

# Choosing Open Coil or Finned Tubular Design

HEATREX manufactures both open coil (Figure 1) and finned tubular (Figure 2) heating elements and can supply virtually any duct heater with either type of element. While most simple space heating applications use the open coil design, there are many applications where finned tubular construction is appropriate. The following are the significant advantages of each type of construction.

## Open Coil



Figure 1.

Only the highest Grade A resistance wire (80% nickel, 20% chromium) is used in all HEATREX duct heaters. This iron-free wire has a higher maximum operating temperature, greater life, lower sag, less resistance change and higher corrosion resistance than other commonly used resistance wires.

Using calibrated tooling, the coils are mechanically crimped into stainless steel terminals. This connection, along with 10-32 terminal threads and stainless steel connection hardware, insures cool, minimum resistance, trouble free terminations.

An extended shank on the terminal places the critical resistance coil-to-terminal connection well out into the airstream to keep it cool even in applications where up to 1" of interior insulation is used in the duct.

Both terminal insulators and coil support insulators are fabricated from high-temperature ceramic. Their design and method of installation enable them to: 1) absorb both mechanical and thermal loading without chipping or cracking and 2) easily withstand high voltage dielectric tests.

**Element Temperature** – The open coil element releases its heat directly into the airstream. As a result, the open coil runs cooler than the coil in the finned tubular element which is isolated from the air by insulation and a metal sheath.

**Low Pressure Drop** – Because of the high percentage of open space across the heater, open coils have very low pressure drop as compared to finned tubular heaters. This can result in reduced fan motor horsepower and

makes it possible to retrofit open coil heaters into existing systems without changing the fan motor.

**Large Electrical Clearances** – Generous electrical clearances between the coil and frame enable open coils to withstand severe applications such as subway car heating, where voltages may exceed 750 volts.

**Economy** – On relatively small, low KW heaters (the bulk of typical space heating applications) the open coil element is more economical. However, in large, high KW heaters, finned tubulars are more economical due to lower manufacturing costs.

**Smaller Size** – It is normally possible to get more KW with open coil construction for a given face area.

## Finned Tubular



Figure 2.

Finned tubular elements are designed and built by HEATREX to meet the requirements of each job. Length, wattage, voltage and element style are engineered to give the most economical package.

All elements consist of a Grade A coil (80% nickel, 20% chromium), precisely centered in a stainless steel tube which is filled with granular magnesium oxide. The entire assembly is compacted to maximize both the heat transfer and dielectric properties of the magnesium oxide. After compaction the tube measures 0.475" (12 mm) O.D., an unusually large diameter providing sufficient insulation for operation up to 600 volts.

A stainless steel fin is helically wound onto the tube to increase its heat transfer surface.

HEATREX has standardized on stainless steel for its finned tubular elements because of its superior resistance to moisture and corrosion.