

# Basement walls -- Moisture & Vapour Barriers

Last Updated: Thursday, August 26th, 2021, Created: Thursday, December 23rd, 2010

Do I need to place a vapour barrier against the brick wall, then insulation and then another vapour barrier over that? The wall does not leak and is fully underground. Barbara

## THE VAPOUR BARRIER

The vapour barrier is more properly called a vapour retarder. It is designed to stop moisture in the form of vapour that is inside the house from moving into the walls and forming condensation or ice. Hence it must always be located on the warm-in-winter side of any insulation. Usually that is right behind the drywall. Moisture in the room will migrate through the drywall, reach the vapour barrier, which is almost at room temperature, and will not collect because it is not cold. So it will go into and out of the drywall as the humidity levels change in the house, but never affect anything deeper in the wall and will never reach the structure of the house. No mold, no rot, no problems.

So the first rule about a vapour barrier is that it goes on the warm-in-winter side of insulation. For exceptions to this, check out Buried Vapour Barriers. Follow this link for a fascinating article on Showers and Vapour Barriers.

if we were to have two vapour barriers in the same wall, one would certainly be slightly or a lot colder than the other and since moisture will always find its way past imperfections, that moisture can easily either condense on the second barrier and/or get stuck between the two. If there is organic material there, like wall studs, now you have rot. Hence the second rule: never two vapour barriers on the same wall.

## THE AIR BARRIER

We have another type of barrier in modern houses -- an "air barrier". Follow this link to see an animation on What Is The Difference Between a Vapour Barrier and an Air Barrier. This does stop air movement and liquid water, like rain, but does not stop vapour. Hence if we have an air barrier wrapped all around the house as our rain and wind protection, and a vapour barrier placed all around inside the house -- most of the moisture that wants to get into the wall is stopped at the warm vapour barrier, and what little gets past it will easily drift out through the air barrier -- hence we keep a wall dry with no rot. Actually a concrete wall, or a masonry wall without cracks is in itself a very good Air Barrier.

## THE MOISTURE BARRIER

If you have a double brick wall in the above ground portion of the house, we will often find some kind of building paper against the brick inside the house. This is a water infiltration barrier and perhaps an air barrier -- designed to cause water to flow down and out, not into the wall. Then insulation and then a vapour barrier.

In the underground portion of the foundation wall the game often changes a bit. Some people have never had any water infiltration in their house, or the neighbouring houses, and so they put no protection at all on the wall before the insulation. If there has been leakage or there is a "potential" for leakage we will put some moisture protection on the wall before anything else. If we put a vapour barrier -- like a polyethylene plastic sheet -- over the full wall we would certainly stop inward moving water but trap outward moving moisture. So there are two ways of protecting from water coming in while still letting moisture escape out.

The most common is to use that plastic sheet but attach it at ground level, no higher, and drape it right down the wall and a foot into the room. Then put the studs up over that, insulate the whole thing full wall height and then put a vapour barrier on the inside -- joining that little foot of plastic on the bottom up to the warm-in-winter vapour barrier. This gives a "J" shaped plastic sheet. The important detail is that the part of the wall above ground level, back on the cold side behind the insulation, has no barrier. It is insulated and has a vapour barrier on the warm indoor side, but nothing directly against the brick. It is extremely rare that any water will come in through this above ground portion of

the wall so it really needs no water protection. Any vapour that does get past the warm-in-winter vapour barrier can easily escape up through the insulation and out the top right through the brick. So you could say that there is a second vapour barrier on this wall, but it is specifically and carefully limited to the underground portion and a moisture escape route is left above it. This technique as well as using "smart vapour retarders" are explained here.

The second technique where someone wants water protection all the way up the wall is to use a house wrap, like Tyvek, against the brick -- this is an air barrier and water barrier but not a vapour barrier. This can go full height because it is not a vapour barrier. Then we put a full height polyethylene vapour barrier over the insulation.

#### AIR SPACES IN THE WALL

There must be no air space between the concrete or masonry wall and the insulation, although there could be an air space between the insulation and the drywall. For extensive details on air spaces in walls, see: [Air Spaces in Walls - Myth and Science](#).

I hope this clears things up. For lots more on Vapour Barriers, just click on the keyword below.

#### **Keywords:**

Mold, Moisture, Brick, Plastic, Humidity, Condensation, Foundation, Walls, Vapour Barrier, Air Barriers, Leaking, Concrete, Protection, Rot, Studs, Wind, Basement, Water, Insulation, House, House Wrap, Problems

**Article 2189**

[www.joneakes.com](http://www.joneakes.com)