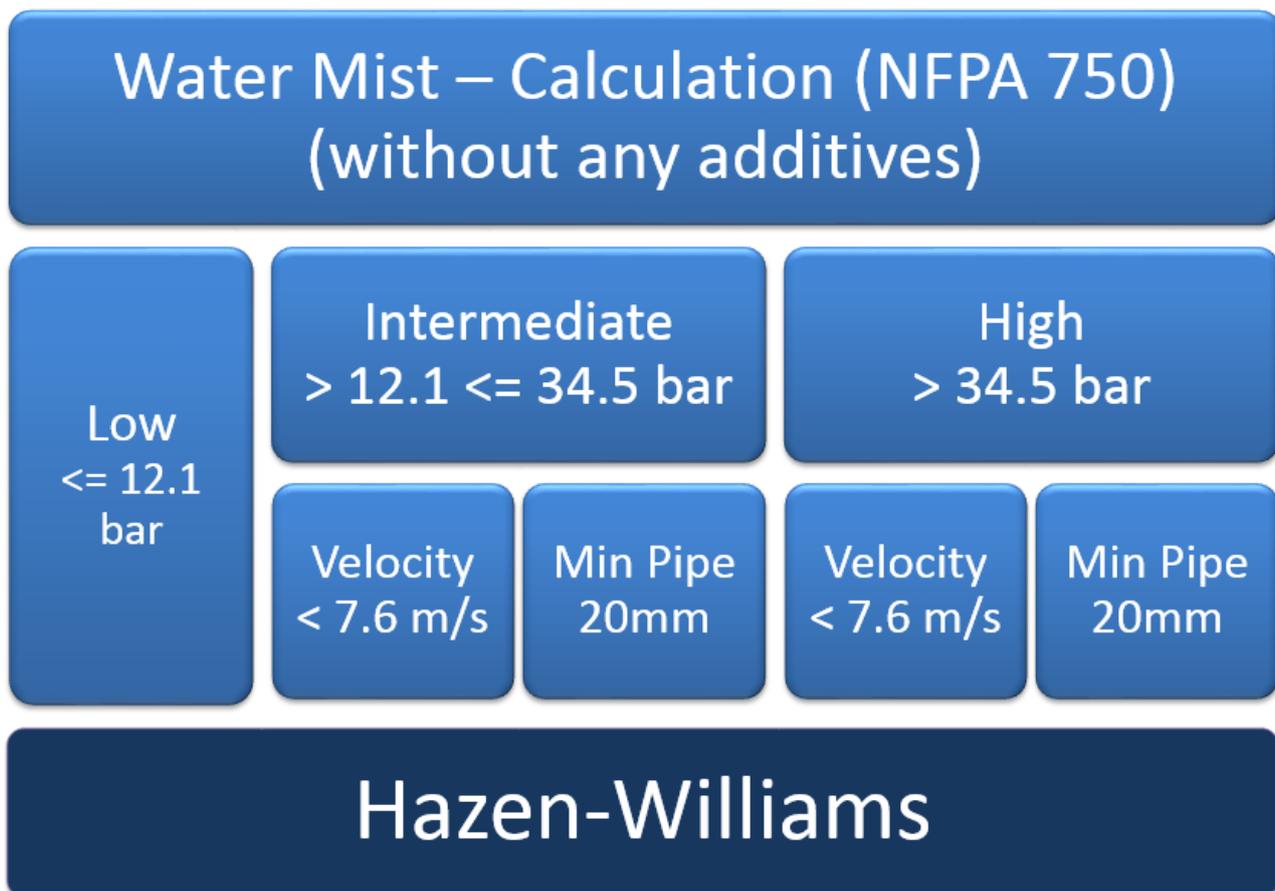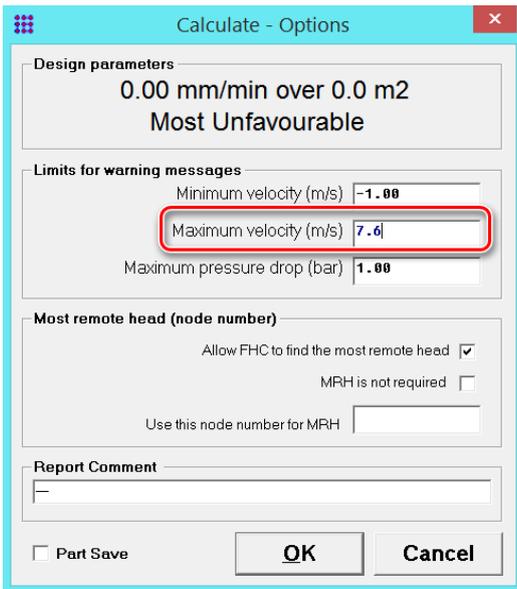Canute FHC hydraulic calculation software can be used for the calculation of water mist systems for low, intermediate and high pressure systems as defined by NFPA 750. Careful consideration needs to be given on which option you use in FHC for your calculation and this will depend on the system pressure, water velocity and if the system has any additives.

