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CHAPTER 44

OWNING AND OPERATING COSTS

Fixed Charges: Amortization, Interest, Taxes, Insurance, Rent; Maintenance Costs; Service Costs: Operating Refrigerating Equipment, Condenser Water, Heating

THE purpose of this chapter is to discuss owning and operating costs of heating, ventilating, and air conditioning systems. The discussion will dwell particularly on air conditioning systems, as most owners or prospective purchasers will be interested in comparing the owning and operating costs with the possible investment return due to increased patronage, improved efficiency of employees, or improvement and maintenance of quality in a manufactured product.

Owning and Operating Costs may be grouped under three headings: (1) *Fixed Charges*, (2) *Maintenance Costs*, and (3) *Service Costs*.

FIXED CHARGES

Fixed Charges, which are the cost of owning the system, include: (1) Amortization, (2) Interest, (3) Taxes, (4) Insurance, and (5) Rent.

Amortization

Amortization cost will depend on: (1) the total first cost, and (2) the amortization period.

The *total first cost* of an installation is the actual dollar outlay or capital expenditure required to buy and install the air conditioning, or heating and ventilating system ready for operation. It can be divided into two parts: (*a*) the first cost of the air conditioning or heating and ventilating system itself, and (*b*) other first costs incurred because of the installation of the air conditioning or heating and ventilating system.

The *first cost* of air conditioning or heating and ventilating systems includes the following:

1. Heat producing equipment including boilers, burners, controls, etc.
2. Heat distributing equipment including direct radiation, piping, etc.
3. Air handling equipment including fans, air heaters, air conditioners, filters, controls, etc.
4. Air distribution system including ducts, outlets, grilles, etc.
5. Refrigerating equipment including piping, pumps, etc.
6. Water conservation devices including towers, evaporative condensers, etc.
7. Insulation of pipes, ducts and equipment.

The best procedure for establishing the first cost of any system is to first determine the heating and cooling load and then, after a thorough engineering study, select the type of system. The installed cost of a system will vary between wide limits depending upon the type of equipment selected, the design of the distribution system, equipment and labor costs in the locality, etc. An approximate cost, within ± 10 percent, may then be quickly determined for a selected design in a given locality by adding