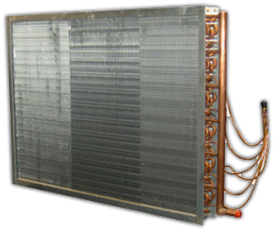
Coil Company Newsletter

Understanding DX Coils

One of the toughest concepts to understand about DX coils is "splitting" the coil, so that (2) compressors can operate off the same coil. The obvious advantage is that you can shut down (1) of the compressors when the load doesn't require it. This saves energy and money when your cooling load is not at maximum design conditions. For example, a coil might be designed to give you 60 tons, but the coil is split so that (2) 30-ton compressors are feeding the same coil. If your load is only about half of design on any particular day, then you can shut down (1) compressor completely and operate the other compressor at 100%. This is a real money-saving feature that is designed and built in many systems. You do, however, need a special circuiting arrangement for the coil, and this is the concept that a lot of people have trouble with. There are three primary ways to do this:

Face Split
Splitting the coil is nothing more than putting (2) completely separate fin/tube packs (coils) in one common casing. When you "face split" a coil, you draw a horizontal line from left to right across the face of the coil, and divide the coil into the top half and bottom half. The top half is circuited by itself and the bottom half is circuited by itself. It's just like having (2) separate coils in one casing. You hook up (1) compressor to the top and (1) compressor to the bottom.



DX Evaporator Coils

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The disadvantage to this arrangement is that the air is directed across the entire face of the coil, and when the system is unloaded, the air passes across either the top half or bottom half of the coil which is not operating. You get air stratification or you need a complicated duct/damper system, which directs the air across only that portion of the coil that is in operation. You don't see much "face splitting" anymore.

Row Split

"Row splitting" a coil is dividing the coil by drawing a line vertically and putting some portion of the total rows in (1) circuit, and putting the remaining rows in the other circuit. This way, the air passes across the entire face of the coil, and will always pass across the rows that are in operation. The problem with this kind of split is that it's very difficult to get a true 50/50 split. As a example, let's say that you have an 8-row coil, and you're aiming to "row split" the coil with 4-rows/each circuit, which would appear to be a perfect 50/50 split. What really happens is that the first 4 rows, closest to the entering air, pick up a much higher portion of the load than the last 4 rows. The coil is actually split 66% / 34%, which doesn't match the 50/50 compressors. You could try to split the coil 3 rows/5 rows. This isn't 50/50 either, but it's closer. The problem now becomes that you've created a very difficult coil to build and circuit. There are times when conditions allow you to row split, and actually come out at 50/50. Conditions have to be right, and you have to be lucky!

Intertwined Circuiting

The common way that coils are split today is to "intertwine" the circuiting. Every alternate tube in the coil is included in (1) circuit, and the other tubes are included in the second circuit. For example, tube numbers 1,3,5,7,9, etc. in the first row are combined with tube numbers 2,4,6,8,10, etc. in the second row, and then the same tubes in succeeding rows to form (1) circuit. You've basically included every alternate tube in the entire coil into (1) circuit, which one compressor will operate to. You pick up all the tubes that you did not include in the first circuit (row 1-2,4,6,8,10,

etc.), and the second compressor operates off this circuit. The obvious advantage is that the air passes across the face of the coil, and there are always tubes in operation, if at least (1) of the compressors is turned on. Also, every split is exactly 50/50, because it can't be any other way. The vast majority of coils are now circuited in this manner, or very close to it.

For more information about DX evaporator coils or to learn more about our other products, visit www.coilcompany.com

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