

TUFF INDUSTRIES^{INC}

TUFDEK

ECONODEK

TUFF-SHIELD

TECHNICAL

BULLETIN

*“Everyone talks about the weather,
but no one does anything about it.”*

- Mark Twain

TECHNICAL BULLETIN FOR COLD / WET WEATHER INSTALLATIONS

Cold / Wet weather requires special attention to ensure vinyl deck installations bond to the substrate. Proper temperatures, humidity, moisture and dew points must be achieved before, during and after installation for the best rate of success.

THE DECK SUBSTRATE

A warm dry substrate is a critical component to the installation of vinyl membranes. This issue becomes more pronounced during the shoulder seasons, October, November, February and March when the day time temperatures can be above freezing but the night time temperatures will drop to freezing or below. Keeping the deck temperatures at 40°F / 5°C and rising, as well as the moisture content of the plywood below 20% will improve your odds of a good quality membrane installation.



DEW POINT

The dew point is the temperature at which water vapor in the air condenses into liquid water which is then called dew as it forms on solid surfaces. The dew point is associated with relative humidity and a high relative humidity indicates the dew point is closer to the current air temperature. Relative humidity of 100% indicates the dew point is equal to the current temperature and the air is maximally saturated with water. When installing vinyl membranes you should always ensure your dew point is a minimum of 5°F or 3°C below your ambient air temperature. When using latex adhesives such as Trowel-On or Roll-On you will be adding moisture to the deck area which increases the relative humidity at the surface. If you use contact adhesive such as Tuff Low VOC or Econodek SBA, the solvents (Acetone and Toluene) will cool the surface they are applied to. This cooling effect when using solvent adhesives can drag the surface temperature through the dew point causing water to form on the adhesive, installers often refer to this as “blushing”. When “blushing” forms on the solvent adhesive you should wait for it to evaporate then apply a second coat of adhesive to create the proper bond.

DEW POINT CALCULATION CHART (FAHRENHEIT)

AT 30 HG BAROMETRIC PRESSURE

Ambient Air Temperature °F

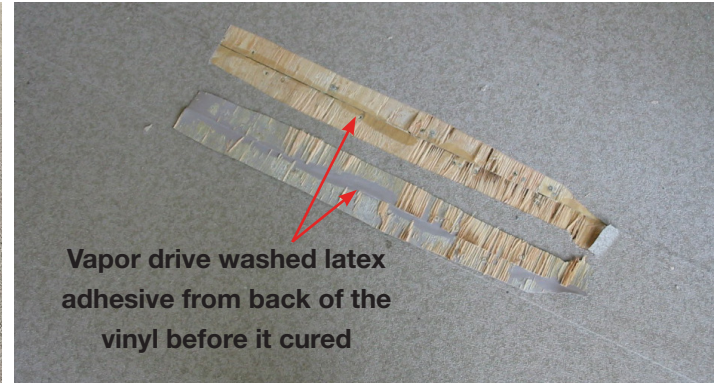
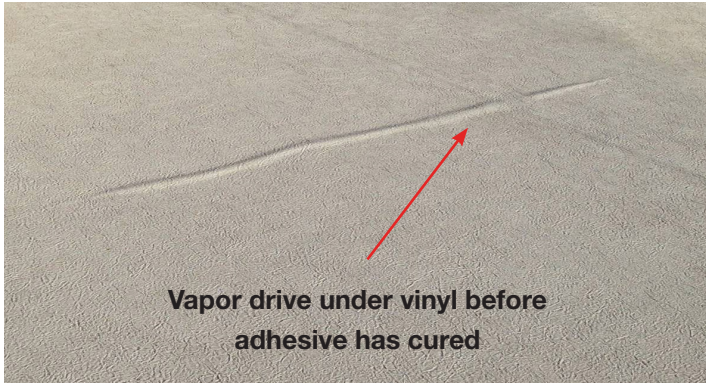
	20	30	40	50	60	70	80	90	100	110	120
90	18	28	37	47	57	67	77	87	97	107	117
85	17	26	36	45	55	65	75	84	95	104	113
80	16	25	34	44	54	63	73	82	93	102	110
75	15	24	33	42	52	62	71	80	91	100	108
70	13	22	31	40	50	60	68	78	88	96	105
65	12	20	29	38	47	57	66	76	85	93	103
60	11	19	27	36	45	55	64	73	83	92	101
55	9	17	25	34	43	53	61	70	80	89	98
50	6	15	23	31	40	50	59	67	77	86	94
45	4	13	21	29	37	47	56	64	73	82	91
40	1	11	18	26	35	43	52	61	69	78	87
35	-2	8	16	23	31	40	48	57	65	74	83
30	-6	4	13	20	28	36	44	52	61	69	77

Dew Point: The temperature at which moisture will condense on the surface. No vinyl membrane should be installed unless the surface temperature is a minimum of 5°F or 3°C above the dew point. Proper temperature and humidity must be maintained during the curing of the adhesive.

Example: If air temperature is 70°F / 21°C and relative humidity is 65%, the dew point is 57°F / 14°C. Since your air temperature is more than 5°F or 3°C above the dew point, you can install vinyl membranes under these conditions.

