

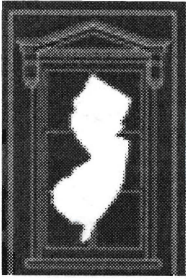
**APPLICATION FOR PROJECT AUTHORIZATION  
UNDER THE NEW JERSEY REGISTER  
OF HISTORIC PLACES ACT  
FOR THE HOBOKEN TERMINAL – PHASE 1  
ADVERTISING INSTALLATIONS PROGRAM**



**PREPARED BY NJ TRANSIT  
MARCH 2010**

974.90  
A244  
2010

C. J.



# Application for Project Authorization Under the New Jersey Register of Historic Places Act

**NJ Department of Environmental Protection · Natural & Historic Resources · Historic Preservation Office**

**Date**                                **March 12, 2010**

**Applicant**                        **NJ TRANSIT**

State, County or Municipal agency or instrumentality thereof, applying for authorization.

Note: If an application is being submitted by an authorized representative on behalf of a public agency, written authorization from the public agency must be submitted with the application.

**Project Name**                    **Hoboken Terminal – Phase 1 Advertising Installations Program**

**Contact Person(s)**            **Dara Callender**

**Address**                            **One Penn Plaza East, Newark, New Jersey 07105**

**Telephone**                    **(973) 491-7205**                    **FAX**    **(973) 461-4678**                    **E-mail**    **DCallender@njtransit.com**

**(FOR HPO USE ONLY)** Technically and Professionally Complete Date \_\_\_\_\_

## New Jersey Register Listed Property Affected by Project

<b>Name of listed Property or Historic District</b>	<b>Erie-Lackawanna Terminal</b>
<b>Address of listed Property</b>	<b>Hudson Plaza at the Bank of the Hudson River</b>
<b>Block #</b>	<b>Lot #</b>
<b>Municipality</b> <b>Hoboken</b>	<b>County</b> <b>Hudson</b>



## Required Documentation

Please enclose the documentation listed below as required by N.J.A.C. 7:4-7.1(d). The required documentation, taken with the project description, must be sufficient to completely describe the proposed undertaking. When using attachments, please label using the letters and numbers (e.g., A.1.c) as listed herein.

1. Complete lists (include addresses) of:
  - a. Local historical societies
  - b. Local historic preservation commissions
  - c. All public and private property owners of registered property directly affected by the project. N.J.A.C. 7:4-7.1(d) stipulates that this list shall be the list of all private and public property owners (including right-of-way owners) named in the official municipal tax records and maps as of the date of the application's submission and shall be notarized by the appropriate municipal official. This list is not the list of property owners within 200 feet of the project; (although submission of that list would be acceptable) it is the list of owners of registered properties which are directly physically impacted by the project.

- d. All affected local government units, any agencies or instrumentalities thereof concerned with historic preservation, and any statewide organization and local organization specifically concerned with historic preservation in the area of the undertaking's potential impact.

Applications which do not include these four lists are not complete and cannot be reviewed until this information is received.

2. Maps
3. Photographs, both of the overall project area and of specific project work areas. Photographs should be labeled as to location and keyed to a plan sheet. (Although optional, slides may augment the application and facilitate the presentation to the Historic Sites Council of a project that is an encroachment.) Photographs should be labeled (identifying site location and keyed to architectural or engineering plans.
4. Complete architectural or engineering plans – including a site plan (2 sets)
5. Specifications (1 set)
6. Proposed agreements (easements, lease, deed, covenant, etc.) applicable to the undertaking.
7. If the application proposes demolition of all or a substantial portion of a property, the application shall include a structural assessment and an evaluation of whether the property could be reasonably repaired, to be prepared by an architect or engineer with demonstrated experience with historic properties.
8. If the application proposes relocation of a New Jersey Register listed property, information and documentation required in N.J.A.C. 7:4-3.2(c) must also be submitted.

## **B.** Project Description

Please describe the proposed undertaking in full detail. Where functional or programmatic constraints call for changes to historic configurations, those constraints should be explained very clearly. (Use lettered attachments when necessary.)

**See attached**

## **C.** Statement of Purpose

Please state the need and/or purpose for the proposed undertaking. Address public benefit of the proposed project. (Use lettered attachments when necessary.)

**See attached**

## **D.** Alternatives/Mitigation

Please describe alternatives (or actions taken) that would avoid, reduce, or mitigate any encroachment of the project on the affected New Jersey Register listed property. Discuss feasibility and prudence of alternatives. (Use lettered attachments when necessary.)

**See attached**

## **E.** Project Funding

Please list sources of funding, including federal funds.

**See attached**

## **F.** Permits

Please list permits needed for the proposed project, including any necessary federal permits, licenses or approvals.

**See attached**

## Other Information

The following information may also be needed depending on the nature of the project:

### Archaeology:

If an archaeological survey or other pertinent survey has been undertaken for this project, it must be included with the application. In all cases, when a professional archaeological survey is not included with (or proposed in) the application and the project will include ground disturbance, the rationale for not conducting survey must be enclosed. This rationale for all areas of potential ground disturbance should include detailed documentation of known prior uses (both modern and historic) and prior disturbances. Areas of potential ground disturbance include construction staging areas, areas of grading, etc. on the New Jersey Register listed property.

### Civil Engineering

(particularly

road & bridge projects):

Data which informs the basis of the project's design such as existing road limitations, traffic counts/studies, road classification, design speeds, design hourly volume, and predicted levels of service. Please provide specific references to the relevant AASHTO design tables. May include an Alternatives Analysis Report.

### Code:

Where a code requirement affects the treatment of historic features or spaces, please provide specific references to the section of the code involved and indicate if flexible application of the code for historic buildings as allowed by the New Jersey Uniform Construction Code has been sought or granted.

### Economics:

If economic factors affect an aspect of the project or the design of a project as a whole, a detailed and documented breakdown of the costs involved should be attached to the application.

### Engineering:

If engineering concerns such as structural stability or load bearing capacity, etc. affect the project's impact on the historic property, engineering reports, prepared by an engineer with demonstrated experience working with similar historic resources, should be attached to the application.

## List of all Documents

Please provide a complete listing of all documents including title. In all cases, when a professional archaeological survey is not included with (or proposed in) the application and the project will include ground disturbance, the rationale for not conducting survey must be enclosed.

See attached

## Review Process

Applications are submitted to the Historic Preservation Office (HPO). Within 30 days, the HPO will evaluate the application for technical and professional completeness. Faxed copies of applications do not formally initiate project review. Within 45 days of receipt of a technically complete application, HPO will determine if the project constitutes an encroachment and notify the applicant accordingly. If the HPO determines that a project does not constitute an encroachment (that the project is in conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties), an application is approved administratively by the HPO and does not require review before the Historic Sites Council. A project which constitutes an encroachment is scheduled for an upcoming Historic Sites Council meeting, and the applicant is notified. The Historic Sites Council makes a recommendation in the form of a formal resolution to the Commissioner of the Department of Environmental Protection. The Commissioner must act within 120 days of receipt of a technically complete application. When the applicant has tight project schedules and deadlines to meet, the HPO strongly encourages early submission of applications.



State of New Jersey  
Department of Environmental Protection  
Natural & Historic Resources  
**Historic Preservation Office**  
P.O. Box 404, Trenton, New Jersey 08615-0404  
TEL: (609) 292-2023 FAX: (609) 984-0578  
[www.nj.gov/dep/hpo](http://www.nj.gov/dep/hpo)

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

**A. Required Documentation**

1a. Local Historical Societies

Helen Manogue  
Coordinator  
Hoboken Quality of Life Coalition  
904 Jefferson Street #6G  
Hoboken, NJ 07030

1b. Local Historic Preservation Commissions

Theresa Castellano  
Chairperson  
Hoboken Historic Preservation Commission  
City Hall  
94 Washington Street  
Hoboken, NJ 07030

1c. Public and Private Property Owners Directly Affected by the Project

New Jersey Transit  
One Penn Plaza East  
Newark, NJ 07105

1d. Affected Local Government Units, continued

Honorable Dawn Zimmer  
Mayor  
City of Hoboken  
City Hall  
94 Washington Street  
Hoboken, NJ 07030

2. Photographs

See attached

3. Architectural or engineering plans

Not applicable

4. Specifications

Not applicable; product materials attached

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

**A. REQUIRED DOCUMENTATION, continued:**

- 5. Proposed agreements  
Not applicable
- 6. Information on demolition  
Not applicable
- 7. Information on relocation  
Not applicable

**PROJECT LOCATION MAP:**



**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

**B. PROJECT DESCRIPTION:**

**HISTORIC INFORMATION**

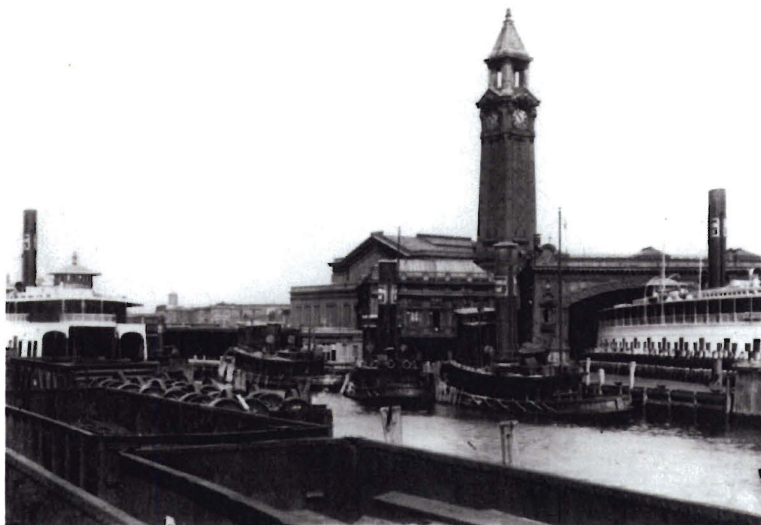
Construction of the Lackawanna Terminal at Hoboken [Erie-Lackawanna Terminal, Hoboken Terminal], consisting of the joined railroad and ferry terminal, the former Pullman Building and Immigrant Station, and the adjacent plaza, was completed in 1907. The facility was designed by Beaux Arts-trained architect Kenneth Murchison, project engineer Charles Hurlbut, and Delaware, Lackawanna and Western Railroad chief engineer A. Lincoln Bush. The Beaux Arts style complex is constructed of reinforced concrete and is covered with elaborately ornamented copper sheets. To maximize the use of odd-shaped waterfront property (where acquisition costs have been high historically), the railroad terminal (with attached train shed) and the ferry terminal were built at a 120-degree angle to each other, and the two transportation entities are connected by the Main Waiting Room and the (recently reconstructed) clock tower.



Hoboken Ferry Terminal (date unknown)

The lower level (Team Concourse) of the ferry terminal originally accommodated freight traffic, while the upper level (Ferry Concourse) was utilized by passengers. The two-tiered structure provided access to ferry boats via cantilevered bridges. The Ferry Concourse is believed to have been one of the world's largest unobstructed interior spaces at the time of its construction, and is appointed with colossal perimeter columns, skylights, and a terrazzo floor. The Main Waiting Room (restored in 1999-2001) is an expansive, double-height, space embellished with rusticated limestone walls, paneled pier pilasters framing the windows, an ornamental plaster ceiling, a stained glass skylight, and a patterned mosaic and terrazzo floor. The nearly five-acre Train Shed consists of a series of seven column-supported canopies, each spanning a platform serving two railroad tracks, and is constructed of steel, cast iron and concrete. The Train Concourse is the long, circulation area between the Main Waiting Room and the Train Shed, providing access to trains and functioning as the north-south axis through the railroad terminal.

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**



Hoboken Ferry Terminal (date unknown)

The first Hoboken railroad terminal, constructed by the Morris and Essex (M&E) Railroad, was built adjacent to the Hoboken Ferry Company's ferry terminal in 1862. A larger terminal replaced the earlier facility in 1868 and, following destruction by fire in 1873, this latter structure was replaced in 1884 by the Delaware Lackawanna and Western (DL&W) Railroad, which had leased the M&E. The DL&W had decided to build a new fireproof terminal by the turn of the twentieth century and, following a 1905 fire that destroyed the existing facility, the new Lackawanna Terminal was opened in 1907. This was the first terminal in Hoboken to combine rail and ferry service under one structure. Kenneth Murchison was a New York-based architect who had a series of commissions for the DL&W, and developed a sophisticated plan for the new terminal at Hoboken by combining Beaux Arts-style ornamentation, English Victorian-style massing, volume and coloration, amusement park-style flourishes, and a monumental design inspired by the City Beautiful Movement.



Hoboken Terminal, Aerial View from Southeast, 2004

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

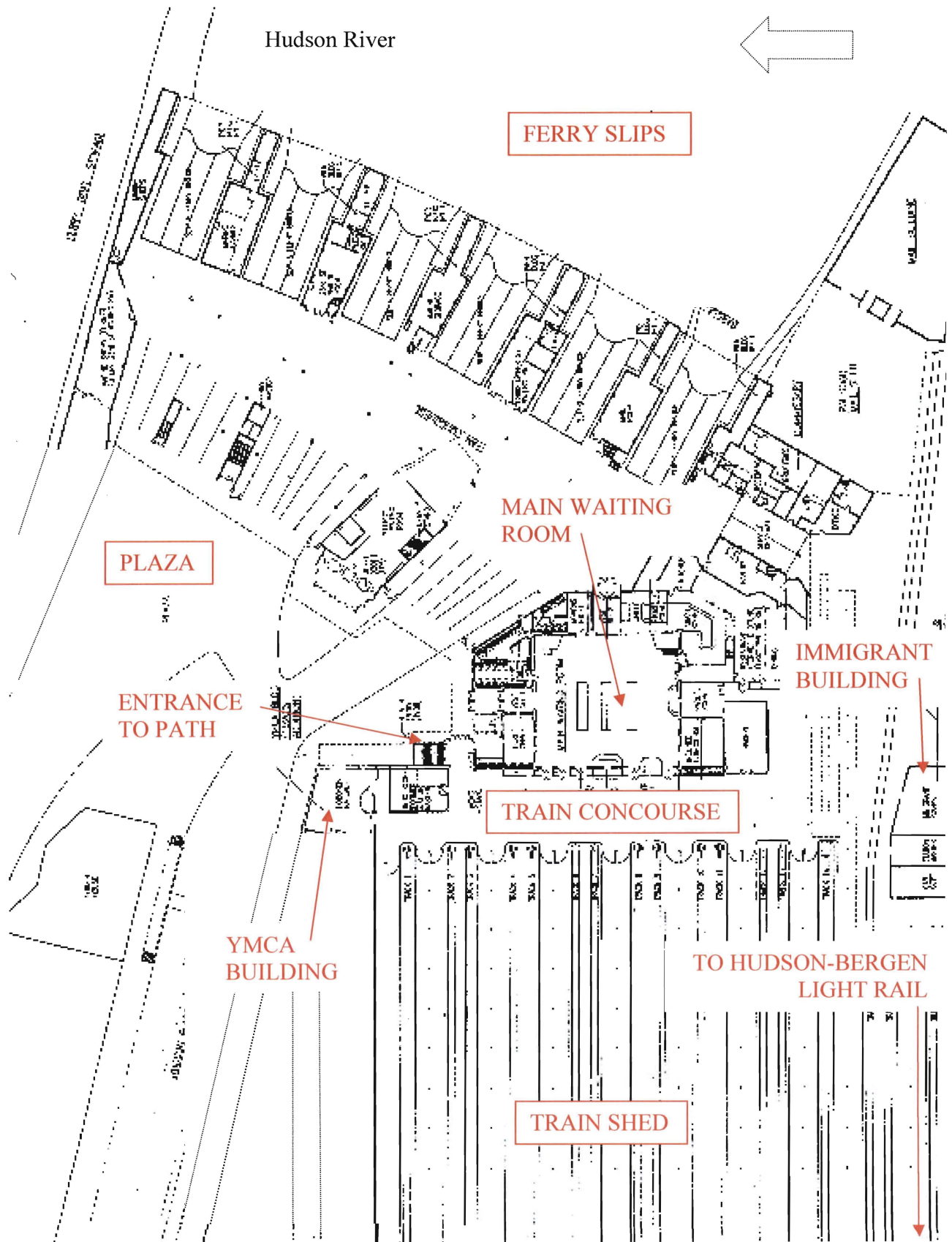
In addition to the accessibility of rail and ferry transport at the Hoboken Terminal, soon after the construction of the complex subway service and trolley service were also made available at the site. The Hudson and Manhattan (H&M) Railroad began tunnel construction between Hoboken and New York City in 1905, and the subway entrances within the Hoboken Terminal complex were constructed between 1907 and 1908. The H&M was accessed via an entry at the north end of the Train Concourse and outdoor kiosks along Hudson Place. This subway service is now operated by the Port Authority of New York and New Jersey as part of the PATH system. The 1910 completion of the Public Service Railway Terminal brought trolleys to the complex. The Hudson Place elevations, and the east and west end walls of the building, were designed by Kenneth Murchison and covered with ornamental pressed copper sheathing. The steel frame, two-level structure was located on the site of the previous trolley station, adjacent to the rail/ferry terminal complex on Hudson Place, bordering the north face of the train shed, and directly atop the underground H&M station. The Public Service trolley terminal was demolished in 1949.



Hoboken Terminal, Aerial View from North, 2004

The Lackawanna Terminal at Hoboken is significant for its association with the development of rail and ferry transportation in the New York area, and as a rare surviving example of a rail-ferry terminal along the New York Harbor. It is also significant as the first implementation of the innovative, early twentieth century Bush train shed-style construction that replaced the single-span style sheds that had been in use in America and Europe since the mid-nineteenth century; it is one of only three known Bush train sheds in the United States that remain in railroad use.

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**



**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

**PROJECT INFORMATION:**

The project consists of an “envelope” of locations within the Hoboken Terminal that NJ TRANSIT’s advertising contractor, currently Titan360.com, can make available for advertising that generates non-farebox revenue for NJ TRANSIT. This “envelope” of locations proposed for advertisement installation use at the Hoboken Terminal complex consists of all locations discussed herein.

Separately, after further research and conclusion of an alternatives analysis, NJ TRANSIT may propose some form of revenue-generating advertising that would replace the in-house promotion currently displayed on the west wall of the former YMCA Building. Currently the otherwise blank, stuccoed wall contains a three-story high graphic reading “NJ TRANSIT Welcomes You to Hoboken Terminal.” Reprogramming the wall with revenue-generating advertising plus additional, complementary, context-sensitive features that serve the needs of customers, enhance the site’s surroundings, and showcase the Hoboken Terminal’s history is the subject of further research, multi-party consultation and cost-benefit analysis. NJ TRANSIT has received helpful advice from one of its consulting parties, the Hoboken Historic Preservation Commission, and will receive input from the other consulting party, the Hoboken Quality of Life Coalition, regarding the programming of this wall space. In addition, NJ TRANSIT would welcome the Historic Sites Council’s appointment of a subcommittee to engage in consultation, including an on-site meeting at Hoboken Terminal.

Phase 1 Project:

The Phase 1 installations discussed herein consist of (1) the existing installations (currently in place), (2) past “special package” installations (previously utilized, not currently in place but proposed for reuse in the future), and (3) proposed additional installations (not currently in place and not previously utilized). All Phase 1 existing, past and proposed additional advertising installations are depicted in the attached booklet entitled “Hoboken Terminal Proposed Advertising Displays” (attached as Exhibit 1). Specific narrative information and photographs describing all Phase 1 advertising locations, types, sizes, materials, and attachment details may also be found on the following pages of this application. Advertising content will change periodically and not all spaces will be utilized during all campaigns, however, all spaces will be available for use at all times.

The majority of the installations discussed herein utilize metal frames or fasteners that are bolted to walls or walking surfaces, or are affixed to existing fences, signs or columns, and do not physically impact existing materials in any other manner. At those locations requiring advertisements to be affixed to structures and/or surfaces using adhesives, the materials have been well tested to ensure that they do not damage underlying substrates and are easily removable within the applicable warranty periods which, depending upon the substrate, are typically up to two years in length. (Specifications on adhesives and other materials are contained in the product bulletins attached as Exhibit 2.) The possibility of retaining residue upon the removal of adhesives is remote, however, should this occur, such residue can be easily removed using denatured alcohol. NJ TRANSIT’s advertising contractor and vendor have performed substrate adhesion tests on specific historic materials at other locations, and will undertake additional tests as deemed necessary and appropriate at the Hoboken Terminal site.

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

Past use of 3M materials on historic fabric at other sites has proven successful and resulted in no adverse impacts. In order to ensure that all advertisements are removed without damage to, or alteration of, any historic materials, NJ TRANSIT and its advertising partners will monitor the installation periods so that no campaigns extend beyond the given adhesive's warranty period.

*Titan360.com, based upon its extensive expertise in evaluating the advertising market and installing appropriate-scale advertising within historic stations, proposed all of the installation types, locations and quantities so as to optimize advertising installations while also retaining sensitivity to the historic significance of the Hoboken Terminal complex. No installation types, locations or quantities other than those discussed herein (Phase 1) or to be discussed in the future Phase 2 application are proposed for the Hoboken Terminal complex.*

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

**ADVERTISING INSTALLATIONS:**

**EXISTING INSTALLATIONS:**

The following installations are currently in place. These locations and advertisement types and sizes are memorialized in this application as elements for which authorization for ongoing installation/usage is requested.

Two-Sheet Displays (a total of thirty-seven (37) two-sheet displays, each measuring 46” high by 60” wide, located within the terminal complex): There are nine (9) 2-sheets on the south side of the wall between Track 1 and the Bus Terminal, twenty (20) 2-sheets within the Hudson-Bergen Light Rail (HBLR) station, and eight (8) 2-sheets along the walkway approaching the HBLR station adjacent to the west end of Track 18. These cardboard poster style displays, mounted in black, powder-coated metal frames, will remain in place. The displays near the Bus Terminal are mounted to the existing non-historic concrete wall using the minimum structurally-required number of anchor bolts; the poster frames for the other installations are mounted using holes drilled into walking surfaces. The two-sheet posters do not physically impact any historic fabric and only minimally impact views of areas of the terminal complex.

