How To Measure for Coil Replacement

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When it comes time to replace an old steam coil that's corroding and cracking like an old pickup truck, it is important to understand the features of the coil that need to be duplicated in order to ensure the performance and fit required. It also is important to understand the general parameters that go into coil design, so that the coil not only fits but matches the footprint exactly and performs to expectation.

Use a coil manufacturer's coil specification sheet to make the replacement process quick, painless and error-free. Typically, spec sheets can be found on the coil manufacturer's web site or via fax. Here is a six-step process to follow.

First, determine what type of coil you are replacing. Is it standard steam, nonfreeze steam, hot water, hot oil, hot gas or other heat transfer fluid that is heating the fin-side gas (usually air)? Or, is it a chilled water, evaporator or other type of coil that is cooling the fin-side gas?

Second, decide whether the airflow is horizontal, vertical, or at an angle in between. This will help determine acceptable coil circuiting, and inlet/outlet connection locations.

Third, determine whether the coil surface needs to be treated. Usually, a coil supplier will be able to determine the required coating if given a general description of the operating conditions of the coil and physical characteristics of the coating.

Fourth, select your materials of construction. Tubes generally are copper, carbon steel, stainless steel, aluminum or cupro-nickel and come in a wide range of wall thicknesses. Most steam and hot water coils for process heating applications use 0.625 to 1" O.D. tubes. Fins generally are copper, carbon steel, stainless steel, aluminum or cupro-nickel and range in thickness from 0.0075 to 0.0160". They may be even thicker, depending on duty in process applications.

Headers (manifolds) generally are the same material as the tubes but can use higher strength materials for added pressure duty. They may be located on the same end or opposite ends. All standard steam coils and nonfreeze steam coils with opposite end connections use a larger steam inlet header and smaller condensate outlet header. Nonfreeze steam coils with same end connections appear to have one header with one larger connection in the center of it and one smaller connection near the end of it, but they actually have one header inside the other. Water coils will have headers of equal diameter. Inlet and outlet connections for steam coils generally are male pipe thread but may be female pipe thread or plain end. Casings (sheet metal) may be any material, but the most common are galvanized steel, stainless steel, aluminum or copper in various gauge thicknesses; 16 gauge (0.063" thick) is common. And, there always will be sheet metal end-plates that the tubes protrude through.

Fifth, decide how the coil will be circuited. Coil circuiting is an art that greatly affects the performance of a coil. The easiest way to get started is to count the number of tubes that extend from the inlet or outlet header into the coil. This number is known as the number of circuits. A coil replacement expert would then drawing out the circuiting on a coil specification sheet. But, generally, the number of circuits and the coil orientation (horizontal or vertical) is enough to get a coil manufacturer started on the design of the replacement coil.

Finally, decide on the overall dimensions, including overall casing height, length and width, finned area (face area) height and width, the number of rows deep, and the connection locations. Correct connection dimensioning will ensure a perfect fit and will eliminate repiping of the existing system. The connection locations as dimensioned from the casing flanges on the front, back, top and bottom of the coil are critical.