CONTENTS

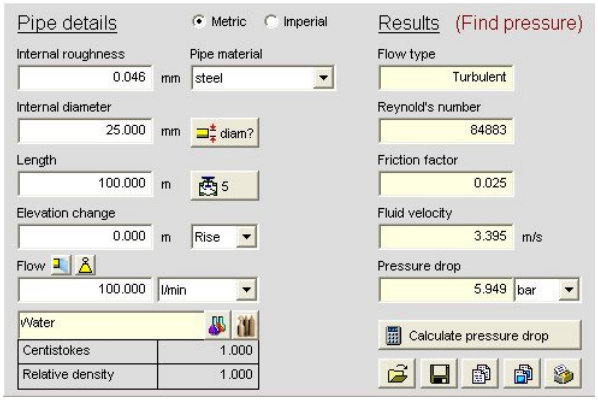
Overview

Pipe Flow Wizard is able to perform four different calculations depending on the known information.

PRESSURE DROP CALCULATION

When internal roughness, internal diameter, length, fittings, elevation change, and flow rate applicable to a pipe are known the PRESSURE DROP through the pipe can be calculated.

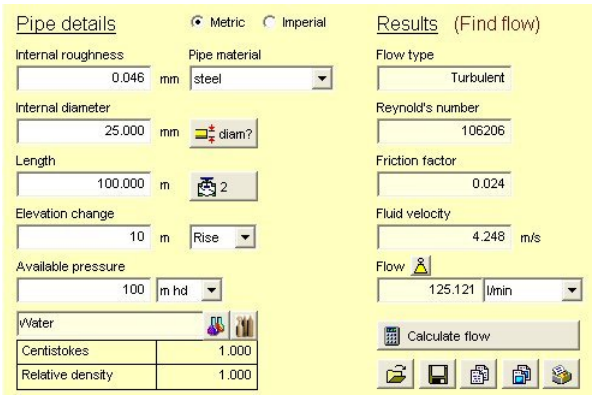
The type of flow, Reynold's number, friction factor, and fluid velocity are also displayed.



FLOW RATE CALCULATION

When internal roughness, internal diameter, length, fittings, elevation change, and available pressure applicable to a pipe are known the FLOW RATE through the pipe can be calculated.

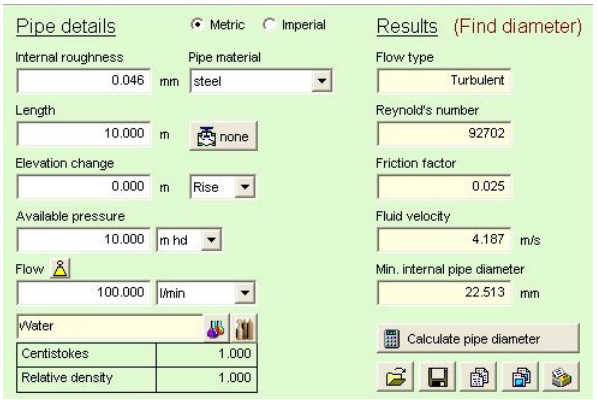
The type of flow, Reynold's number, friction factor, and fluid velocity are also displayed.



INTERNAL DIAMETER CALCULATION

When internal roughness, length, fittings, elevation change, available pressure, and flow rate applicable to a pipe are known the MINIMUM INTERNAL DIAMETER of the pipe can be calculated.

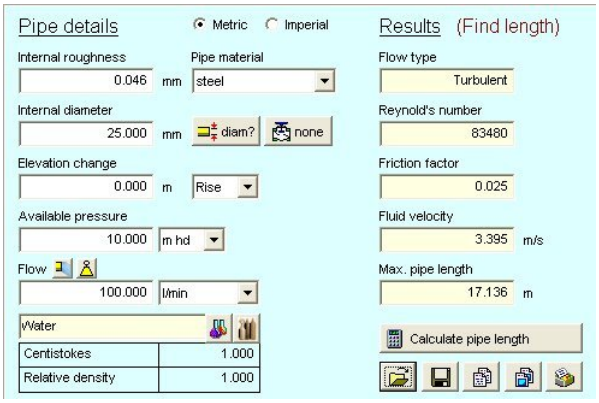
The type of flow, Reynold's number, friction factor, and fluid velocity are also displayed.



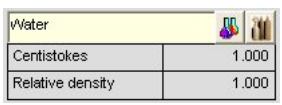
PIPE LENGTH CALCULATION

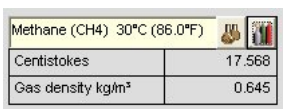
When internal roughness, internal diameter, fittings, elevation change, available pressure, and flow rate applicable to a pipe are known the MAXIMUM LENGTH of the pipe can be calculated.

The type of flow, Reynold's number, friction factor, and fluid velocity are also displayed.



Pipe Flow Wizard will calculate results for **LIQUIDS or COMPRESSED GASES.** A database of viscosity and density for a number of common fluids is included.



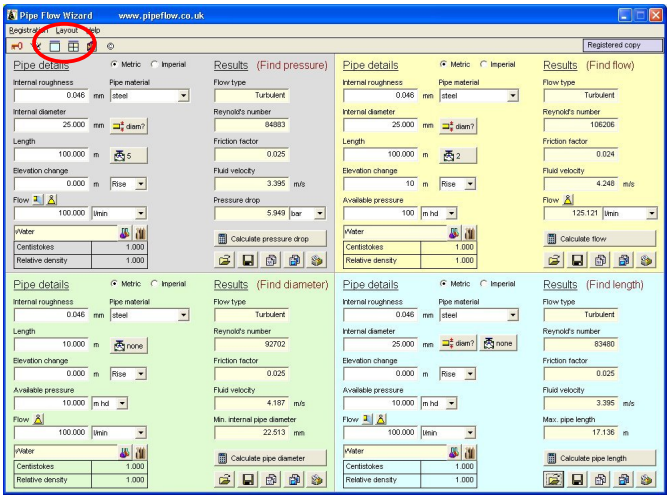


Back to contents . . . .

Single / Four page layout

Pipe Flow Wizard allows all four calculations screens to be displayed at the same time.

