project Management

### 1.5 Head and Flow Rate panel

HEAD FLOW RATE INPUT	
Type	<input checked="" type="radio"/> Q-Brake <input type="radio"/> Q-Plate
Head	<input type="text" value="1.00"/> m
Flowrate	<input type="text" value="2.00"/> l/s

The Head and Flow Rate panel allows selection of Q-Brake (vortex flow control) or Q-Plate (orifice plate) and input of the design head and flow rate. This is the basic information required for the calculation of the Q-Brake or Q-Plate dimensions.

See section 3 Head and Flow Rate.

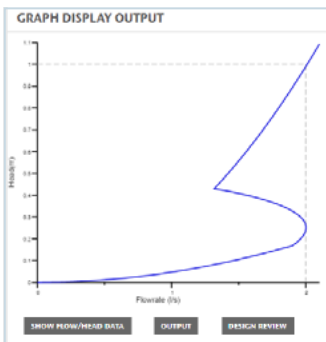
### 1.6 Chamber Information panel

CHAMBER INFORMATION	
Backplate Type	<input checked="" type="radio"/> Flat <input type="radio"/> Curved
Chamber Material	<input checked="" type="radio"/> Concrete <input type="radio"/> Plastic
Outlet Pipe Size DN/ID (mm)	<input type="text" value="100"/> ?
Chamber Diameter (mm)	<input type="text" value="1050"/>
Minimum Sump	<b>287mm</b>

The Chamber Information panel allows selection of flat or curved back Q-Brake and Q-Plate units, chamber diameter, outlet pipe diameter and indicates the minimum sump depth.

See section 4 Chamber Information.

### 1.7 Graph Display panel



The Graph Display panel shows a graph of the calculated head and flow rate, along with buttons for different output options.

The graphical display will be updated automatically as the design head and flow rate are changed.

See section 5 Graph Display and Outputs

### 1.8 Results panel

RESULTS	
Body Diameter	<b>273mm</b>
Body Depth	<b>65mm</b>
Outlet Spigot OD	<b>95mm</b>
Flush Flow Height	<b>186mm</b>
Reattachment Height	<b>429mm</b>

The Results panel shows the calculated dimensions for the Q-Brake or Q-Plate based on the parameters inputted.

See section 6 Results.

### 1.9 Product panel



The Product panel shows a render of the product selected.

## 2. Project Management

### 2.1 New Project

To create a new project, click on the 'CREATE NEW PROJECT' button. This will open up a dialogue box:

By default, the project name is 'New Project' and this can be changed by typing directly into the Project Name box.

If you try to create a project with the same name as an existing project, an error message will be raised. (Note that this name checking is case insensitive, e.g. 'new project' cannot be created if 'New Project' already exists.)

The project name can be edited later, if required (see below)

All projects have at least one 'Chamber'. When creating a New Project, by default a chamber is named New Chamber with an identifier of Chamber 1. The chamber name can be changed by typing the name directly in the Chamber Identification box and the Chamber Number can be changed from the drop down box. Note that chamber names can be the same within the same project - it is the user's responsibility to distinguish between them.

Chamber names can be edited later, if required (see below)

Select 'APPLY & CLOSE' to save the project name and chamber name.

### 2.2 New Chamber

Each Project can have up to 99 chambers associated with it.

Select the Project to have a new chamber added. The Project will open up to show the existing Chambers on the Project. Click on the 'ADD NEW CHAMBER' button. This will open up the dialogue box but the Project Name will be greyed out and cannot be changed.

The Chamber Number offered is the lowest unused number in the Project. The Chamber Number can be changed from the drop down box.

By default 'New Chamber' will appear as the Chamber Name. The chamber name can be changed by typing the name directly in the Chamber Identification box and. Note that chamber names can be the same within the same project.

Select 'APPLY & CLOSE' to save the added chamber.

### 2.3 Project Management

The project panel at the left of the main screen shows your projects with the most recent project being at the top of the list. The sorting can be changed to be alphabetically by selecting 'Alphabetically' from the 'Sort By' drop down box and changed back to 'Most Recent First' in the same drop down box.

Project names can be filtered by using the search box. Any sequence of characters (letters and numbers) can be typed into the search box. Pressing the enter button will return all

projects that contain that sequence of characters in any part of the project name. (You can also search by the Design Identification Number, if known.)

