

K-Factors & Degree Days Basics

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Degree Days

What are Heating Degree Days?

- **Heating Degree Days (HDD)** – The average temperature that falls below 65 degrees. Weather based sites calculate by adding the High + Low temperatures (assumes the high temp for 12 hours and low temp for 12 hours) then divide by 2. Then subtract from 65 to equal the Heating Degree Days.
- **Software Degree Day (SDD)** – The accumulation of readings throughout the day and then averaged out, which is much more accurate than Heating Degree Days.

What is a K-Factor?

- **K-Factor** – The number of Degree Days required to burn one gallon of fuel (Burn Rate). K-Factors vary depending upon house information including *Square Feet In House*, *Ceiling Height*, *Quality of Insulation*.
 - The K-Factor Calculator can open from any screen in Energy Force by pressing **Ctrl+K**. Any calculations will need to be noted as they will not save upon closing. However, on the *Tank* screen in *Create* mode, double-click in the *K-Factor* field to open the calculator. Upon choosing **Select**, the *K-Factor* and *Daily-Use* fields will automatically populate based on the information entered in the calculator.

The screenshot displays the 'House Information' section of a calculator. It includes input fields for Length, Width, Square Feet In House (2500), and Ceiling Height (7), which result in a Cubic Foot value of 17500. Below this, there are fields for Heat Loss (122500), Fuel Type (Propane selected), Degree Days Annually (5500), Gross Heating Gallons (2891), and Net Heating Gallons (1879). A yellow callout box lists insulation options: Average Insulation = 35, Good Insulation = 40, Super Insulation = 50, and Storm Windows and Doors = 10. The 'Daily Use Gallons' section has input fields for Cooking (40), Water Heating (40), Clothes Dryer (75), and Other (0), with a Total Add On of 155. At the bottom, the Daily Use is calculated as 0.42, and the Estimated Annual Usage is 2034, resulting in a K-Factor of 2.93.

- **Daily Use** – The propane used by appliances other than home heat including Water Heaters, Clothes Dryers, Cook Stoves, Gas Fireplace/Logs, etc. *Daily Use* calculations are extremely important for proper estimated propane usage tracking.
 - The *Daily Use Gallons* calculator is located at the *K-Factor Calculator* screen to input specific information, for example, the number of persons in home for water heaters.

Daily Use Gallons

Cooking

Water Heating (40 gals per person)

Clothes Dryer

Other (Estimated Usage)

Total Add On

Daily Use

How do they work together?

- When a tank is first set up, the K-Factor is calculated with Next DD (Degree Day) or when the tank reaches 20%.

Co Owns	Tank Serial Number	A / I	Type	Tank Description	Tank Capacity	Update K-Factor
Yes	2367	A	P		500.00	Yes
					Total Capacity 500.00	Est Gallons Left 400.00
					Daily-Use 0.42	Est Percent Left 80
					K-Factor 3.17	Delivered Gallons 0.00
					Prev K-Factor 0.00	Tot Gals with Delivery 0
					DD Region 1	Gals Since Last FF 0.00

DD Last Del Next Last Del Julian Delivery Last Charge Last Full Fill

Customer Type RESIDENTIAL Sales YTD Last % Update

Delivery Type KEEP FULL Gallons Used YTD Hold Date

Regulatory Code Hold Reason

Public Assembly? Underground? Cathodic Test Pass/Fail

- Degree Days are updated daily via SDD during Automated Tasks or manually input through the **Posting Menu**.
- When processed, *Delivery Type 2* tank percentages are depleted based on the K-Factor value and if applicable by *Daily Use Gallons*.
- In the example below, 30 degree days were posted. The system reduced the *Estimated Percentage Left* using both the *K-Factor* and *.42 Daily-Use Gallons* for one day's usage.

Co Owns	Tank Serial Number	A / I	Type	Tank Description	Tank Capacity	Update K-Factor
Yes	2367	A	P		500.00	Yes
					Total Capacity 500.00	Est Gallons Left 398.63
					Daily-Use 0.42	Est Percent Left 80
					K-Factor 3.17	Delivered Gallons 0.00
					Prev K-Factor 0.00	Tot Gals with Delivery 0
					DD Region 1	Gals Since Last FF 0.00

DD Last Del Next Last Del Julian Delivery Last Charge Last Full Fill

Calculations for New Deliveries

- As sales are made, readings are stored in the *Tank Readings* screen based on delivery dates and actual tank values at the time of delivery.
- K-Factors are re-calculated based on the percentage change threshold (stored in the *Division* table) and the data from the last two deliveries. While percentage updates are included in the recalculation process, the

initial calculation cannot be triggered by a percentage update alone. A delivery of gallons is required to initiate the first recalculation.

