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MULCAHY CO.

MULCAHY MINUTE

Since 1929

ENGINEERED FLUID HANDLING AND HVAC SOLUTIONS

B & G SELECTION PROGRAMS

Computerized equipment selection programs are a modern design tool that most people designing a mechanical system find invaluable. Throughout all of our product lines, the most popular by far is the Bell and Gossett Equipment Selection Program (ESP Plus). Throughout the years the program has been updated many times and is currently available in two versions. The most recent is the On-Line version which can be used to select and analyze pump options for your system. To access it, merely go to the B&G web site (www.bellgossett.com) and click on the "Software" tab near the top and then look for "On-Line Pump Selection".

You will need to apply for a free password (applied for online) in order to access the pump selection program and download the 2D and 3D CAD drawings. The online version of ESP has the capability of both selecting a new pumping system as well as analyzing an existing pump under a new set of conditions (ex. What is the pump curve effect on a 1510-4BC pump with a 9.250" impeller if 40% glycol is added to the system? Can it meet the new conditions?). The major advantages of the online programs are that it is ALWAYS up to date and does not tax your computer network. The main disadvantages of the online selection program are that it requires an internet connection and is limited to only evaluating pumps.

The desktop/CD version of ESP-Plus will do most of the pump related functions of the on-line version and more. The CD version includes selection programs for hydronic specialties (expansion tanks, air separators etc), heat exchangers (steam to water, water to water, etc), and steam specialties (steam traps, PRV's, etc). In order to access this wealth of design tools, you will need to load the program onto your computer/network which of course requires the CD.

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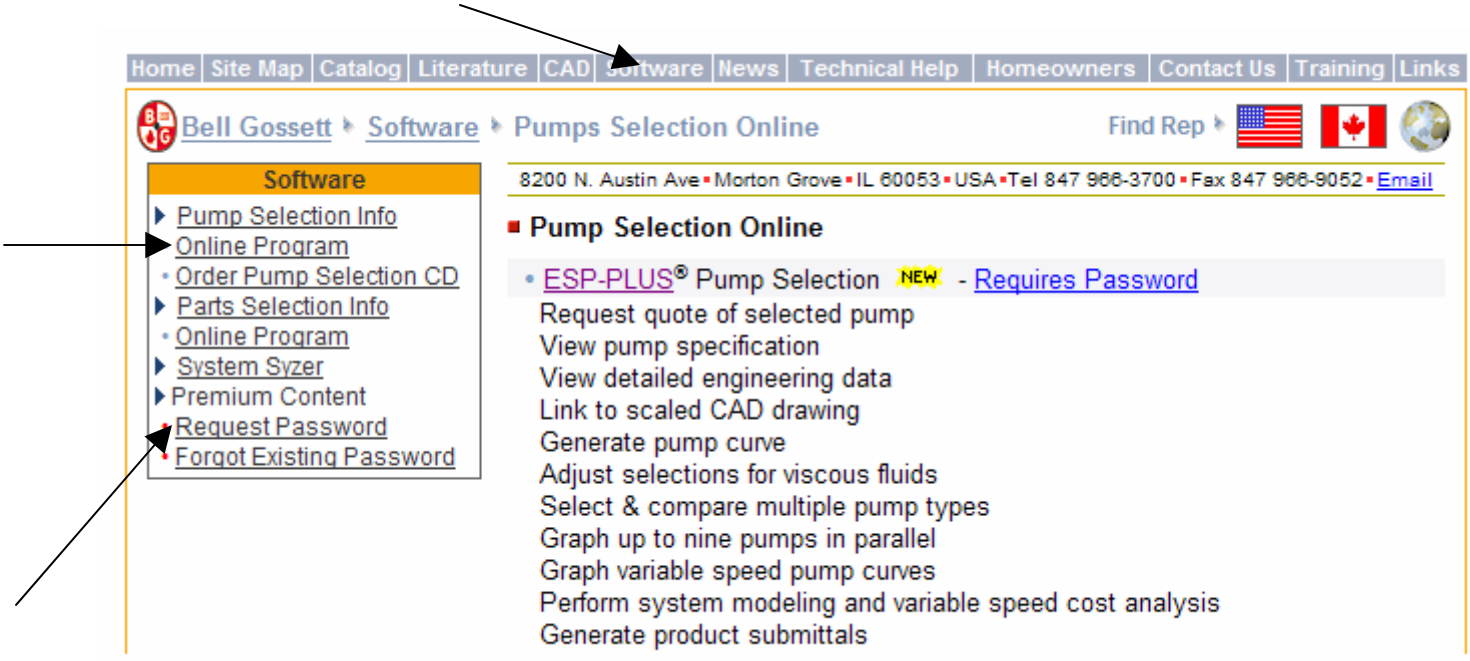


