

General

IMPERMITEK systems, when used with the relevant primers, may be applied over a variety of substrates including but not limited to existing single-ply membranes (PVC, TPO and EPDM), built-up roofing, concrete, acceptable existing non-silicone coatings, masonry, wood, coverboards, metals and plastics.

IMPERMITEK systems, as with other liquid applied membranes and coatings, require monitoring of environmental variables along with a sound stable dry substrate to ensure proper application and performance. At time of application, the substrate must be clean, dry, free of loose, spalled or weak material, oil, grease, contaminants, abrupt changes in level, waterproofing agents, curing compounds, and free of projections which could damage IMPERMITEK components.

Jobsite Weather & Environmental Considerations

Jobsite monitoring of basic environmental conditions is necessary during application. All jobsites should be equipped with a means to monitor and record:

- Ambient air, substrate & resin temperatures.
- Relatively humidity (RH) & dew point.



Typically, this will require the use of a multi-function non-contact Infrared Thermometer with integrated relative humidity (RH) and Dew Point features.

Prior to and during applications, monitor ambient, substrate, and material temperatures as well as environmental factors such as forecast precipitation, sun, cloud cover, shade, wind, humidity, and dew point. Ensure conditions are satisfactory to begin work and ensure conditions remain satisfactory during the installation of specified IMPERMITEK components. Materials and methods should be adjusted as necessary to accommodate varying project conditions.

Unexpected Precipitation

If rainfall or other precipitation occurs during application resin components may be damaged requiring additional remediation before proceeding with further application. Generally, IMPERMITEK catalyzed liquid systems will fully cure if rained on, and remediation is often aesthetic only. Always stop the installation when experiencing unexpected rainfall or precipitation.

If precipitation has occurred prior to application, the wet substrate must be dried before beginning work. If

precipitation occurs during application, ensure that the substrate is dry before continuing with work.

Wind

In windy conditions it is more likely that the applied product will become contaminated by windblown leaves, dirt, debris, dust, etc. In this situation suitable remedial action should be taken. Wind can also affect surface and air temperatures during application.

Application Temperatures

Generally, IMPERMITEK components may be applied while ambient temperatures remain 5°F (3°C) above the dew point and air temperatures are between 34°F (1°C) to 95°F (35°C) for most resins and between 41°F (5°C) and 113°F (45°C) for IMPERMITEK SlowCure Grade resins. All IMPERMITEK resin components may be applied up to a maximum 95% RH.

Keep in mind that resin temperature is generally the primary influence on pot life and cure time. In high and low ambient temperatures, provide jobsite protection for resin storage and mixing for optimum pot-life and workability.

Refer to individual Product Data Sheets (PDS) for specific product environmental restrictions, recommendations, use of weather additives, and other requirements or limitations.

Ensure conditions are satisfactory to begin work and ensure conditions remain satisfactory during the installation of specified materials. Materials and methods may need to be adjusted as necessary to accommodate varying project conditions. IMPERMITEK materials should not be installed when conditions are unacceptable to achieve the specified results.

Working in Lower Temperatures

When working at lower temperatures, IMPERMITEK recommends storing materials in a warm location to ease application and promote curing.

Keep in mind at a low temperature the surface temperature may be lower than the air temperature. If the surface temperature is at or below freezing point, or below dew point, the application must be postponed. The temperature should be stable and at least 5°F (3°C) above dew point (the temperature at which condensation can occur). Refer to individual product data sheets for use of Low Temperature Accelerators where applicable.

Working in Higher Temperatures

When working in higher temperatures, IMPERMITEK recommends storing materials in a cool location to

ease application and slow curing. Use tarps or an appropriate cover to reduce substrate temperature.

Deck temperatures should be monitored to help ensure recommended application temperatures are not exceeded. In hot sunny conditions it is likely that some surface temperatures will exceed air temperatures, especially when working on dark colored substrates. In such cases and were appropriate use of Uni-Primer DP, a white pigmented primer or IMPERMITEK Foil-Faced Base Ply will greatly lower substrate temperature and should be considered as well as working during off hours such as early morning or evening.

Also, when working in high temperatures consider resin-based options for longer pot life and working times including IMPERMITEK Protec FW-25 SlowCure Grade and High Temperature Inhibitors for Protec FW-25 Standard Grade resins.

Substrate Conditions

Before applying IMPERMITEK components, substrates must be evaluated to determine the following:

- Soundness & suitability.
- Required surface preparation.
- Substrate moisture content.
- Adequate primer adhesion.

Once the substrate is evaluated and deemed suitable by the applicator, the IMPERMITEK application may proceed.

IMPERMITEK Recommended Substrate Guidelines

Determinations of moisture content and bond strength should be performed by the contractor prior to application of IMPERMITEK components and periodically throughout the course of work. IMPERMITEK recommends checking moisture and adhesion at minimum three (3) tests per 5000 ft² (465 m²) intervals or otherwise required by project conditions.

