

## **SELECTION OF HVAC EQUIPMENT**

by

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### **Introduction**

Performing accurate heat load calculations is necessary prior to selecting the equipment. Making selections for equipment in warm, humid climates is challenging, however, properly sized and operated equipment can be quite effective in controlling relative humidity levels, thus preventing mold and mildew growth.

### **Preliminary Equipment Selection**

A preliminary equipment selection should be performed based on the design day heat load calculations. Standard equipment usually can handle 75% sensible load and 25% latent load splits. Since the calculations rarely fall into the equipment ranges, it is necessary to make judgments. First and foremost, the equipment's total cooling capacity should be capable of handling the calculated total heat load.

### **Refining Equipment Selection**

The calculated air flow (cfm) should be compared to the equipment's capability. Since the calculated cfm is based on the sensible load component, a judgment must be made. Occasionally, if the calculated cfm is much larger than the equipment's cfm, then the next larger piece of equipment should be selected. Meeting the sensible capacity is necessary to maintain the space temperature.

Mismatched equipment may be used when the sensible to latent capacities are drastically different than standard equipment. It is necessary to make sure that the temperature leaving the coil does not exceed 55°F.

### **Humidity Control**

Maintaining temperatures below 55°F off the coil are necessary to remove moisture from the air and are effective means for humidity control.

Do not oversize the equipment. Oversized equipment

will quickly meet the space temperature requirements and shut off. When the unit is not operating, it is not dehumidifying. This is one of the most common causes of elevated indoor relative humidity levels which can lead to mold and mildew growth.

### **Additional Features for Humidity Control**

Add a dehumidifier to a standard constant volume system. See Technical Bulletin No. 4, ***Dehumidification***, for additional information.

Choose a variable speed air handler. The fan speed gradually ramps up over a period of time until the space temperature is satisfied. This allows the leaving coil temperature to dip under 55°F, thus further removing water from the air. The run time is also increased, allowing more moisture to be removed from the air.

Another choice may be staged cooling. This choice employs two compressors to each air handling unit and can be used in 3-ton units or larger. In the first stage of cooling, only one compressor operates. If the space temperature could not be satisfied, the second stage would then run. This also allows a longer run time. In addition, the first stage more closely matches the "average day" for heat loads. Staging of equipment is also a good idea if there are intermittent equipment, people or lighting loads.

Reheat is another form of humidity control. It is found mostly in heat pump units. The manufacturer builds a second circuit that allows the waste heat off the compressor to be used to reheat the air after the cooling coil. Control of the reheat coil is through a space mounted humidistat. Reheat allows the equipment to run longer even when the space temperature is satisfied because the air is first cooled to remove the moisture and then reheated so the space is not over-cooled.