LETS STOP THE CHEATING! BY JAMIE PRIBYL

Due to the ability of plate type heat exchangers to achieve close temperature approaches with high heat transfer rates, altering the design temperatures by even tenths of a degree or understating the pressure drops can significantly reduce the amount of surface area required and therefore, cost of the heat exchanger.

One way to check if the heat exchanger in question has enough surface area to transfer the required BTU/h is by using this equation.

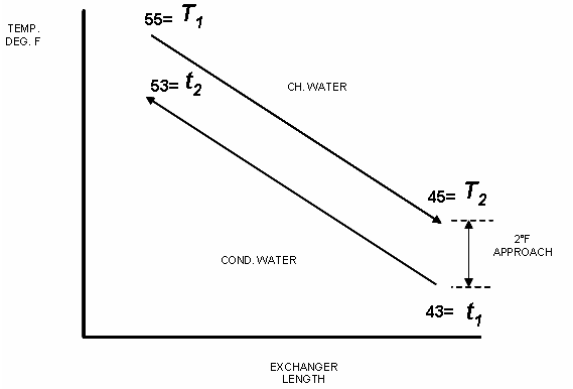
Q=UA*(LMTD)

Q = Heat Transfer in BTU/hr

U = Heat Transfer Coefficient (This is a fixed number given for every style plate exchanger)

A = Surface area of all the plates

LMTD *= LMTD is the logarithmic mean temperature obtained from the temperature differences between both fluids at each end of the exchanger OR in this case the difference of T1 as it enters the Heat Exchanger and T2 as it leaves the Heat Exchanger.



This equation comes from the ASHRAE handbook, and represents the heat transfer from one fluid to another separated by a solid surface.

Let's look at a typical Chilled Water Heat Exchanger. For this example, let's say we want to transfer 5,000,000 BTU/hr of chilled water using condenser water entering the heat exchanger at 43°F and leaving the heat exchanger 53°F. Coming in the other side of the heat exchanger we are cooling chilled water from 55°F to 45°F.

Using our equation and solving for "A" we get:

A = Q/U*LMTD

2°F Approach Temperature (55°F - 53°F)

LMTD = 2.0°F

Q = 5 Million BTU/hr.

Heat Transfer Coefficient (U) = 1200 btu/ft2*h*f

A = 5,000,000 / 1200 *(2) = 2,083 ft²

Now let's look at what happens if we change our temperature approach by 0.2, 0.3, and 0.5 degrees. So instead of cooling water from 55°F to 45°F we are now cooling it from 55°F to 45.2°F.

LMTD (degrees F)	Area Required (Ft^2)	Cost Index
2.0 (Design Criteria)	***2086***	***1***
2.2	1893	0.95
2.3	1812	0.93
2.5	1667	0.87

Results: Increase LMTD 0.2°F, Lower cost 5%

0.3°F, Lower cost 7%

0.5°F, Lower cost 13%

*The log mean temperature difference or LMTD is used to describe the average temperature difference throughout the exchanger. The difference between the temperatures of the fluids provides the "driving force" for the heat transfer to occur. However, there are special cases where the LMTD equation shown to the right is not applicable. If you try to apply the equation in these special cases the result would be zero. Therefore, in these cases the LMTD is the same as the temperature difference on each "end" of the heat exchanger, or 2 degrees for this example.

$$LMTD = \frac{(T_{Hin} - T_{Cout}) - (T_{Hout} - T_{Cin})}{LN\left(\frac{(T_{Hin} - T_{Cout})}{(T_{Hout} - T_{Cin})}\right)}$$

Changing the approach temperature by 0.5°F reduces the number of plates needed by 20% and reduces the cost of the unit by around 13%. This is what causes some heat exchanger suppliers to alter their data reports, also known as "Cheating". A lot of times this goes unnoticed simply because it's difficult to measure 0.5°F, but it does make a difference in the efficiency of the Chiller or Boiler. On a design day, your chiller more than likely will not be able to keep up, causing the indoor space to become clammy because of the high humidity.