- The averages of 3 or more deliveries helps to eliminate large fluctuations.

Tank Reading Screen

- The *Tank Reading* screen displays current Delivery readings as well as Estimated Percent.
- *Current K-Factor vs. Calculated K-Factor* is based on % to change and 2 previous deliveries.
- *Estimated % Left vs. Start %* should be within a 10% range.

Tank Serial Number	Tank RRN	Type	Status	Size	Tank Name
UNDERGROUND TANK	19,818	P	A	500	House

Delivery Date	Old DD Reading	New DD Reading	Glns Deliv	Prev Glns	Est Glns Left	Est % Left	Start%	End%	Curr KFactor	Calc K-Factor
07/23/15	-978	9	180.30	424	219.15	44	49	85	7.27	8.22
03/11/15	3817	5758	314.40	425	121.85	24	22	85	6.76	6.57
01/26/15	1750	3817	324.90	426	100.81	20	20	85	6.84	6.83
12/04/14	16	1750	310.60	420	93.12	19	23	85	6.87	7.24

K-Factor Deviations

When a K-Factor wants to adjust by a value greater than what's allowed in the *Division* table (generally 1.0 or greater), a report generates at the end of each sales journal if any deviations occurred while posting sales to notify of the deviation for review.

- This report needs to be monitored daily and propane usage investigated for those most vulnerable for future runouts.
- Has something changed?
 - Number of residents
 - Added another room to house
 - Wood burners or alternative heat source

										Journal Number	50743							
		From Journal Date	01/01/2015	To Journal Date	01/05/2015	From Division		1	To Division	9999								
Div	Cust #	Customer Name	Tank RRN	Dust Type	Description	Serial#	Size	Type	Old New Read	Est %	Est Gls	St %	End%	Gls Divd	DUse	Prev KF	New KF	Calc KF
1	18127	TWOHEY, STEPHEN D	1940	15	MISC LP AUTO SCHE	885942	500	P	21 272	22	109.84	43	79	180.00	C.00	9.99	11.99	15.30
1	10991	LEE, ZACHARY & LAURA	15038	11	AUTO SCHED RESID	232055	500	P	13 280	16	98.85	32	79	235.50	C.99	15.99	18.11	24.58
1	20528	HIGGINBOTTOM, RICHARD & DA	10843	11	AUTO SCHED RESID	1053	1000	P	6607 260	17	168.56	0	79	790.00	0.11	4.13	3.30	0.30
1	26389	STIEL OWEN	27832	17	BUDGET	980260	1000	P	3 260	16	193.80	64	79	150.80	C.00	4.92	5.90	29.35

- Read more about [K-Factor Deviations](#) on the Energy Force Help Center.

Update Information

- Contact customers regarding major changes in usage and log all information in a tickler.
- Modify Tank information as needed, or manually adjust a K-Factor to alter the depletion rate. While manual K-Factor changes immediately affect the depletion rate, the next calculation (whether triggered by a percentage update or a delivery) will revert to using the previous K-Factor for that calculation.

Other Useful Tips

- Update DD Readings Daily, even in the summer time when DD's do not occur as well as Daily Usage to avoid experiencing a run out in summer due to daily use.
 - Run K-Factor Deviation and Management reports as part of a daily routine to ensure employees are reviewing the data.
 - Run K-Factor Delivery Analysis reports to review runouts and percent updates.
 - A great K-Factor tank, is one that uses propane for the entire heating season.
- A customer must participate in reviewing heat usage if utilizing supplemental heat to avoid run outs, as the K Factor will never be correct.
- Non-ideal K-Factor Candidates
 - 120 gallon tanks are not good candidates for a K-Factor because they are not used consistently for heat and may have a high daily usage rate.
 - Julian's (interval schedules or day of the month, etc.) and Call In are also tanks that do not qualify for K-Factor.
 - Shop, garage, dairy barns, poultry, pool heaters and temporary heat tanks are not good K-Factor tanks as the usage pattern is not consistent.
 - Remote Tank Monitors work great with tanks that do not qualify as good K-Factor tanks.