Three-Sheet Displays (a total of twelve (12) three-sheet displays, each measuring 84” high by 42” wide, and mounted in black, powder-coated metal frames, located within the terminal complex): Six (6) pairs of 3-sheet posters currently exist along the Train Concourse, and are located at the east ends of Tracks 2 and 3, 4 and 5, 6 and 7, 8 and 9, 10 and 11, and 12 and 13. These cardboard poster style displays will remain in place and are affixed to existing materials by attaching the frames using holes drilled into walking surfaces. The three-sheet posters do not physically impact any historic fabric and only minimally impact views of areas of the terminal complex.



Hoboken Terminal Train Concourse, 2002

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

Fence Displays (a total of six (6) fence displays, constructed of vinyl-sheet banners, each measuring 46” high by 60” wide, within the terminal complex): Four (4) displays are attached to the circa 1967 chain link fence running along the north side of the Track 2 platform near the Bus Terminal, and two (2) displays are attached to the intertrack fence at the east end of Tracks 17 and 18. These displays will remain in place; as the banners are hung from existing fences using metal hooks/rings they do not physically impact any historic fabric. The banners at the chain link fence only minimally impact views of areas of the terminal complex, and the banners at the intertrack fence only partially obscure that historic element of the complex.

Double-Sided Clocks (three (3) double-sided clocks, each measuring 21” high by 62” wide, hung from non-historic struts within the terminal complex): One (1) clock exists above the walkway adjacent to the Bus Terminal at the east end of Track 1, and two (2) clocks exist above the Train Concourse at the east ends of Track 7 and Track 10. Each clock consists of a clock face and adjacent advertising. These displays will remain in place until they are replaced with new clocks of the same size and shape; the clocks do not physically or visually impact any historic fabric.

Light Pole Banners (eleven (11) pairs of banners along the walkway between the Train Concourse and the Hudson-Bergen Light Rail (HBLR) station, and along the walkway approaching the HBLR station): The banners, which are hung from existing light standards, will remain in place at these locations, and do not physically or visually impact any historic fabric.

Gateboard Displays: The existing train information display boards, located within the Train Concourse at the east end of each track, are utilized for advertising content during those time intervals when train information is not required and NJ TRANSIT is not using them for “house ads” (e.g., safety campaigns). There are a total of seventeen (17) displays located within the Train Concourse and the approaching walkway areas. The digital displays will remain in place for train information, non-advertising use, and occasional advertising use; they do not physically or visually impact any historic fabric.

Floor Graphics (a total of ten (10) floor graphics, each measuring 46” high by 60” wide, located within the station complex): These graphics consist of vinyl film with an overlamine layer affixed with a removable adhesive (refer to the enclosed product bulletins 3662 and 3647 attached within Exhibit 2). The installations include six (6) displays within the Train Concourse and four (4) displays north of the Train Shed in the walkway area approaching the Bus Terminal. As these graphics are affixed to the concrete walkways, which are not a character-defining element of the station, they do not physically or visually impact any historic fabric.

Stairway Window (a display, filling the window over the stairway down to the underground PATH station): This display, which consists of 13 oz. flexible vinyl (refer to the enclosed technical data sheet for Normandy Pro FL Ultraflex material attached within Exhibit 2) stretched over a wooden frame set into the existing window frame, covers a boarded-up window at the rear side of the Train Concourse area food court. The window was not utilized prior to the installation, which will remain in place, and the placement of the display does not preclude the future re-opening of the window should such action be deemed appropriate in the future. The window display does not physically impact the surrounding wall and, as it is located in front of a boarded-up, non-utilized window, it does not block any historic views.

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

**PAST INSTALLATIONS:**

The following “special package” installations are not currently in place, however, they were utilized during a prior two-year advertising campaign. These locations and advertisement types and sizes are memorialized in this application as elements for which authorization for future installation, i.e., renewed usage, is requested.

Station Signs: A total of thirteen (13) signs, each measuring 13” high by 30” wide, set in aluminum frames mounted atop the existing station identification signs within the station complex were utilized for the prior advertising campaign. These displays were, and in the future will be, located at the nine (9) signs above the platforms within the Train Shed, and at the four (4) signs within the HBLR station and the walkway approaching the light-rail. These sign types and locations will be available for advertising use in the future; they do not physically or visually impact any historic fabric.

Station Plaques: A total of eighteen (18) plaques, each measuring 8” high by 8” wide, were utilized for the prior campaign that is no longer underway. Fourteen (14) of these plaques were mounted, using metal straps, to canopy columns within the HBLR station stop, and four (4) were mounted to columns within the walkway approaching the light-rail. These plaque types and locations will be available for advertising use in the future; they are located entirely within the modern light-rail facility and do not physically or visually impact any historic fabric.



Hudson-Bergen Light Rail Station, 2009

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

**PROPOSED ADDITIONAL INSTALLATIONS:**

The following installations are not currently in place and have not previously been utilized. These locations and advertisement types and sizes are described in this application as elements for which authorization for installation/usage is requested.

Double-Sided Two-Sheet Displays: Fourteen (14) double-sided 2-sheet displays are proposed for installation on the rail platforms within the Train Shed. Two sets of 4 posters will be installed on each of the 7 platforms (adjacent to Track 2, and between Tracks 3 and 4, 5 and 6, 7 and 8, 9 and 10, 11 and 12, and 13 and 14). Each double-sided set of displays consists of four cardboard posters, each measuring 46” high by 60” wide, mounted in black, powder-coated, metal frames that are a total of 75” high and 122” wide. The details of the frames may be found in Exhibit 1; these displays will not physically or visually impact any historic fabric. NJ TRANSIT proposes a total of 14 displays (for a total of 56 posters) as an appropriate revenue enhancer that maintains visual integrity, passenger flow, and operational flexibility on the platforms.



Hoboken Terminal Train Shed, 2001

Single-Sided Eight-Sheet Displays: Three single-sided 3-sheet displays, each measuring 72” high by 144” wide and mounted in black, powder-coated, metal frames, are proposed for installation. Two of these cardboard poster displays will be installed in front of the north face of the Immigrant Building, and one will be installed in front of the pedestrian railing at the east end of Track 16. These displays will not physically impact any historic fabric. The displays in front of the Immigrant Building will obscure only the modern vinyl fabric that currently covers the walls of the building; the display in front of the railing will partially obscure that historic element; placement will not preclude access for maintenance of the railing. These display locations were selected to attract the attention of commuters transferring from rail or ferry to light rail.

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

The Immigrant Building is a significant historic component of the overall Hoboken Terminal. NJ TRANSIT has prepared a scope of work for a separate project for the future structural stabilization and waterproofing of the building to ensure that the structure is protected against future deterioration. These activities will be undertaken at such time that the necessary funding becomes available for this purpose. The placement of advertising installations adjacent to the Immigrant Building will not preclude future rehabilitation of that historic building, and should stabilization/waterproofing actions be undertaken in the future, these advertising locations will be eliminated from the advertising “envelope” at that time. Should this occur, and should NJ TRANSIT wish to select replacement locations, a separate New Jersey Register of Historic Places Act application will be submitted for that purpose. A separate New Jersey Register application will also be submitted at such time that work is proposed to be undertaken on the Immigrant Building itself.

Wallscape Display: One cardboard poster display, measuring 72” high by 105” wide, and mounted in a black, powder-coated, metal frame, is proposed for installation in front of the south wall of the former YMCA Building. The display will be attached to the concrete wall using the minimum structurally-required number of anchor bolts and, therefore, will only minimally physically impact the wall; it will also visually obscure a portion of the concrete wall of the building. This display was selected as an ideal location for capturing the attention of commuters transferring between bus and rail.

Column Wrap Display: One 17” diameter, 71” high, banded, stainless steel wrap, adhered to the existing column enclosure using acrylic foam tape will be attached to, and will cover, the column located within the pathway between the terminal bus lanes and the Train Concourse. (Refer to the wrap details found in Exhibit 1, and the enclosed 3M design guide and technical data for VHB Tapes attached within Exhibit 2). The existing column enclosure is a non-historic addition; the original column remains inside this enclosure and will be unaffected by the exterior attachment of the wrap display. This location was selected as ideal for capturing the attention of commuters transferring between bus and rail.

Entrance Soffit Display: One display, measuring 22” high by 166” wide and consisting of 4 millimeter thick vinyl film affixed with a removable adhesive (refer to the enclosed product bulletin PIJ36 attached within Exhibit 2), will be attached to the soffit above the entrance from the Train Concourse to the pedestrian plaza next to the PATH station entrance near the north end of the complex. This display will not physically or visually impact historic fabric; it will visually alter the view approaching the entrance to the PATH station from the station concourse. This display location was selected to capture the attention of commuters transferring to PATH.

Waterway Soffit Displays: Seven (7) displays, each measuring 12” high by 165” wide and consisting of 4 millimeter thick vinyl film affixed with a removable adhesive (refer to the enclosed product bulletin PIJ36 attached within Exhibit 2), will be attached to alternate soffits under the canopies over the Hudson-Bergen Light Rail station platform. These displays will be affixed to modern elements of the light rail station, and will not physically or visually impact historic fabric. These locations were chosen to attract the attention of commuters transferring to rail from light rail.

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

**C. STATEMENT OF PURPOSE:**

NJ TRANSIT relies on advertising income to keep its plant and equipment in a state of good repair. Advertising revenue, systemwide, provided a \$9 million subsidy in FY2009. Non farebox revenue such as advertising revenue plays a critical role in reducing pressure on NJ TRANSIT for increased fares and government funding. NJ TRANSIT applies advertising revenue from all sources to the general operating fund so that it can be allocated to those facilities and sites that warrant repair and rehabilitation. A significant percentage of NJ TRANSIT's annual operating expenditures is utilized at the Hoboken Terminal as the site of numerous ongoing rehabilitation and maintenance projects. The program discussed herein will benefit the Hoboken Terminal as well as other historically significant facilities owned by NJ TRANSIT. Advertising at key stations, such as the Hoboken Terminal, plays a critical role in NJ TRANSIT's overall advertising program.

In assembling advertising inventory at the Hoboken Terminal that is attractive to advertisers, NJ TRANSIT and its contractor, Titan360.com, worked together to balance the need for mission-critical revenue with NJ TRANSIT's statutory obligation to protect and make visible the historically significant features of the station complex. The Hoboken Terminal is valuable to advertisers as one of the primary transportation facilities within NJ TRANSIT's system. It is utilized not only by rail commuters but also by passengers accessing the Hudson River ferries, the Hudson-Bergen light rail system, the PATH system, and numerous local and intercity bus routes. Titan360.com, after undertaking extensive research relative to passenger circulation within the terminal complex, and based upon their expertise in evaluating the advertising market, made decisions as to the most profitable advertising placements and selected all of the installation types, locations and numbers so as to optimize the advertisement installations while still retaining a consideration of, and a sensitivity to, the historic significance of the Hoboken Terminal complex. NJ TRANSIT and Titan have paid particular attention to the character-defining features, spaces and materials of the facility and, as such, have *not* proposed the installation of any advertising within the most significant area of Hoboken Terminal – the Main Waiting Room – or on original exterior historic fabric.

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

The anticipated annual revenues, based upon current advertising market values, to be received by NJ TRANSIT for each element of the Phase 1 project are as noted below (refer to the “pro forma” statements included as the last three pages of Exhibit 1). The use of all installations discussed herein will result in the receipt of over \$0.5 Million by NJ TRANSIT.

<b>ANNUAL ESTIMATED ADVERTISING REVENUE</b>		
	<b>Subtotal</b>	<b>Total</b>
<b>EXISTING INSTALLATIONS</b>		
Two-sheet Posters	95,904	
Three-sheet Posters	28,728	
Fence Displays	33,696	
Double Sided Clocks	16,200	
Light Pole Banners	12,960	
Gateboard Displays	87,118	
Floor Graphics	10,800	
Stairway Window	16,200	
		301,606
<b>SPECIAL PACKAGE/PAST INSTALLATIONS</b>		
Station Signs and Plaques *	47,520	
		47,520
<b>PROPOSED/ADDITIONAL INSTALLATIONS</b>		
Two-sheet Posters	131,040	
Eight-sheet Posters	13,162	
Wallscape Display	2,633	
Column Wrap	2,048	
Entrance Soffit Display	8,775	
Waterway Soffit Displays	4,095	
		161,753
<b>TOTAL NJ TRANSIT PHASE 1 REVENUE</b>		<b>\$510,879</b>

\* The two-year “special package” of station signs and plaques yielded NJ TRANSIT a total revenue of \$95,040 (refer to Exhibit 1). Based upon that figure, it is estimated that the re-use of these installations would yield annual revenue, to NJ TRANSIT, of approximately \$47,520. It should be noted, however, that this estimate has not been substantiated by recent market research and is likely a conservative figure.

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

**D. ALTERNATIVES / MITIGATION:**

One project alternative would be to take no action; however, this would not satisfy the project need of providing advertising space to generate revenue. The proposed advertisements will not alter or damage any historic fabric, and the advertising placements will be at locations of the station complex that do not detract from the building's architectural detail or historic significance. NJ TRANSIT and its advertising contractor, Titan360.com, have consulted extensively to prepare an advertising plan that will generate much-needed revenue while remaining sensitive to the historic importance of the Hoboken Terminal.

Significant spaces, materials and decorative features were all considered in the evaluation of the complex. Titan's survey of this facility determined the critical spaces for reaching the greatest number of passersby, and the large volume of commuters that pass within the station, to utilize the various modes of transportation available therein. Some areas within the complex were not included in the proposed plan due to the limited number of passersby that would see advertisements placed within these locations. However, it should also be noted that, while other potentially viable spaces within the station complex were evaluated in addition to those described herein, decisions were made to avoid placements at some locations due to concerns with obscuring significant architectural, character-defining features of the station. The overall goal was the inclusion of signs that capture the attention of passersby while not detracting from their enjoyment and appreciation of the magnificence of the station itself. NJ TRANSIT and Titan believe that the proposed plan represents a reasonable balance between the incorporation of advertising into the station complex and the preservation of historic materials, elements and spaces in the listed, nationally significant Hoboken Terminal.

Following the receipt of authorization for this program NJ TRANSIT will provide, for Historic Preservation Office staff review and approval, a plan sheet with locations and photographs of all signs, describing the specific measurement of each installation and documenting the instructions for installation, including the techniques to ensure that no historic fabric will be damaged during installation or removal. Technical data documenting that any adhesives and fasteners to be utilized to affix advertisements to historic materials will not in any way damage the underlying substrates will also be provided.

In addition, as mitigation for the installation of advertising within the Hoboken Terminal complex, NJ TRANSIT proposes to prepare an advertising and media master plan for Hoboken Terminal that examines the cumulative effects of advertising on the historic character of the facility and on signs designed and located to guide NJ TRANSIT's customers, inventories and graphically delineates all existing advertising and electronic media currently installed, and identifies anticipated or planned additions, deletions or changes to all advertising and electronic media. The advertising and media master plan will also include an examination of the opportunities for the installation or presentation of historic interpretive material, and will be submitted to the Historic Preservation Office within one year of the date of authorization of the project discussed herein.

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

NJ TRANSIT acknowledges that numerous actions are undertaken at the Hoboken Terminal, initiated by the various departments within the agency, many of which are presented to the State Historic Preservation Office for review and approval as separate, stand-alone projects. At times this process results in confusion relative to the anticipated long-term, cumulative impacts to the station complex. In response to this situation NJ TRANSIT's Environmental Services Unit (ESU) recently initiated a program whereby ESU staff will participate in the regularly programmed monthly meetings attended by stations management personnel (project management, operations, facilities/infrastructure, customer service, safety training, etc.) and organized by the Manager of the Hoboken Terminal. Through this process, stations staff and operations personnel will be informed of issues relative to the historic significance of the terminal and the regulatory processes that apply to various undertakings, and ESU staff will be kept up to date on all work planned for the facility. This will ensure the implementation of state and/or federal regulatory review and approval processes for those actions requiring such oversight. For those activities that do not rise to the level of requiring formal regulatory agency oversight, the meetings will also provide the opportunity for ESU staff to offer input into project planning to ensure that decision-making includes consideration of, and sensitivity to, the historic significance of the Hoboken Terminal.

Advertising has been a visible element of railroad facilities for nearly as long as those facilities have been in place. The outdoor advertising industry developed in conjunction with the rise and maturation of the railroad industry, and billboards and signboards became common around the turn of the 20<sup>th</sup> century, particularly along railroad rights-of-way and at railroad crossings. Rail station poster advertising has played a part in the business of NJ TRANSIT and its predecessor railroads for more than 100 years, and virtually every rail station in New Jersey had advertising in place by the early 1900s. NJ TRANSIT believes that, while it is absolutely appropriate to be sensitive to the historic nature of the terminal and the significance of its character defining features, there is also a significant precedent for the use of advertising in railroad station history. Given this precedent and based upon the above information, NJ TRANSIT believes that the project discussed in this application represents an acceptable balance between drawing in much-needed revenue and protecting a historically significant resource through the introduction of advertisements that do not damage or require the removal or alteration of historic fabric and do not obscure key character defining features or elements.

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

**E. PROJECT FUNDING:**

The installation of the new frames will be paid for with advertising revenue.  
No funds from NJ TRANSIT will be utilized.

**F. PERMITS:**

Not applicable

**OTHER INFORMATION:**

Archaeology:	Not applicable
Civil Engineering:	Not applicable
Code:	Not applicable
Economics:	See information above relative to project economic considerations
Engineering:	Not applicable

**LIST OF EXHIBITS:**

1. Titan360 Booklet Entitled “Hoboken Terminal Proposed Advertising Displays”
2. Product Bulletins and Technical Data:
  - a. 3M Scotchcal Graphic Film Product Bulletin 3662
  - b. 3M Scotchcal Matte Overlamine Product Bulletin 3647
  - c. Normandy Pro FL Ultraflex Technical Data Sheet
  - d. 3M VHB Tapes “Design Guide for Sign Assembly”
  - e. 3M VHB Tapes Technical Data
  - f. 3M Scotchcal Graphic Film IJ36-20 Product Bulletin PIJ36

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

**EXHIBIT 1**

**HOBOKEN TERMINAL  
PROPOSED ADVERTISING DISPLAYS**

HOBOKEN

TERMINAL

*proposed  
advertising displays //*

*prepared by*  
**TITAN**  
titan360.com  
*for*



*march 1st, 2010*

>>

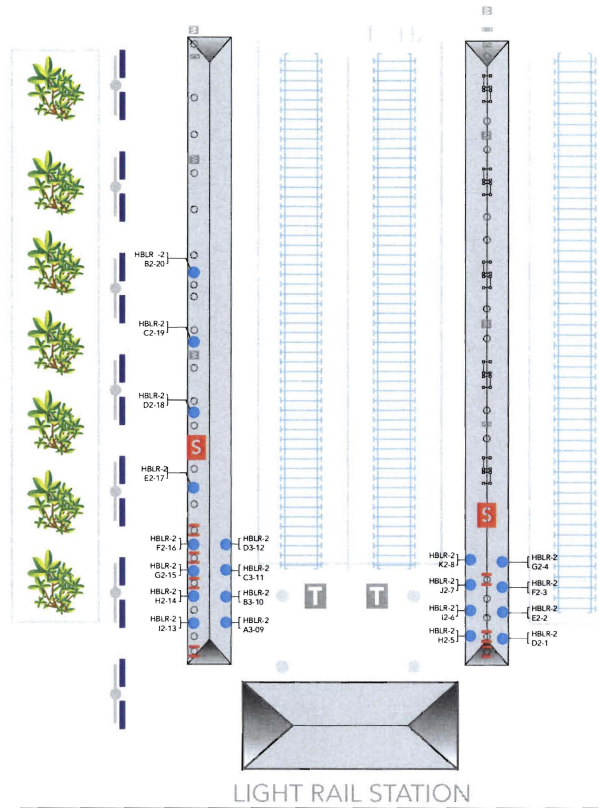
## table of contents

- *Site Plan – page 1*
- *Existing Inventory – pages 2 to 9*
- *Special Package– page 10*
- *Proposed Additional Inventory – pages 11 to 21*
- *Pro-formas – pages 22 to 24*



# hoboken terminal

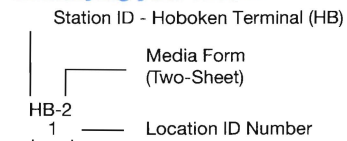
Station Media - March 1st, 2010



LIGHT RAIL STATION

key	Note: EXISTING MEDIA	
●	(2) TWO-SHEET POSTERS (9 Bus Terminal, 20 Light Rail & 8 Walkway)	S STATION SIGN
●	(3) THREE-SHEET POSTERS (12 Train Concourse)	T TICKET MACHINE
■ (FB)	FENCE BANNER (4 Bus Terminal & 2 Walkway)	
(C)	CLOCKS (1 Bus Terminal & 2 Train Concourse)	
—	LIGHT POLE BANNERS (7 Pair Light Rail & 4 Pair Walkway)	
□ (DGD)	DIGITAL GATEBOARD DISPLAY (17 Train Concourse)	
■ (FG)	FLOOR GRAPHIC (6 Train Concourse & 4 Bus Terminal)	
■ (SW)	STAIRWAY WINDOW	
<b>SPECIAL PACKAGE</b>		
S	STATION SIGNS (4 Light Rail & 9 Train Shed)	
—	STATION PLAQUES (18 Light Rail)	