VAPOR DRIVE

Warm air is able to hold more water vapor (water in its gaseous state) than cold air. Like any other gas, areas of higher water vapor concentration will try to disperse into areas of lower concentration to reach an equilibrium density. This means there is a tendency, often referred to as a vapor drive, for water vapor to move from warm temperature areas to lower temperature areas. As vapor passes through lower temperatures the air may reach its saturation or dew point, causing the vapor to condense into liquid water. This vapor drive will happen if you tarp only one side of the deck structure or if the deck is near a large body of water and wind drives the humidity off the water surface and up under the structure. Never create two temperature environments above and below the deck, this will create vapor drive up through the plywood joints depositing moisture on the back of the vinyl membrane and washing the uncured adhesive from back of the vinyl before it cures.



INSTALLING A TARP STRUCTURE TO CREATE THE RIGHT WORKING ENVIRONMENT

If the outside temperature is constantly at or below 40°F / 5°C you should avoid installing vinyl deck membranes unless you have a method for creating the right work environment. When creating this work environment you must never create two temperature environments above and below the deck or vapor drive can occur. The best method for achieving a warm dry substrate is to install a tarp structure to the ground encapsulating the deck and leaving a large enough space to work under with the tarp in place. A properly installed tarp will limit the moisture in the substrate due to frost, rain, snow or dew and provide better working conditions and efficiencies for your installers.



ADHESIVES

There are no adhesives available for the installation of vinyl deck membranes that work at temperatures below freezing or for installations on damp or wet decks. If you take the risk of installing under these conditions, you increase the chance of failure due to poor adhesion. All Tuff adhesives should be used at temperatures of 40°F / 5°C and rising, with a moisture content of the wood substrate no higher than 20%. If these conditions are not present during the vinyl installation, you need to artificially create them.

LOW VOC CONTACT ADHESIVE

Low VOC Contact Adhesive is manufactured with a limited volume of volatile organic compounds, specifically Acetone and Toluene. This will be particularly noticeable in the application process as Low VOC Contact Adhesive is very thick and difficult to apply. The issue will become worse if you remove the lid from the pail and the limited amount of solvents flash off. There are four solutions for making Low VOC Contact Adhesive easier to use.



1. Keep the adhesive warm (approx 70°F / 21°C) during installation.
2. Do not remove the lid, instead pour the adhesive into a separate application pail in small amounts to avoid flashing off the solvents.
3. Add Toluene or Acetone to the adhesive to thin it out. This will no longer enable the product to be considered Low VOC which you might need to consider depending on the application. As a rule no more than 2 cups of Toluene or Acetone can be added per 5 gallon pail.
4. If "blushing" occurs remove moisture and create proper conditions before re-applying new adhesive.

ROLL-ON

Roll-On is fast curing latex adhesive which can be used as a one sided transfer application (vinyl installed into wet adhesive) or as a two side “contact” application (one side dry and one side tacky). The advantage with Roll-On is the quick cure time enabling you to drop your vinyl passes into the adhesive sooner on cool damp days. Installing vinyl into latex adhesive which has not properly cured can trap moisture under the vinyl enabling vapor drive and wash the adhesive off the back of the membrane before it has dried.



Here are some product specific guidelines for using Roll-On.

1. Do not use when relative humidity is above 90% or when rain is expected.
2. Do not use when the temperatures can be expected to fall below the dew point during application and/or up to 6 hours after application.
3. Do not use when temperatures are expected to fall below freezing within 24 hours of application.

TROWEL-ON LATEX

Trowel-On latex is applied with a notched trowel and requires wet glue transfer. This application method can be the most challenging in cool damp weather as the adhesive should be allowed to skin over before dropping the vinyl into the adhesive. Once the vinyl is placed into the adhesive you must apply weighted pressure to cause the adhesive to transfer to the back of the vinyl sheet. Installing the vinyl into adhesive which is too wet will trap moisture under the vinyl and prolong the curing time. If the adhesive is not cured and you get vapor drive under the structure it will wash the adhesive off the back of the membrane before it cures. Keeping the deck warm and dry will help avoid this issue. Here are some product specific guidelines for using Trowel-On.



1. Do not use when relative humidity is above 75% or when rain is expected.
2. Do not use when the temperatures can be expected to fall below the dew point during application and/or up to 24 hours after application.
3. Do not use when temperatures are expected to fall below freezing within 24 hours of application.

DECK PATCH



Deck Patch is a modified polymer cement based compound requiring the right conditions to properly bond to the deck. Only use Deck Patch when the substrate and ambient temperatures are between 50°F and 100°F / 10°C and 38°C and the relative humidity does not exceed 85%. When mixing Deck Patch we recommend using clean potable water that does not exceed 73°F /23°C. Using water at a lower temperature will increase the working time or pot life of Deck Patch and using water at a higher temperature will decrease it. Never force dry the Deck Patch on the substrate as you could weaken the bond.

ECONODEK SBA ADHESIVE

SBA Contact is a two side solvent based adhesive applied with a brush or roller and used for both horizontal and vertical attachment of vinyl membranes with backings. Here are some guidelines specific to this product.



1. Keep the adhesive warm (approx 70°F / 21°C) during installation.
2. If “blushing” occurs remove moisture and create conditions to properly apply adhesive before re-applying.
3. SBA contact adhesive can only be used on vinyls with backings such as Econodek. Never use on vinyl back vinyl such as Tufdek.

Although we cannot control Mother Nature we can control our work environment by taking the appropriate precautions to ensure the best possible installations year round. If you monitor the temperature humidity and dew points of your work environment, you will significantly increase your success of a quality installation.