Flash & Dash.

There is a method of insulating that is being marketed in our service areas we call ‘flash & dash’. This is a system that advocates installing 1 inch of foam to the plywood sheathing of a building between studs, then installing fiberglass batt insulation inside that, and applying a vapor barrier on the inside of the studs. My company does not offer this service.

There are a variety of reasons for this decision, and it seems to me that it is time for me to explain why. This is kind of long, and it has a fiberglass vs cellulose portion, so it may be boring, but it is well worth your reading.

First of all, the best reason for a foam contractor to offer that compromise is he or she cannot profitably undersell an established contractor with an equal system. Better to lower the price by offering a less expensive compromise and hope the other guy will adjust to the lower standard.

I have found that the system of applying all foam works very well, and it is reliable. However, the price of foam has risen excessively these past 4 years, so some sort of compromise is reasonable. We have recently (last 3 years) been installing foam in areas where it is absolutely the only good way to insulate, using spray cellulose in the balance of exterior walls, and blowing loose cellulose in attic floors. That compromise system is working well too. We have tested installations and found air change rates are similar to those for all foam jobs, clients are very happy, etc.

Cellulose is installed at densities of 2 to 3 pounds per cubic foot in these applications. Fiberglass batt insulation is commonly manufactured at 0.9 pounds per cubic foot. This means the fiberglass is more susceptible to convective air movement in wall cavities than cellulose is.

Fiberglass guys will say cellulose absorbs water. It does, because by definition ‘absorb’ means it takes the water into its cells. Fiberglass doesn’t absorb water. BUT, your toothbrush doesn’t absorb water either. Ever tried to dry a tooth brush? Capillary action is a very tenacious way of moving and holding water. Fiberglass holds water by capillary action. The problem of holding water is common to both products in the absence of air movement. If the fiberglass allows air to move well enough to dry it, then it is allowing too much air movement to effectively insulate.

Fiberglass people also say cellulose burns. Most cellulose manufactured today uses liquid applied borate based fire retarders, not powders that can separate. We use those borate products, and I have confidence in them. The biggest risk in cellulose is application around an incompatible (IP) recessed light. In that situation, there have been fires. The process is fire begins in the wiring. The cellulose gets hot enough to allow the fire to propagate along the wire to a framing member and the framing burns

much like an underground coal fire. In the end, the cellulose often has not burned, but the frame in it has. This happens because the recessed light designers don't consider insulation as cellulose or foam, they assume it is fiberglass and it will allow enough heat to escape through the insulation to prevent this problem. In a way, this argument again proves that cellulose is a more effective insulation product than fiberglass.

Back to flash & dash.

There are a lot of installations where one inch of rigid foam (exterior foam sheathing) is installed on the exterior of a structure, and the wall cavities are insulated with fiberglass. These systems do not usually exhibit moisture problems associated with a condensing surface inside the wall, so I do not believe that will happen with flash & dash in our area either, PROVIDED the foam is at least 1 inch thick everywhere. However, if I were writing the specification, I would specify 1 ½ inch thick foam to be certain there is enough. Also, if this is the system you want, then why not use the rigid on the outside, and 2x4 studs with R-13 in the studs? That would actually perform better because the thermal break caused by the studs would be removed by the exterior foam sheathing.

This is NOT effective in ceilings though. I have been involved with one, and only one, installation of flash & dash in a roof system, and it failed miserably. In that case, the building was a radiant slab with ICF walls footer to roof, and an I joist rafter cathedral ceiling system. The owner specified a rigid foam sheathing ½ inch thick be applied to the top web of the I joists to create a roof ventilation system, and 1 inch of foam be applied to the rigid. Then we installed R-30 fiberglass in the remainder of the joist system. When the floor was first fired, the water ran out of the roof so fast they shut down the heat. We went back and applied a second inch of foam to rectify that problem. At that point, there was 2 ½ inches or more of foam in the roof. That was enough foam to make the fiberglass minimally important so no condensing surface.

We all have to stop thinking of walls, floors, and ceilings in two dimensions. These systems are three dimensional. When we apply foam 3 inches thick in a 2x6 wall, we cover 4 to 5 inches of the sides of the studs and top and bottom plates, which effectively seals the penetrations electricians, plumbers, and HVAC contractors put in these framing appliances. One inch of foam would not reach those penetrations and that would lessen the performance of those systems. Spray cellulose at 2 pounds per cubic foot will seal those penetrations as well as foam, so I don't find a problem with that application.

The last argument is economics. To install an inch of foam in a building, we still have to transport equipment, men, and material to the job, and do the preparation for foam. We have to maneuver the hose and gun throughout the house. Foam comes out of the gun at about 110°F, as it reacts on the surface; it heats further to 140 °F. As the substrate temperature increases we get better yields. The economy of installing 3 inches of foam at $ 2.75 per foot is in this added yield in the second and third inch. If

we reduced to 2 inches or less, I would still charge $ 2 per foot. That means the fiberglass guys would have to install batts and vapor barrier at $ 0.75 per foot or less to equate to the same cost. A fiberglass company may be able to do this for less by paying crews piece rates and buying at a volume discount, but we cannot. And, lessening the cost of the foam does not seem sensible economically.

The only way flash & dash makes sense is if the foam is applied at 2 inches thick or more. In that situation, it doesn't matter how well the fiberglass is installed because the foam is doing the insulating. It would make everyone's life easier if the codes just understood how foam works and allowed installation based on what works, not what the R value is.

One final point, I would promote flash and dash in R-49 ceiling applications. BUT, my endorsement is to install R-30 foam and R-19 fiberglass. In this situation, the foam is stopping 93% of heat loss, and the fiberglass is just there to satisfy the code guys. This system would cost about $ 4.50/ft as compared to $ 6.50 for R-49 foam. Foam applied more than 4 inches thick in one day can result in cracking and fires due to spontaneous combustion. Applications at 7 inches or more to get R-49 are extremely expensive because they require doing the job twice with a 24 hour cooling off period between applications.