Identifying your media

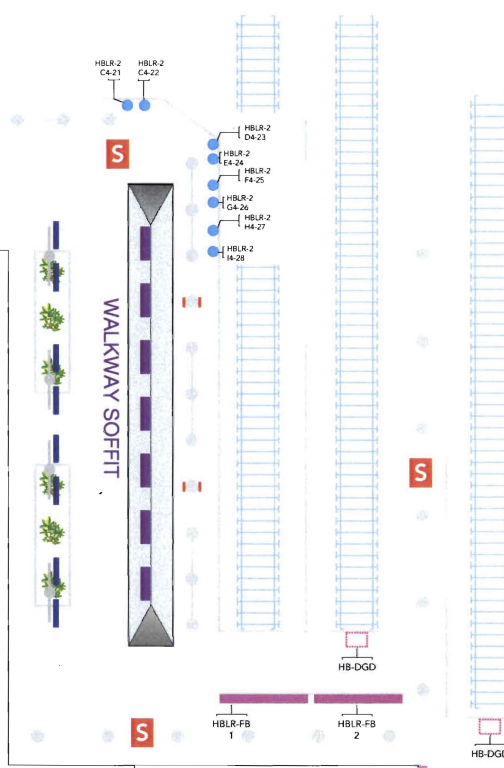


55 Dwight Place  
Fairfield, NJ 07004

T 973.439.5621  
F 973.244.5744

TITAN  
titan360.com

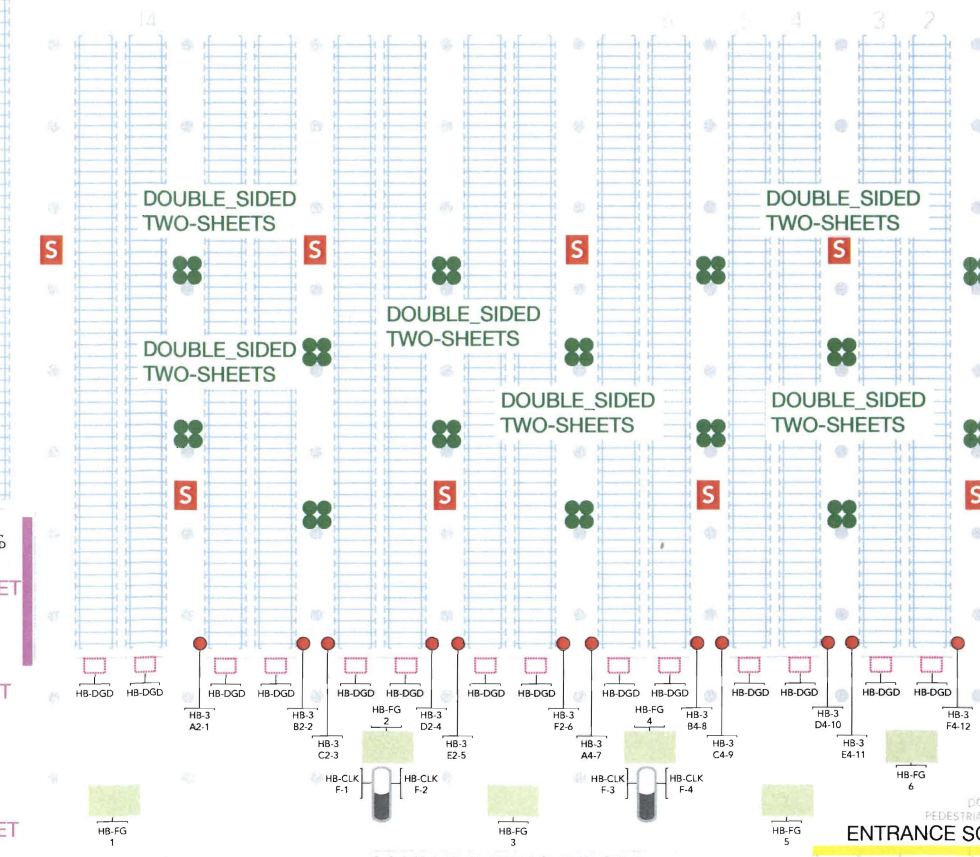
key	PROPOSED ADDITIONAL MEDIA
●	14 units - (56 faces) DOUBLE-SIDED TWO-SHEET POSTER DISPLAYS
■	3 EIGHT-SHEET DISPLAYS
■	1 WALLSCAPE DISPLAY
●	1 COLUMN WRAP DISPLAY
■	1 ENTRANCE SOFFIT DISPLAY
■	7 WALKWAY SOFFIT DISPLAYS



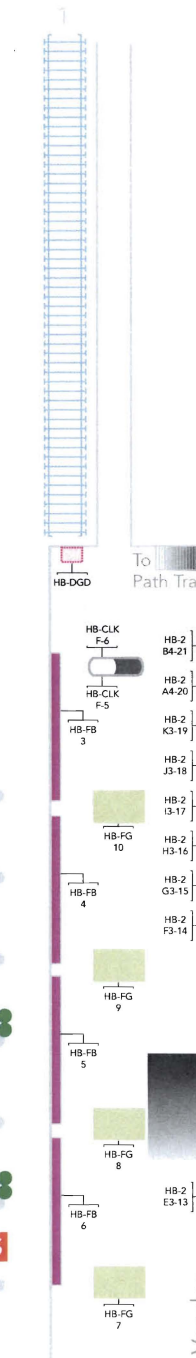
WALKWAY SOFFIT

FORMER IMMIGRANT STATION

8-SHEET A  
8-SHEET B  
8-SHEET C



MAIN WAITING ROOM



BUS TERMINAL

COLUMN WRAP  
WALLSCAPE A

FORMER YMCA BUILDING

TITAN  
titan360.com

PATH ENTRANCE

ENTRANCE SOFFIT

DOORS TO PEDESTRIAN PLAZA

Vendor

TO PATH TRAIN

>>

## *hoboken terminal // existing displays*



Two-Sheet Poster Displays – 46”H x 60”W – on wall along Track 1

>>

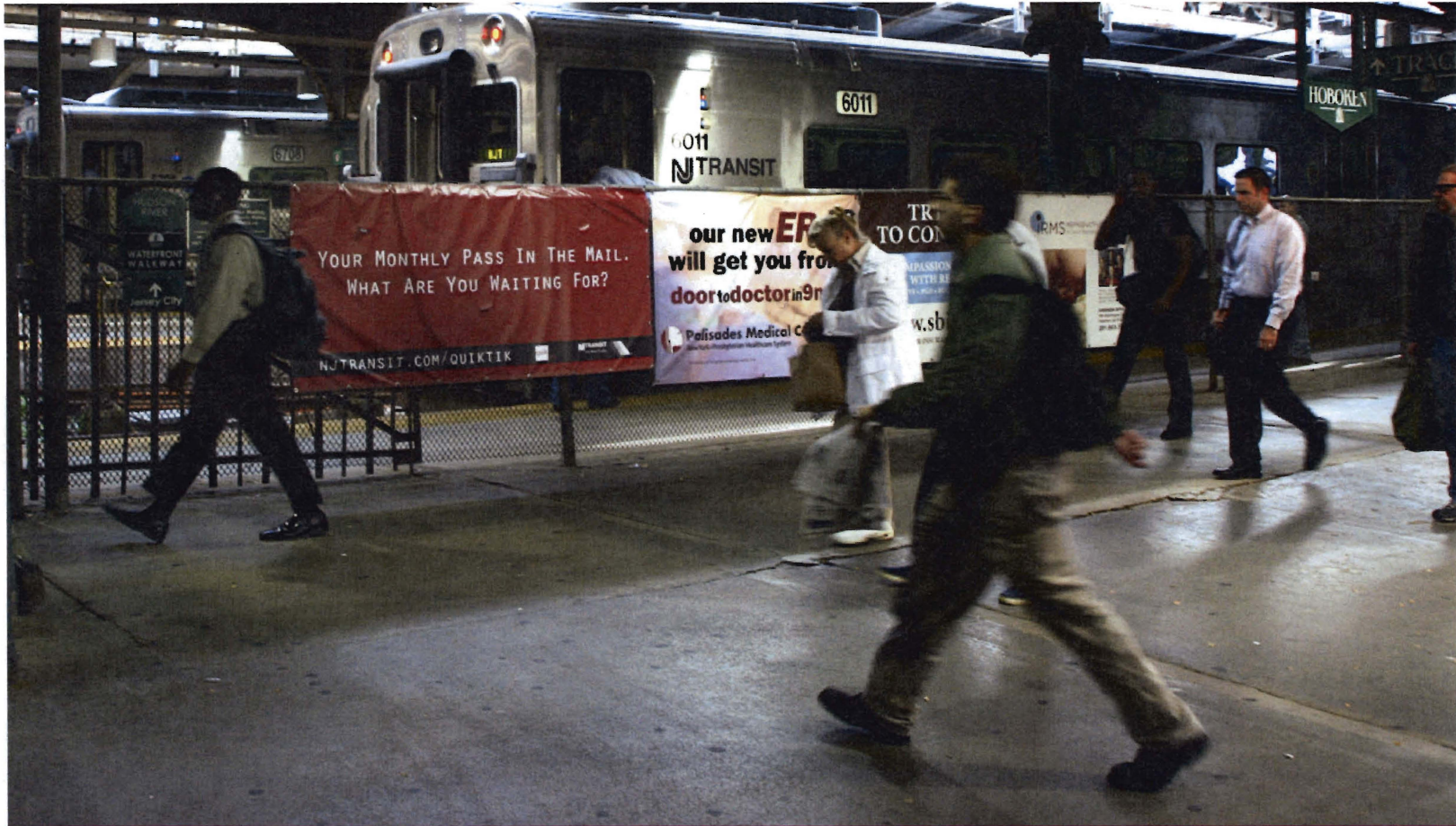
# *hoboken terminal // existing displays*



Three-Sheet Poster Display – 84”H x 42”W – at Track 9

>>

# *hoboken terminal // existing displays*



Fence Banner – 46”H x 60”W – at Track 2

>>

## *hoboken terminal // existing displays*



Clocks – 21”H x 62”W - on Rail Concourse

>>

## *hoboken terminal // existing displays*



Light Pole Banners – along walkway between Rail Concourse and Light Rail Station

>>

# *hoboken terminal // existing displays*



Digital Gateboard Displays – at Tracks 15 & 16

>>

*hoboken terminal // existing displays*



Floor Graphic Displays

>>

## *hoboken terminal // existing displays*



Stairway Window

>>

# *hoboken terminal // special package*



>>  
Station Plaques & Station Signs

>>

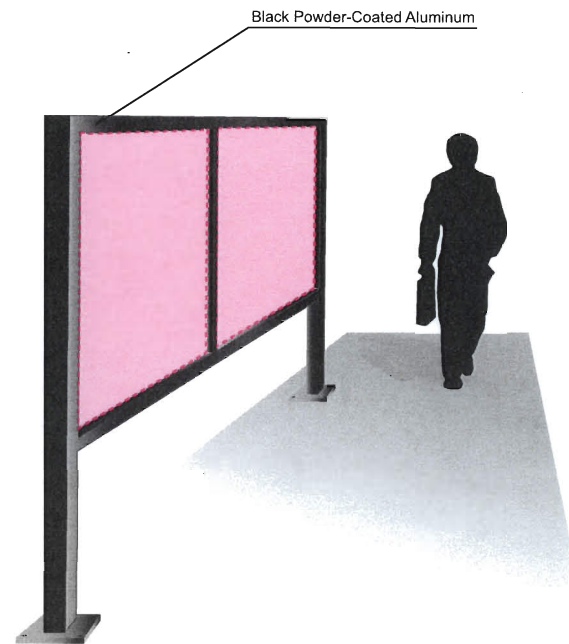
## *hoboken terminal // proposed new media*



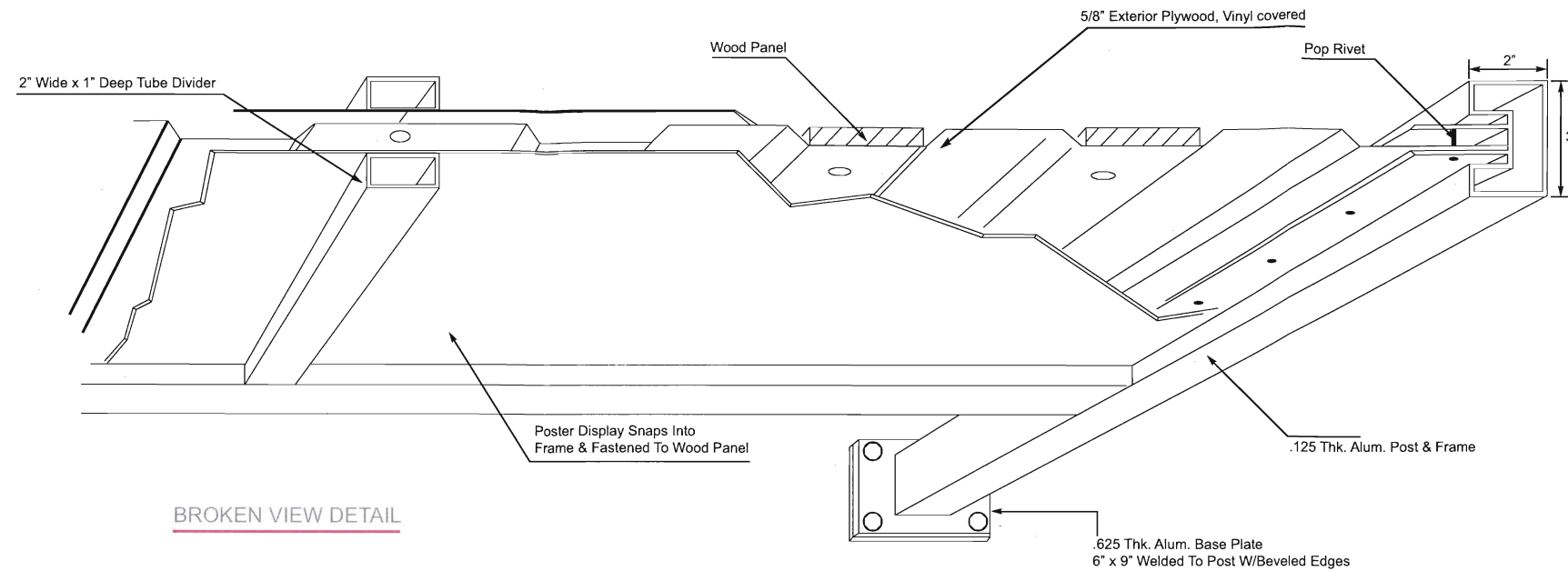
Double-Sided Two-Sheet Poster Displays – 75”H x 122”W each unit – proposed between Track 1 through 14

# technical illustration // double sided two-sheet poster display

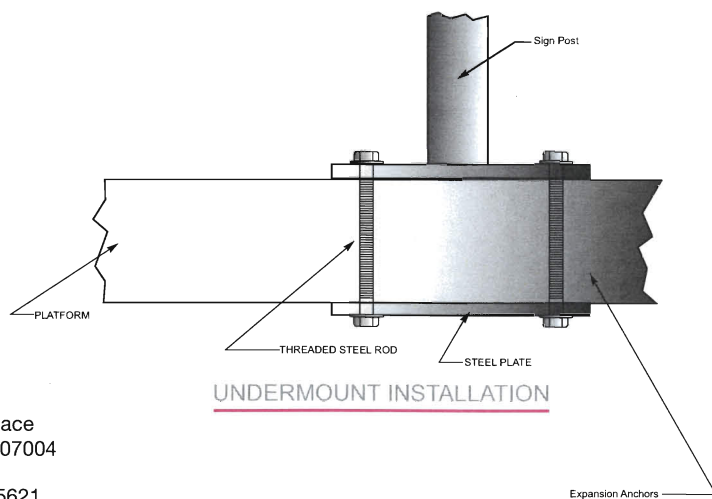
New Jersey // Platform Mounted // Each Copy Area 46"H x 60"W - December 11th, 2009



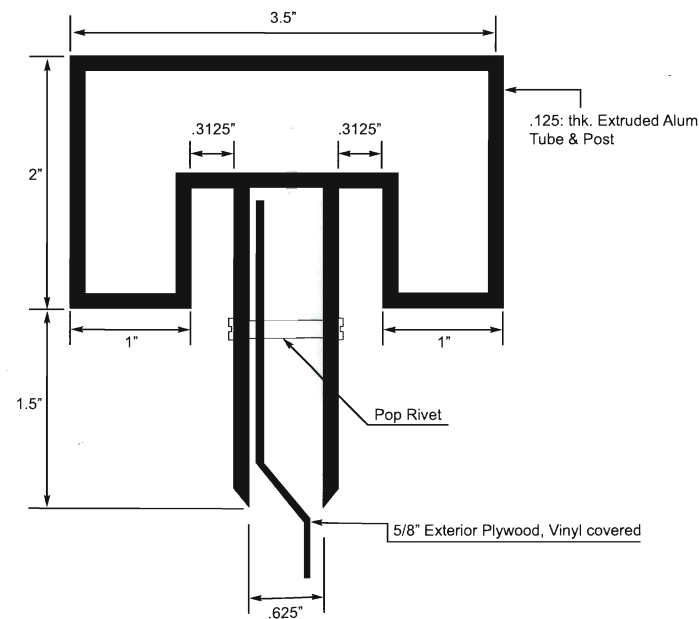
Perspective View:  
Double Two Sheet Poster Display / Post Mounted



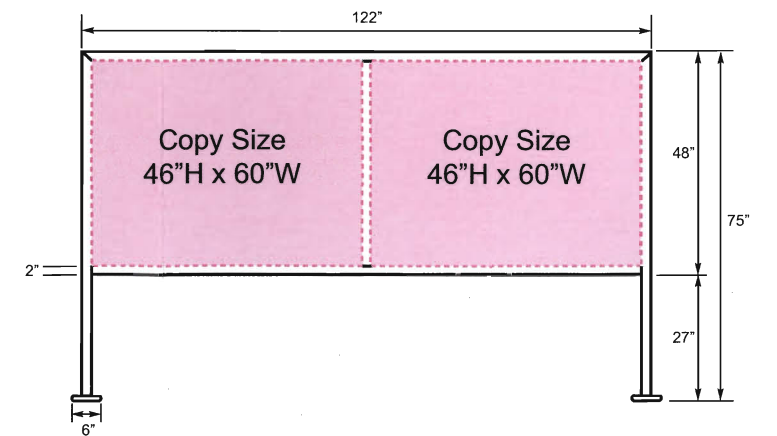
BROKEN VIEW DETAIL



UNDERMOUNT INSTALLATION



DETAIL THRU EXTRUDED ALUM. TUBE



ELEVATION:  
DOUBLE TWO SHEET POSTER DISPLAY-POST MOUNTED

55 Dwight Place  
Fairfield, NJ 07004

T 973.439.5621  
F 973.244.5744

TITAN  
titan360.com

>>

*hoboken terminal // proposed new media*



Eight-Sheet Display – 72”H x 144”W – proposed for fence along Track 15

>>

*hoboken terminal // existing condition*

**B** & **C**



Eight-Sheet Displays – outside former Immigrant Station

>>

*hoboken terminal // existing condition*

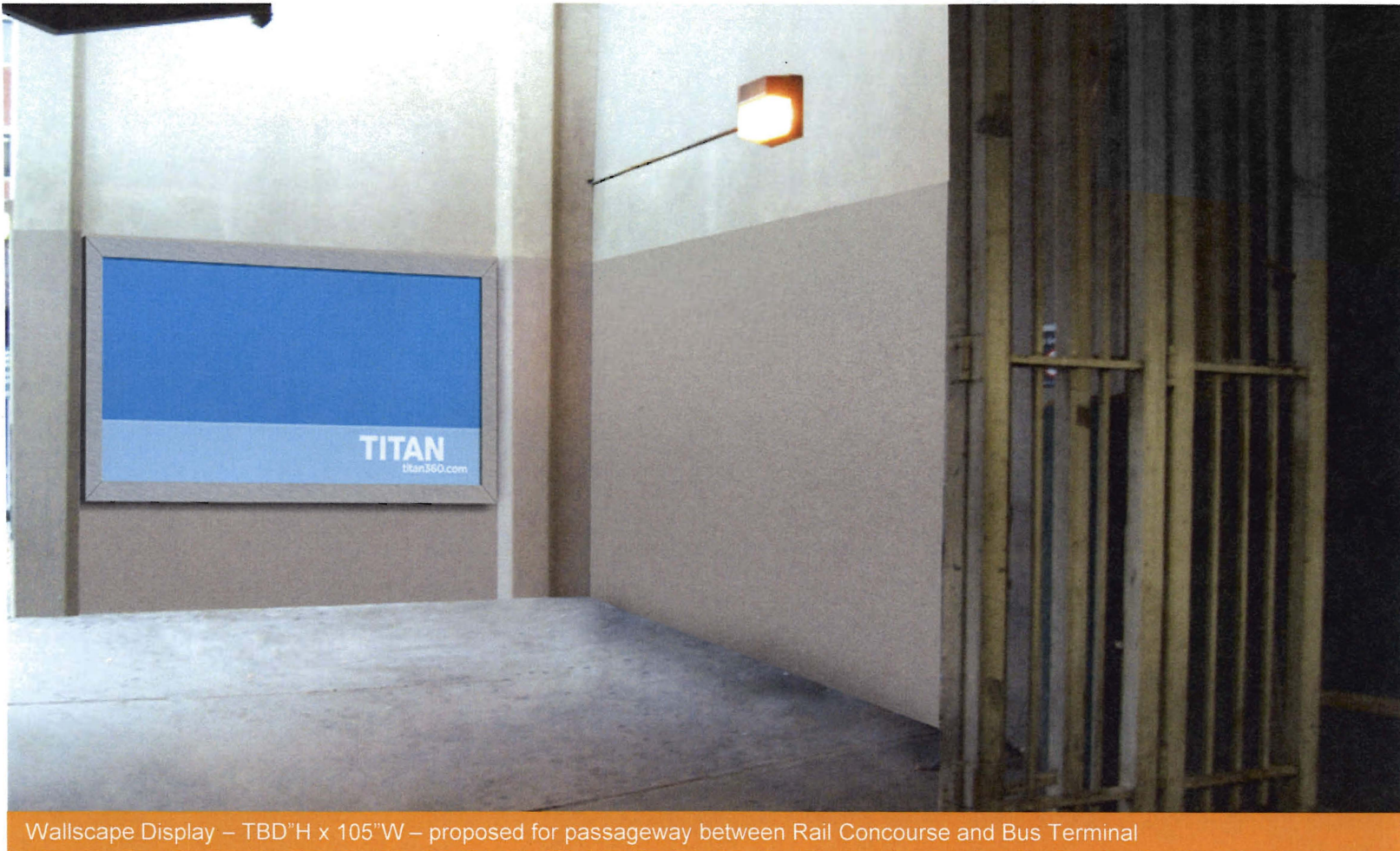
**B** & **C**



Eight-Sheet Displays – outside former Immigrant Station

>>

*hoboken terminal // proposed new media*



Wallscape Display – TBD”H x 105”W – proposed for passageway between Rail Concourse and Bus Terminal