Click the single panel tool button or the four panel tool button to select the type of display preferred.

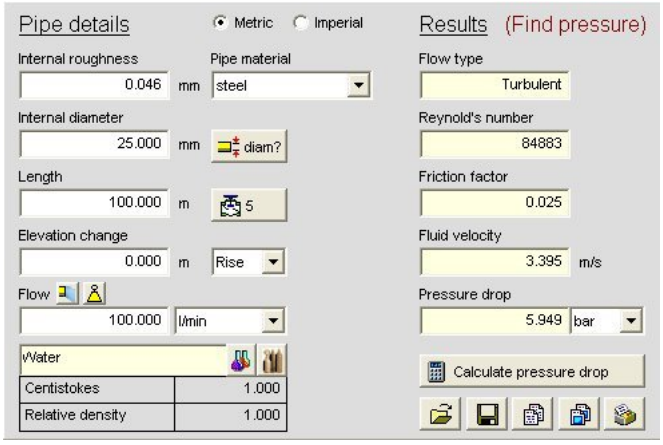


When only the result of one calculation is needed a single page layout can be chosen, the appropriate calculation page may be selected by clicking a calculation tab.

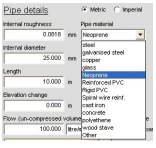
Pressure Drop Calculation

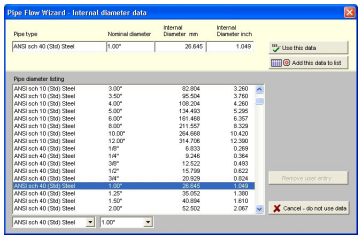
Set the following values :
1*. Internal roughness of the pipe.
2*. Internal diameter of the pipe.
3 . Length of the pipe.
4*. Valves, bends, and other fittings in the pipe.
5 . Elevation change of the pipe (Rise or fall).
6 . Flow through the pipe.
7 . Select flow rate units from drop down list.
8 . Select pressure units from drop down list.
9 . Change the fluid data : Name, viscosity, density

The internal diameter will always be reset to 25mm (0.984252 in), if the Pipe Flow Wizard program has not been registered.

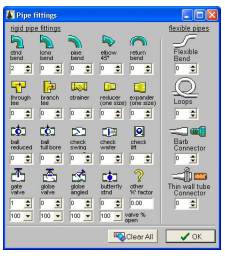


Click 'Calculate pressure drop' to display :
Flow type.
Reynold's number.
Friction factor.
Fluid velocity.
Pressure drop. (Change units if required).





NOTES:
1*. Select a pipe material from the drop down list to set a common value for internal roughness of the pipe, or enter your own preferred value.
2*. Use 'diam?' button to assist in setting the internal diameter of the pipe, or enter your own preferred value.
4*. Click the 'Valve' button to show the pipe fittings entry screen.

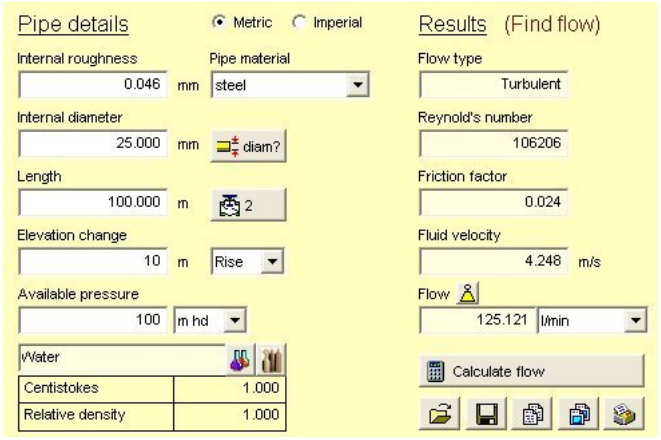


Back to contents . . . .

Flow Rate Calculation

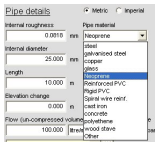
Set the following values :
1*. Internal roughness of the pipe.
2*. Internal diameter of the pipe.
3 . Length of the pipe.
4*. Valves, bends, and other fittings in the pipe.
5 . Elevation change of the pipe (Rise or fall).
6 . Available pressure at inlet of the pipe.
7 . Select pressure units from drop down list.
8 . Select flow rate units from drop down list.
9 . Change the fluid data : Name, viscosity, density

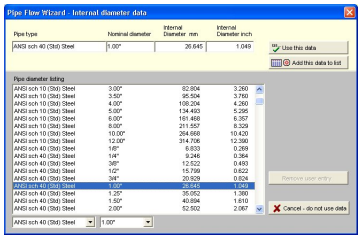
The internal diameter will always be reset to 25mm (0.984252 in), if the Pipe Flow Wizard program has not been registered.

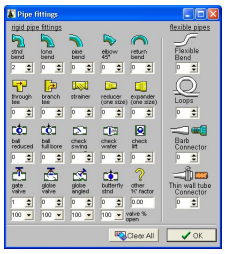


Click 'Calculate flow' to display :
Flow type.
Reynold's number.
Friction factor.
Fluid velocity.
Flow rate. (Change units if required).

NOTES:
1*. Select a pipe material from the drop down list to set a common value for internal roughness of the pipe, or enter your own prefered value.
2*. Use 'diam?' button to assist in setting the internal diameter of the pipe, or enter your own preferred value.
4*. Click the 'Valve' button to show the pipe fittings entry screen.



