Have you ever wondered how we know when to come to your home and deliver your fuel as an Automatic Delivery customer? The purpose of this essay to share the processes behind the fill-up. These are known as “Degree Days” and “K-factors” – the foundation by which Fuel Services is based.

First, let me say this information is not all my original content. Some examples have been chosen from either Degree Day Systems or an excellent article Bob Hedden wrote in Oil Heating Magazine. Now that I have given credit to those that deserve it, let’s begin.

What is a “Degree Day”? A Degree Day is simply a unit for measuring how cold (or hot) it has been over a 24-hour period. Whenever the average (or mean) temperature is below 65 degrees, you have a degree day.

For example, if during a 24 hour period the high outdoor temperature was 70 degrees and the low was 50 degrees, then the average temperature for that day was 60 degrees (halfway between 70 and 50 degrees). This is 5 degrees less than the base temperature of 65 degrees. Therefore there was 5 degree days for that period.

How We Figure Out the Daily Degree Days
It is easy to figure out the daily degree days. The daily degree days are found by adding the high temperature for the day and the low temperature for the day together, dividing by two and subtracting the answer from 65.

Let’s try calculating an example:
High Temperature: 50 degrees
Low Temperature: 34 degrees

We add the high and low together; then divide by two.

This gets us our mean temperature. In this case that is 42, but we are not done…
We then take 42 and subtract it from 65.  
**Note: 65 is always the base.**

Consider this: In the summer it is 90 degrees during the day and 70 at night. Well just using the degree day calculation method above won’t net you any degree days… but a person still used oil during the day to take their 30 minute long morning shower? So, to calculate this we compensate for hot water installations by using this formula...

When the mean temperature is:

- 62 degrees and above: Add 6 degree days
- 58 to 61 degrees: Add 5 degree days
- 54 to 57 degrees: Add 4 degree days
- 50 to 53 degrees: Add 3 degree days
- 46 to 49 degrees: Add 2 degree days
- 43 to 45 degrees: Add one degree day

**Let’s try calculating an example for hot water:**
(We’ll pretend it is a cool early fall night)

High Temperature: 74 degrees
Low Temperature: 48 degrees

Again, we take 74 + 48 and get 122, then divide by 2 to get our mean temperature of 61 in this case. Then we figure out Heat Only Degree Days. This number is the heat only degree days for the day. In this example we had 4 degree days. (65 – 61 = 4).

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What About Hot Water Installations?

At Fuel Services we track *two different* Degree Day numbers on a daily basis:

- Heat only (which is the example above) and
- Heat/Hot Water Degree Days

Why? Simply put, the colder it is the more accurate using Heat Only Degree Days becomes for hot water installations, but the warmer it gets the more inaccurate it becomes.
So, now to figure out Heat/Hot Water Degree Days lets refer to the chart above.

Our mean temperature was 61, so according to the chart we add 5 degree days to our Heat Only total.

So on this day we would have 9 Heat/Hot Water Degree Days.

**What Does This Mean In the Real World for You?**

If this were a real world example, in the morning we would enter 4 HO (Heat Only) and 9 HW (Heat/Hot Water) Degree Days into the computer.

The computer then takes these numbers and calculates the rate at which our customers burn oil.

And this leads us to our next discussion. The term: K-factor.

**What is a K-Factor?**

Simply put, it is a number that shows how fast a customer uses fuel:

- The lower the K-factor – the more fuel burned
- The higher the K-factor – the less fuel used

You can compare this number to miles per gallon (mpg). A K-factor is Degree Days per gallon*.

Think of the number as the number of degree days that one gallon of fuel will last.

* You may read that the K-factor is thought of as gallons per degree day. While the concept is the same; I don’t recommend you do this. If a person has a K-factor of 5, that means they get 5 degree days for a gallon of fuel, NOT 5 gallons per degree day.

Each home will have a different K-factor, depending on many things: heat loss, equipment efficiency, how many people take showers and for how long, and more. As long as the heating situation doesn’t change, the K-factor can be relied upon. For delivery purposes, we don’t actually measure all that (*it would be strange if we asked you to log your shower times – LOL).*

There is a much simpler formula for us to determine the K-factor. It is very much like figuring out the miles per gallon in our cars.
How You Calculate a K-Factor

MPG for your car is Miles Driven / Gallons of gas to fill tank. So if for example, a car got 300 miles between two fill ups and the tank took 15 gallons; you would get 20 miles per gallon. \((300/15=20)\)

So this is the formula to calculate a K-Factor:

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\text{Elapsed degree days / Gallons of oil to fill tank} = \text{K-Factor}
\]

\[
2,000 / 400 = 5
\]

So in in this example the K-factor would be 5.

So Why Are K-Factors Important?

As a company if we have accurate K-factors for you as our customer, we can truly figure out proper delivery dates \(\text{(and more importantly the number of gallons)}\) for you.

We are lucky to have an exceptional computer program to help calculate the data, but let’s look at a real example manually.

The K-factor (degree days per gallon) is set at 6.7, we have an optimum delivery of 180 gallons, that means we should have 1206 degree days between deliveries (180 gallons times the degree days per gallon number of 6.7), which we see the computer does show accurately. The computer then adds that amount to the degree days of the last delivery; thereby giving us our next delivery day (in degree days) with an estimate of the actual delivery date.

Conclusion

Degree Days and K-Factors are the very core of any fuel oil delivery business. As a company it is our job to maintain accurate data to provide you the very best service. These numbers are not only used for accurate and timely deliveries, but also for estimating your yearly usage, which can determine an accurate budget plan for your family. Thank you for reading; and thanks for trusting our family to keep your family fueled up!

About the Author

Christopher Chase is Executive Vice President of Fuel Services. He has worked alongside his father, Steve Chase, President & CEO, at Fuel Services since 2005.

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