>>

*hoboken terminal // existing condition*



Wallscape Display – for passageway between Rail Concourse and Bus Terminal

>>

# *hoboken terminal // proposed new media*

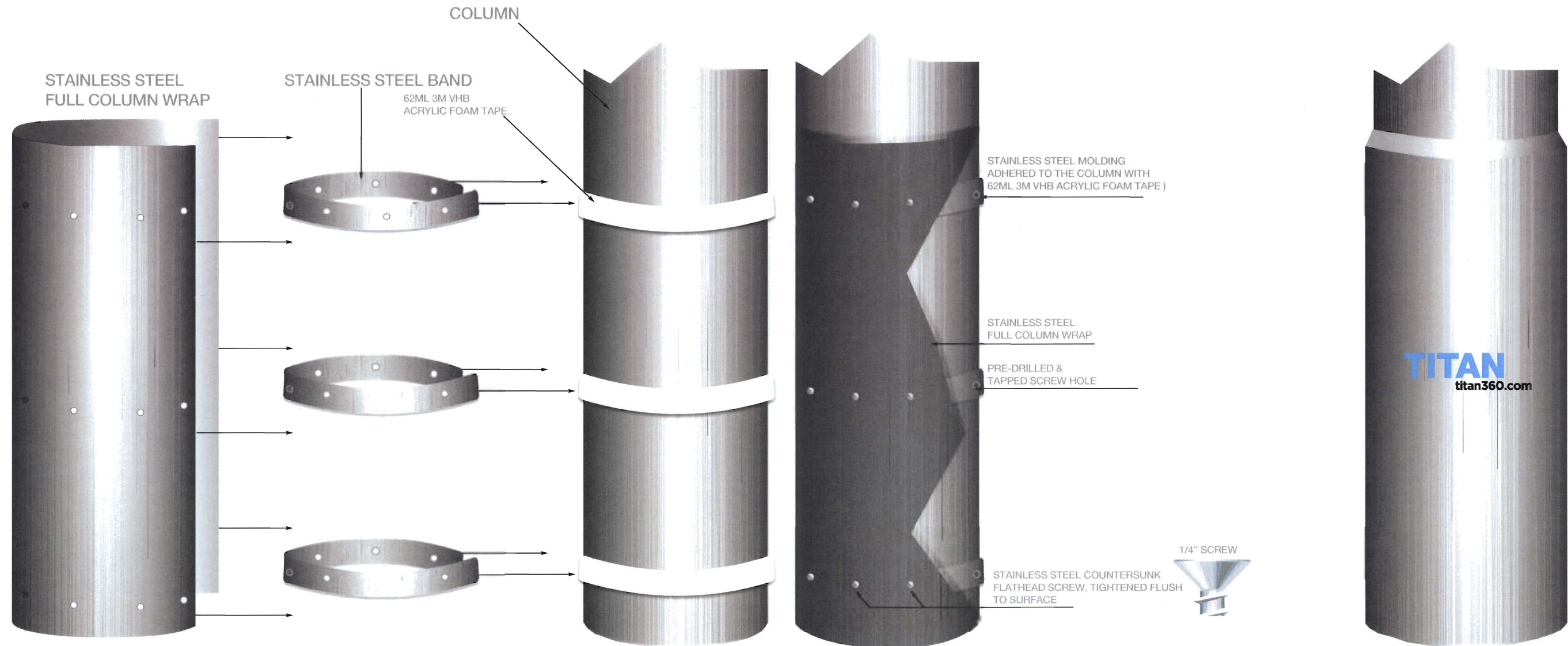


Column Wrap Display – 17” diameter – proposed for Rail Concourse

**TITAN**  
titan360.com

**technical illustration // column wrap display**

December, 2009



questions:  
**titan production**  
[production@titan360.com](mailto:production@titan360.com)

[titan360.com](http://titan360.com)

**TITAN**  
[titan360.com](http://titan360.com)

>>

*hoboken terminal // proposed new media*



Entrance Soffit Display – 21-1/2”H x 166”W – proposed for entrance to Pedestrian Plaza

>>

# *hoboken terminal // proposed new media*



Walkway Soffit Displays – 12”H x 165”W – proposed for Light Rail Walkway

>> *hoboken terminal // pro-forma: revenue from existing media*

a. two-sheet posters – HBLR & Terminal	
Total number of two-sheet posters	37
Net rate per month (per face)	\$400
Monthly Revenue	\$14,800
Annual Revenue	\$177,600
Assumed Occupancy	90%
Estimated Annual Revenue	\$159,840
<b>NJT's 60% revenue share</b>	<b>\$95,904</b>

b. three-sheet posters	
Total number of three-sheet posters	12
Net rate per month (per face)	\$350
Monthly Revenue	\$4,200
Annual Revenue	\$50,400
Assumed Occupancy	95%
Estimated Annual Revenue	\$47,880
<b>NJT's 60% revenue share</b>	<b>\$28,728</b>

c. fence banners	
Total number of two-sheet posters	6
Net rate per month (per face)	\$1,200
Monthly Revenue	\$7,200
Annual Revenue	\$86,400
Assumed Occupancy	65%
Estimated Annual Revenue	\$56,160
<b>NJT's 60% revenue share</b>	<b>\$33,696</b>

d. clocks	
Total number of clocks	6
Net rate per month (per face)	\$500
Monthly Revenue	\$3,000
Annual Revenue	\$36,000
Assumed Occupancy	75%
Estimated Annual Revenue	\$27,000
<b>NJT's 60% revenue share</b>	<b>\$16,200</b>

e. platform banners	
Total number platform banners	24
Net rate per month (per face)	\$100
Monthly Revenue	\$2,400
Annual Revenue	\$28,800
Assumed Occupancy	75%
Estimated Annual Revenue	\$21,600
<b>NJT's 60% revenue share</b>	<b>\$12,960</b>

f. digital gateboards	
Total number of spots	5
Monthly Revenue (per spot)	\$3,723
Monthly Revenue	\$18,615
Annual Revenue	\$223,380
Assumed Occupancy	65%
Estimated Annual Revenue	\$145,197
<b>NJT's 60% revenue share</b>	<b>\$87,118</b>

>> **hoboken terminal // pro-forma: revenue from existing media**

**g. floor graphic displays**

Total number of floor graphics	10
Net rate per month (per face)	\$500
Monthly Revenue	\$5,000
Annual Revenue	\$60,000
Assumed Occupancy	30%
Estimated Annual Revenue	\$18,000
<b>NJT's 60% revenue share</b>	<b>\$10,800</b>

**h. stairway window**

Total number of windows	1
Net rate per month (per face)	\$3,000
Monthly Revenue	\$3,000
Annual Revenue	\$36,000
Assumed Occupancy	75%
Estimated Annual Revenue	\$27,000
<b>NJT's 60% revenue share</b>	<b>\$16,200</b>

**\* i. special package**

Number of Plaques	18
Number of Station Signs	13
Date of Program	1/30/06 – 1/29/08
Monthly Package Cost	\$6,600
Total 2 Year Package	\$158,400
<b>NJT's 60% revenue share</b>	<b>\$95,040</b>

**\* This was sold as a one time sponsorship to Stevens Technical Institute**

>> total NJT additional annual revenue at 60%:

**\$301,606**

## >> *hoboken terminal // pro-forma: projected additional revenue*

>> *proposed traditional media*

Titan is proposing to develop two-sheet posters, eight-sheet displays, wallscape display, column wrap, entrance soffit display, and walkway soffit display advertising within the Hoboken Terminal. Projected additional revenue is:

<b>a. two-sheet posters</b>	
Total number of two-sheet posters	56
Net rate per month (per face)	\$400
Monthly Revenue	\$22,400
Annual Revenue	\$291,200
Assumed Occupancy	75%
Estimated Annual Revenue	\$218,400
<b>NJT's 60% revenue share</b>	<b>\$131,040</b>

<b>b. eight sheet posters</b>	
Total number of eight sheet displays	3
Net rate per month (per face)	\$750
Monthly Revenue	\$2,250
Annual Revenue	\$29,250
Assumed Occupancy	75%
Estimated Annual Revenue	\$21,938
<b>NJT's 60% revenue share</b>	<b>\$13,162</b>

<b>c. wallscape display</b>	
Total number of wallscape displays	1
Net rate per month	\$450
Monthly Revenue	\$450
Annual Revenue	\$5,850
Assumed Occupancy	75%
Estimated Annual Revenue	\$4,388
<b>NJT's 60% revenue share</b>	<b>\$2,633</b>

<b>d. column wrap</b>	
Total number of column wrap	1
Net rate per month	\$350
Monthly Revenue	\$350
Annual Revenue	\$4,550
Assumed Occupancy	75%
Estimated Annual Revenue	\$3,413
<b>NJT's 60% revenue share</b>	<b>\$2,048</b>

<b>e. entrance soffit</b>	
Total number of entrance soffits	1
Net rate per month	\$1,500
Monthly Revenue	\$1,500
Annual Revenue	\$19,500
Assumed Occupancy	75%
Estimated Annual Revenue	\$14,625
<b>NJT's 60% revenue share</b>	<b>\$8,775</b>

<b>f. walkway soffit displays</b>	
Total number of walkway soffits	7
Net rate per month (per face)	\$100
Monthly Revenue	\$700
Annual Revenue	\$9,100
Assumed Occupancy	75%
Estimated Annual Revenue	\$6,825
<b>NJT's 60% revenue share</b>	<b>\$4,095</b>

>> *total NJT additional annual revenue at 60%:*

**\$161,753**

**Application for Project Authorization Under  
The New Jersey Register of Historic Places Act  
Hoboken Terminal – Phase 1 Advertising Installations**

**EXHIBIT 2**

**TECHNICAL DATA AND  
PRODUCT BULLETINS**



# Scotchcal™ Graphic Film

3662-10

For Screen Printing Only

## Product Description

This is a 2-mil, durable, opaque film designed for making short term graphics that are applied to unsealed, outdoor, pedestrian traffic surfaces or selected smooth-to-rough wall surfaces. This film has excellent hiding power and can be screen printed.

## Application Ideas

Sidewalk signs provide a unique way to reach consumers at the retail point-of-customer contact. Almost anywhere you have pedestrian traffic, sidewalk signs can present your message effectively to customers, clients, visitors and employees. Here are just some of the many locations and ways a sidewalk sign may be used whether it is needed for just a day or for months.

- Use outside at fairs, trade shows, retail outlets, entertainment and sports venues, convention centers, private businesses, schools, public buildings and special events such as parades and marathons
- Build brand equity and support for sales promotions at the retail level
- Use for market test promotions
- Advertise product brands, sales, and upcoming events
- Create directional and informational signs
- Promote internal company events such as celebrations, employee recognition, etc.

## Recommended Types of Graphics and End Uses

When constructed and used as described in this Bulletin, these types of graphics and end uses may be warranted by the 3M™ MCS™ Warranty. Please read the Bulletin for details.

- Sidewalk sign graphics applied to **unsealed, outdoor, pedestrian** traffic surfaces
- Graphics applied to indoor and outdoor concrete block and brick-type wall surfaces

## Limitations of End Uses

3M specifically does not recommend or warrant the following uses, but please contact us to discuss your needs or recommend other products.

### Unsuitable End Uses for This Product

- Application to playing surfaces such as basketball courts.
- Exposure to frequent vehicle traffic, snowplows, snow shovels, heavy equipment traffic; minor edge chipping is unavoidable
- Graphics made of individually laminated cut numbers, letters and characters.
- Indoor floor applications
- Walls that may be exposed to high moisture from rain, sprinklers, etc.



## CAUTION

Loose, damaged or wet sidewalk signs may cause a pedestrian to slip or trip and fall.

To reduce the risk of slipping or tripping on sidewalk signs:

- Use only 3M™ Scotchcal™ Matte Overlamine 3647, which has a slip-resistant surface.
- Properly apply only to unsealed outdoor surfaces (unsealed asphalt, unsealed concrete, paving bricks).
- Immediately remove or replace loose or damaged sidewalk signs. Do not attempt to repair or re-adhere.
- Upon completion of a pedestrian event on a roadway, remove the sidewalk sign before normal traffic resumes.

Failure to heed this Caution may result in personal injury.

## Wall Graphics

This film can be used for wall graphics; however, the user must determine the product's suitability and whether it has the necessary adhesion for their application. The user is solely responsible for the graphic adhesion to the substrate. For guidelines, see Instruction Bulletin 5.37.

## Compatible Products

### Screen Printing Inks

- 3M™ Screen Printing Ink Series 1900
- 3M™ Screen Printing UV Ink Series 9800

### Cut Graphic Decoration

- 3M™ Scotchcal™ ElectroCut™ Film Series 7725 (See Film Decorating, page 3.)

### Overlaminates for Sidewalk Signs

- 3M™ Scotchcal™ Matte Overlaminates 3647 (required for sidewalk signs)

### Graphic Protection for Walls

- 3M™ Scotchcal™ Luster Overlaminates 8519
- 3M™ Scotchcal™ Matte Overlaminates 8520
- 3M™ Screen Print Gloss Clear 1920DR
- 3M™ Screen Print Matte Clear 1930
- 3M™ Screen Print Gloss Clear 9720UV
- 3M™ Screen Print Gloss Clear 9720i
- 3M™ Screen Print Matte Clear 9730UV
- 3M™ Screen Print Gloss UV Clear 9800CL

## Characteristics

These are typical values for unprocessed product; processing may change the values. Contact your 3M representative for a custom specification.

### Physical Characteristics

Characteristic	Value
Film	Cast vinyl
Film color	White, opaque
Thickness	<b>Without adhesive:</b> 2 mils (0.04 mm) <b>With adhesive:</b> 6-7 mil (0.15-0.17 mm)
Adhesive	Pressure sensitive
Adhesive color	Gray
Liner	Polyethylene-coated layflat paper
Tensile strength	13 pound/inch at 73°F (2.3kg/cm at 23°C) <i>minimum</i>
Chemical resistance	Resists mild alkalis, mild acids, and salt Excellent resistance to water ( <i>but not immersion</i> )

### Application Characteristics

Characteristic	Value
Finished graphic application recommendation	<b>Surface type:</b> Flat <b>Substrate type for sidewalk signs:</b> Unsealed, outdoor pedestrian traffic including asphalt, concrete, paving bricks  Note: Some outdoor surfaces are highly dimensional and the film's adhesive may not have enough contact area to adhere properly to the surface. Contact 3M Commercial Graphics Technical Service at 1-800-328-3908 if you have a question about the suitability of any surface.  <b>Substrate type for walls:</b> Unsealed concrete block or brick-type wall surfaces  <b>Application temperature:</b> 70° to 90°F (21° to 32°C) <i>air, film and surface</i>

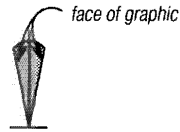
*continued on the next page*

Applied shrinkage	0.032 inch (0.8 mm)
Removal	<p><b>Sidewalk signs:</b> Removal without heat, little or no adhesive residue, for up to 3 months</p> <p><b>Wall graphics:</b> Removal is not warranted: user must test and approve, and accept responsibility</p>

## Definitions

### Exposure

#### U.S. Vertical Exposure



The face of the graphic is +/- 10° from vertical.

#### U.S. Horizontal Exposure



The face of the graphic is +/- 5° from horizontal.

### Graphic Construction

The products used to make a graphic, which may include film and/or flexible substrate, graphic protection, ink, printer and application tape.

### Graphic Protection

Overlaminated films or clear coats used to protect the graphic and/or change gloss.

## Warranty Information

### Sidewalk Signs

*This warranty is made in lieu of any and all other express or implied warranties, including any implied warranty of merchantability:* 3M warrants that Scotchprint® Graphics for Sidewalk Signs, which are constructed using only the recommended 3M film, inks and overlaminate, and are produced and installed in accordance with 3M's written instructions, will for the warranted durability period maintain original brightness, color and image quality, except for ordinary and expected wear and tear, and adhere to 3M-recommended unsealed, outdoor, pedestrian surfaces and be removable without damage to the surface. 3M will replace or refund the cost of materials for such quantity of sidewalk signs found not to meet this warranty.

This warranty is exclusive. In no case shall 3M be liable for any other direct or indirect damages or loss, including without limitation any incidental, special, or consequential damages, or any labor charges incident to the removal or replacement of sidewalk signs.

### Wall Graphics

The following is made in lieu of all other express or implied warranties, including any implied warranty of **merchantability** or fitness for a particular purpose or implied warranty arising out of a course of dealing, custom or usage of trade: all 3M products are warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin. 3M will replace or refund the price of any 3M materials that do not meet this warranty within the specified time periods. These remedies are exclusive. **In no case shall 3M be liable for any direct, indirect, or consequential damages, including any labor or non-3M materials charges.**

See the Graphics Market Center Warranty Brochure, which gives the terms, additional limitations of the warranty, if any, and limitations of liability.

### Warranty Coverage Overview

Both the warranty coverage and the durability for each graphic is based on the user(s) reading and following all applicable and current 3M Product and Instruction Bulletins. 3M will honor the Warranted Durability stated in the Warranted Durability Table in the base film or substrate Product Bulletin that is current when the film was purchased. Warranted durabilities may be reduced and stipulations may apply for certain constructions and applications, as covered in this Bulletin.

**3M™ MCS™ Warranty**  
Warranted Durability Table  
for Finished Graphics

Finished graphics constructed as shown in the tables below are eligible for the MCS Warranty

Ink Series	Graphic Protection	Sidewalk Signs Horizontal Exposure	Wall Graphics Vertical Exposure
	3647	3 months	none
1900 9800	8519 8520 1920DR 1930 9720UV 9730UV 9800CL	none	3 months

**General Warranty Stipulations**

These stipulations apply to graphics covered by the 3M™ MCS™ Warranty. Specific provisions of these stipulations are found in the *3M Graphics Market Center Warranty Brochure* at 3Mgraphics.com.

**Abrasion and Loss of Gloss**

Abrasion damage and loss of gloss are not covered by any 3M warranty. This is considered normal wear and tear.

**Application to Glass**

3M accepts no liability for glass breakage when using this film for window graphics. See Instruction Bulletin 5.1 for details.

**Application Outside the U.S.**

Contact the 3M organization for that country.

**Graphics Made with  
Components Not Sold or  
Recommended by 3M**

The 3M™ MCS™ Warranty does not cover finished graphics made with inks, film, graphic protection and/or application tapes that are not sold or recommended by 3M. The user is solely responsible for the graphic appearance, performance and durability of graphic constructions that include any other products.

**Factors that Affect Graphic  
Performance Life**

The actual performance life of a graphic is affected by all of the following.

- The combination of graphics materials used
- Ink formulation
- Adequate ink drying and/or UV curing
- Selection, condition and preparation of the substrate
- Surface texture
- Application methods
- Angle and direction of sun exposure
- Environmental conditions
- Cleaning or maintenance methods

**Screen Printing**

Formulations and processing conditions can affect ink durability. Refer to the Product and Instruction Bulletins for your ink for limitations and proper usage.

**Film Decorating**

Film 3662-10 may be decorated with film series 7725.

**Graphic Protection**

For sidewalk signs, use ONLY overlaminate 3647; no other option is approved or warranted. The *Graphic Protection for Walls* options listed on page 2 ARE NOT intended for sidewalk signs.

**Cutting**

We recommend cutting radiuses on any sharp corners after lamination. This helps prevent premature lifting of the graphic after application.

The following are common cutting methods for this film. See Instruction Bulletin 4.1 for details.

- Die cut
- Hand cut
- Guillotine

## Application and Maintenance

**Sidewalk Signs** See Instruction Bulletin 5.33 for detailed application, cleaning and maintenance instructions. Sidewalk sign should be cleaned periodically for optimum skid resistance and appearance.

**Wall Graphics** When two or more panels are applied to a vertical wall surface, the adjoining panels should have a 1 inch (25 mm) overlap seam  
Refer to Instruction Bulletin 5.37 for the unique characteristics of applying graphics to walls.

## Removal

**Sidewalk Signs** This product is removable without heat or chemicals for up to 3 months when used for sidewalk signs. See Instruction Bulletin 5.33 for details on removing from a sidewalk surface.

**Wall Graphics** See Instruction Bulletin 5.37 regarding removability from a wall.

## Shelf Life, Storage and Shipping

**Shelf Life** **Total shelf life: 2 years** from the date on the original box  
Up to 2 years unprocessed, **OR** process within 1 year **and** apply within 1 year of processing

- Storage Conditions**
- 40° to 100°F (4° to 38°C)
  - Out of sunlight
  - Clean dry area
  - Original container
  - Bring the film to print room temperature before using

**Shipping Finished Graphics** Flat, or rolled printed side out on 6 inch (15 cm) or larger core. This helps prevent the liner and, if used, the application tape from popping off.

## 3M Related Literature

Before starting any job, be sure you have the most current Product and Instruction Bulletins.

The information in 3M Product and Instruction Bulletins is subject to change. Current Bulletins are available at 3Mgraphics.com. The following applicable Bulletins provide information and processes you need to properly make the graphics described in this Bulletin. Additional Bulletins may be needed as indicated in the 3M Related Literature section of other 3M components you use.

Bulletin types: PB = Product Bulletin; PB-IB = Product & Instruction Bulletin; IB = Instruction Bulletin

Subject	Type	Bulletin No.
3M™ Screen Printing Ink Series 1900 and Overprint Clear V10402	PB	1900
- Screen printing with ink series 1900 - line color	IB	3.12
- Screen printing with ink series 1900 - 4-color	IB	3.11
3M™ Screen Printing UV Ink Series 9800	PB	9800
- Screen printing with UV ink series 9800 - line color	IB	3.20
- Screen printing with UV ink series 9800 4-color	IB	3.21
3M™ Screen Print UV Gloss Clear 9720i	PB-IB	9720i
3M™ Screen Print Gloss Clear 9720UV and Matte Clear 9730UV	PB	9700
-Applying screen printing clear 9720UV or 9730UV	IB	3.4
3M Graphic Protection Products <i>overview of all graphic protection products and specific information on most overlaminates</i>	PB	GP-1
Design of graphics	IB	2.1
Scoring and cutting	IB	4.1
Application, substrate selection, preparation and substrate-specific application techniques	IB	5.1
Application, general procedures for indoor and outdoor dry applications	IB	5.5

Subject	Type	Bulletin No.
Application, wet method for translucent screen printed, thermal mass transfer and cut graphics	IB	5.7
Storage, handling, maintenance, removal	IB	6.5
Application and maintenance of sidewalk signs	IB	5.33
A Guide to Understanding and Applying Graphics to Common Indoor and Outdoor Wall Surfaces	IB	5.37
3M Graphics Center Warranty Brochure	go to <a href="http://www.3Mgraphics.com">www.3Mgraphics.com</a> , Warranties	

*Scotchprint is a registered trademark of 3M in the US and other countries.*

*3M, ElectroCut and Scotchcal are trademarks of 3M Company.*

## Bulletin Change Summary

Updated layout and improved Caution statement on safe usage of sidewalk signs. Added 3M™ Screen Print Gloss Clear 9720i as a compatible product for wall graphics. Corrected substrate type for walls to read: unsealed concrete block or brick-type wall surfaces. Please note that for maximum success, an application temperature of 70° to 90°F (21° to 32°C) is recommended.



