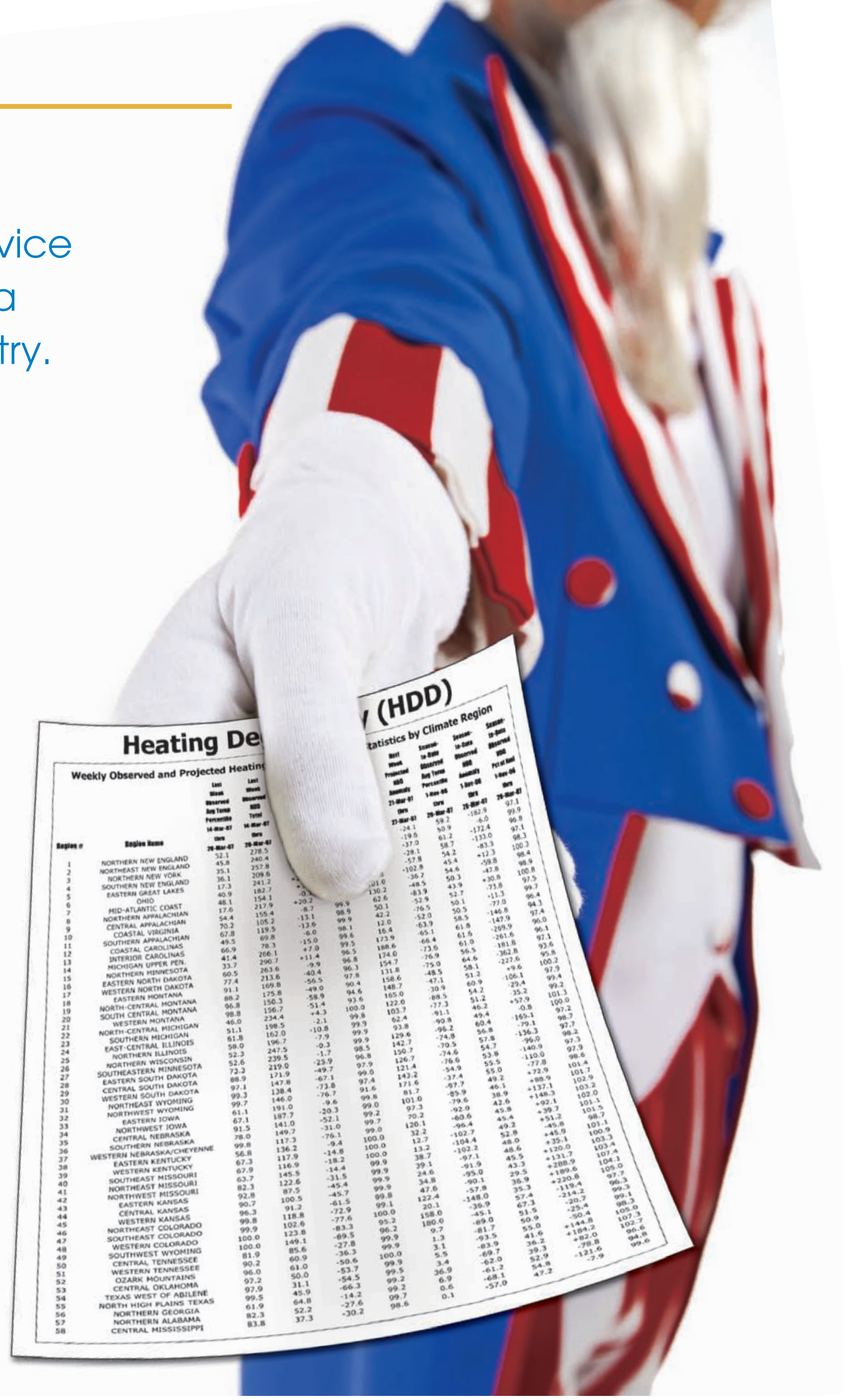
by James E. Houck & Brian N. Eagle

The National Weather Service provides a bounty of data useful to the hearth industry.

Uncle SAM is the MAN



The U. S. Department of Commerce's National Oceanic and Atmospheric Administration's National Weather Service provides information useful to the hearth industry without our even asking. Weather data are compiled from approximately 8,000 weather stations; of particular value to the hearth industry is Heating Degree-Day (HDD) data. HDD is an index used to determine the duration and intensity of the heating season. The index, originally developed in 1927 by the American Gas Association, is widely used to estimate home heating requirements.

The concept is quite simple. Once the outdoor temperature falls below 65° F, space heating is required in a building to maintain a comfortable indoor temperature. For every degree of temperature below 65° F, 1 HDD is accumulated. On a day where 40 HDDs have accumulated, four times as much fuel is required to heat a building as on a day when only 10 HDDs have accumulated.

HDDs are useful in a number of ways. They can be used to gauge the relative severity of a winter. The total daily HDD values for a winter season can be compared to previous winter totals or to a long-term average. HDDs allow home heating suppliers to estimate fuel consumption, which permits efficient scheduling of deliveries and the avoidance of shortages. HDDs characteristic of a given region can be used in building design to calculate insulation requirements and/or to properly size heating equipment for new buildings.

HDDs also allow individuals to assess their home heating efficiency. By dividing fuel consumption (from fuel bills) over a period of a week, month or year by the accumulated HDDs for the same period, the home occupant can calculate how much fuel is consumed per single degree-day. Comparisons before and after new heating equipment is installed, or before and after home weatherization, allows for a good estimate of the benefits.

HDDs are calculated simply by subtracting the mean daily temperature (F°) from 65° F. The mean daily temperature is arrived at by averaging the maximum and minimum temperatures for the day. When the daily mean temperature is above 65° F, no degree-days are counted. These daily values are then added together to obtain a cumulative total for the period of record (i.e., week, month, year). In countries using the metric system, such as Canada, HDDs are calculated based on an 18° C "balance point," and the HDD's are smaller in magnitude because a degree Centigrade (Celsius) is 1.8 times larger than a degree Fahrenheit.

While HDDs are very useful in assesing heating demands, they are not perfect. Heat requirement is not linear with temperature, and heavily insulated buildings have a lower balance point: some will need heating below 65°F, but others won't need any heating until the temperature is much lower. Solar gain (passive solar) reduces the need for heating on sunny days (but not cloudy days), and wind increases the need for heating (by an amount that depends on how tightly the building is constructed). People also differ in their opinions about what constitutes a comfortable indoor temperature.

Even with these imperfections, HDDs are extremely useful to the hearth industry. Data for literally hundreds of locations throughout the country are available online at:

http://cdo.ncdc.noaa.gov/climatenormals/clim81/MDnorm.pdf. (Note the URL is for Maryland (MD). If you require data for Pennsylvania or Oregon simply substitute PA or OR for MD, respectively.) Graphic representation of average HDD patterns for the entire United States can be found at: http://lwf.ncdc.noaa.gov/oa/documentlibrary/clim81supp3/clim81.html.

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Heating Degree Days

For every degree of temperature below 65° F, one Heating Degree Day is accumulated. For example, if the day's high temperature is 60 and the low is 40, the average temperature is 50 degrees. 65 minus 50 equals 15 heating degree days.