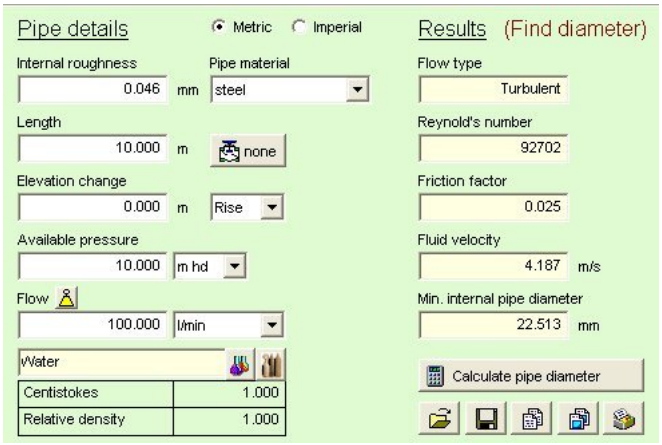




Internal Diameter Calculation

Set the following values :
1*. Internal roughness of the pipe.
2 . Length of the pipe.
3*. Valves, bends, and other fittings in the pipe.
4 . Elevation change of the pipe (Rise or fall).
5 . Available pressure at inlet of the pipe.
6 . Select pressure units from drop down list.
7 . Flow through the pipe.
8 . Select flow rate units from drop down list.
9 . Change the fluid data : Name, viscosity, density

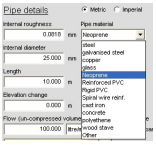
The pipe length will always be reset to 10.000 m (32.808 ft), if the Pipe Flow Wizard program has not been registered.

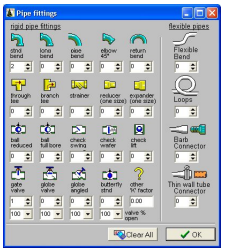


Click 'Calculate pipe diameter' to display :
Flow type.
Reynold's number.
Friction factor.
Fluid velocity.
Minimum internal pipe diameter.

Back to contents . . . .

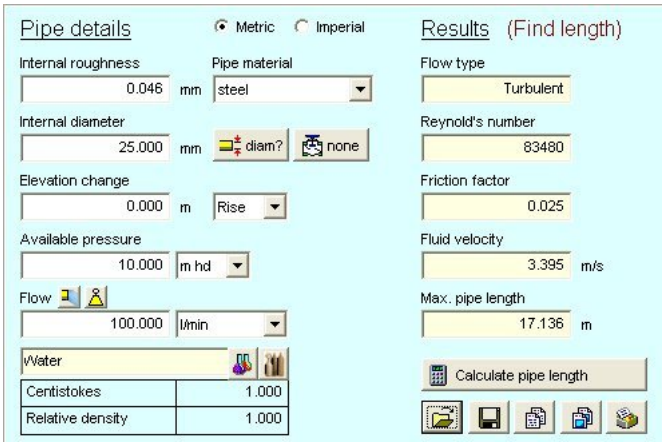
Internal Diameter Calculation (cont.)





NOTES:
1*. Select a pipe material from the drop down list to set a common value for internal roughness of the pipe, or enter your own preferred value.
3*. Click the 'Valve' button to show the pipe fittings entry screen.

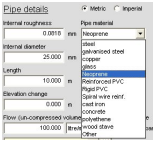
Pipe Length Calculation

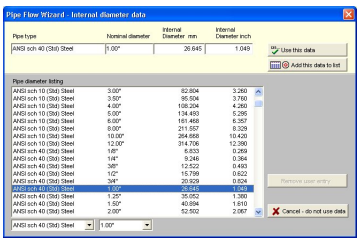


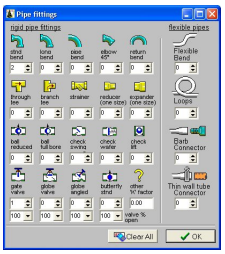
Set the following values :
1*. Internal roughness of the pipe.
2*. Internal diameter of the pipe.
3*. Valves, bends, and other fittings in the pipe.
4 . Elevation change of the pipe (Rise or fall).
5 . Available pressure at inlet of the pipe.
6 . Select pressure units from drop down list.
7 . Flow through the pipe.
8 . Select flow rate units from drop down list.
9 . Change the fluid data : Name, viscosity, density

The internal diameter will always be reset to 25mm (0.984252 in), if the Pipe Flow Wizard program has not been registered.

Click 'Calculate pipe length' to display :
Flow type.
Reynold's number.
Friction factor.
Fluid velocity.
Max. pipe length.



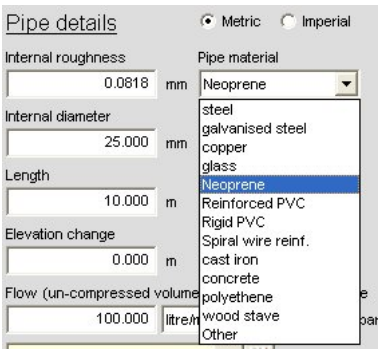




NOTES:
1*. Select a pipe material from the drop down list to set a common value for internal roughness of the pipe, or enter your own preferred value.
2*. Use 'diam?' button to assist in setting the internal diameter of the pipe, or enter your own preferred value.
3*. Click the 'Valve' button to show the pipe fittings entry screen.

Back to contents . . . .

Internal roughness of pipe



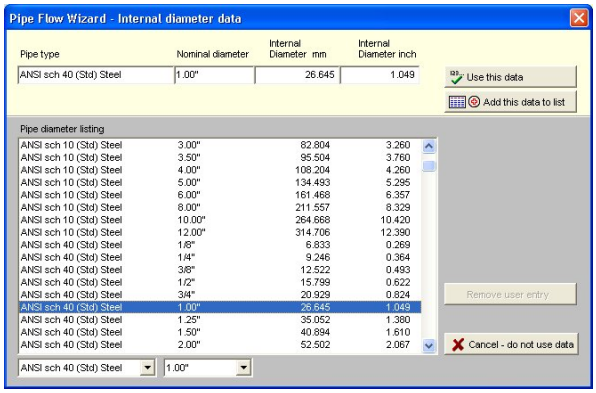
The internal roughness of the pipe can be set by amending the value in the input box.

Common values for the internal roughness of some pipe materials can be entered by selecting a pipe material from the drop down list provided.
The entry value will be displayed in mm if the 'Metric radio button' has been selected or inches if the 'Imperial radio button' has been selected.

The following are common values normally used as the internal roughness for various pipe materials :

Tube Material	mm (Metric)	inch (Imperial)
Steel tube	0.0460	0.001811
Galvanised steel	0.1500	0.005906
Copper	0.0015	0.000059
Glass	0.0001	0.000004
Neoprene	0.0818	0.003219
Reinforced PVC	0.1400	0.005512
Rigid PVC	0.0050	0.000197
Spiral wire reinforced	1.0000	0.039370
Concrete	0.2600	0.010236
Cast iron	0.4000	0.015748
Polythene	0.0010	0.000039
Wood stave	0.1800	0.007087

Internal diameter of pipe



The internal diameter of the pipe can be set by amending the value in the input box.