### Commercial Graphics Division

3M Center, Building 220-12E-04  
 PO Box 33220  
 St. Paul, MN 55144-3220 USA  
 General Info. 1-800-374-6772  
 Technical Info. 1-800-328-3908  
 Fax 1-651-736-4233

[www.3Mgraphics.com](http://www.3Mgraphics.com)

### 3M Canada

P.O. Box 5757  
 London, Ontario  
 Canada N6A 4T1  
 1-800-265-1840  
 Fax 519-452-6245

### 3M México, S.A. de C.V

Av. Santa Fe No. 55  
 Col. Santa Fe, Del. Alvaro Obregón  
 México, D.F. 01210  
 52-55-52-70-04-00  
 Fax 52-55-52-70-22-77

### 3M Puerto Rico, Inc.

Puerto Rico Industrial Park  
 350 Chardon Avenue, Suite 1100  
 San Juan PR 00918  
 787-620-3000  
 Fax 787-620-3018

©3M 2009. All rights reserved.



# Scotchcal™ Matte Overlamine 3647

## Product Bulletin 3647

Release C, Effective February 2003  
Black bar in margin indicates a change

### Description

#### Advantages

- Transparent overlamine for use ONLY with 3M™ Scotchcal™ Graphic Film 3662-10
- Scuff-resistant, slip-resistant
- Excellent resistance to wear from high foot traffic
- Exterior, short term durability

#### Applications and Uses

3M™ Scotchcal™ Matte Overlamine 3647 is intended ONLY for use with film 3662-10 in the making of Scotchprint® Graphics for Sidewalk Signs. This graphic system is warranted by the 3M™ MCS™ Warranty.

See Product Bulletin 3662 for complete applications and uses of sidewalk signs.

#### Limitations

We do not normally warrant other applications, but please contact us to discuss your needs or let us suggest other 3M products.

Specifically, we do not warrant this film for the following:

- Exposure to vehicle traffic, snowplows, snow shovels, heavy equipment traffic

#### Film and Overlamine Kit 4630-10

The film and overlamine used to make screen printed, graphics for sidewalk signs are designed to work together.

Order kit no. 4630-10, which includes a 50 yard roll of each of the following:

- Film 3662-10
- Overlamine film 3647

### Characteristics

Characteristic	Description
Film	19 mil, clear
Thickness (film plus adhesive)	23 mil (0.6 mm)
Adhesive	Pressure sensitive
Liner	58 pound, polycoated kraft paper

Note: All Product and Instruction Bulletins mentioned in this bulletin can be ordered through our Fax-on-Demand system. See 3M Related Literature near the end of this bulletin for details.

### Effective Performance Life

When overlamine 3647 is applied to film 3662-10 in accordance with 3M recommended procedures to make a sidewalk sign, the following performance may be expected. The performance is based upon foot traffic experience in the field. Graphics may be damaged by frequent vehicular traffic or heavy equipment such as snowplows and snow shovels; minor edge chipping is unavoidable. These types of damage are not covered by 3M's warranty. Performance depends upon the condition and preparation of *unsealed, exterior, pedestrian surfaces* before application, the exposure conditions, and the maintenance of the graphics.

**Warranted Durability:** 3 months

### Overlamine

To make a warranted sidewalk sign, overlamine 3647 must be applied to film 3662-10.

Refer to the laminator operator's manual for additional details. Also see Instruction Bulletin 4.22 on Cold Roll Lamination.

### Cutting

We recommend cutting radiuses on any sharp corners. This helps prevent premature lifting of the graphic after application.

The following are common cutting methods for this film. See Instruction Bulletin 4.1 for details.

- Hand cut
- Guillotine
- Cold steel-rule die cutting

### Premasking and Prespacing

Typically, overlamine 3647 does not require a premask or prespace tape for application. However, if you are applying die cut, pre-spaced graphics, we recommend using 3M™ Prespace Tape SCPS 53-X.

## Application and Removal

See Instruction Bulletin 5.33.

## Maintenance and Cleaning

Scotchprint® Graphics for Sidewalk Signs should be cleaned periodically for optimum skid resistance and appearance. See Instruction Bulletin 5.33 for detail cleaning and maintenance instructions.

## Shelf Life, Shipping, and Storage

- Unprocessed film has a shelf life of two years after receipt from 3M. Processed film has a shelf life of one year. However, the total shelf life of a graphic before and after processing cannot exceed two years.
- Store the film in a clean, dry area, out of direct sunlight, at less than 100°F (38°C) and in the original container.
- We recommend storing and shipping sidewalk signs lying flat or rolled, graphic side out, on a 6 inch (152 mm) core. This helps prevent the film from wrinkling or popping off the liner.
- See Instruction Bulletin 6.5 for details.

## Physical Properties

The values given are typical for 3M™ Scotchcal™ Matte Overlaminates 3647 and are not for use in specifications.

### Skid Resistance

Overlaminates 3647 has been tested per ASTM E303, "Standard Test Method for Measuring Frictional Properties Using the British Pendulum Tester", and meets the requirements of the skid resistance values, or British Pendulum Number (BPN), as set forth in the proposed European norms prEN1341 and prEN1342 for pedestrian surfaces.

Test Method	Results	
	Dry Surface	Wet Surface
ASTM E303	BPN = 95	BPN = 40

### Physical Properties

Property	Value
Tensile strength (minimum)	11 pound/inch at 73°F (2.0 kg/cm at 23°C)
Applied shrinkage	0.015 inches (0.4 mm)

## Health and Safety

### Caution

When handling any chemical products, read the manufacturers' container labels and the Material Safety Data Sheets (MSDS) for important health, safety and environmental information.

To obtain MSDS sheets for 3M products:

- By fax, call 1-800-364-0768 in the US and Canada or 1-650-556-8417 for all other locations.
- Electronically, visit us at <http://www.3M.com/MSDS>.
- By mail, or in case of an emergency, call 1-800-364-3577 or 1-651-737-6501.

When using any equipment, always follow the manufacturers' instructions for safe operation.

## Warranty and Limited Remedy

*This warranty is made in lieu of any and all other express or implied warranties, including any implied warranty of merchantability:* 3M warrants that sidewalk signs, which are constructed using only the recommended 3M film, inks and overlaminates film, and are produced and installed in accordance with 3M's written instructions, will for a period up to 3 months after application have the following expected performance: maintain original brightness, color, and image quality, except for ordinary and expected wear and tear, and adhere to 3M-recommended unsealed exterior surfaces and be removable without damage to the surface. 3M will replace or refund the cost of materials for such quantity of sidewalk signs found not to meet this warranty.

**This warranty is exclusive. In no case shall 3M be liable for any other direct or indirect damages or loss, including without limitation any incidental, special, or consequential damages, or any labor charges incident to the removal or replacement of sidewalk signs.**

## 3M Related Literature

Listed below is related 3M technical literature that may be of interest. You may view and print these Bulletins from our Web site at [www.scotchprint.com](http://www.scotchprint.com), or order them via our Fax-on-Demand (FOD) system. Call one of these phone numbers to order the desired bulletins, and specify the FOD document number provided in the chart.

United States or Canada: 1-800-364-0768

International: 1-651-732-6506

Subject	Bulletin No.	FOD No.
<b>Product Bulletins</b>		
3M™ Scotchcal™ Graphic Film 3662-10	3662	1521
<b>Instruction Bulletins</b>		
Cold Roll Lamination	4.22	6522
Application and Maintenance for Scotchprint® Graphics for Sidewalk Signs	5.33	7033
Storage, Handling, Maintenance, Removal	6.5	8505

### Bulletin Change Summary

Corrected Applied Shrinkage dimensions.



#### Commercial Graphics Division

3M Center, Building 220-6W-06  
PO Box 33220  
St. Paul, MN 55133-3220 USA  
General Info. 1-800-374-6772  
Technical Info. 1-800-328-3908  
Fax 1-651-736-4233

Fax-on-Demand 1-800-364-0768 US/Canada or 1-651-732-6506 International  
Fax-on-Demand document: 1522  
[www.scotchprint.com](http://www.scotchprint.com)

#### 3M Canada

P.O. Box 5757  
London, Ontario  
Canada N6A 4T1  
1-800-265-1840  
Fax 519-452-6245

#### 3M México, S.A. de C.V.

Av. Santa Fe No. 55  
Col. Santa Fe, Del. Alvaro Obregón  
México, D.F. 01210  
52-55-52-70-04-00  
Fax 52-55-52-70-22-77

#### 3M Puerto Rico, Inc.

Puerto Rico Industrial Park  
P.O. Box 100  
Carolina, PR 00986-0100  
787-620-3000  
Fax 787-750-3035

©3M 2003. All rights reserved.

Normandy® Pro FL is a 13 oz. quality, economical front-lit banner or billboard material for UV, solvent or screen-printing. Recommended by printer manufacturers across the globe, Normandy Pro FL is tear and fade resistant, strong, durable and prints vibrantly and consistently. Available in both matte and gloss finishes in widths ranging from 98"-196". In 80" widths and below this product is called JetFlex® FL.

### Material Details

CHARACTERISTICS	TEST METHOD	METRIC	ENGLISH
Support Cloth	DIN 60001	Polyester	Polyester
Yarn dtex	DIN 53830	1100 x 1100 dtex	1000 x 1000 denier
Type of Coating	N/A	PVC	PVC
Total Weight	DIN EN ISO 2286-2	440 g/m <sup>2</sup>	13 oz/ld <sup>2</sup>
Tensile Strength	ASTM D 751:2006, C.R.E	151 X 128 kgF	333 X 281 lbs/in
Tear Strength (warp/weft)	ASTM D 4830:1988, C.R.E	15 X 10 kgF	39 X 21 lbs/in
Flame Resistance	DIN 4102	NFPA701, CA Fire Marshall, NYC (MEA)	
Low Temperature (No Crack at:)	ASTM D 2137	Low at -40°C	Low at -40°F
RF Weldable (Heat Sealable)	DIN 53354	Yes	Yes
Fungus Resistant	ASTM G21	Treated	

### Applications

	Backlit	Banner	Billboard	Blockout	Building Wrap	Display Systems	Truckside
Applications		■	■			■	

### Ink Printability

Solvent	Eco Solvent	UV	Screen Printing	Dye Transfer	Dye Direct
■	□	■	■		

### Available Sizes

Metric (m)	English (inches)
2.50, 2.60, 3.20, 3.81, 4.50, 5.00	98, 102, 126, 150, 177, 197

Key: ■ - Excellent □ - Good

The information on physical and chemical characteristics is based upon tests believed to be reliable. The values are intended only as a source of information. A legally binding guarantee of specific properties is not to be inferred from our specifications. They are given without guaranty and do not constitute a warranty. The purchaser should independently determine, prior to use, the suitability of this material for his/her specific purpose. (Data represents averages and is not intended for use as a specification.)

**3M**

# VHB™ Tapes

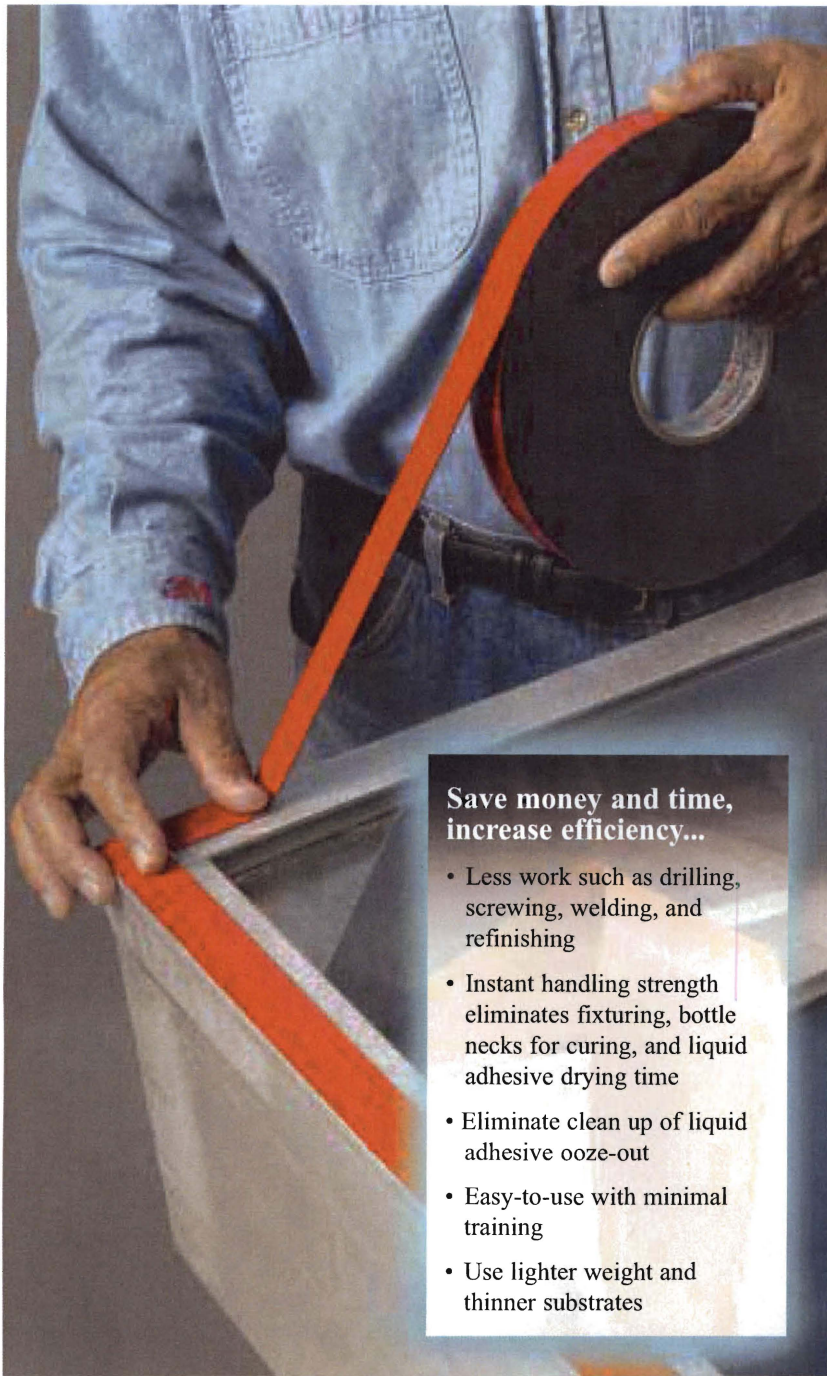
Design Guide  
for Sign Assembly

*Proven  
worldwide.*

*Now even  
more versatile  
for more sign  
applications,  
more surfaces.*



# Saving time, enhancing appearance for more than 20 years...



## Save money and time, increase efficiency...

- Less work such as drilling, screwing, welding, and refinishing
- Instant handling strength eliminates fixturing, bottle necks for curing, and liquid adhesive drying time
- Eliminate clean up of liquid adhesive ooze-out
- Easy-to-use with minimal training
- Use lighter weight and thinner substrates

## Enhance design and appearance...

- Invisible fastening provides smooth aesthetically-pleasing surfaces
- Use a wider variety of materials more readily for high impact visual combinations

## Increase material options...

- Join dissimilar materials; tape flexes with thermal expansion and prevents bi-metallic corrosion
- Bond metal and most plastics with minimal surface preparation
- Bond most painted and powder coated surfaces, and hard-to-bond plastics such as acrylic, polycarbonate, and high temperature co-polyester

## Replace welds, screws, rivets, and epoxies...

- Bond with high holding strength for static and dynamic loads
- Elastic properties absorb shock and flexing for reliability against wind and vibration
- Fill irregularities and gaps between surfaces to help keep out dirt, water, and cleaning chemicals

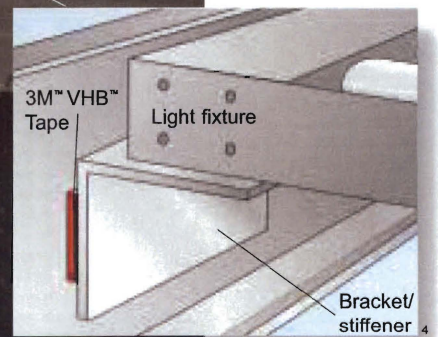
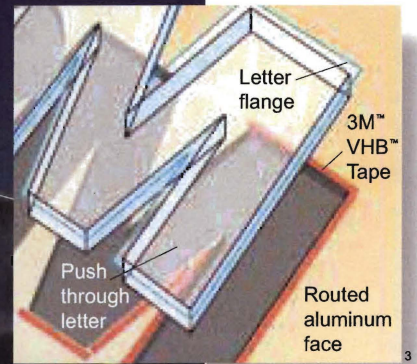
For more than 20 years, sign builders worldwide have been using 3M™ VHB™ Tapes to permanently bond and seal many surfaces for all the reasons shown here.

## **3M™ VHB™ Tape 5952 expands your options.**

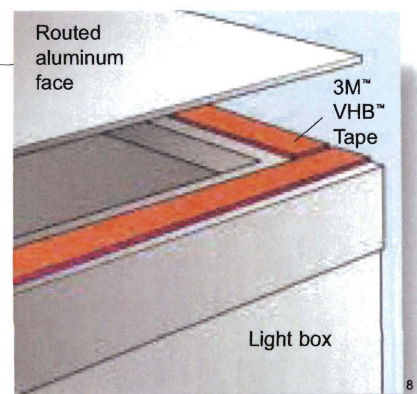
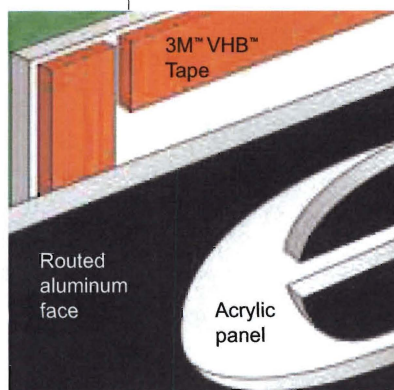
As with other 3M™ VHB™ Tapes, you can easily bond to clean aluminum and steel, but now you can also readily bond painted metal and many plastics throughout a sign. In many cases, Tape 5952 requires minimal surface preparation, eliminating surface priming or abrading. Special formulation also bonds on contact to most paints and powder coats, as well as hard-to-bond plastics, such as acrylic, polycarbonate and high temperature co-polyester.

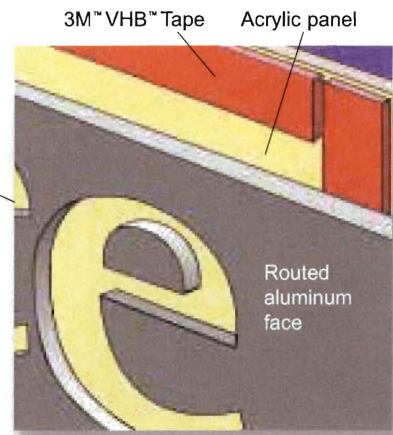
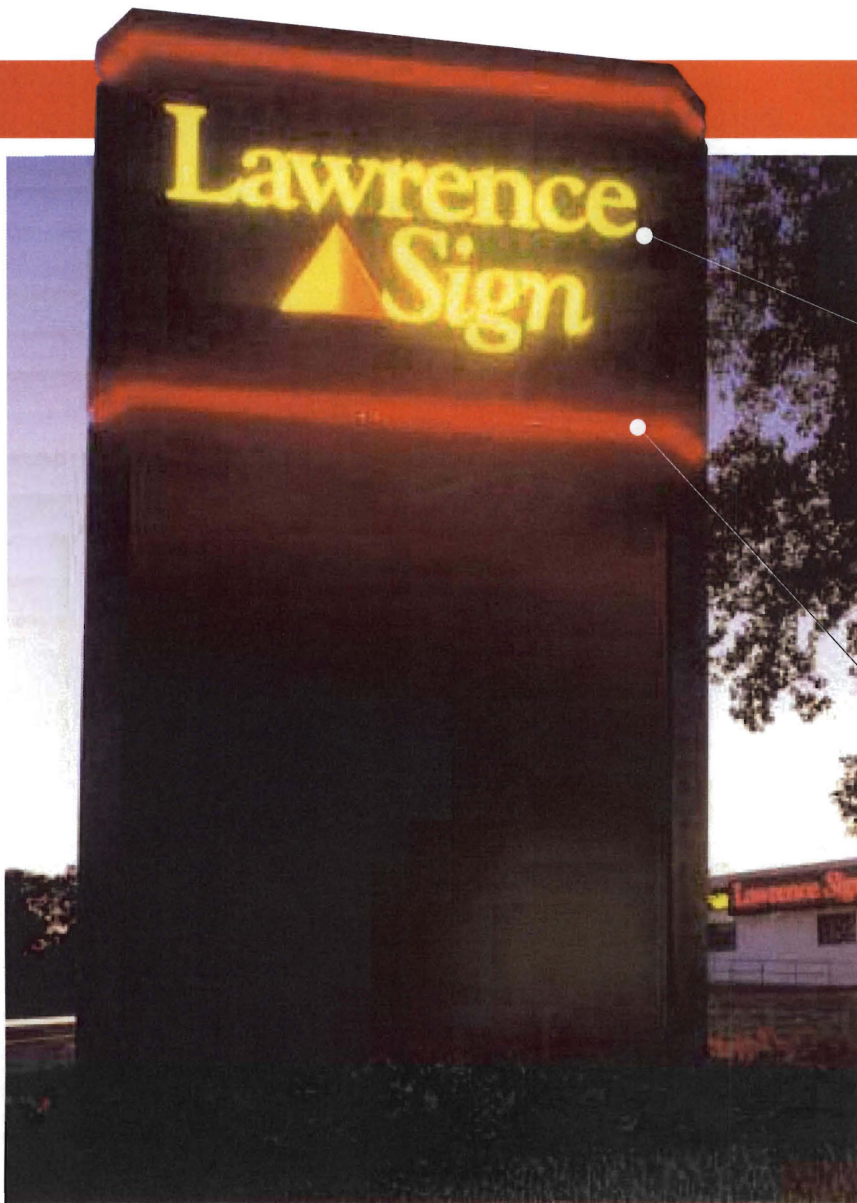
# Around the Sign and Around the World

Versatility and reliable performance for applications throughout any sign

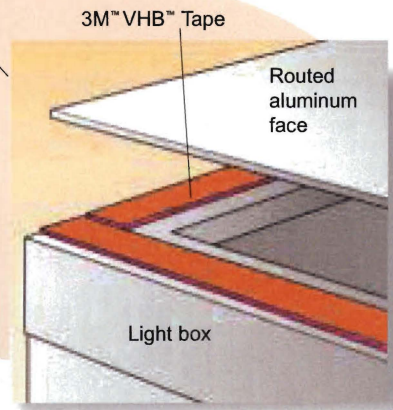


Twin pole monument sign.

