Ratings for Gas Appliances

Since a gas appliance has a heat-generating capacity that can be predicted accurately to within 1 or 2 per cent, and since this capacity is not affected by such things as condition of fuel bed and soot accumulation, makers of these appliances have an opportunity to rate their product in exact terms. Consequently all makers give their product an hourly Btu output rating. This is the amount of heat that is available at the outlet of a boiler in the form of steam or hot water, or at the bonnet of the furnace in the form of warm air. The output rating is in turn based upon the Btu input rating which has been approved by the *American Gas Association* Testing Laboratory and upon an average efficiency which has been assigned by that association.

In the case of boilers, the rating can be put in terms of square feet of equivalent direct radiation by dividing it by 240 for steam, and 150 for water. This gives what is called the *American Gas Association* rating, and is the manner in which all appliances approved by the *American Gas Association* Laboratory are rated. To use these ratings it is only necessary to increase the calculated heat loss or the equivalent direct radiation load by an appropriate amount for starting and piping, and to select the boiler or furnace with the proper rating.

The rating given by the *American Gas Association* Laboratory is not only a conservative rating when considered from the standpoint of capacity and efficiency, but is also a safe rating when considered from the standpoint of physical safety to the owner or caretaker. The rating that is placed upon an appliance is limited by the amount of gas that can be burned without the production of harmful amounts of carbon monoxide. This same limitation applies to all classes of gas-consuming heating appliances that are tested and approved by the Laboratory. Gas boilers are available with ratings up to 14,000 sq ft of steam, while furnaces with ratings up to about 500,000 Btu per hour are available. (See Chapter 20.)

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PROBLEMS IN PRACTICE

1 ● List some factors which might account for higher efficiencies with stoker firing than with hand firing.

a. The uniform rate of coal feed, *b.* Better distribution in the fuel bed, and *c.* Positive control of the air supplied for combustion.

2 ● Classify stokers as to construction and operation.

a. Overfeed flat grate, *b.* Overfeed inclined grate, *c.* Underfeed side cleaning type, and *d.* Underfeed rear cleaning type.

3 ● What classification may be made of stokers as to their use?

Class 1. For residences (Capacity up to 60 lb of coal per hour).

Class 2. For apartment houses and small commercial heating plants (Capacity 60 to 100 lb of coal per hour).

Class 3. For medium sized commercial heating plants (Capacity 100 to 300 lb of coal per hour).

Class 4. For large commercial plants and small high pressure steam plants (Capacity 300 to 1200 lb of coal per hour).

4 ● What main parts are found in an underfeed residential stoker?

A *hopper* is supplied to hold coal which is fed by a *screw* or *plunger* into a *retort* provided with air openings called *tuyeres*. A *blower* supplies air under pressure for combustion, and a *gear case* provides for changes in coal feeding rates.

5 ● What is a dead-plate?

A dead-plate is a flat surface without air supply openings upon which the fuel rests while combustion of the fixed carbon is completed. Generally the ash is removed from the dead-plate.