The internal diameter of certain pipe size types may be entered by selecting a value from the internal diameter data screen. Click the 'diam?' button to display the internal diameter data screen.

Select an item from the 'Pipe diameter listing' to copy the data to transfer boxes at the top of the screen
Click 'Use this data' to transfer the data to the appropriate calculation screen.

The 'Pipe type' drop down list and the 'Nominal diameter' drop down list at the bottom of the screen may be used to navigate the 'Pipe diameter listing'.

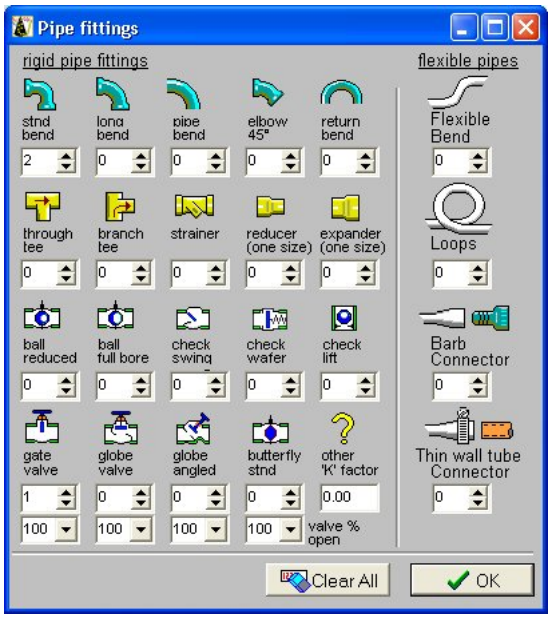
New entries may be added to the 'Pipe diameter listing' :
Amend the data in the 4 transfer boxes at the top of the screen and click 'Add this data to list', the new data will be added at the top of the 'Pipe diameter listing'.

User entries may be removed, select the appropriate entry and click 'Remove user entry'.

Back to contents . . . .

Fittings on the pipe

The type and quantity of various valves and fittings associated with the pipe can be set by amending the values on the 'Pipe fittings' screen.



Click the 'Valve' button to display the 'Pipe fittings' screen.

Enter the quantity of bends, fittings, valves etc. in the appropriate input boxes, click 'OK' to return to the calculation screen.
The total quantity of fittings will be displayed on the 'Valve' button, on the appropriate calculation screen.

If the fitting type required is not displayed an appropriate entry in the other 'K' factor input box can be used to include the pressure drop of the fitting in the calculation.

Where two or more of these fittings are required the 'K' factor for each fitting should be added together and the total 'K' value should be entered.

When a 'Find diameter' calculation is carried out, it may be necessary to first estimate the pipe diameter to allow the 'K' factor to be established (perform the calculation without the 'K' factor data to estimate the pipe diameter).

Generally the effect of pipe fittings are considered as minor losses.
The pressure loss of a fitting (m hd or ft.hd) is calculated using the 'K' factor as shown here where :
v = fluid velocity (m/s or ft/s)
g = 9.806 m/s² or 32.174 ft/s²

$$hd_{loss} = \frac{v^2}{2\,g}$$

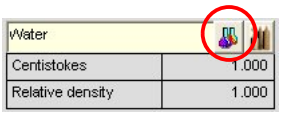
One occasion the pressure loss of a fitting is expressed as an 'Equivalent length' of pipe.
Pipe Flow Wizard does not allow the use of equivalent length of pipe.

The 'K' factor of a fitting may be calculated from the 'Equivalent length' (Eq.) (in m or ft.) if the friction factor (ff) and the Internal diameter (i.d.) (in m or ft.) is known.
The 'Equivalent length' and 'Internal diameter' must be in the same units to calculate the 'K' factor.

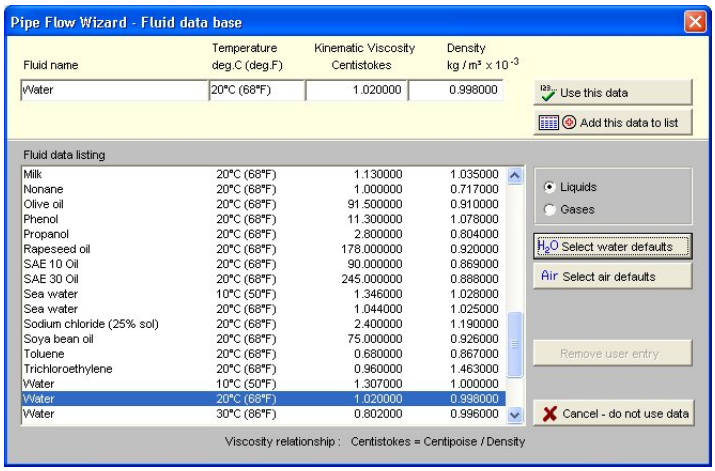
$$K = \frac{Eq.\ f\,f}{i.d.}$$

Back to contents . . . .

Change the fluid data



The fluid data may be changed by clicking the 'Change fluid' button to display the Fluid data base screen.



Select an item from the 'Fluid data listing' to copy the data to transfer boxes at the top of the screen
Click 'Use this data' to transfer the data to the appropriate calculation screen.

New entries may be added to the 'Fluid data listing' : Amend the data in the 4 transfer boxes at the top of the screen and click 'Add this data to list', the new data will be added to the 'Fluid data listing', the new list will be sorted in to alphabetical order.

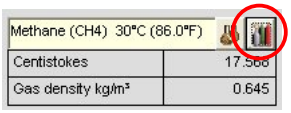
User entries may be removed, select the appropriate entry and click 'Remove user entry'.

The 'Liquids' or 'Gases' radio buttons may be used to display either Liquid or Gas data listings (Selecting 'Gases' will change the nature of the calculation, and you may need to re-assess the flow rate value to be used).