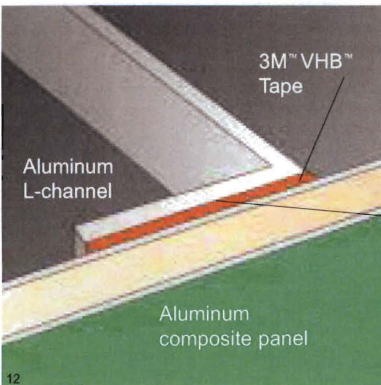




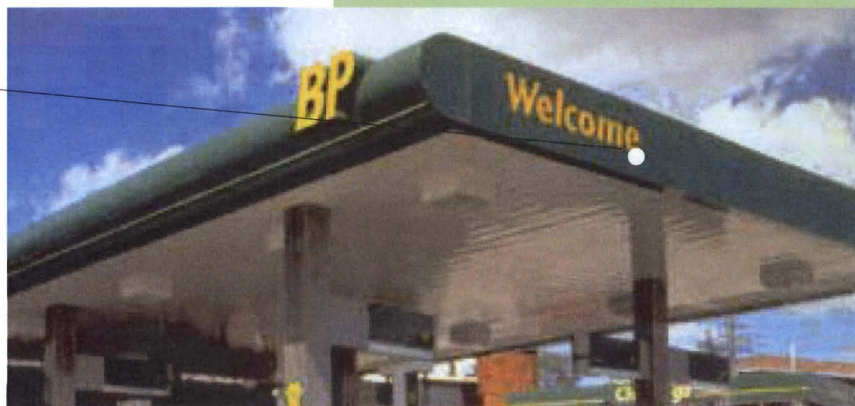
9



10



12



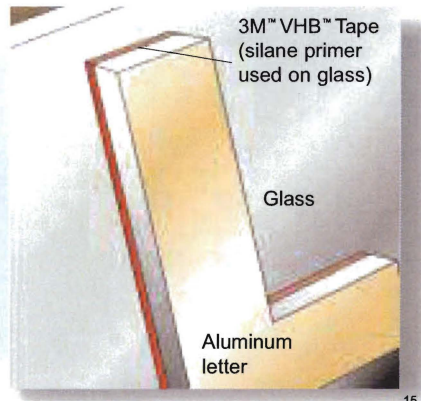
Gas station canopy.

13



Characters on glass.

14



15

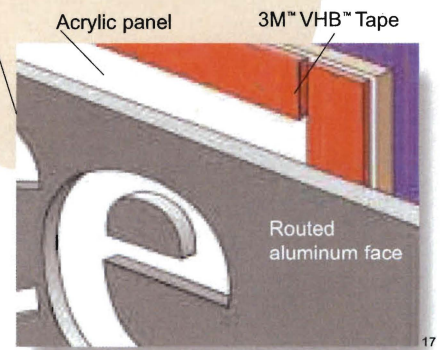


Custom post and panel sign.

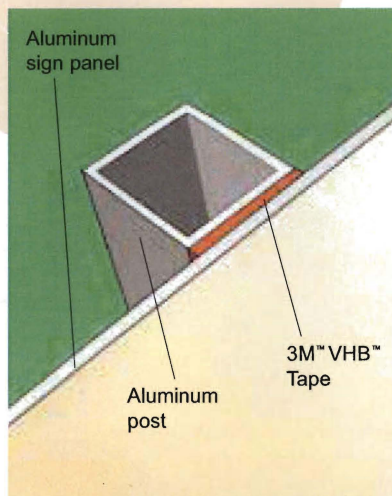


Twin pole monument sign.

16



17



18

19

# Optimizing 3M™ VHB™ Tape performance on a wider variety of surfaces

3M™ VHB™ Tapes bond permanently to most surfaces when application requirements are met.

**Clean**

In most cases, simply clean substrate with an IPA/water mixture.

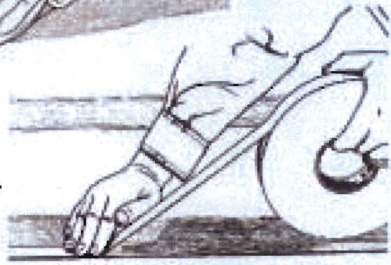


**Pressure**

Apply 15 psi at the bond line.

**Temperature**

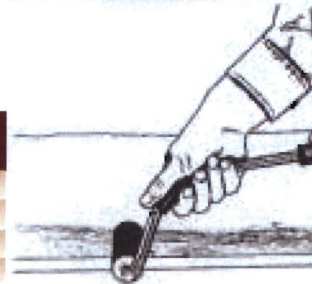
Typically apply at 50-60°F (10-26°C). Some VHB tapes can be applied as low as 32°F (0°C).



Instant handling strength at room temperature.

**Time**

Time	Bond strength
20 min.	50%
60 min.	75%
24 hrs.	90%
3 days	100%



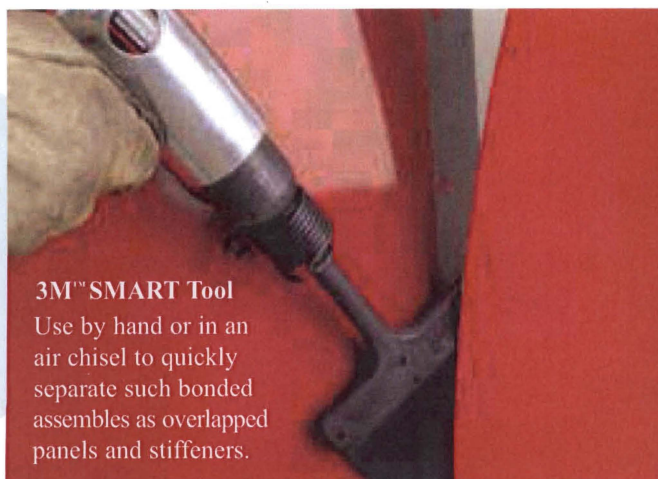
20

**NOTE:** The technical information and data provided here should be considered representative or typical only and should not be used for specification purposes. User should evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for user's method of application.

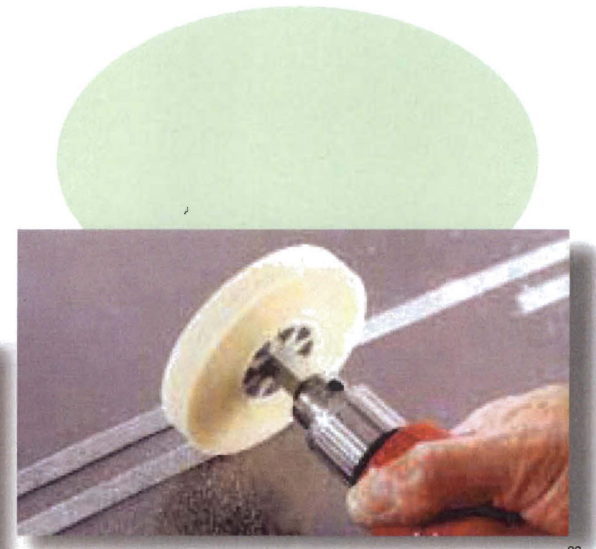
## 3M™ VHB™ Tape Removal Systems

Easy-to-use for separating bonded parts and removing residue

3M™ VHB™ Tapes bond most surfaces permanently, but if you have to separate the surfaces and remove residue, 3M also has the tools for a fast, effective job.



**3M™ SMART Tool**  
Use by hand or in an air chisel to quickly separate such bonded assemblies as overlapped panels and stiffeners.



**3M™ Stripe Off Wheel**

Takes residue off faster and easier than solvents or adhesive cleaners. Resilient rounded edge follows contours and irregular surfaces and cleans without scratches or damage to acrylic enamel or urethane paint.

22

21

# and UL 48 Listed for sign accessories



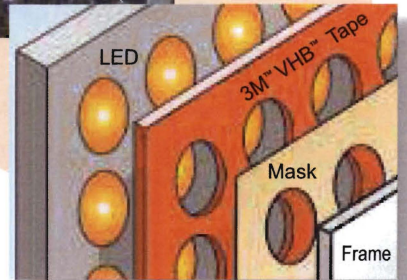
**Skin attachment** – For a sign face or other panel, application is quick and easy for a durable bond that also seals against dust and moisture. The seal also reduces light leakage for a more aesthetic appearance.

25



Highway LED sign.

23

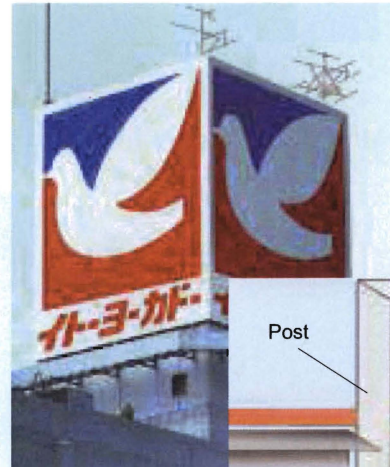


24



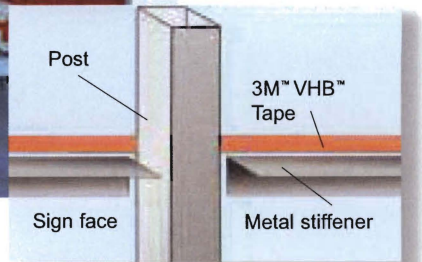
26

**Brackets and stiffeners** – For permanent attachment of light fixture brackets to the interior of side panels, 3M™ VHB™ Tape eliminates the time and work of rivets, welds, or screws. The bracket also acts as a side panel stiffener.

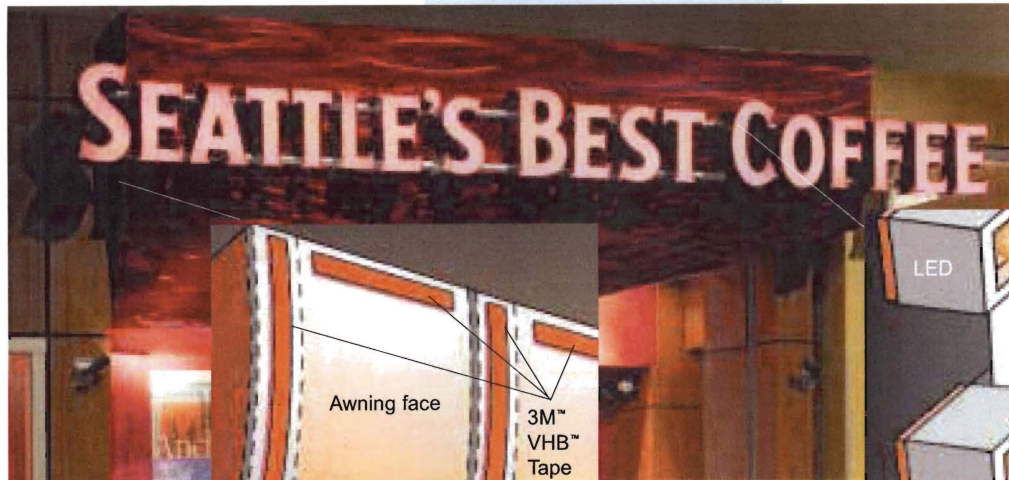


Grocery store signage.

27

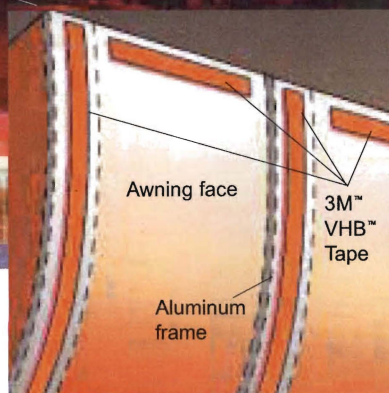


28

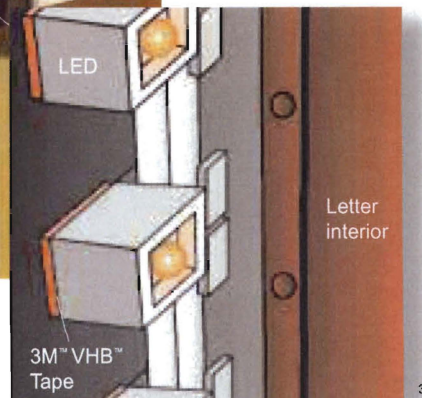


Channel letter sign with decorative backdrop.

29



30



31

## 3M™ VHB™ Tapes for sign assembly

Tape Families	Product Number	Tape Thickness w/o Liner Mills	Color	Temperature		Application Ideas
				Short	Long	
1	5925 5952 5962	25 mil 45 mil 62 mil	Dark gray	300°F	200°F	Bond and seal metal and plastic throughout a sign.
2	4930 4950 4955	25 mil 45 mil 80 mil	White	300°F 400°F	200°F 300°F	Bond unpainted metal.
3	4936 4941 4956	25 mil 45 mil 62 mil	Dark gray	300°F	200°F	Bonding flexible vinyl banners.
4	4905 4910	20 mil 40 mil	Clear	300°F	200°F	Bond transparent materials throughout a sign.

## UL 48 Listings

3M™ VHB™ Tapes	UL
4919F, 4926, 4936, 4936F, 4941, 4941F, 4947F, 4956, 4956F, 4979F	Component – Sign Accessories
5925, 5952, 5962	File E 65361
4920, 4930, 4950	Category UYMR2
4905, 4910	

## 3M™ VHB™ Tape Selection Guide

	Unpainted Metals	Painted Metals	ACM (Paints) Aluminum Composite Materials	Glass	Acrylic (Plexiglass®)	Polycarbonate (Lexan)	FRP Reinforced Plastic (Fiberglass)	Copolyester (PETG, VIVAK®)	Sealed/Painted Wood	Rigid PVC Sintra	Flexible Vinyl (Banners)
Top Candidate	4950	5952	5952	5952	5952	5952	5952	5952	5952	5952	4941
Followed by*	1,3,4	3,2,4	3,2,4	3,2,4	3,2,4	3,2,4	3,2,4	3,2,4	3,2,4	3,2,4	–

5952 is the newest VHB Tape offering the highest tack to a variety of substrates including unpainted metals. 4950, 4941, and 4910 are also candidates for these substrates, however additional surface prep may be necessary.

\* VHB Families:

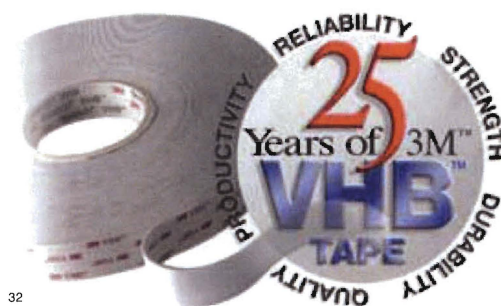
1 – 5952    2 – 4950    3 – 4941    4 – 4910

## Hat Channel Stiffener Cost Comparison

	Spot Welding	3M VHB Tape
Attachment Time	8 minutes (weld + refinish)	3 minutes (clean + apply)
Labor Cost	\$6.67	\$2.50
Material Cost	–	\$1.67
Total Cost	\$6.67	\$4.17
<b>Savings per stiffener</b>		<b>\$2.50</b>

Figures are estimates based on \$50 per hour labor burden rate and a 6 foot long hat channel stiffener.

Application times and costs are estimates based on customer input. Times will vary due to letter size, worker competency, and other shop variables.



32

**Note:** This technical information and data should be considered representative or typical only and should not be used for specification purposes.

**Warranty:** 3M warrants for 24 months from the date of manufacture, that 3M™ VHB™ Tape will be free of defects in material and manufacture. 3M MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. This warranty does not cover damage resulting from the use or inability to use 3M VHB Tape due to misuse, workmanship in application, or application or storage not in accordance with 3M recommended procedures. **Important Notice:** User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of application. Please remember that many factors can affect the use and performance of a 3M product in a particular application. The materials to be bonded with the product, the surface preparation of these materials, the product selected for use, the conditions in which the product is used, and the time and environmental conditions in which the product is expected to perform are among the many factors that can affect the use and performance of a 3M product. Given the variety of factors that can affect the use and performance of a 3M product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application. **Limitation of Remedies and Liability:** If the 3M™ VHB™ Tape is proved to be defective within the warranty period stated above, THE EXCLUSIVE REMEDY, AT 3M'S OPTION, SHALL BE TO REFUND THE PURCHASE PRICE OF OR TO REPAIR OR REPLACE THE DEFECTIVE 3M™ VHB™ TAPE. 3M shall not otherwise be liable for loss or damages, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including negligence, warranty, or strict liability.



### Industrial Adhesives and Tapes Division

3M Center Bldg. 21-1W-10  
900 Bush Ave.  
St. Paul, MN 55144  
1-800-362-3550  
www.3M.com/VHB

3M and VHB are trademarks of 3M Company.

Printed in U.S.A.  
© 2008 3M  
70-0703-7525-1



# VHB™ Tapes

## Technical Data

June, 2009

### Product Description:

3M™ VHB™ Tapes provide the convenience and simplicity of a tape fastener and are ideal for use in many interior and exterior bonding applications. In many situations, they can replace rivets, spot welds, liquid adhesives and other permanent fasteners.

These 3M™ VHB™ Tapes are made with acrylic foam which is viscoelastic in nature. This gives the foam energy absorbing and stress relaxing properties which provides these tapes with their unique characteristics. The acrylic chemistry provides outstanding durability performance.

These tapes utilize a variety of specific foam, adhesive, color and release liner types to provide each product/family with specific features. These features can include adhesion to specific or a broad range of materials, conformability, high tensile strength, high shear and peel adhesion, resistance to plasticizer migration, and UL746C recognition. All 3M™ VHB™ Tapes have excellent durability and excellent solvent and moisture resistance.

**Note:** All 3M™ VHB™ Tapes should be thoroughly evaluated by the user under actual use conditions with intended substrates to determine whether a specific tape is fit for a particular purpose and suitable for user's method of application, especially if expected use involves extreme environmental conditions or high dead load stress.

### 3M™ VHB™ Tape Products

Tape Number	Color	Thickness in. (mm)	Tape Number	Color	Thickness in. (mm)	Tape Number	Color	Thickness in. (mm)
4611	Dk Gray	0.045 (1.1)	4930 (F)	White	0.025 (0.64)	4955	White	0.080 (2.0)
4618	White	0.025 (0.64)	4932	White	0.025 (0.64)	4956 (F)	Gray	0.062 (1.55)
4622	White	0.045 (1.1)	4936 (F)	Gray	0.025 (0.64)	4957F	Gray	0.062 (1.55)
4624	White	0.062 (1.55)	4941 (F)	Gray	0.045 (1.1)	4959 (F)	White	0.120 (3.0)
4646	Dk Gray	0.025 (0.64)	4943F	Gray	0.045 (1.1)	4979F	Black	0.062 (1.55)
4655	Dk Gray	0.062 (1.55)	4945	White	0.045 (1.1)	4991	Gray	0.090 (2.3)
4905	Clear	0.020 (0.5)	4946	White	0.045 (1.1)	5915 (P)	Black	0.016 (0.4)
4910	Clear	0.040 (1.0)	4947F	Black	0.045 (1.1)	5925 (P)	Black	0.025 (0.64)
4919F	Black	0.025 (0.64)	4949	Black	0.045 (1.1)	5930 (P)	Black	0.032 (0.8)
4920	White	0.015 (0.4)	4950	White	0.045 (1.1)	5952 (P)	Black	0.045 (1.1)
4926	Gray	0.015 (0.4)	4951	White	0.045 (1.1)	5958FR	Black	0.040 (1.0)
4929	Black	0.025 (0.64)	4952	White	0.045 (1.1)	5962 (P)	Black	0.062 (1.55)

(F) or (P) after the product number designate that both a paper and film liner product version are available. [e.g. 4930 (paper liner) and 4930F (film liner), 5915 (film liner) and 5915P (paper liner)]. See page 3 for specific details.

### 3M™ VHB™ Tapes Adhesive Types:

**Multi-Purpose Acrylic:** This adhesive bonds to a wide range of materials including metals, glass, and high and medium surface energy plastics and paints. This unique adhesive also has the ability to resist migration of plasticizers in vinyl substrates.

**Modified Acrylic:** This adhesive bonds to medium low surface energy paints and plastics, including many powder coated paints in addition to the substrates listed with the multi-purpose acrylic adhesive (except plasticized vinyl).

**General Purpose Acrylic:** This adhesive bonds to most higher surface energy substrates including metal, glass and high surface energy plastics.

**Low Temperature Applicable Acrylic:** This adhesive can make bonds down to 32°F (0°C), compared to 50°F (10°C) for most acrylic adhesives. This adhesive system bonds to most high surface energy substrates including metal, glass and high surface energy plastics.

**Low Surface Energy:** This high performance synthetic adhesive bonds to many lower surface energy substrates, including many plastics and power coated paints, plus smooth general purpose substrates.

### 3M™ VHB™ Tapes Foam Types:

**Conformable:** This foam provides high strength with the capability of conforming to the irregularities of rigid substrates, even when there might be slight mismatch.