To be considered suitable for application of IMPERMITEK components and systems, IMPERMITEK advises all substrates meet the following requirements unless otherwise noted:

- 75% relative humidity or 6% maximum moisture content.
- 116 psi (0.8 N/mm²) for roofing or non-traffic bearing waterproofing applied on structural substrates. The bond of IMPERMITEK components will vary and be limited by the substrate type or material used. Lower values would be anticipated and acceptable for applications direct to coverboards,

insulations, existing roof membranes, and certain coatings.

- 220 psi (1.5 N/mm²) for traffic bearing waterproofing and surfacing applied on structural substrates.

NOTE: If substrate RH exceeds recommended levels, consult IMPERMITEK regarding possible use of an appropriate moisture mitigation primer when required.

Recovering Existing Waterproofing Membranes & Coatings

When recovering an existing waterproofing membrane or coating, IMPERMITEK systems are limited by the integrity and adhesion of the existing membrane or coating to the structural substrate. Therefore, in recovery applications any warranty offered by IMPERMITEK is limited to adhesion of IMPERMITEK components to the properly prepared and primed surface of the existing membrane or coating.

At a minimum the existing membrane or coating should be intact and bonded to the substrate with adequate adhesion to resist the design uplift pressures and/or dynamic loads required by the model building code for the structure, building components, cladding and new waterproofing system.

Evaluating Existing Roof Systems for Recovery Applications

General

When considering roof recovery options, the existing roof system must be evaluated to determine if it may be re-covered or whether removal and replacement is necessary. Evaluation should follow NRCA recommended guidelines beginning with visual inspection of the building perimeter and existing roof system, core testing, and moisture surveys. Whenever possible, the underside of the roof deck should be visually inspected to determine its type, condition, slope, and attachment.

The contractor is responsible for examining existing roof substrates and identifying potential hidden conditions throughout construction to ensure conditions are acceptable for recovery operations and building code compliance.

Core Tests

Core cuts should be made to determine the roof system's composition and component condition. Cores will help confirm the membrane type and thickness and other components such as coverboard type, thickness, and attachment method were used as well as insulation type, thickness, number of layers, attachment method, and condition were present. Core size may vary depending on the roof system being evaluated and as may be required by the roof designer or consultant. IMPERMITEK recommends all cores

be made using a standard 2 in (50 mm) diameter minimum roof core sample cutter.

Multiple core cuts should be done at select locations including separate roof area, elevations and levels, or when different roof compositions are visually apparent. If access to the building interior is prohibited determination of deck types can be made following removal of the roof cores.

Once the core cuts are complete and documented, the core materials should be replaced, and roof or waterproofing assembly patch as required to make the existing assembly watertight.

Moisture Surveys

Roof moisture surveys, leak tests, uplift tests and other integrity tests are encouraged by IMPERMITEK as needed for the contractor to evaluate existing conditions. When evaluating moisture content of roof assemblies, nondestructive moisture evaluation techniques should be considered. Nondestructive moisture evaluation techniques include infrared thermography, neutron (nuclear) thermalization and electrical capacitance. IMPERMITEK may request a copy of these findings but generally they are not a requirement for IMPERMITEK warranty issuance.

Acceptability

Once all evaluations and testing are complete, any wet or defective roof areas that are not suitable for recovery should be removed and replaced with new materials to match existing. An existing roof acceptable for recovery shall be totally dry and free from any signs of deterioration or rot.

Field Adhesion Testing

General

The applicator is responsible to select a suitable means for jobsite adhesion testing when evaluating substrate suitability. A variety of recognized methods can be used to determine bond strength to a substrate.

Commonly used field techniques include adhesion peel strips for roofing and non-traffic bearing waterproofing applications or use of a portable pull-off adhesion tester for traffic bearing waterproofing and surfacing applications.

When determining substrate suitability, both the adhesive bond strength and failure mode should be considered. Typically, optimum adhesion is demonstrated by cohesive failure within the IMPERMITEK components or membrane. Adhesive failure at the substrate interface or failure of the substrate itself would indicate issues with the substrate structural integrity, possibility of contaminants, or need for additional substrate preparation.

Adhesion Peel Testing

Peel testing may be used to qualitatively establish whether adhesion of IMPERMITEK components to a substrate, coating, membrane, or previously applied components in multi-coat systems are generally adequate. Peel testing is often used for IMPERMITEK roofing and non-traffic bearing waterproofing applications where adequate adhesion typically results in a residual layer of bonded resin remaining on the substrate. Peel testing should be performed in accordance with ASTM C794.



Any failure at the substrate interface or failure of the substrate itself could indicate issues with the substrate integrity, possibility of contaminants, or need for additional substrate preparation.