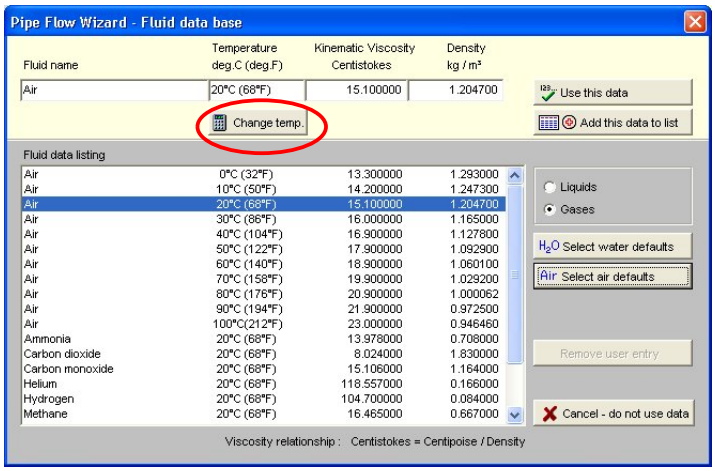
The LIQUID data base includes 'Kinematic viscosities' in Centistokes and Density in kg / m^3x 10^{-3}
The density value is also known as RELATIVE DENSITY (formerly this value was known as Specific Gravity).

see . . . VISCOSITY and DENSITY UNITS

Change the gas data



The fluid data may be changed by clicking the 'Change gas' button to display the Fluid data base screen.



Select an item from the 'Fluid data listing' to copy the data to transfer boxes at the top of the screen
Click 'Use this data' to transfer the data to the appropriate calculation screen.

Click 'Change Temp.' button to show approximate properties of some gases at other temperatures.

New entries may be added to the 'Fluid data listing' : Amend the data in the 4 transfer boxes at the top of the screen and click 'Add this data to list', the new data will be added to the 'Fluid data listing', the new list will be sorted in to alphabetical order.

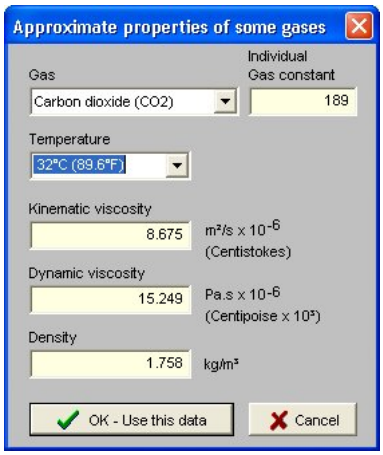
User entries may be removed, select the appropriate entry and click 'Remove user entry'.

The 'Liquids' or 'Gases' radio buttons may be used to display either Liquid or Gas data listings (Selecting 'Gases' will change the nature of the calculation, and you may need to re-assess the flow rate value to be used).

The GASES data base includes 'Kinematic viscosities' in Centistokes and Density in kg / m³

see . . . VISCOSITY and DENSITY UNITS

Gas data at other temperatures



Approximate gas data at other temperatures may be calculated by clicking the 'Change temp.' button to display the 'Approximate properties of some gases' screen.

Select a gas type and temperature from the drop down lists, to display the calculated gas data.

Click 'OK - Use this data' to transfer the data to the Fluid data base screen.

Back to contents . . . .

Viscosity and Density units

Density *p*

p = kg/m³

Water @ 20°C has a density of 998 kg/m³

or 0.998 kg/m³ x 10^{-3} (Relative Density)

p = slugs/ft³

Water @ 70°F has a density of 1.93 Slugs/ft³ Note: Slug = weight/g slug = lb/(32.174 ft • s²)

Dynamic Viscosity *μ*

μ = Pa • s 1.00 Pa • s = 10 Poise = 1000 Centipoise

Water @ 20°C has a viscosity of 1.00 x 10^{-3} Pa • s

or 0.001000 Pa • s

or 1.00 Centipoise

μ = lb • s / ft²

Water @ 70°F has a viscosity of 2.04 x 10^{-5} lb •s/ft²

1.000 lb •s/ft² = 47880.26 Centipoise

Kinematic Viscosity *v*

v = m²/s 1.00 m²/s = 10000 Stokes = 1000000 Centistokes

Water @ 20°C has a viscosity of 1.004 x 10^{-6} m²/s

or 0.010040 Stokes

or 1.004000 Centistokes

v = ft²/s 1.00 ft²/s = 929.034116 Stokes = 92903.4116 Centistokes

Water @ 70°F has a viscosity of 10.5900 x 10^{-6} ft²/s

or 1.05900 x 10^{-5} ft²/s

or 0.00983847 Stokes

or 0.98384713 Centistokes

Kinematic Viscosity and Dynamic Viscosity Relationship

Kinematic Viscosity = Dynamic Viscosity / Density $v = \mu / p$

Centistokes = Centipoise / Density

Example: *μ* = Pa • s Substitution : Pa = N / m²

and . . . . . N = kg • m / s²

therefore *μ* = Pa • s = kg / (m • s)

p = kg/m³

Kinematic Viscosity = *v* = *μ* / *p* = (kg / (m • s) x 10^{-3}) / (kg / m³)= m²/ s x 10^{-6}

Example: *μ* = lb • s / ft²

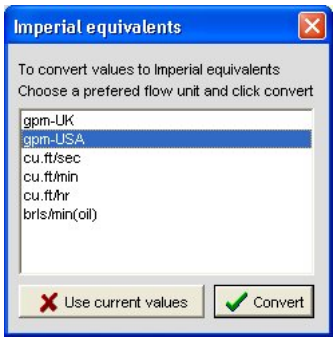
p = Slugs / ft³ (Note : Slug = lb / (32.174 ft • s²)

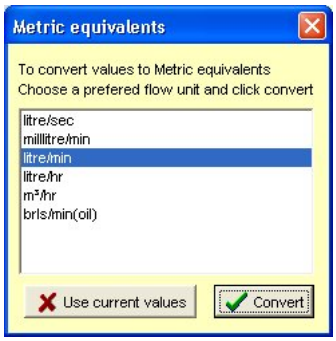
p = Slugs / ft³ = (lb / ft³) / 32.174 ft • s² = ((lb / 32.174) • s²) / ft⁴

Kinematic Viscosity = *v* = *μ* / *p* = (lb • s / ft²) / (Slugs / ft³) = ((lb • s / ft²) / (lb • s²)) • ft⁴ = (ft⁴/ ft²) • (s / s²) = ft²/ s

Back to contents . . . .

