

Monday, September 23, 2019

# Propylene Glycol BTUH Correction Factors in Hydronic HVAC Systems

Monday Morning Minutes | by Norm Hall, September 23, 2019

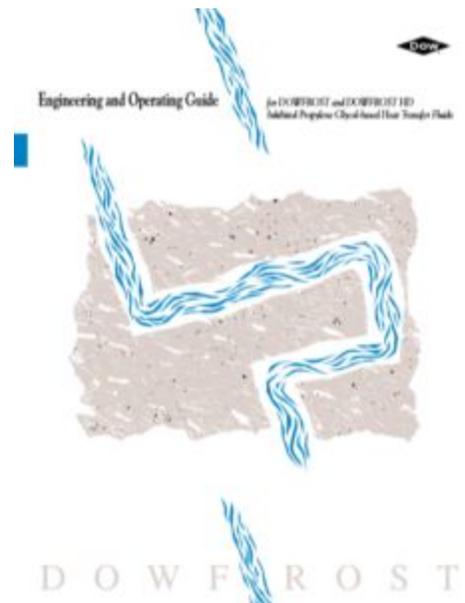
We are all familiar with the BTUH formula ( $BTUH = GPM \times \Delta T \times 500$ ) used to calculate the gallons per minute (GPM) water flow rate when we have the temperature difference. What is the flow rate when using fluids other than water?

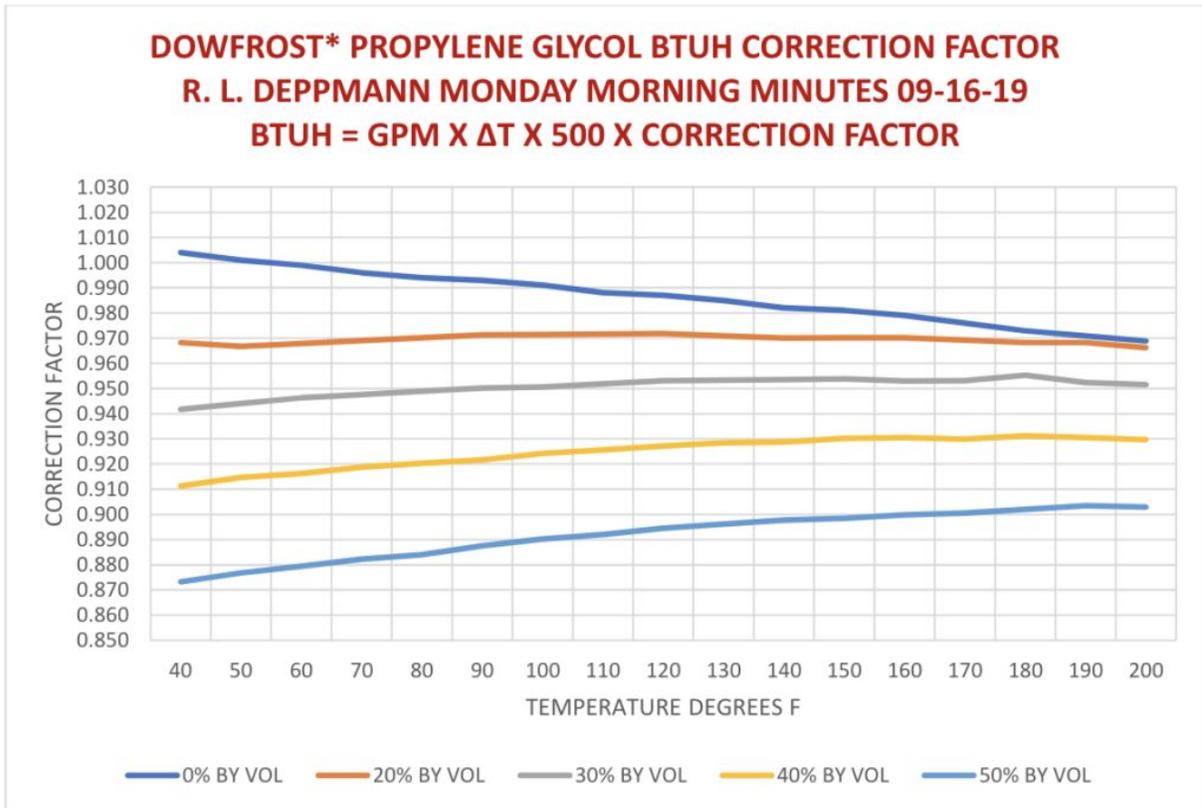
## BTUH Formula for Fluids Other Than Water

The formula we use for BTUH in hydronics includes specific heat and specific gravity of the fluid. Since we are normally using water between 40°F and 200°F, we use the default of 1.0 for both values. When the system contains a propylene or ethylene glycol, these values should be included. If we take the specific gravity times the specific heat, we could call it a correction factor.

$$GPM = BTUH / (GPM \times \Delta T \times 500 \times CORRECTION \ FACTOR)$$

The correction factor depends on the temperature of the fluid and the percentage of the fluid. We offer you the following chart of these correction factors.





## Examples Use of BTUH Correction Factors

EXAMPLE 1. What is the BTUH of a chilled water system with 40% Dowfrost\* solution at 40°F temperature difference and a measured flow rate of 100 GPM? If this was water, we would use

BTUH = 100 x 40 x 500 = 2,000,000 BTUH. If we look at the chart provided below, we see the correction factor is 0.911. The BTUH for the new fluid is:

$$\text{BTUH} = 100 \times 40 \times 500 \times .911 = 1,822,000$$

EXAMPLE 2. A heating system requires 4,000,000 BTUH. The fluid is 35% Dowfrost at 150°F to 180°F. What flow rate is required for the 30°F temperature difference?

$$\text{GPM} = 4,000,000 / (30 \times 500 \times .9) = 284 \text{ GPM}$$

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R. L. Deppmann Company will mix Dowfrost and Dowtherm\* propylene and ethylene glycol solutions with deionized water in any percentage you want. In Northern Ohio and Michigan, we can save you money by installing it in the system. [Visit our website for more information.](#) Learn more about Dowfrost engineering and technical information from the [Dowfrost Engineering and Operating Guide.](#)

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