

How to properly duct an exhaust fan through a roof

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This item falls under the heading of 'things that homeowners can teach their contractor'.

Unfortunately too many renovators do not know that you can cause serious damage to your roof if you don't duct exhaust fans completely out of an attic. Some know, but just don't care.

You cannot just leave the exhaust duct to discharge in the open attic space, there is far too much water in that air. You cannot just lie it down in the soffit area, the air is warm and will rise not fall, bringing all that moisture back into the attic to rot out the roof. You cannot point it down into the soffits either, it still comes back although the Ontario building code allows this last configuration under the condition that you completely board off the soffit venting for three feet on both sides of the outlet. That Ontario practice is contested by many people, including members of the National Research Council generally along the same lines of my argument that we need continuous soffit venting and heat and moisture kept far away from the underside of the roof. In fact if you go through the wall you need to be three feet below the soffits if you want to avoid most of that steam from getting into the attic.

You cannot just put it near a roof vent, it will create massive frost all around the underside of that vent. There are only two ways for moisture laden hot air to really get out of an attic. Use a regular wall hood if you can go out through the vertical wall in the gable end of the house. Use a proper roof top exhaust hood if you must go through the roof.

In the first photo you see one very good roof top exhaust hood made by Ventilation Maximum in Quebec, where they tend to make roof vents taller to avoid being buried in the snow. On the outside you will see the wind baffle that prevents snow from blowing in. What you don't see is the arrangement that causes any accumulated frost on the inside to melt out onto the roof, not back into the ducting. On the inside, the critical element is you can make a positive air tight connection to the hood by clamping your ducting right to the duct that is part of the exhaust hood. This is not an attic vent, this is a roof top exhaust hood that totally prevents any moisture from the bathroom or the kitchen from causing rot problems in the attic. I prefer to run my exhaust vents downward and out through the basement because there is no condensation inside the ducting, but if you must go up through the roof, use a proper exhaust hood.

Richard wrote in asking if he could run the kitchen exhaust up an unused masonry chimney and if so, should he put in a liner?

Yes it is possible to exhaust up a chimney race way and because of the high moisture content of this exhaust air you must absolutely use a liner to protect the very porous masonry structure. You can do this, but I don't recommend it.

Even with a liner there will remain the problem of dripping coming back down that liner. The problem is that you are pushing very humid and not very hot air vertically up a good distance through a channel that may be totally exposed to winter temperatures on one side and once past the ceiling of the house it is exposed to winter temperatures on all sides. That is a guarantee of at least condensation if not frost build up during cold weather. Frost will melt and drip almost every time you turn on the fan. In addition, when the fan is not on, there is a very strong tendency for that column of cold air to flow downward into the kitchen. Hence this arrangement must have a back flow damper in the run and it is a good idea to have that damper accessible for cleaning given the quantity of grease that normally gets past the range hood filters. Overall -- cold air drafts, dripping water and grease build-up by trying to use a duct run that is not ideal for a kitchen range hood. [Click here for many more details on running exhaust fans through the attic.](#)

I would much rather spend all that energy getting the run down to a fan in the basement and out at ground level. [Click here](#) for an animation on how in-line fans can let you run long distances to allow you to go down and out lower. Down means no cold air drafts coming up the ducting, running inside the house means no condensation, out low down means that the exhaust hood is easily wind protected and finally any condensation that does form on the cold part of this run drips into the garden.

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