

Smoke Pipes

Section 9. a. The smoke pipe shall be as short and direct as consistent with the location of the furnace. It shall be made of either black or galvanized iron not lighter than No. 24 U. S. Standard Gauge, and of the full size of the collar on the furnace throughout its entire length. It must have no other opening for attaching any fire place, stove, range, water heater, gas or ventilating connection. It shall be lock-seamed or riveted; all joints shall lap not less than one and one-half ($1\frac{1}{2}$ ") inches and it shall be rigidly secured. Cast iron smoke pipe may be used.

b. Where the smoke pipe enters the flue, a thimble shall be cemented into the flue and the connections thereto made air tight. Should any smoke pipe come within eighteen (18") inches of any combustible material, such combustible material must be covered with asbestos paper and a metal shield so fastened that a two-inch air space exists between this shield and the combustible material. This shield shall be no less in size than twice the diameter of the smoke pipe and of sufficient length to cover the wood at all points.

c. No smoke pipe shall project through any external wall or window.

Pipeless or One Pipe Furnaces

Section 10. a. When but one duplex grating is used for both warm air and cold air in a so-called pipeless furnace, the area of the cold air intake shall be at least equal to the area of the warm air outlet of the grating. Article 4, Section 4, relative to casing shall not govern when this type of furnace is installed, but the following specification shall be followed: The inner and outer casing of this type of furnace may be made of either black or galvanized iron not lighter than No. 26 U. S. Standard Gauge. A uniform air space shall be maintained at all points between the inner and outer casing. In no case shall the top of the furnace be allowed closer than twelve (12") inches to any ceiling or joists above the furnace.

b. Where joists are cut to accommodate this furnace, headers shall be put in and braced so as not to weaken the structure of the floor above the furnace.

c. Article 3 for determining area of warm air pipe shall not govern in figuring a pipeless furnace.

d. Where one warm air register face is used and separate face or faces for cold air supply are used, then Article 4, Sections 5 and 8 shall apply.

CHAPTER XI

OIL FUEL FOR INDUSTRIAL AND DOMESTIC HEATING

INDUSTRIAL OIL BURNING

OIL has established its place in the heating field first in the industrial and more recently in the domestic service where effective methods have been devised to burn it economically under automatic control. The engineer, architect and contractor should have a fundamental knowledge of its characteristics, its applications, and should know some of the practical phases of installation methods in new and existing plants. Specific data is necessary for successful service of a plant and for the protection of the client's interests. Every installation should be a matter of individual and careful study.

Oil as a fuel is desirable because it is liquid in form, being petroleum in its constituent parts. There is claimed for liquid fuel, the advantages of space for storage, simplicity in location of storage adjacent to boilers and means of transportation from the remote points of storage to boiler, reduction in labor and handling of fuel, the elimination of ash removal, ease of control of furnace temperatures, and the elimination of the expense of banked fires. Each case, however, where the liquid fuel is contemplated will have, of necessity, to stand on its merit. The heating engineer must figure out the operating cost both with coal and with oil, and the user will have to evaluate the extra convenience, after which a decision can be made as to what type of fuel should be used.

Crude oil has either a paraffin or asphalt base, or a blending of the two. Fuel oil, is heavy, dark in color and has a greater viscosity, higher calorific value and higher flash point than the crude oil from which it is made. It results from the distillation of crude oil during which processes naphtha, benzine, gasoline, kerosene and other distillates are removed. The character of the fuel oil varies in accordance with the extent to which the crude oil has been refined.

In the selection of burner equipment and in the determination of storage facilities, it is well to decide what grade of oil is to be used, its Baumé gravity, viscosity, flash point, and cold test, or temperature at which it will cease to be fluid.

The following table gives data from standard authorities on various oils. The flash point varies considerably in the oils from different fields, hence the figures given are subject to variation:

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