Metric and Imperial unit choice





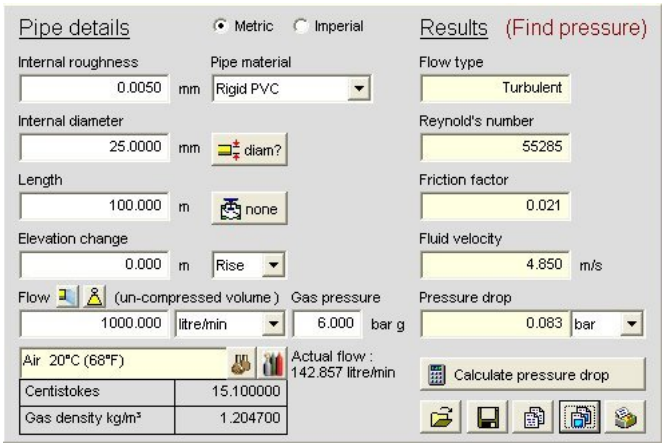
Pipe Flow Wizard can perform calculations in both Metric and Imperial units.
Click the appropriate 'Metric' or 'Imperial' radio button to select the units required.

When you select 'Imperial' units, you will be offered the option to convert the existing values from Metric to Imperial equivalents, and to select an Imperial flow unit preference.

When you select 'Metric' units, you will be offered the option to convert the existing values from Imperial to Metric equivalents, and to select a Metric flow unit preference.

If a calculation is to be performed using a gas as the fluid type, some of the flow unit preferences (such as gpm) will not be available.

Calculations for gas flow



If a gas is selected as the fluid type, Pipe Flow Wizard will perform calculations using the un-compressed flow rate value (together with the standard viscosity and density of the gas).

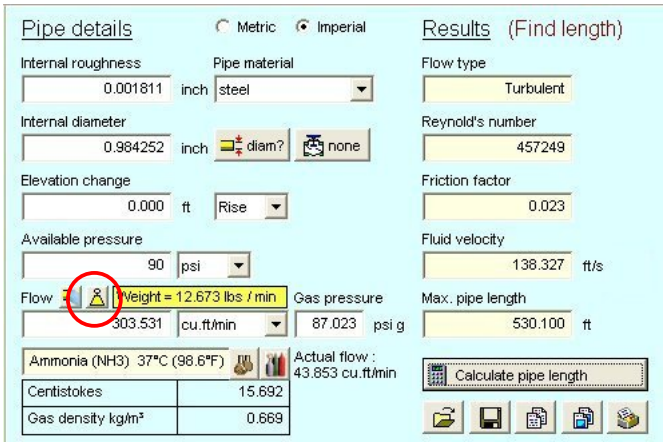
The un-compressed volume is also known as Normal flow, or Free flow.

When the calculation is performed the 'Gas pressure' data will be used to calculate the 'Actual flow' through the pipe, the effect of the pressure on the viscosity of the gas and the actual density of the compressed gas.
Note : pressure has little effect on gas viscosity.

The 'Actual flow' will be displayed next to the 'Change gas' button.

The flow type, Reynold's number, friction factor, fluid velocity and pressure drop all apply to the compressed flow rate.

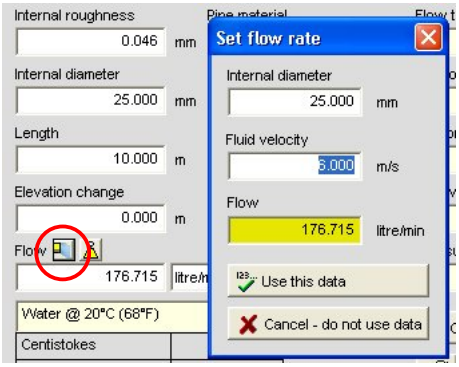
Weight of flow



Sometimes it is useful to know the 'Weight of flow' (This is usually more applicable to gas flow).
To show the 'Weight of flow' complete the appropriate calculation, click the 'Weight' button - a panel with the weight information will be displayed.

Back to contents . . . .

Max. velocity recommendations



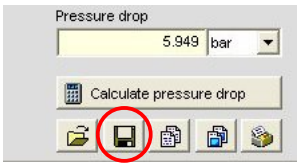
On occasion it may be necessary to choose a flow rate which does not exceed a certain velocity.

An example : It is sometimes recommended that the maximum velocity for compressed air distribution is 6 m/s (20 ft/s).

To assist with determining flow rate for these 'Maximum velocity' instances Pipe Flow Wizard incorporates a flow rate calculator which uses the current internal diameter and a fluid velocity to calculate a flow rate.

A flow calculator button is provided on the 'Find Pressure' and 'Find Length' screens.

Save calculation data



The data associated with a particular calculation may be saved to a file.

Pipe Flow wizard uses file extensions PW1, PW2, PW3 and PW4 to differentiate between the different types of calculation.

To save the data to a file - use the 'Save File' tool button on the current calculation screen.

Calculation data can only be saved if the Pipe Flow Wizard program has been registered.

Load calculation data

Data associated with a particular calculation may be loaded from a file. (Which has been saved using Pipe Flow Wizard).

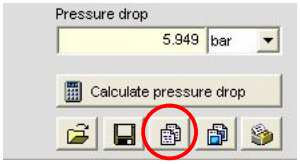
Pipe Flow wizard uses file extensions PW1, PW2, PW3 and PW4 to differentiate between the different types of calculation.

To load the data from a file - use the 'Open File' tool button on the required calculation screen.

Calculation data can only be loaded if the Pipe Flow Wizard program has been registered.

Back to contents . . . .

Copy data to clipboard



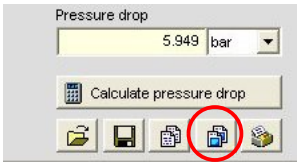
The results of a particular calculation may be copied to the clipboard.
The data will be copied in tab delimited format (suitable for a paste operation into an Excel spreadsheet).