A Chiller's efficiency increases 2% for every degree cooler the supply water is to the chiller. Undersizing a plate heat exchanger will increase operating costs by requiring chillers or boilers to operate longer. This ends up costing the owner more MONEY.

This is where the ARI 400-2001 specification comes into play. ARI stands for "Air Conditioning & Refrigeration Institute. ARI certification insures heat exchanger operation to specification. Members of ARI's Liquid to Liquid Heat Exchanger committee developed Standard 400. Though members included delegates from ITT, Alfa Laval, Tranter and FlatePlate, only ITT and Alfa Laval have obtained their certification. Certification requires annual testing by ARI approved testing lab. **All GPX units specifying ARI 400 Certification will be provided with an ARI Standard 400 Certification Sticker.**

Why should you specify ARI 400-2001?

-Eliminates the possibility that others could "cheat" or take sizing "liberties" to undersize the heat exchanger, use the equation to check the math.

-Insures all three main components in commercial HVAC systems are independently certified.

-Insures that the owner gets what he or she paid for.

ARI Standard 400-2001
Defines Test Requirements
Rating Requirements
Conformance & Marking Conditions

More info: http://www.ari.org/cert/index.html

Contact Mulcahy Company for your next specification stating ARI Certification.

SELECTION PROGRAMS CON'T PAGE 1

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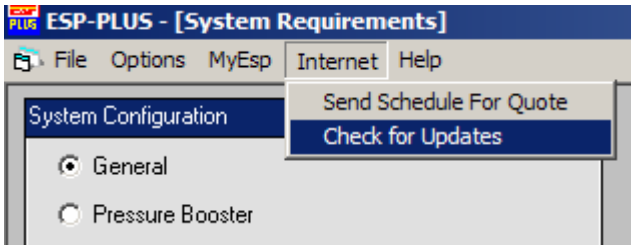

One disadvantage of CD based programs is keeping them updated. This has been made easier in recent years. The latest generations of ESP Plus have included a feature that allows you to update the set of programs via the internet.

Bell and Gossett is slated to ship a new 2-CD version of the desktop program in August which will include many new features. The new program will come with the newest pumps (Maintenance Free Series 60, VSX, etc) and will also have the CAD files for all B&G equipment included with the program. Contact Laura Citrowske to make sure your company will receive the next update.

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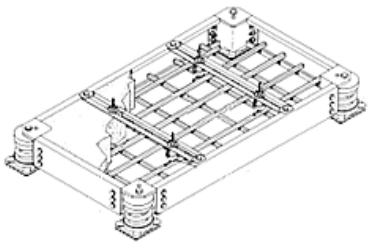
ENGINEERED FLUID HANDLING AND HVAC SOLUTIONS

MULCAHY INTRODUCES: MASON INDUSTRIES

Mulcahy Company is pleased to announce the appointment by Mason Industries to become their representative for vibration isolation, seismic control and architectural isolation products for Minnesota, North and South Dakota, and western Wisconsin. Mason Industries has been a leader in the field of noise and vibration control products for more than 40 years. Their products have been specified as the standard by consultants and architects throughout the World. Mason products are built to provide the ultimate in vibration isolation and seismic restraint control. Mulcahy has obtained the assistance of Carl Peterson from the C. W. Peterson Company. Carl brings over 40 years experience with the Mason product line. His vast knowledge will help the continued quality service Mulcahy has strived to supply to its valued customers. For technical assistance for any of the Mason products, you can call your Mulcahy sales representative or Carl at (651) 686-8580. For more information please visit our website at www.mulcahyco.com. When in need of the highest quality noise and vibration control products, call the Mason experts at Mulcahy Company.



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