

## Tech Tips: 2-in-1 Adhesives vs. Vapor Retarders

### 2-in-1 Adhesives versus Stand Alone Vapor Retarders

#### Do 2-in-1 adhesives work?

The simple answer is “yes”, as long as substrate prep is done properly, and the flooring material is manufactured flat. And by flat, I mean FLAT!!!

**What makes 2-in-1 adhesives both a vapor retarder and an adhesive?** 2-in-1 adhesives contain *more* urethane resin compared to a regular urethane adhesive.

**How are they applied?** By trowel

**What is a 2-Part Epoxy System:** They are primarily polymers built up from monomers that contain an ether group. They consist of a resin and a curing agent. The following are examples of 2-part epoxy systems commonly used in the wood flooring industry:

- Franklin Titebond 531
- DriTac 7000
- Deco-Rez (by General Polymer)

**How are they applied?** Most manufacturers suggest using a paint roller (usually ¼” nap) over a specified amount of surface area to obtain warranty coverage.

**How do they guard against moisture?** They don’t prevent moisture from emitting from the slab’s surface, but rather slow down the process by sealing the slab’s surface. The wood can then absorb a controlled amount of moisture, and release it (within a 24-hour period) while maintaining dimensional stability. This helps to prevent moisture related damage (i.e., crowning, checking, splitting, buckling, blisters etc).

**What are urethane membrane systems?** Just what the name implies...

**How are they applied?** By trowel

**How do they guard against moisture?** Typically they contain a higher percentage of urethane, and are developed with a viscosity that allows the product to flow or self-level. The self-leveling results in a continuous membrane (usually 20 to 30 mils thick) that works to control the amount of moisture passing from the slab’s surface in a 24-hour period. As is the case with 2-part epoxies, they don’t stop moisture they simply slow it down. An example is Bostik Finley’s MVP (Moisture Vapor Protection).

## Pros and Cons of 2-in-1 Systems

### Pros:

2-in-1 systems perform well if the flooring mechanic follows the adhesive manufacturer's guidelines. This includes subfloor prep, utilizing the correct trowel, and obtaining 100% transfer of the adhesive to the back of the boards. The idea is to create a continuous membrane between the substrate and the back of the boards.

When they work they save time by not having to wait for the epoxy coating or urethane membrane to dry. Dry times can vary, but usually take eight to 24 hours before work can continue.

### Cons:

Failure to achieve 100% transfer to the back of the boards creates a weakness in the system. An example of this is without the development of a membrane between the wood and the subfloor there is minimal to no protection against moisture emitting from the slab's surface. This can result in moisture-generated failure.

Manufacturers of 2-in-1 systems design their products to perform within tight subfloor flatness requirements. They typically require a flat subfloor, within 1/8" to 3/16", in 10-feet in all directions for their system to create a vapor retarder along with adhesion when the flooring is installed into the glue.

Adhesive manufactures that produce this type of system did not consider the floor flatness tolerance (bow up and bow down) for wood flooring. This according to ANSI/HPVA standards, at time of manufacturing. ANSI/HPVA allows 1.25% x the length for bow up and bow down. I can only assume that they figured that all wood flooring must be manufactured flat! The bottom line is that the subfloor and the wood floor can fall within their perspective flatness requirements and the system can still fail.

### An Example:

The adhesive manufacturer calls out a subfloor flatness of 3/16" in 10-feet in all directions. The flooring installer prepped the subfloor to conform to the tolerance, but the wood floor was out of flat by 3/16". This is well within the allowable flatness range per ANSI/HPVA. However, the entire flatness package is out of tolerance because there would be a gap as much as 3/8" between the subfloor and the bottom of the wood.

### Result:

A condition known as "*spring back*". Spring back can occur with boards that are bowed (but still in tolerance). When placed into the adhesive, boards spring back to their original bowed condition resulting in wet release and a compromised vapor retarder. If the vapor retarder is compromised by wet release, the chances of moisture making its way passed this stringy mess of adhesive is increased substantially. The chances of moisture caused failure also increase substantially.

It is for this reason that Johnson does not recommend the use of 2-in-1 type systems in lieu of standalone type systems. The amount of claims we receive for moisture caused failures when using 2-in-1 systems compared to standalone 2-step systems is incomparable. I would say that for every one claim we receive involving standalone systems we receive 10 to 20 claims involving a 2-in-1 system.