The total number of projects that have been found will be displayed at the base of the project panel.

A scroll bar will appear to the right of the project panel when there are too many projects to be displayed within the project panel.

### 2.4 Project and Chamber Editing and Deletion

To Edit a project, select the Edit pen next to the project name. The only field that will be editable at the project level will be the project name.

To delete a project from the project panel, select the Delete bin icon. A warning will appear that 'This will delete the project <Project Name> and all its chambers'. Only click OK if you really want to delete the project.

Note that if the project is currently 'active' it cannot be deleted. Select another project to be active and then delete the project you want to delete.

Editing and deletion of individual chambers is done in a similar way. Deletion of a chamber will not affect any other chambers within that project but, where there is only one chamber on a project, the project will be deleted.

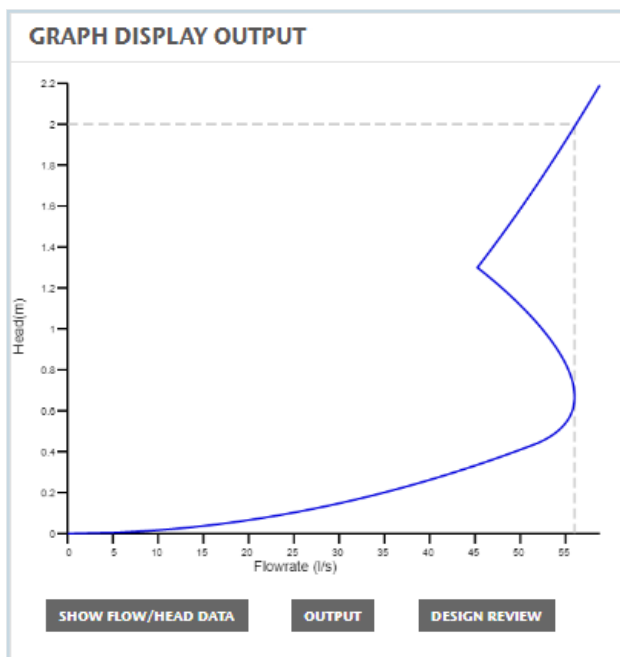
## 3. Head and Flow Rate

### 3.1 Choose the Type of Flow Control

HEAD FLOW RATE INPUT	
Type	<input checked="" type="radio"/> Q-Brake <input type="radio"/> Q-Plate
Head	<input type="text" value="2.00"/> m
Flowrate	<input type="text" value="56.00"/> l/s

Radio buttons allow the selection of either Q-Brake (Vortex Flow Control) or Q-Plate (orifice plate). This selection can be changed at any time.

### 3.2 Design Head and Flow Rate



The Design Head is entered in metres to two decimal places. The Graph Display will update to reflect the entered value.

The maximum head height that can be entered is 3.00 m.

The Design Flow Rate is entered in l/s to two decimal places. The Graph Display will update to reflect the entered value.

The Flow Rate entered must be between 2 l/s and 99.99 l/s.

## 4. Chamber Information

### 4.1 Backplate Type

Both Q-Brakes and Q-Plates can be designed with either a flat back, for fixing to a head wall, or a curved back, for fixing directly to a chamber wall. The back plate style can be selected with the radio buttons and can be changed at any time.

### 4.2 Chamber Material

Standard concrete chambers and rings are available in a range of standard diameters and these diameters are shown in the Chamber Diameter drop down list when Concrete is selected as the Chamber Material.

It is also possible to fit Q-Brake and Q-Plate models into large diameter plastic pipes (see ACO Q-Chamber). Some manufacturers of large diameter plastic pipes offer diameters that match the internal diameter of concrete pipes but other manufacturers offer other diameters. The list of available plastic pipe diameters are shown in the Chamber Diameter drop down list when Plastic is selected as the Chamber Material.

### 4.3 Outlet Pipe Size

Here you can select the outlet pipe diameter that you want to use for your chamber from the drop down list that has the standard pipe sizes used for drainage applications. The outlet spigot diameter will be designed to fit within the outlet pipe (not applicable to Q-Plate Flat Back).

The diameters available for selection will be those greater than the minimum spigot diameter calculated from the input parameters.