NFPA 750 allows the Hazen Williams pressure loss formula to be used for water mist system including high pressure systems (pressure exceeds 34.5 bar) if certain conditions are met, for intermediate and high pressure systems the water velocity must be below 7.6 m/s and a smallest pipe diameter must not be less than 20mm. The infographic below summarises the differences between the three pressure classifications and when the Hazen Williams pressure loss formula can be used.

Water Mist – Calculation (NFPA 750) (without any additives)

Low <= 12.1 bar	Intermediate > 12.1 <= 34.5 bar	High > 34.5 bar
	Velocity < 7.6 m/s / Min Pipe 20mm	Velocity < 7.6 m/s / Min Pipe 20mm

Hazen-Williams

Source NFPA® 750 : 2010 Standard on Water Mist Fire Protection Systems
© 2014 – Canute LLP

Hazen Williams pressure loss formula is the standard method used by Canute FHC when calculating pressure losses in pipework therefore you do not need to make any changes but you do need to be careful that you selected the appropriate minimum pipe size and your water velocity does not exceed 7.6 m/s.

TDS #1 Issus 2, December 2014

Hydraulic Analysis Software for the Fire Protection Industry
77, Holbeck Lane, Leeds, West Yorkshire, LS11 9UL, United Kingdom
T: +44 (0)113 328 0350 W: www.canutesoft.com E: support@canutesoft.com

When making water mist calculations and your system meets the criteria which allows Hazen Williams pressure loss formula to be used you can specify a maximum water velocity in the *calculation options* as shown to the left. This dialogue is displayed after you select *calculate*, you can now enter 7.6 m/s as your maximum velocity and if this is exceeded FHC will display a dialogue box at the end of the calculation and will display the pipes exceeding this velocity.

You can also find the pipes the highest velocities by going to the *menu -> reports -> pipe summary* and you will find that any pipes exceeding the set velocity will be displayed in red.

USING DARCY WEISBACH PRESSURE LOSS FORMULA

If your system does not meet the requirements which allows you to use the Hazen William pressure loss formula then you will need to switch to the Darcy Weisbach pressure loss formula.
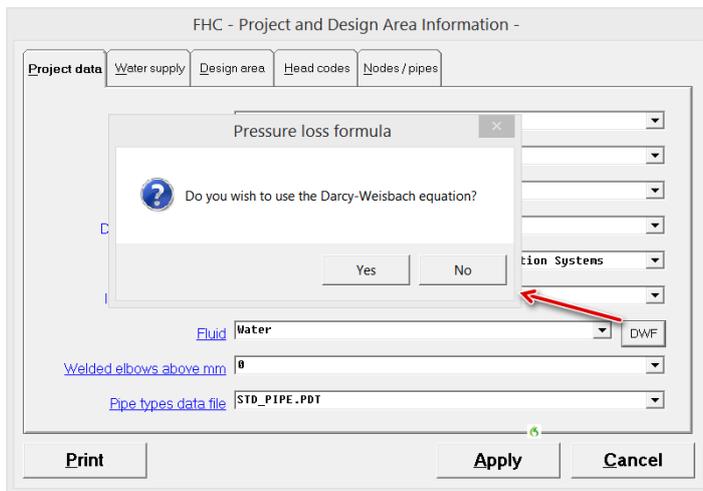
To do this open the project data [Ctrl+P] and you will see a button to the right of *fluid* labelled 'DWF' press this button and a dialogue box will appear asking you if you wish to switch the pressure loss formula. You can now see a command statement is automatically inserted into the fluid line as shown below. This has 2 parameters which you can modify if you so require

The command statement can be broken up into parts 'DWF' is instructing FHC to use the Darcy Weisbach pressure loss formula. The 'DENS' specifies the water density and 'VISC' is the absolute viscosity (in centipoise). Canute FHC is automatically inserted the correct values for clean water at a temperature of 21.1°C. If you wish you may alter these values and you will find more information various temperatures in NFPA 750 table 9.2.2 (b).

DARCY WEISBACH PRESSURE LOSS FORMULA

Darcy Weisbach pressure loss formula is considered to be the most accurate pressure loss formula and you may find that you get beneficial results when using it. Although NFPA 750 allows you to use the Hayes Williams formula for certain systems under certain conditions it does not preclude you from using Darcy Weisbach.

SELECTING DESIGN AUTHORITY

If you open the FHC project data [Ctrl+P] you should select the appropriate design authority for the standard you are designing to have this may affect the calculation. NFPA 750 : 2010 - Water mist fire protection systems is available.

FHC will allow the Darcy Weisbach pressure loss formula to be used with any design authority however caution must be taken as not all design authorities will allows pressure loss formulas to be used.

FURTHER INFORMATION

It is important that you are familiar with the design standard for which you are designing to and understand their methodology for the system calculations and the use of different pressure loss formulas and the criteria when they can and cannot be used.