

How to convert from Ideal to Real BTU's

The difference between Ideal Btu's and Real Btu's is the compressibility of the gas.

Compressibility for gases = Z

$$\text{Compressibility factor} = \frac{1}{Z}$$

The compressibility of the gas and the compressibility factor are not the same. The compressibility factor is also known as the gas deviation factor or the "Z" Factor. It is important to not get confused between the compressibility of the gas and the compressibility factor.

The compressibility of the gas is always a value of less than 1.000

The compressibility factor is always a value greater than 1.000

Example 1:

How to convert 1050.0 Ideal gross, dry Btu/scf with a "Z" Factor of 1.00235

$$1050.0 \text{ Ideal gross, dry Btu/scf} \times 1.00235 \text{ (Z Factor)} = 1052.5 \text{ Real gross, dry Btu/scf}$$

Example 2:

How to convert 1050.0 Ideal gross, dry Btu/scf with a compressibility of 0.9979

$$\frac{1}{Z} = \text{Z Factor}$$

$$\frac{1}{0.9979} = 1.0021$$

$$1050.0 \text{ Ideal gross, dry Btu/scf} \times 1.0021 \text{ (Z Factor)} = 1052.2 \text{ Real gross, dry Btu/scf}$$

The compressibility of gas is different for different gas streams and different pipeline conditions.

The Z Factor is different for different gas streams and different pipeline conditions.