

Fig. 6 is taken from the 3rd edition of Industrial Gas Series on House Heating, published by the *American Gas Association*, and indicates the average gas consumption per degree-day for various heat contents. While the fuel consumption in individual cases may vary somewhat from the curve values, these average values are sufficiently accurate for estimating purposes and give very satisfactory results.

The value generally used in the manufactured gas industry for residences is 0.21 cu ft per degree-day per square foot of equivalent steam radiation (240 Btu) based on the theoretical requirements. A correction for warmer climates is necessary and it is customary to gradually increase

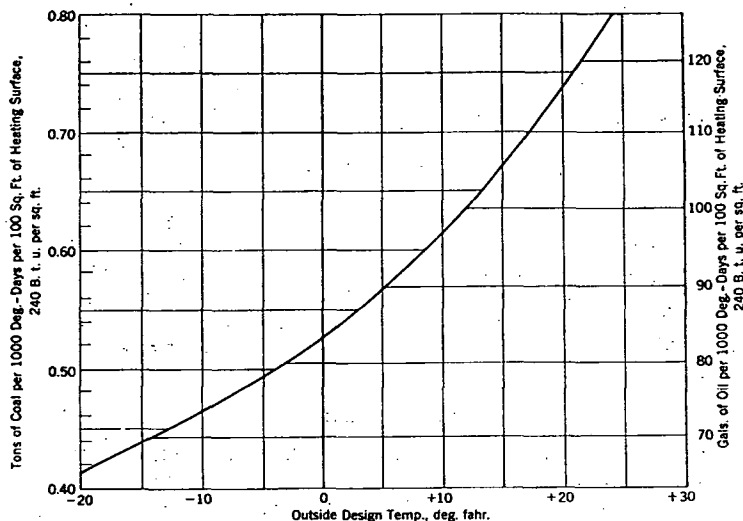


FIG. 5. CURVE FOR OBTAINING ROUGH APPROXIMATION OF ANNUAL FUEL CONSUMPTION IN TONS OF COAL OR GALLONS OF OIL PER 1000 DEGREE-DAYS PER 100 SQ. FT. OF EQUIVALENT STEAM HEATING SURFACE^a

^aThis curve is based on heating efficiencies of 60 and 70 per cent for coal and oil respectively, a calorific value of coal of 13,000 Btu per pound, a calorific value of oil of 141,000 Btu per gallon, an inside temperature of 70 F, and an emission of 240 Btu per equivalent square foot of heating surface (steam), and does not allow for unusual factors which would affect the fuel consumption, such as open windows, week-end shut-downs, etc. For hot water, divide the result obtained by means of this chart by 1.6.

the fuel consumption below 3,000 degree-days to about 20 per cent more at 1,000 degree-days.

For hot water or warm air the fuel consumption is about 0.19 cu ft per degree-day per square foot of equivalent steam radiation, that is, per 240 Btu per hour. The actual requirements likewise increase with hot water or warm air systems as the number of degree-days decreases below 3,000. For larger installations, that is, 1,000 sq ft of theoretical radiation and above, there is an increase in efficiency, and a consequent decrease in the fuel consumption per degree-day per square foot of heating surface.

Heat to Warm Air for Ventilation Requirements

The preceding discussion on fuel consumption has dealt with the heating requirements of the building irrespective of any air that may be intro-

duced for ventilation purposes, other than the normal infiltration of outside air. The heat required for warming air brought into the building for ventilation may be estimated from data given in Chapters 4 and 24.

RELATIVE COST OF HEATING WITH DIFFERENT FUELS

A comparison of the relative cost of heating with different fuels can only be made with even a fair degree of accuracy when there is a full knowledge of the equipment which will be used with each fuel, and the

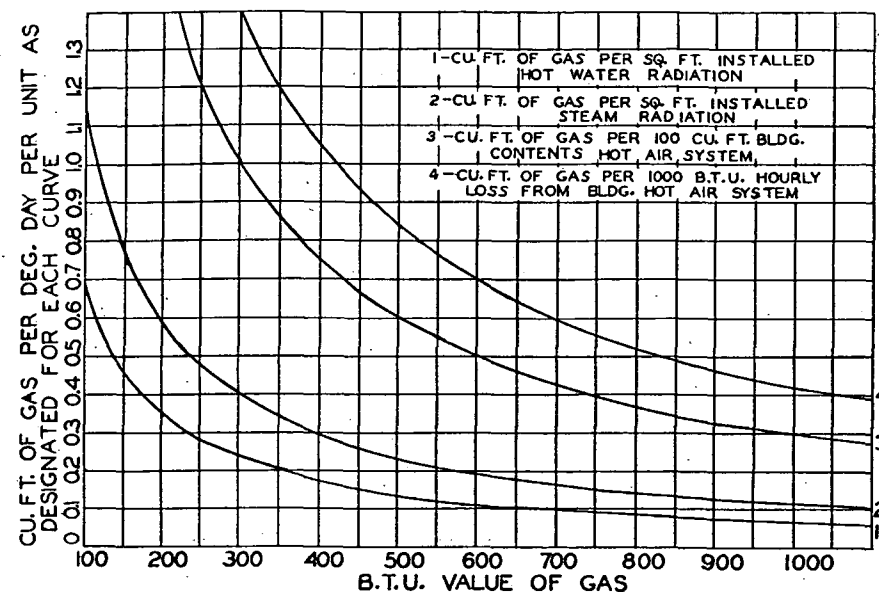


FIG. 6. CHART GIVING GAS REQUIREMENTS PER DEGREE-DAY FOR VARIOUS CALORIFIC VALUES OF GAS AND FOR DIFFERENT HEATING SYSTEMS^a

^aThis chart is based on an inside temperature of 70 F and an outside temperature of zero. If the radiation is installed on the basis of any other temperature difference, multiply the result obtained from this chart by 70, and divide by the actual temperature difference.

efficiency with which each will be operated. When proposing to substitute one fuel for another, the yearly cost with the fuel being used can be obtained, and the accuracy of the comparison will depend on the care taken in estimating the quantity that will be required with the new fuel and the equipment which will be used.

A convenient basis for comparison of various fuels is the cost per million Btu, and the following formulæ may be used for obtaining comparisons on this basis:

Coal

$$X = \frac{500 \times c}{C_o \times E_c} \quad (4)$$

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