Adhesion Pull Testing

Pull testing is often used for IMPERMITEK traffic bearing waterproofing and surfacing systems to quantitatively establish whether adhesion of IMPERMITEK components to a substrate, coating, membrane, or previously applied components in multi-coat systems are generally adequate. Pull testing is performed using a portable adhesion tester in accordance with ASTM D4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.



As with peel testing, any failure at the substrate interface or failure of the substrate itself could indicate issues with the substrate integrity, possibility of contaminants, or need for additional substrate preparation.

Substrate Moisture Testing

IMPERMITEK recommends monitoring substrate moisture content, especially in concrete and masonry.

It is important when applying IMPERMITEK system components that the substrate or intermediate layers to which they are being applied are sufficiently prepared, clean and dry. Even with visibly dry substrates, moisture content may be greater than the recommended levels, so substrate moisture content should be confirmed using an appropriate moisture meter before and throughout application.

IMPERMITEK components should not be applied over damp, wet or saturated insulation, decks, or other substrates. Where latent moisture is a concern, careful consideration should be given to the installation of permanent roof ventilation and/or using an approved moisture mitigation primer where appropriate. Areas where the insulation



or underlying substrate has collapsed or is defective or decayed, should be cut out, repaired and reinstalled to provide a good solid base prior to applying any IMPERMITEK components.

Concrete & Masonry

IMPERMITEK recommends all concrete and masonry moisture testing be performed by relative humidity (RH) in accordance with ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes or other means suitable to the project application.

Other Substrates

For relatively dry substrates, surface moisture can quickly, easily and repeatedly be performed non-destructively using hand-held electronic moisture/RH meters. IMPERMITEK recommends the use of an electronic hand-held meter specifically designed for measuring moisture/RH utilizing a pin-less meter pad with a minimum $\frac{3}{4}$ in (19 mm) penetration in accordance with ASTM D7954 Standard Practice for Moisture Surveying of Roofing and Waterproofing Systems Using Non-Destructive Electrical Impedance Scanners. The optimum instrument would measure moisture content, relative humidity, temperature, and dew point in concrete and cementitious substrates.

NOTE: Substrate with higher than recommended moisture levels should be left to dry naturally or may require use of an appropriate moisture mitigation primer. Application onto wet substrates is likely to cause a loss of adhesion that could lead to either localized or extensive blistering, delamination, or failure impacting the application and long-term performance of IMPERMITEK systems. Consult IMPERMITEK with any substrate moisture issues that may be in question before proceeding with application of IMPERMITEK components or membrane.

Substrate Contaminant & Other Testing

Issues demonstrated through previously applied material failures or presented by visual observations may dictate additional field and/or laboratory testing to confirm substrate suitability for IMPERMITEK systems. This may be of particular importance for traffic systems applied directly over structural concrete substrates. Consult IMPERMITEK with any substrate issues that may be in question before proceeding with the application of IMPERMITEK components.

Integrity Testing Completed Work

Once construction is completed, moisture surveys, flood tests or other integrity testing may provide useful information for the contractor or be a requirement by the owner, specifier or consultant.

IMPERMITEK recommends performing post-installation nondestructive roof integrity testing using electronic leak detection and more specifically EFVM (Electric Field Vector Mapping) as a preferred method

for testing membrane continuity. This is of particular importance after installing the field membrane and before placing aesthetic color finishes, overburden, or traffic surfacing.

IMPERMITEK advocates for roof assemblies that are designed ELD ready by using an electrically conductive primer such as TruGround® Conductive Primer that can be applied to the top of the cover board or insulation. This primer below the waterproofing membrane allows ELD test procedures to be performed without false negative results that can occur when the ground is not directly available.

Post-installation leak detection on roofs with overburden and vegetation, IMPERMITEK recommends using low-voltage ELD. Low-voltage ELD can be performed and provide accurate results even in the presence of water and overburden as in the case of green roofs.

Post-installation integrity testing does not guarantee a warranty will be issued by IMPERMITEK. The IMPERMITEK warranty is issued upon satisfactory completion and review by IMPERMITEK.

DISCLAIMER

The purpose of this Guide is to provide fundamental information and important design and/or application considerations for IMPERMITEK roofing, waterproofing and surfacing assemblies. IMPERMITEK manufactures and sells roofing, waterproofing, and traffic surfacing materials and does not practice architecture or engineering.

IMPERMITEK is not responsible for the performance or damage to its products caused by such things as improper building design, construction flaws, or defects in workmanship. These guidelines should not be construed as being all-inclusive, nor should they be considered as a substitute for good application practices. This document and/or any other literature produced by or on behalf of IMPERMITEK are offered for the purpose of guidance and must be evaluated and modified as required, by the Designer of Record and or applicator for each individual project.

The design and use responsibility of IMPERMITEK products remains with the architect, engineer, roofing contractor, or owner. Please consult your design professional for more information. IMPERMITEK responsibility is limited to the terms and conditions of IMPERMITEK warranty which takes effect only when issued in writing by IMPERMITEK to the customer. Specimen warranties are available on request.