The 'Pipe details' and the 'Calculation Results' (if any) will be included in the copy operation.

To copy the data - use the 'Copy text to clipboard' tool button on the required calculation screen.

Copy functions can only be used if the Pipe Flow Wizard program has been registered.

Copy screen to clipboard



An image of a particular calculation screen may be copied to the clipboard.
The image may be pasted into a word processor or into an Excel spreadsheet.

To copy the calculation image - use the 'Copy image to clipboard' tool button on the required calculation screen.

Copy functions can only be used if the Pipe Flow Wizard program has been registered.

Print a calculation screen

An image of a particular calculation screen may be printed.

To print the calculation image - use the 'Print screen' tool button on the required calculation screen.

Print functions can only be used if the Pipe Flow Wizard program has been registered.

Back to contents . . . .

Pressure drop theory

Fluids in motion are subjected to various resistance's, which are due to friction.
Friction may occur between the fluid & the pipe work, but friction also occurs within the fluid as sliding between adjacent layers of fluid takes place.
The friction within the fluid is due to the fluid's viscosity.

When fluids have a high viscosity, the speed of flow tends to be low, and resistance to flow becomes almost totally dependant on the viscosity of the fluid, this condition is known as 'Laminar flow'.

Fluids which have a low viscosity are usually moved at higher velocities, the flow characteristics change, small eddy currents occur within the flow, & the friction between the pipe work and the fluid becomes a factor to be considered.

This type of flow is know as 'Turbulent flow'.
It is generally accepted that the 'changeover' point for these two types of flow, in a circular pipe, occurs when the Reynolds number (Re) is approximately 2300.

i.e.
Laminar flow (Re less than 2300)
Turbulent flow (Re greater than 2300)

It follows that the friction factor for these two types of flow must be calculated, using different formula's.
Many formula's have been developed to model the flow of fluids.
The use of Colebrook's formula, Darcy & Weisbach's formula, & Reynolds numbers all contribute to determine the friction factors within a fluid & it's boundary layers.

Friction Factors

Before the pipework losses can be established, the friction factor must be calculated.
The friction factor will be dependant on the pipe size, inner roughness of the pipe, flow velocity and fluid viscosity.

The flow condition, whether 'Turbulent' or not, will determine the method used to calculate the friction factor.
The starting point must be to find the fluid's viscosity.
This will be the factor that has most effect on the pipework losses.

The fluid velocity is used in the Reynold's number calculation.

Reynold's Numbers

Reynold's numbers (Re) describe the relationship between a fluid's velocity, the pipe size and the fluid's KINEMATIC viscosity.

$$\text{Reynold's number} = \frac{\text{Fluid velocity x Internal pipe diameter}}{\text{Kinematic viscosity}}$$

NOTE : KINEMATIC viscosity (not Dynamic viscosity)
must be used to calculate Reynold's Numbers

see . . . VISCOSITY and DENSITY UNITS

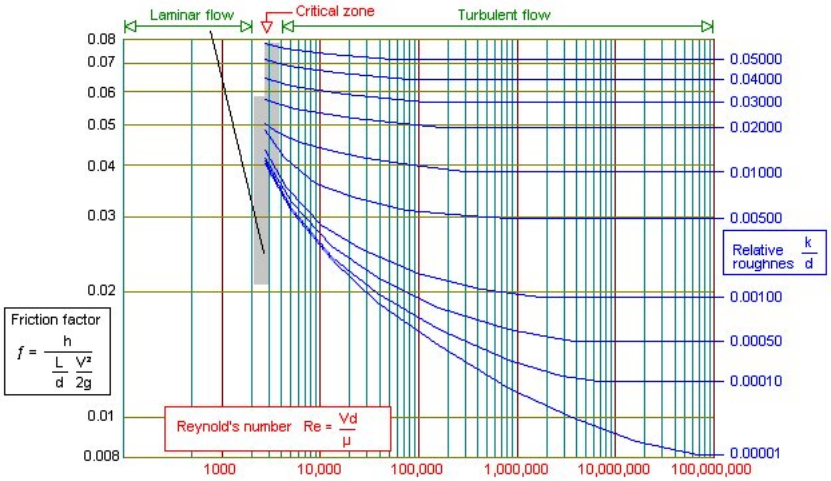
Back to contents . . . .

Effect of Relative roughness

The inner roughness of the pipe can create eddy currents.
This increases the friction between the pipe wall and the fluid.
The relative roughness of the inside of the pipe is used in determining the friction factor to be used.

$$\text{Relative roughness} = \frac{\text{Inside pipe roughness}}{\text{Inside pipe diameter}}$$

Friction Factor Chart



The chart above shows the relationship between Reynold's number and pipe friction.
Calculation of friction factors is dependant on the type of flow that will be encountered.
For Re numbers <2300 the fluid flow is Laminar, when Re number is >2300 the fluid flow is Turbulent.

Laminar flow (Re < 2300) f = 64/Re
Turbulent flow (Re > 2300) 1/sqrt(f) = -1.8 log [(6.9/Re) + ((k/3.7)^1.11]

(where k = inner pipe roughness / inner pipe diameter)

Most commercial applications involve Turbulent flow. In these cases the inner roughness of the pipework can have a significant effect on the Friction factor.

The Relative roughness is the inner roughness divided by the internal diameter of the pipe work.

The Friction factor is found by plotting the intersection of Re and Relative roughness, and reading the friction factor on the left hand axis of the chart.

The Fluid head loss can be calculated once the friction factor is known.

The Pressure drop in pipe work can be calculated from fluid head loss, the density of fluid and the acceleration due to gravity.

Back to contents . . . .

Calculate fluid head

Fluid head resistance can be calculated from $h = f (L/d) \times (v^2/2g)$

where
h = head loss (m)
f = friction factor
L = length of pipe work (m)
d = inner dia of pipe work (m)
v = velocity of fluid (m/s)
g = acceleration due to gravity (m/s^2)

Calculate fittings head loss

The fluid head resistance through various pipe work fittings can be calculated when the 'K' factor of the fitting is known. Manufacturers of pipe work fittings & valves publish 'K' factors for their products.