For Q-Brakes the outlet pipe diameter cannot be larger than the body diameter for a standard unit and the program will reject that selection. Special units can be designed where the outlet pipe has to be larger than the body diameter – contact [suds@aco.co.uk](mailto:suds@aco.co.uk).

For Q-Plates, the plate width and height will be adjusted to suit the outlet pipe selected.

Note that the pipe sizes are based on DN/ID ranges where the nominal diameter is defined by the internal diameter in mm. For DN/OD ranges, the internal diameter will vary with the wall thickness. Please contact [suds@aco.co.uk](mailto:suds@aco.co.uk) for further assistance.

### 4.4 Chamber Diameter

Here you can select the chamber diameter that you want to use from the drop down list that has the standard chamber sizes (see 4.2 Chamber Material).

The diameters available for selection will be those greater than the minimum chamber diameter calculated from the input parameters.

### 4.5 Minimum Sump

The minimum sump depth is given for information for consideration when designing the chamber itself.

The minimum depth is the distance between the internal wall at the invert of the outlet pipe and the base of the chamber.

ACO Q-Chamber is a durable bespoke prefabricated chamber designed to house an ACO Q-Brake or ACO Q-Plate. It combines easy-handling and simple installation with a fully-welded plastic, durable construction.



#### Key benefits:

- Easy transportation and installation
  - Minimise working time in a confined space
  - All plastic interfaces fully welded, watertight and spark tested
  - Available in a structured wall HDPE plastic chamber with a solid HDPE baseplate
  - Bespoke fabrication of chambers with inlets and outlets in twin-wall pipe for simple connection
  - Chambers available in\*:
    - Diameters 900mm – 2100mm
    - Height 1000mm – 3500mm
- \*other dimensions available on special request

Contact [suds@aco.co.uk](mailto:suds@aco.co.uk) for further information and a quote.

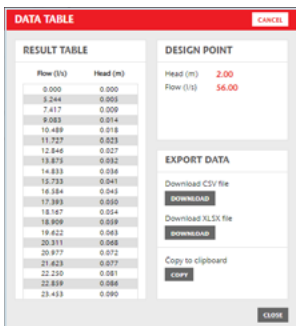
# 5. Graph Display and Outputs

## 5.1 Graph

The graph shows the flow curve calculated from the input design head and design flow rate. Changing the input values will change the graph automatically.

## 5.2 Outputs

### HEAD/FLOW DATA



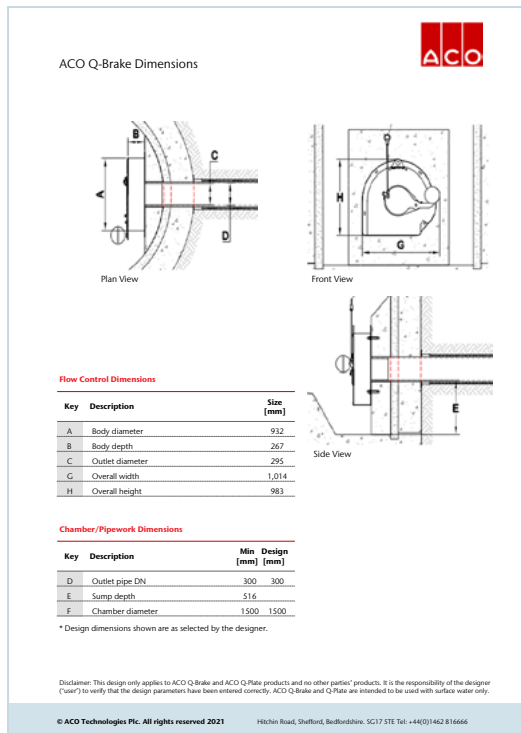
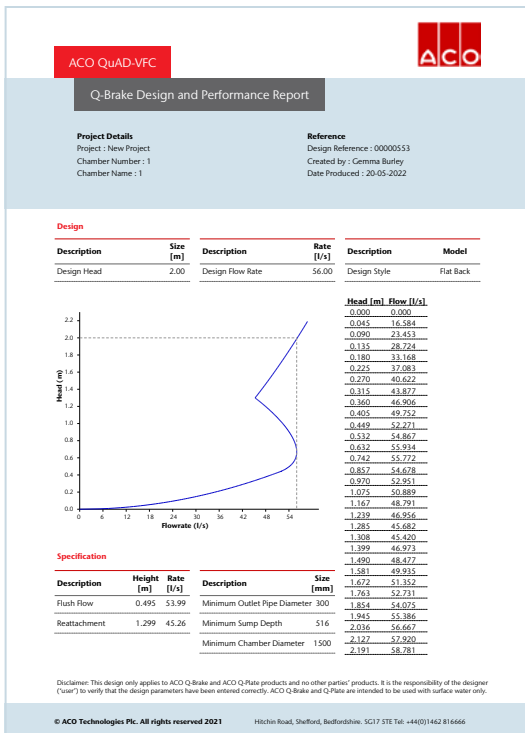
When this is selected a DATA TABLE pop-out will appear:

A calculated flow rate for incremental increase in head is shown in a scrollable list at the left of the pop-out.

The data can be downloaded as a .csv file or a .xlsx file, or copied to your clipboard. The data can then be saved and/or used in third party hydraulic design software.

### OUTPUT

When this is selected a pdf is prepared which has the following:



- Project details: project name, chamber, QID, Designer and Date.
- Design head and flow rate.
- Graph of the flow curve and 31 data points.
- Calculated Flush Flow and Reattachment heights and flow rates; calculated minimum dimensions.

- Generic drawings for the model selected.
- Dimensions of the flow control.
- Chamber and pipework dimensions – minimum and selected by the designer.

## DESIGN REVIEW

This facility allows you to send a link to a non-editable view of your design to a third party/parties. This may be for a review of the parameters or could be used, for example, as part of a tender or to send to suds@aco.co.uk for a quotation.

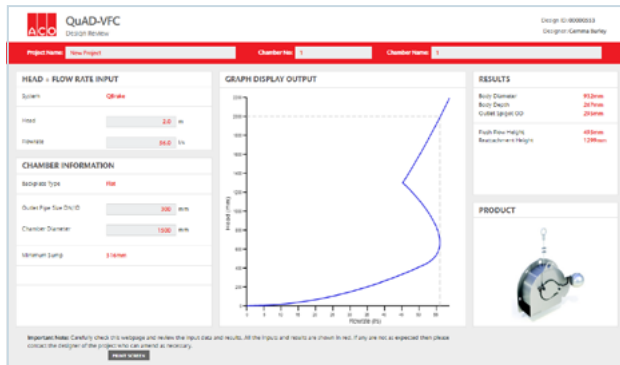
Add the intended recipient's email address. Multiple email addresses can be entered separated by a comma.

Add any message that you want by overwriting the suggested text.

SEND Link.

This recipient, who does not have to be registered on QuAD-VFC, will receive an email with your message, a link and project details. The email will also contain your email address, as registered on the website, for any return correspondence.

Note: some spam filters may put the email in the recipients junk folder.



When the recipient clicks on the link, they will be taken to a facsimile view of your design.

This view will show the design parameters that you have input, the graph and the flow control dimensions. There is a PRINT SCREEN function which produces a pdf version of the screen.

The facsimile view is not a live view of your design – it pulls data through from your design at the time the link is accessed. That data is then static: changes you make between sending the email and the recipient accessing the view will be reflected in the view, but changes made while the third party is accessing the view will not change the view.

- The facsimile view is 'dumb' - there is no calculation carried out in the view.
- This view is non-editable - only you can change any of the parameters of your design.
- The third party cannot see any of your projects – only you can access your projects.
- There is no functionality to output the data points or the summary pdf – only you control the outputs you want.



## 6. Results

### 6.1 Results pane

<b>RESULTS</b>	
Body Diameter	<b>932mm</b>
Body Depth	<b>267mm</b>
Outlet Spigot OD	<b>295mm</b>
Flush Flow Height	<b>495mm</b>
Reattachment Height	<b>1299mm</b>

The Results pane has the basic information about the designed unit.

Q-Brakes: Body Diameter, Body Depth and Outlet Spigot OD; Flush Flow and Reattachment heights.

Q-Plates: Orifice Diameter and Plate Width.

Q-Plate Drain Down: Orifice Diameter, Plate Width and Outlet Spigot OD.