

## Duct Condensation

In areas of high humidity, it is important to take extra steps to ensure that moisture does not condense on the exterior of the supply duct. There are two goals that must be achieved. The duct and connections must be sealed and the R-factor of the duct must be maintained.

In most cases our standard sound attenuator (UPC-26C) and our aluminum supply duct (UPC-25) have sufficient insulation to prevent condensation. However, for extreme humidity conditions or when the local codes mandate, we also offer the sound attenuator with an R-factor of 4.2 and 6.0. The 6.0 R-factor duct also has two vapor seals for added protection in case of punctures in the outer jacket.

Condensation occurs only when the surface temperature of the duct falls below the dew point of the ambient air. Under the right conditions just about any duct can be made to sweat. Our duct is no exception, so it is important to take some preventive measures to keep the surface temperature below the expected dew point.

Most individuals do not know the design dew point but do know the design temperature and relative humidity so it is more convenient to show the maximum relative humidity before condensation will occur. The chart above indicates how more insulation increases the maximum relative humidity allowed.

The chart also shows the effect of covering the duct with attic insulation (dotted lines). Even though the R-factor is increased by covering the duct with more insulation, it does not prevent condensation. Without a vapor barrier moisture will easily migrate to a cold surface even if surrounded by insulation. Therefore, it is important not to bury the duct in insulation in an area of high humidity.

The following steps will ensure that you minimize or eliminate any potential condensation.

1. Maintain the insulation thickness, even at the seams and joints. Wrap the duct with foam insulation or a larger piece of fiberglass rigid insulation wherever the outer insulation is compressed. Be sure that the insulation has an outer vapor barrier.
2. Always use the tape rings.
3. Use a foam rubber or rigid fiberglass saddle under all hanging straps.
4. Insulate the outside of the tape rings, especially around the terminator with a 2-inch or wider piece of insulation tape.
5. Repair all punctures and rips in the outer jacket.
6. Do not bury the duct in the attic insulation.
7. Seal all metal plenum joints and seams with mastic or aluminum foil UL tape. Use at least 1-inch of fiberglass blanket or sleeve insulation. Be sure the insulation has an outer vapor barrier.
8. Use shiplap joints and seal all rigid round fiberglass plenum joints with either UL heat tape or UL aluminum foil tape.
9. Use gaskets and make sure all take-offs are snug and secure against the plenum. Caulk if necessary.
10. CHECK FOR LEAKS BEFORE BOXING IN THE DUCT.

**NOTE: The outer jacket of the sound attenuator is the vapor seal. Be especially careful not to puncture or tear the outer mylar jacket.**