**Very Conformable:** This foam provides the highest level of conformability while maintaining high internal strength.

**Firm:** This foam provides the highest level of foam strength in the 3M™ VHB™ Tapes family.

**Clear:** Not technically a foam, this solid acrylic material provides excellent clarity.

# 3M™ VHB™ Tapes

## 3M™ VHB™ Tape Families:

- 4941** This family utilizes multi-purpose acrylic adhesive on both sides of conformable foam. The adhesive provides excellent adhesion to a broad range of high and medium surface energy substrates including metals, glass, and a wide variety of plastics, as well as plasticized vinyl. The conformable foam provides good contact, even with mismatched substrates. Available in gray and black.
- 5952** This family matches the modified acrylic adhesive on both sides of very conformable foam, providing adhesion to the broadest range of substrates, including most powder coated paints. Available in black.
- 4950** This family has general purpose adhesive on both sides of firm type foam. This family is typically used on metal, glass and high surface energy plastic substrates. Available in white and black.
- 4945** This family has multi-purpose adhesive on both sides of firm foam. Available in white.
- 4910** This family of clear tapes is excellent for applications where clear or colorless is desired. The general purpose adhesive on both sides is suitable for high surface energy substrates.
- 4951** This family of tapes is based around the low temperature applicable acrylic adhesive system, utilized on both firm and conformable foam types. These products are suitable for high surface energy substrates. Available in white (firm foam) and gray (conformable foam).
- 4952** This family utilizes the low surface energy adhesive on a firm foam. Available in white.
- 4611** This family has a general purpose adhesive on both sides of firm foam. This family of tapes is typically used on metal substrates, and has the added feature of high temperature resistance, making it often suitable for bonding prior to high temperature paint processing. Available in dark gray.
- 4622** This family has general purpose adhesive on the face side (the side that typically would be bonded first) and multi-purpose adhesive on the liner side (the side exposed when the release liner is removed) of a conformable foam. Available in white.

## 3M™ VHB™ Tape Product Family Guide

Thickness inches (mm)	Family ▶	4941		5952	4950		4945	4910	4951		4952	4611	4622	
	Color ▶	Gray	Black	Black	White	Black	White	Clear	White	Gray	White	Dk Gray	White	
	Foam type ▶	Conform	Conform	Very Conf	Firm	Firm	Firm	n/a	Firm	Conform	Firm	Firm	Firm	Conform
	Adhesive ▶	Multi-Purpose		Modified	General Purpose		Multi-Purp	Gen-Purp	Low Temp Apply		LSE	Gen-Purp	Gen/Multi	
0.015 / 0.016 (0.4)		4926		5915 5915P	4920									
0.020 (0.5)							4905							
0.025 (0.64)		4936 4936F	4919F	5925 5925P	4930 4930F	4929					4932	4646	4618	
0.032 (0.8)				5930 5930P										
0.040 (1.0)				5958FR				4910						
0.045 (1.1)		4941 4941F	4947F	5952 5952P	4950	4949	4945 4946		4951	4943	4952	4611	4622	
0.062 (1.55)		4956 4956F	4979F	5962 5962P						4957		4655	4624	
0.080 (2.0)					4955									
0.090 (2.3)		4991												
0.120 (3.0)					4959 4959F									

**NOTE:** For easy product comparison, data in this product information page will be organized by product family.

# 3M™ VHB™ Tapes

## Typical Physical Properties

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

3M™ VHB™ Tapes			Thickness		Adhesive	Foam	Density	Release Liner Thickness			
Family	Product Number	Color	Inches	(mm) Tolerance				Type	Type	Inches	(mm)
4941	4919F	Black	0.025	(0.64) ± 15%	Multi-Purp	Conform	45 (720)	PE Film	0.005	(0.125)	Red (printed)
	4926	Gray	0.015	(0.4) ± 15%	Multi-Purp	Conform	45 (720)	DK Paper	0.003	(0.08)	White (printed)
	4936	Gray	0.025	(0.64) ± 15%	Multi-Purp	Conform	45 (720)	DK Paper	0.003	(0.08)	White (printed)
	4936F	Gray	0.025	(0.64) ± 15%	Multi-Purp	Conform	45 (720)	PE Film	0.005	(0.125)	Red (printed)
	4941	Gray	0.045	(1.1) ± 10%	Multi-Purp	Conform	45 (720)	DK Paper	0.003	(0.08)	White (printed)
	4941F	Gray	0.045	(1.1) ± 10%	Multi-Purp	Conform	45 (720)	PE Film	0.005	(0.125)	Red
	4947F	Black	0.045	(1.1) ± 10%	Multi-Purp	Conform	45 (720)	PE Film	0.005	(0.125)	Red (printed)
	4956	Gray	0.062	(1.55) ± 10%	Multi-Purp	Conform	45 (720)	DK Paper	0.003	(0.08)	White (printed)
	4956F	Gray	0.062	(1.55) ± 10%	Multi-Purp	Conform	45 (720)	PE Film	0.005	(0.125)	Red (printed)
	4979F	Black	0.062	(1.55) ± 10%	Multi-Purp	Conform	45 (720)	PE Film	0.005	(0.125)	Red (printed)
4991	Gray	0.090	(2.3) ± 10%	Multi-Purp	Conform	45 (720)	PE Film	0.005	(0.125)	Red (printed)	
5952	5915	Black	0.016	(0.4) ± 15%	Modified	Very Conf	43 (690)	PE Film	0.005	(0.125)	Red
	5915P	Black	0.016	(0.4) ± 15%	Modified	Very Conf	43 (690)	PCK Paper	0.004	(0.10)	White (printed)
	5925	Black	0.025	(0.64) ± 15%	Modified	Very Conf	37 (590)	PE Film	0.005	(0.125)	Red
	5925P	Black	0.025	(0.6) ± 15%	Modified	Very Conf	37 (590)	PCK Paper	0.004	(0.10)	White (printed)
	5930	Black	0.032	(0.8) ± 15%	Modified	Very Conf	37 (590)	PE Film	0.005	(0.125)	Red
	5930P	Black	0.032	(0.8) ± 15%	Modified	Very Conf	37 (590)	PCK Paper	0.004	(0.10)	White (printed)
	5952	Black	0.045	(1.1) ± 10%	Modified	Very Conf	37 (590)	PE Film	0.005	(0.125)	Red
	5952P	Black	0.045	(1.1) ± 10%	Modified	Very Conf	37 (590)	PCK Paper	0.004	(0.10)	White (printed)
	5958FR	Black	0.040	(1.0) ± 10%	Modified	Very Conf	50 (800)	PE Film	0.005	(0.125)	Red
	5962	Black	0.062	(1.55) ± 10%	Modified	Very Conf	37 (590)	PE Film	0.005	(0.125)	Red
5962P	Black	0.062	(1.55) ± 10%	Modified	Very Conf	37 (590)	PCK Paper	0.004	(0.10)	White (printed)	
4950	4920	White	0.015	(0.4) ± 15%	Gen Purp	Firm	50 (800)	DK Paper	0.003	(0.08)	White (printed)
	4929	Black	0.025	(0.64) ± 15%	Gen Purp	Firm	50 (800)	Polyester	0.002	(0.05)	Clear
	4930	White	0.025	(0.64) ± 15%	Gen Purp	Firm	50 (800)	DK Paper	0.003	(0.08)	White (printed)
	4930F	White	0.025	(0.64) ± 15%	Gen Purp	Firm	50 (800)	PE Film	0.005	(0.125)	Red
	4949	Black	0.045	(1.1) ± 10%	Gen Purp	Firm	50 (800)	Polyester	0.002	(0.05)	Clear
	4950	White	0.045	(1.1) ± 10%	Gen Purp	Firm	50 (800)	DK Paper	0.003	(0.08)	White (printed)
	4955	White	0.080	(2.0) ± 10%	Gen Purp	Firm	45 (720)	Polyester	0.002	(0.05)	Clear
	4959	White	0.120	(3.0) ± 10%	Gen Purp	Firm	45 (720)	Polyester	0.002	(0.05)	Clear
	4959F	White	0.120	(3.0) ± 10%	Gen Purp	Firm	45 (720)	PE Film	0.005	(0.125)	Red
4945	4945	White	0.045	(1.1) ± 10%	Multi-Purp	Firm	50 (800)	DK Paper	0.003	(0.08)	White (printed)
	4946	White	0.045	(1.1) ± 10%	Multi-Purp	Firm	50 (800)	PE Film	0.005	(0.125)	Clear
4910	4905	Clear	0.020	(0.5) ± 15%	Gen Purp	Solid	60 (960)	PE Film	0.005	(0.125)	Red (printed)
	4910	Clear	0.040	(1.0) ± 10%	Gen Purp	Solid	60 (960)	PE Film	0.005	(0.125)	Red (printed)
4951	4951	White	0.045	(1.1) ± 10%	Low Temp Appl	Firm	50 (800)	Polyester	0.002	(0.05)	Clear
	4943F	Gray	0.045	(1.1) ± 10%	Low Temp Appl	Conform	45 (720)	Polyester	0.002	(0.05)	Clear
	4957F	Gray	0.062	(1.55) ± 10%	Low Temp Appl	Conform	45 (720)	Polyester	0.002	(0.05)	Clear
4952	4932	White	0.025	(0.64) ± 15%	LSE	Firm	50 (800)	DK Paper	0.003	(0.08)	White (printed)
	4952	White	0.045	(1.1) ± 10%	LSE	Firm	50 (800)	DK Paper	0.003	(0.08)	White (printed)
4611	4611	Dk Gray	0.045	(1.1) ± 10%	Gen Purp	Firm	52 (840)	PE Film	0.005	(0.125)	Red
	4646	Dk Gray	0.025	(0.64) ± 15%	Gen Purp	Firm	52 (840)	PE Film	0.005	(0.125)	Red
	4655	Dk Gray	0.062	(1.55) ± 10%	Gen Purp	Firm	52 (840)	PE Film	0.005	(0.125)	Red
4622	4618	White	0.025	(0.64) ± 15%	Gen/Multi Purp	Conform	45 (720)	PE Film	0.004	(0.10)	Green
	4622	White	0.045	(1.1) ± 10%	Gen/Multi Purp	Conform	45 (720)	PE Film	0.004	(0.10)	Green
	4624	White	0.062	(1.55) ± 10%	Gen/Multi Purp	Conform	45 (720)	PE Film	0.004	(0.10)	Green

# 3M™ VHB™ Tapes

## Typical Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Family	3M™ VHB™ Tapes			Dynamic Adhesion Performance					
	Product Number	Color	Thickness Inches	90° Peel Adhesion		Normal Tensile		Dynamic Overlap Shear	
				lb/in	N/100 mm	lb/in <sup>2</sup>	kPa	lb/in <sup>2</sup>	kPa
4941	4919F	Black	0.025	17	(300)	90	(620)	80	(550)
	4926	Gray	0.015	12	(210)	95	(655)	90	(620)
	4936 (F)	Gray	0.025	17	(300)	90	(620)	80	(550)
	4941 (F)	Gray	0.045	20	(350)	85	(585)	70	(480)
	4947F	Black	0.045	20	(350)	85	(585)	70	(480)
	4956 (F)	Gray	0.062	20	(350)	80	(550)	70	(480)
	4979F	Black	0.062	20	(350)	80	(550)	70	(480)
	4991	Gray	0.090	20	(350)	70	(480)	65	(450)
5952	5915 (P)	Black	0.016	13	(230)	90	(620)	90	(620)
	5925 (P)	Black	0.025	17	(300)	90	(620)	90	(620)
	5930 (P)	Black	0.032	18	(315)	90	(620)	85	(585)
	5952 (P)	Black	0.045	20	(350)	90	(620)	80	(550)
	5958FR	Black	0.040	20	(350)	100	(690)	100	(690)
	5962 (P)	Black	0.062	20	(350)	90	(620)	80	(550)
4950	4920	White	0.015	15	(260)	160	(1100)	100	(690)
	4929	Black	0.025	20	(350)	160	(1100)	100	(690)
	4930 (F)	White	0.025	20	(350)	160	(1100)	100	(690)
	4949	Black	0.045	25	(440)	140	(970)	80	(550)
	4950	White	0.045	25	(440)	140	(970)	80	(550)
	4955	White	0.080	20	(350)	95	(655)	70	(480)
	4959 (F)	White	0.120	20	(350)	75	(520)	55	(380)
4945	4945	White	0.045	25	(440)	140	(970)	80	(550)
	4946	White	0.045	25	(440)	140	(970)	80	(550)
4910	4905	Clear	0.020	12	(210)	100	(690)	70	(480)
	4910	Clear	0.040	15	(260)	100	(690)	70	(480)
4951	4951	White	0.045	18	(315)	110	(760)	80	(550)
	4943F	Gray	0.045	20	(350)	85	(585)	70	(480)
	4957F	Gray	0.062	20	(350)	75	(515)	70	(480)
4952	4932	White	0.025	20	(350)	100	(690)	100	(690)
	4952	White	0.045	25	(440)	80	(550)	80	(550)
4611	4611	Dk Gray	0.045	18	(315)	90	(590)	65	(445)
	4646	Dk Gray	0.025	15	(250)	100	(690)	80	(550)
	4655	Dk Gray	0.062	18	(315)	80	(550)	60	(415)
4622	4618	White	0.025	17	(300)	85	(580)	80	(550)
	4622	White	0.045	20	(350)	70	(480)	65	(445)
	4624	White	0.062	20	(350)	55	(380)	60	(410)



**90° Peel Adhesion** - Based on ASTM D3330 - To stainless steel, room temperature, jaw speed 12 in/min (305 mm/min). Average force to remove is measured. 72 hour dwell.



**Normal Tensile (T-Block Tensile)** - ASTM D-897 - To aluminum, room temperature, 1 in<sup>2</sup> (6.45 cm<sup>2</sup>), jaw speed 2 in/min (50 mm/min.) Peak force to separate is measured. 72 hour dwell.



**Dynamic Overlap Shear** - ASTM D-1002 - To stainless steel, room temperature, 1 in<sup>2</sup> (6.45 cm<sup>2</sup>), jaw speed 0.5 in/min (12.7 mm/min.) Peak force to separate is measured. 72 hour dwell.

# 3M™ VHB™ Tapes

## Typical Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Family	3M™ VHB™ Tapes			Static Shear					Temperature Tolerance			
	Product Number	Color	Thickness Inches	Weight (grams) that 1/2 square inch will hold 10,000 minutes (7 days)					Short Term (Minutes, Hours)		Long Term (Days, Weeks)	
				72°F (22°C)	150°F (66°C)	200°F (93°C)	250°F (121°C)	350°F (177°C)	°F	°C	°F	°C
4941	4919F	Black	0.025	1000	500	500			300	(149)	200	(93)
	4926	Gray	0.015	1000	500	500			300	(149)	200	(93)
	4936 (F)	Gray	0.025	1000	500	500			300	(149)	200	(93)
	4941 (F)	Gray	0.045	1000	500	500			300	(149)	200	(93)
	4947F	Black	0.045	1000	500	500			300	(149)	200	(93)
	4956 (F)	Gray	0.062	1000	500	500			300	(149)	200	(93)
	4979F	Black	0.062	1000	500	500			300	(149)	200	(93)
	4991	Gray	0.090	1000	500	500			250	(121)	200	(93)
5952	5915 (P)	Black	0.016	1000	500	500	250		300	(149)	250	(121)
	5925 (P)	Black	0.025	1000	500	500	250		300	(149)	250	(121)
	5930 (P)	Black	0.032	1000	500	500	250		300	(149)	250	(121)
	5952 (P)	Black	0.045	1000	500	500	250		300	(149)	250	(121)
	5958FR	Black	0.040	1000	350	250			300	(149)	200	(93)
	5962 (P)	Black	0.062	1000	500	500	250		300	(149)	250	(121)
4950	4920	White	0.015	1500	500	500			300	(149)	200	(93)
	4929	Black	0.025	1500	500	500			300	(149)	200	(93)
	4930 (F)	White	0.025	1500	500	500			300	(149)	200	(93)
	4949	Black	0.045	1500	500	500			300	(149)	200	(93)
	4950	White	0.045	1500	1000	500			300	(149)	200	(93)
	4955	White	0.080	1500	1000	750	750	750	400	(204)	300	(149)
	4959 (F)	White	0.120	1500	1000	750	750	750	400	(204)	300	(149)
4945	4945	White	0.045	1500	500	500			300	(149)	200	(93)
	4946	White	0.045	1500	500	500			300	(149)	200	(93)
4910	4905	Clear	0.020	1000	500	500			300	(149)	200	(93)
	4910	Clear	0.040	1000	500	500			300	(149)	200	(93)
4951	4951	White	0.045	1250	500	500			300	(149)	200	(93)
	4943F	Gray	0.045	1000	500	500			300	(149)	200	(93)
	4957F	Gray	0.062	1000	500	500			300	(149)	200	(93)
4952	4932	White	0.025	1500	500				200	(93)	160	(71)
	4952	White	0.045	1500	500				200	(93)	160	(71)
4611	4611	Dk Gray	0.045	1500	750	750	750	750	450	(232)	300	(149)
	4646	Dk Gray	0.025	1500	750	750	750	750	450	(232)	300	(149)
	4655	Dk Gray	0.062	1500	750	750	750	750	450	(232)	300	(149)
4622	4618	White	0.025	1000	250	250			250	(121)	200	(93)
	4622	White	0.045	1000	250	250			250	(121)	200	(93)
	4624	White	0.062	1000	250	250			250	(121)	200	(93)



**Static Shear** - ASTM D3654 - To stainless steel, tested at various temperatures and gram loadings. 0.5 in<sup>2</sup> (3.22 cm<sup>2</sup>). Will hold listed weight for 10,000 minutes (approximately 7 days). Conversion: 1500 g/0.5 in<sup>2</sup> equals 6.6 lb/in<sup>2</sup>; 500 g/0.5 in<sup>2</sup> = 2.2 lb/in<sup>2</sup>.

**Short Term Temperature Tolerance** - No change in room temperature dynamic shear properties following 4 hours conditioning at indicated temperature with 100 g/static load. (Represents minutes, hours in a process type temperature exposure).

**Long Term Temperature Tolerance** - Maximum temperature where tape supports at least 250 g load per 0.5 in<sup>2</sup> in static shear for 10,000 minutes. (Represents continuous exposure for days or weeks).

**3M™ VHB™ Tapes****Available Sizes**

Tape Thickness inches (mm)	Standard Length yards (meters)	Minimum Width inches (mm)	Maximum Width inches (mm)	Maximum Roll Length					
				Width 1/4" up to 3/8" (6.4mm up to 9.5mm)		Width >3/8" up to 1/2" (>9.5mm up to 12.7mm)		Width 1/2" and wider (12.7mm and wider)	
				yards (meters)	yards (meters)	yards (meters)	yards (meters)	yards (meters)	yards (meters)
0.015/0.016 (0.4)	72 (65.8)	0.25 (6.4)	48* (1220)	144 (131.6)	175 (160)	360 (330)			
0.020 (0.5)	72 (65.8)	0.25 (6.4)	48* (1220)	72 (65.8)	108 (98.8)	175 (160)			
0.025 (0.64)	72 (65.8)	0.25 (6.4)	48 (1220)	72 (65.8)	108 (98.8)	175 (160)			
0.032 (0.8)	72 (65.8)	0.25 (6.4)	48 (1220)	72 (65.8)	108 (98.8)	175 (160)			
0.040 (1.0)	36 (32.9)	0.25 (6.4)	48 (1220)	72 (65.8)	108 (98.8)	144 (131.6)			
0.045 (1.1)	36 (32.9)	0.25 (6.4)	48 (1220)	72 (65.8)	108 (98.8)	144 (131.6)			
0.062 (1.55)	36 (32.9)	0.25 (6.4)	46 (1170)	72 (65.8)	72 (65.8)	108 (98.8)			
0.080 (2.0)	36 (32.9)	0.25 (6.4)	46 (1170)	36 (32.9)	36 (32.9)	72 (65.8)			
0.090 (2.3)	36 (32.9)	0.25 (6.4)	46 (1170)	36 (32.9)	36 (32.9)	72 (65.8)			
0.120 <sup>(4959)</sup> (3.0)	36 (32.9)	0.5 (12.7)	46 (1170)	N/A	N/A	36 (32.9)			
0.120 <sup>(4959P)</sup> (3.0)	36 (32.9)	0.25 (6.4)	46 (1170)	36 (32.9)	36 (32.9)	36 (32.9)			

\*Exception – 5915 (P) max. width 46 inches (1170 mm); 5925 (P) max. width 47 inches (1195 mm).

**Slitting Tolerance**

Standard slitting tolerance  $\pm 1/32$  inch ( $\pm 0.031$  inch,  $\pm 0.8$  mm).

Precision slitting with slitting tolerance of  $\pm 1/64$  inch ( $\pm 0.016$  in.,  $\pm 0.44$  mm) is available on select products with minimum order of full web increments.

**Core Size**

All products are available on a 3 inch ID Core (76.2 mm).

**Converted Parts**

In addition to standard and custom roll sizes available from 3M through the distribution network, 3M™ VHB™ Tapes are also available in limitless shapes and sizes through the 3M Converter network. For additional information, contact 3M Converter Markets at 1-800-223-7427 or on the web at [www.3M.com/converter](http://www.3M.com/converter).

**Shelf Life**

All 3M™ VHB™ Tapes have a shelf life of 24 months from date of manufacture when stored at 40°F to 100°F (4°C to 38°C) and 0-95% relative humidity. The optimum storage conditions are 72°F (22°C) and 50% relative humidity.

Performance of tapes is not projected to change even after shelf life expires; however, 3M does suggest that 3M™ VHB™ Tapes are used prior to the shelf life date whenever possible.

The manufacturing date is available on all 3M™ VHB™ Tape cores as the lot number. The lot number, typically a 4 digit code, is a Julian date (Y D D D). The first digit refers to the year of manufacture, the last 3 digits refer to the days after January 1. Example: A lot number of 4266 would translate to a date of manufacture of Sept. 22 (266th day of year) in 2004. On most products this is found as the 4 digits after the "9" following the product number. For tapes printed continuously around the core (e.g. 3M™ VHB™ Tape 5952 family) the lot number typically will be the string of 4 digits preceding the product number.

# 3M™ VHB™ Tapes

## Additional Typical Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

### Outgassing:

3M™ VHB™ Tapes	% TML	%VCM	%WVR
4930	0.77	0.01	0.21
4932	2.41	0.66	0.23
4945	1.24	0.01	0.19

TML - Total Mass Loss

VCM - Volatile Condensable Materials

WVR - Water Vapor Regained

NASA Reference Publication, "Outgassing Data for Selecting Spacecraft Materials", (11/18/2004)  
Available online at <http://outgassing.nasa.gov>

### Dielectric Breakdown Strength (ASTM D149)

3M™ VHB™ Tapes	(in volts/mil)
4941	360
4926	330
5952	455
5925	520
4950	460
4920	640
4910	630
4611	330

### Dielectric Constant (ASTM D150)

3M™ VHB™ Tapes	Dielectric Constant	Dissipation Factor
4941 at 1 kHz	2.29	0.0245
at 1 MHz	1.99	0.0374
5952 at 1 kHz	2.14	0.0065
at 1 MHz	1.95	0.0506
4950 at 1 kHz	2.28	0.0227
at 1 MHz	1.99	0.0370
4910 at 1 kHz	3.21	0.0214
at 1 MHz	2.68	0.0595
4611 at 1 kHz	2.80	0.0130
at 1 MHz	2.43	0.0564

### Thermal Conductivity - K-value

3M™ VHB™ Tapes	BTU in/ hr ft² °F	(w/mK)
4941	0.53	(0.08)
5952	0.37	(0.05)
4950/4945	0.63	(0.09)
4910	1.09	(0.16)
4611	0.77	(0.11)

R-Value =  $\frac{\text{thickness}}{\text{K-value}}$   
(When units of K-value are BTU-in/hr ft² °F and thickness is given in inches.)