Usually a particular type of fitting from various manufacturers have similar 'K' factors, therefore this computer program tends to use average 'K' factor values.

Fluid head loss of these fitting can be calculated from $h = \text{total 'K'} \times v^2 / 2g$

where
h = head loss (m)
total 'K' = total of 'K' factors for each fitting
v = velocity of fluid (m/s)
g = acceleration due to gravity (m/s^2)

Note: If the pipework involves different pipe sizes, this calculation must be carried out separately for each pipe size, using the appropriate velocity within that pipe section.

The 'K' value of entry & exit points can be taken as 0.8 and 1.0 respectively to calculate the head loss attributable to these features.

Calculate total pressure loss

The total fluid head resistance may be used to calculate the pressure required to overcome the resistance to fluid flow.

$Pd = h \times p \times g / 100000$

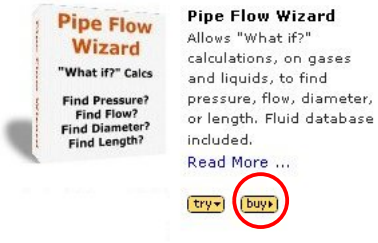
where
Pd = pressure drop (bar)
h = head loss (m)
p = fluid density (kg/m^3)
g = acceleration due to gravity (m/s^2)

Finally, the fluid is most likely to exit into atmospheric pressure. The difference between the pressure on the fluid surface during storage & the atmospheric pressure must be taken into account in determining the pressure drop to be overcome by a pump.
This difference in pressure may be positive (assisting fluid flow) or negative (resisting fluid flow).

Back to contents . . . .

Program Registration

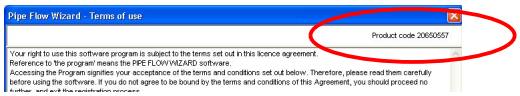
The Pipe Flow Wizard program must be registered to allow the 'Change Fluid', 'Save', 'Open', 'Copy to clipboard' and 'Print' functions to operate.



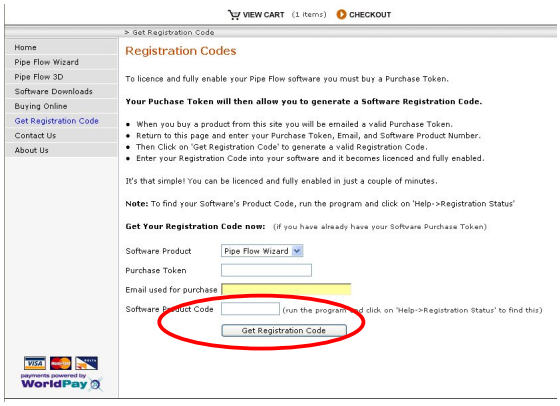
The registration process is easy :

1. Visit www.pipeflow.co.uk to purchase a registration token.

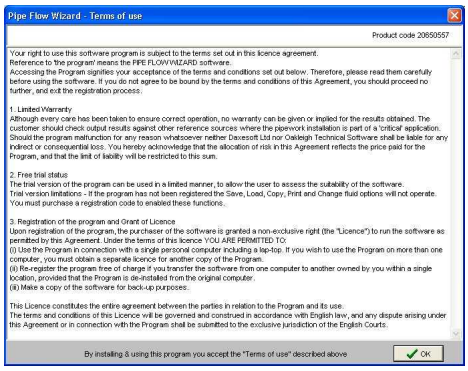
2. Obtain the Product Code from the software installation - this code is shown on the 'Terms of use' screen.



3. Use the registration token and the Product Code from the software installation, to obtain your Registration Code from the 'www.pipeflow.co.uk' website.



4. Read 'Pipe Flow Wizard - Terms of use' and click the 'Register program' menu option to display the 'User registration' entry form.



5. Enter your Registration code and click Register Program.

6. Pipe Flow Wizard is now registered and fully operational.

Back to contents . . . .

Moving Pipe Flow Wizard

The Pipe Flow Wizard license allows a user to use the program on one machine only.

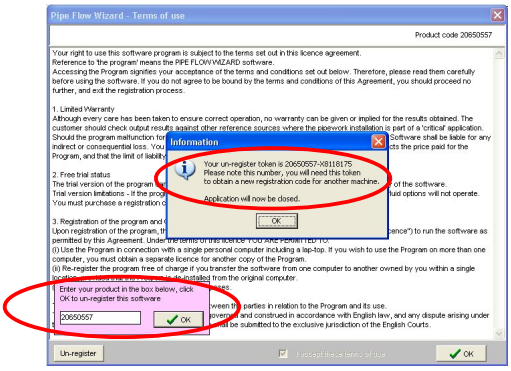
To move the program to another machine the original program must be un-registered from the current machine.

The un-register process :

1. To un-register the program choose 'Un-register program' from the Registration menu.

2. Enter the product code in the 'un-register' box and click the OK button.

3. Confirm that you wish to un-register the program.



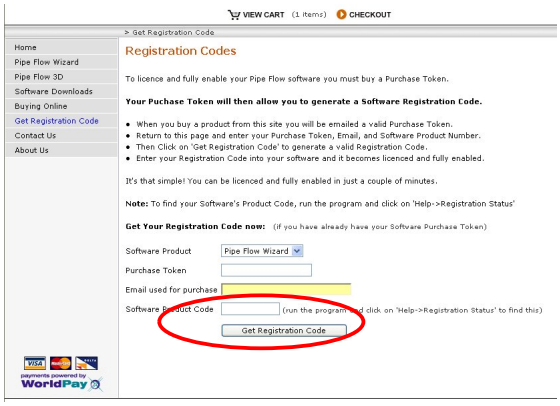
4. Your un-register token will be displayed - make a note of this number.

Installation and re-activation on another machine

1. Install the Pipe Flow Wizard software on the new machine.

2. Send email to : info@pipeflow.co.uk

Include details of your un-register token, and request a new registration token.
A new registration token will be emailed to you.



3. Use the new registration token and the Product Code from the new software installation to obtain your Registration Code from the 'www.pipeflow.co.uk' website.

4. Enter your Registration code and click Register Program.

5. Pipe Flow Wizard is now registered and fully operational.

Back to contents . . . .