Tamarack RAP White Paper

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The Need

The biggest duct in your home is the home itself. Conditioned air comes out of the supply vents and then travels through the house as it makes its way to the return vent. But if that pathway from supply vent to return vent is obstructed by a closed bedroom door, some of the air might not get back to the return.

The extra resistance to air flow created by not having a return air pathway creates a positive pressure in the bedroom. And the air in a pressurized room wants to find a way out. One possibility is that the conditioned air finds air leakage pathways to the outside. So that air you've just spent money conditioning now leaks out of the house.

In the room near the return vent, a negative pressure can develop. The result is that unconditioned outdoor air—which can be cold in winter, hot and humid in summer, and full of pollutants any time of year—leaks into the house. In addition, the negative pressure can cause problems for some combustion appliances, which can put carbon monoxide and other pollutants in your indoor air.

How the Return Air Pathway (RAP) Works

The RAP return air pathway is a grille that gets installed in a wall between a bedroom and a part of the house connected to the return vent. With the RAP in place, the pressure doesn't build up, at least not as much, when the air handler runs. Why? Because air in the bedroom now travels through the RAP and then to the air handler.

The RAP works on the same principle as the Perfect Balance. It provides a passageway for air to flow out of the bedroom, where it then can make its way to the return vent. The grille on the outside is a different material (metal vs. plastic), and the baffle inside the RAP transfer grille is the same as in the Perfect Balance. And as with the Perfect Balance, the air flow through the RAP will increase as the pressure difference across it increases.

Pros and Cons of the Perfect Balance

The RAP's advantages are similar to those of the Perfect Balance. It's inexpensive and easy to install. It can equalize pressures in the house, bringing the pressure difference down below the 3 Pa threshold for many bedrooms. It also contains a cardboard baffle to dampen sound transmission, which provides more privacy.

In addition, both the RAP and Perfect Balance can eliminate return ductwork, which can cut installation costs in new duct systems. By reducing return ductwork in unconditioned spaces, these transfer grilles also can reduce the heating and cooling loads.

There's a small chance that privacy could be reduced. But since the RAP goes into a wall, you can choose a location that minimizes that potential. Even if the RAP is located at an accessible height, however, the interior baffle makes views difficult at best and it was designed with that possibility in mind. The view and sound would be very limited.

In summary, the RAP is an excellent retrofit product for rooms that need a return air pathway as well as being a great return air pathway for new construction.