### Resistivity (ASTM D257)

3M™ VHB™ Tapes	Volume Resistivity (in ohm-cm)	Surface Resistance (in ohms/square)
4941	$2.1 \times 10^{14}$	$2.7 \times 10^{14}$
5952	$2.5 \times 10^{14}$	$>10^{16}$
4950	$1.5 \times 10^{15}$	$>10^{16}$
4920	$1.7 \times 10^{15}$	$>10^{16}$
4910	$3.1 \times 10^{15}$	$>10^{16}$
4611	$1.4 \times 10^{15}$	$>10^{16}$

### Typical 3M™ VHB™ Tape Properties for Modeling

#### Thermal Coefficient of Expansion

$1 \times 10^{-4}$  in/in/°F  
 $1.8 \times 10^{-4}$  mm/mm/°C

#### Shear Modulus (@25°C, 1 Hz)

4950 Family:  $6 \times 10^5$  Pa  
4941 Family:  $3 \times 10^5$  Pa

(Shear Modulus is both temperature and frequency dependent).

Youngs Modulus: For VHB tapes the Youngs Modulus will be about 3 times the Shear Modulus.

#### Poisson's Ratio

0.49

### Burn Characteristics 3M™ VHB™ Tape 5958FR

Meets FAR 25.853 (a) 12 second vertical burn, Appendix F, Part I (a)(ii).

Meets NBS Smoking Density (ASTM F814/E662).

Meets Toxicity (Draeger Tube ABD0031, AITM 3.0005)

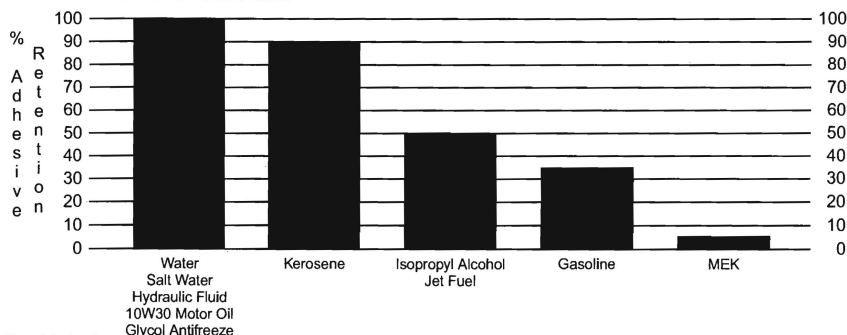
## 3M™ VHB™ Tapes UL746C Listings - File MH 17478

Category QOQW2 Component - Polymeric Adhesive Systems, Electrical Equipment

3M™ VHB™ Tapes/ Product Families	Substrates	Temperature Rating Minimum	Maximum
4919F, 4926, 4936, 4936F, 4941, 4941F, 4947F, 4956, 4956F, 4979F	Ceramic	-35°C	110°C
	Aluminum, Galvanized steel, stainless steel, enameled steel, nickel coated ABS, glass (with or without silane coating) PVC, glass/epoxy, PBT, polycarbonate, acrylic/polyurethane paint, polyester paint	-35°C	90°C
	ABS	-35°C	75°C
4920, 4930, 4950	Aluminum, galvanized steel, enameled steel, stainless steel, ceramic, glass/epoxy	-35°C	110°C
	PBT, Acrylic	-35°C	90°C
	ABS, Polycarbonate, Rigid PVC	-35°C	75°C
4945, 4946	Phenolic, aluminum, galvanized steel, alkyd enamel	-35°C	110°C
	ABS, polycarbonate, polyimide, stainless steel, acrylic/polyurethane paint, polyester paint	-35°C	90°C
	unplasticized PVC	-35°C	75°C
5915, 5915P, 5925, 5925P, 5930, 5930P, 5952, 5952P, 5962, 5962P	Polycarbonate, Primer 94 coated polycarbonate, aluminum, acrylic/polyurethane paint, galvanized steel, steel, polyester paint, epoxy/polyester paint, epoxy paint, glass (with or without silane coating), stainless steel, enameled steel, glass epoxy, polybutylene terephthalate, Nylon®, Noryl® (PPE) polyphenylene ether	-35°C	90°C
	Rigid PVC, ABS	-35°C	75°C
5915, 5925, 5930, 5952	Acrylic	-35°C	90°C
	Acrylic	-35°C	80°C
5952	Cellulose Acetate Butyrate	-35°C	90°C
4991	Polycarbonate, aluminum, acrylic/polyurethane paint, polyester paint	-35°C	90°C
4611, 4646, 4655	Stainless steel, aluminum, galvanized steel, glass, glass/epoxy, phenolic	-35°C	110°C
	Nylon, polycarbonate	-35°C	90°C
	ABS, rigid PVC	-35°C	75°C
4905, 4910	Polycarbonate, aluminum, acrylic/polyurethane paint	-35°C	90°C

A current list can be found at [www.ul.com](http://www.ul.com) (select certifications, search file MH17478)

### Solvent and Fuel Resistance



#### Test Method

- Tape between stainless steel and aluminum foil.
- 72 hours dwell at room temperature.
- Solvent immersion for 72 hours.
- Test within 45 minutes after removing from solvent.
- 90° peel angle.
- 12 in./min. rate of peel.
- Peel adhesion compared to control.

Note: Continuous submersion in chemical solutions is not recommended. The above information is presented to show that occasional chemical contact should not be detrimental to tape performance in most applications in ordinary use.

# 3M™ VHB™ Tapes

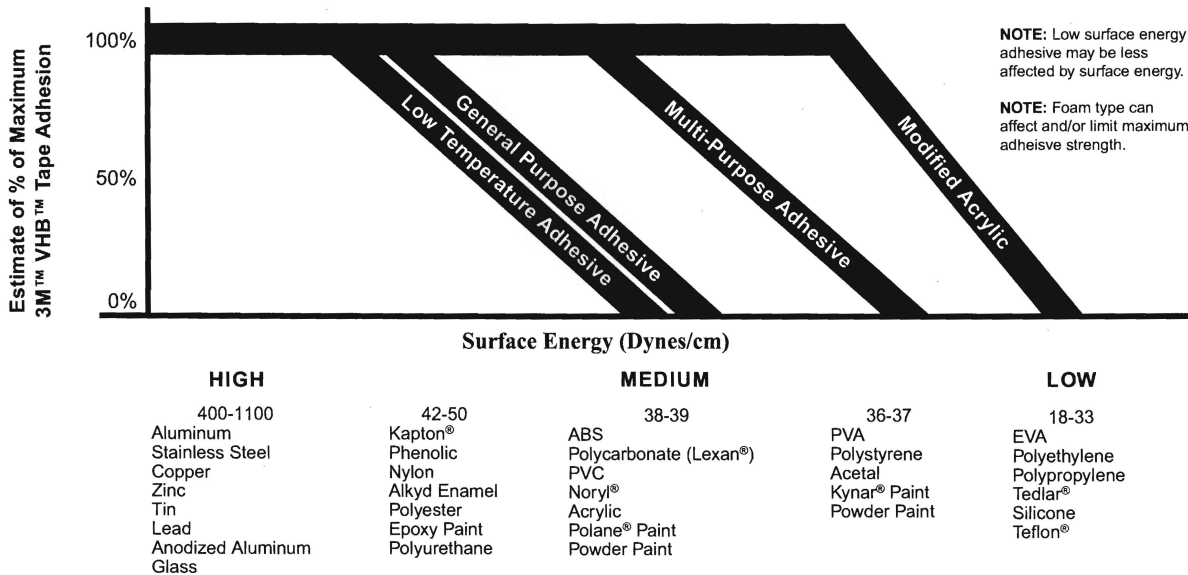
## Design and Tape Selection Considerations

- ▶ **Choose the right tape for the substrate:** Adhesives must flow onto the substrate surfaces in order to achieve intimate contact area and allow the molecular force of attraction to develop. The degree of flow of the adhesive on the substrate is largely determined by the surface energy of the substrate.



This illustration demonstrates the effect of surface energy on adhesive interfacial contact. High surface energy materials draw the adhesive closer for high bond strength.

Relationship of Adhesion and Surface Energy for 3M™ VHB™ Tape Adhesive Families



NOTES: There are a wide variety of formulations, surfaces finishes and surface treatments available on substrate materials which can affect adhesion. This chart is intended to provide only a rough estimate of the adhesion levels which can be expected on some common materials relative to a reference surface such as aluminum. Light surface abrasion will significantly increase adhesion levels on many materials, except when using tapes 4952/4932.

- ▶ **Use the right tape thickness:** The necessary thickness of tape depends on the rigidity of substrates and their flatness irregularity. While the 3M™ VHB™ Tapes will conform to a certain amount of irregularity, they will not flow to fill gaps between the materials. For bonding rigid materials with normal flatness, consider use of tapes with thickness of 45 mils (1.1 mm) or greater. As the substrate flexibility increases thinner tapes can be considered.
- ▶ **Use the right amount of tape:** Because 3M™ VHB™ Tapes are viscoelastic by nature their strength and stiffness is a function of the rate at which they are stressed. They behave stronger with relatively faster rate of stress load (dynamic stresses) and will tend to show creep behavior with stress load acting over a long period of time (static stresses). As a general rule, for **static loads**, approximately four square inches of tape should be used for each pound of weight to be supported in order to prevent excessive creep. For **dynamic loads**, the dynamic performance characteristics provided on page 4 should be useful, factoring in the appropriate safety factors.
- ▶ **Allow for thermal expansion/contraction:** 3M™ VHB™ Tapes can perform well in applications where two bonded surfaces may expand and contract differentially. Assuming good adhesion to the substrates, the tapes can typically tolerate differential movement in the shear plane up to 3 times their thickness.
- ▶ **Bond Flexibility:** While an advantage for many applications where allowing differential movement is a benefit, the tape bonds are typically more flexible than alternate bonding methods. Suitable design modifications or periodic use of rigid fasteners or adhesives may be needed if additional stiffness is required.
- ▶ **Severe Cold Temperature:** Applications which require performance at severe cold temperatures must be thoroughly evaluated by the user if the intended use will subject the tape product to high impact stresses. A technical bulletin "3M™ VHB™ Tape Cold Temperature Performance" is available for additional information. (70-0707-3991-0)

# 3M™ VHB™ Tapes

## Application Techniques

- **Clean:** Most substrates are best prepared by cleaning with a 50:50 mixture of isopropyl alcohol (IPA\*) and water prior to applying 3M™ VHB™ Tapes.

**Exceptions to the general procedure** that may require additional surface preparation include:

- **Heavy Oils:** A degreaser or solvent-based cleaner may be required to remove heavy oil or grease from a surface and should be followed by cleaning with IPA/water.
- **Abrasion:** Abrading a surface, followed by cleaning with IPA/water, can remove heavy dirt or oxidation and can increase surface area to improve adhesion.
- **Adhesion Promoters:** Priming a surface can significantly improve initial and ultimate adhesion to many materials such as plastics and paints.
- **Porous surfaces:** Most porous and fibred materials such as wood, particleboard, concrete, etc. need to be sealed to provide a unified surface.
- **Unique Materials:** Special surface preparation may be needed for glass and glass-like materials, copper and copper containing metals, and plastics or rubber that contain components that migrate (e.g. plasticizers).

Refer to 3M Technical Bulletin "Surface Preparation for 3M™ VHB™ Tape Applications" for additional details and suggestions. (70-0704-8701-5)

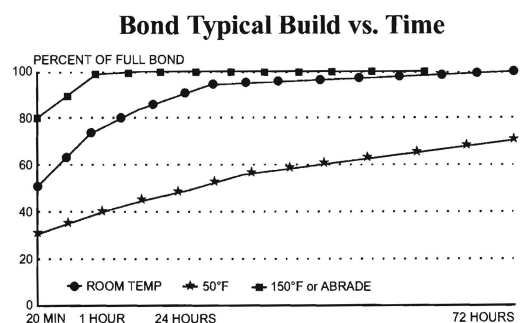
\***Note:** These cleaner solutions contain greater than 250 g/l of volatile organic compounds (VOC). Please consult your local Air Quality Regulations to be sure the cleaner is compliant. When using solvents, be sure to follow the manufacturer's precautions and directions for use when handling such materials.

- **Pressure:** Bond strength is dependent upon the amount of adhesive-to-surface contact developed. Firm application pressure develops better adhesive contact and helps improve bond strength. Typically, good surface contact can be attained by applying enough pressure to insure that the tape experiences approximately 15 psi (100 kPa) pressure. Either roller or platen pressure can be used. Note that rigid surfaces may require 2 or 3 times that much pressure to make the tape experience 15 psi.
- **Temperature:** Ideal application temperature range is 70°F to 100°F (21°C to 38°C). Pressure sensitive adhesives use viscous flow to achieve substrate contact area. Minimum suggested application temperatures:
  - 50°F (10°C): 3M™ VHB™ Tapes 4950, 5952, 4910, 4952, 4611, 4622 families.
  - 60°F (15°C): 3M™ VHB™ Tapes 4941, 4945 families.
  - 32°F (0°C): 3M™ VHB™ Tape 4951 families.

**Note:** Initial tape application to surfaces at temperatures below these suggested minimums is not recommended because the adhesive becomes too firm to adhere readily. However, once properly applied, low temperature holding is generally satisfactory.

To obtain good performance with all 3M™ VHB™ Tapes, it is important to ensure that the surfaces are dry and free of condensed moisture.

- **Time:** After application, the bond strength will increase as the adhesive flows onto the surface. At room temperature approximately 50% of ultimate bond strength will be achieved after 20 minutes, 90% after 24 hours and 100% after 72 hours. This flow is faster at higher temperatures and slower at lower temperatures. Ultimate bond strength can be achieved more quickly (and in some cases bond strength can be increased) by exposure of the bond to elevated temperatures (e.g. 150°F [66°C] for 1 hour). This can provide better adhesive wetout onto the substrates. Abrasion of the surfaces or the use of primers/adhesion promoters can also have the effect of increasing bond strength and achieving ultimate bond strength more quickly.



# 3M™ VHB™ Tapes

---

## Special Cases:

Rough Surfaces with 3M™ VHB™ Tapes 4932/4952 – 3M™ VHB™ Tapes 4932/4952 were designed to adhere to many low surface energy substrates. Rough surfaces created by light abrasion or textured molds are typically detrimental to bond strength with this tape family.

Plasticized Vinyl – Plasticizers compounded in soft vinyl can migrate into adhesives and significantly change their performance characteristics. 3M™ VHB™ Tapes 4941 and 4945 families have very good plasticizer resistance and adhesion to many vinyl formulations. Because of the wide variation in vinyl formulations, however, evaluation by the user must be conducted with the specific vinyl used to ensure that performance will be satisfactory over time. Problems related to plasticizer migration can often be predicted by accelerated aging of assembled parts at 150°F (66°C) for one week).

---

## Technical Information

The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

---

## Product Use

Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

---

## Limited Warranty

3M warrants for 24 months from the date of manufacture that 3M™ VHB™ Tape will be free of defects in material and manufacture. 3M MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. This limited warranty does not cover damage resulting from the use or inability to use 3M™ VHB™ Tape due to misuse, workmanship in application, or application or storage not in accordance with 3M recommended procedures. AN APPLICATION WARRANTY EXPRESSLY APPROVED AND ISSUED BY 3M IS AN EXCEPTION. THE CUSTOMER MUST APPLY FOR A SPECIFIC APPLICATION WARRANTY AND MEET ALL WARRANTY AND PROCESS REQUIREMENTS TO OBTAIN AN APPLICATION WARRANTY. CONTACT 3M FOR MORE INFORMATION ON APPLICATION WARRANTY TERMS AND CONDITIONS.

---

## Limitation of Remedies and Liability

If the 3M™ VHB™ Tape is proved to be defective within the warranty period stated above. THE EXCLUSIVE REMEDY, AT 3M'S OPTION, SHALL BE TO REFUND THE PURCHASE PRICE OF OR TO REPAIR OR REPLACE THE DEFECTIVE 3M™ VHB™ TAPE. 3M shall not otherwise be liable for loss or damages, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including negligence, warranty, or strict liability.

ISO 9001:2000

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001:2000 standards.



## Industrial Adhesives and Tapes Division

3M Center, Building 225-3S-06  
St. Paul, MN 55144-1000  
800-362-3550 • 877-369-2923 (Fax)  
www.3M.com/vhb



Recycled Paper  
40% pre-consumer  
10% post-consumer

3M and VHB are trademarks of 3M Company.  
Kapton, Tedlar and Teflon are registered trademarks of E.I. DuPont de Nemours & Co. Inc.  
Kynar is a registered trademark of Arkema.  
Lexan and Noryl are registered trademarks of Sabic Innovative Plastics IP BV.  
Polane is a registered trademark of Swinc, Inc.  
Printed in U.S.A.  
©3M 2009 70-0709-3863-7 (6/09)



# Scotchcal™ Graphic Film

## IJ36-20

For Piezo Inkjet and Screen Printing with Solvent and UV Inks

### Product Description

Film IJ36-20 is a 3-mil matte vinyl film with a changeable, pressure-sensitive adhesive. Use it where a good quality film is needed for short-term king and queen board promotional graphics on transit vehicles or box trucks and point-of-purchase displays. It is designed for piezo inkjet or screen printing with solvent or UV inks.

### Characteristics

All values are typical for unprocessed film and are not for use in specifications. Contact your 3M representative for a custom specification.

#### Physical Characteristics

Characteristic	Value
Material	Vinyl
Color	White opaque
Gloss	Matte
Film thickness	<b>Without adhesive:</b> 3 mil (0.081 mm) <b>With adhesive:</b> 4.0 mil (0.102 mm)
Adhesive type	Pressure-sensitive
Adhesive color	Gray
Liner	Polycoated paper

#### Application Characteristics

Finished graphic application recommendations	<b>Surface type:</b> Smooth, flat and simple curved surfaces <b>Substrate type:</b> Metal, rigid plastic and painted substrates <b>Application temperature:</b> <i>air and substrate</i> 40° to 100°F (4° to 38°C)
Application method	Dry
Finished graphic exposure temperature	-30° to +200°F (-34° to +93°C)
Graphic removal	Changeable; may require heat when removing at cool or cold ambient temperatures

### Warranty and Durability

#### 3M Basic Product Warranty

This product has been tested and is believed to be a good product when used as recommended in this Bulletin. The film is covered by the 3M Basic Product Warranty and is guaranteed to be free of physical and manufacturing defects. There is no warranty for printability, visual appearance, fitness for use or durability. See the 3M Graphics Market Center Warranty Brochure for the complete warranty and remedy details.

#### Expected Performance Life

1 year in a vertical exposure may be expected with typical usage.

3M Product and Instruction Bulletins provide practical recommendations for using this product in a way that maximizes performance, but using other 3M products or procedures with this film does not change the terms of the warranty.

## Warranty and Limited Remedy

The following is made in lieu of all other express or implied warranties, including any implied warranty of **merchantability** or fitness for a particular purpose or implied warranty arising out of a course of dealing, custom or usage of trade: all 3M products are warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin. 3M will replace or refund the price of any 3M materials that do not meet this warranty within the specified time periods. These remedies are exclusive. **In no case shall 3M be liable for any direct, indirect, or consequential damages, including any labor or non-3M materials charges.**

See the Graphics Market Center Warranty Brochure, which gives the terms, additional limitations of the warranty, if any, and limitations of liability.

## Definitions

### Vertical Exposure



*face of graphic* The face of the graphic is  $\pm 10^\circ$  from vertical.

## Fabrication

### All Printing Methods

This film has been optimized to perform well with a variety of piezo inkjet printers and inks as well as screen printing inks and processes. It is the graphic manufacturer's responsibility to determine the film's suitability for use with their printers and inks.

To maximize the film performance:

- Use graphic protection. 3M™ Scotchcal™ Luster Overlaminate 8509 is a cost-effective option for use with 3M's promotional graphic films.
- Thoroughly dry the ink and film or properly cure the ink before applying graphic protection, and before storing or installing a graphic.
- Always use the dry application method.
- Be aware that using sheeting film on a flat-bed piezo inkjet printer may produce printing defects.
- The typical maximum ink limit is 250%.
- If you are storing sheeted and stacked finished graphics for an extended period of time, leave an unprinted margin (about 1/4 inch) to allow for possible shrinkage before trimming the graphic.

### Piezo Inkjet Printing Only

## Shelf Life, Storage and Shipping

Activity	Recommendations
Shelf life	Total shelf life: 2 years Up to 2 years unprocessed, <i>OR</i> Up to 1 year processed and applied within 1 year of processing
Storage conditions	<ul style="list-style-type: none"> <li>• 90°F (32°C) maximum</li> <li>• Out of direct sunlight</li> <li>• Clean, dry area</li> <li>• Original container</li> </ul>
Shipping finished graphics	Flat: may be separated by paper Roll: printed side out on 5 inch (13 cm) diameter or larger core

## Health and Safety



### CAUTION

When handling any chemical products, read the manufacturers' container labels and the Material Safety Data Sheets (MSDS) for important health, safety and environmental information. To obtain MSDS sheets for 3M products go to [3M.com/MSDS](http://3M.com/MSDS), or by mail or in case of an emergency, call 1-800-364-3577 or 1-651-737-6501.

When using any equipment, always follow the manufacturers' instructions for safe operation.

## 3M Related Literature

Before starting any job, be sure you have the most current Product and Instruction Bulletins.

The information in 3M Product and Instruction Bulletins is subject to change. Current Bulletins are available at [3Mgraphics.com](http://3Mgraphics.com). The following applicable Bulletins provide information and processes you need to properly make the graphics described in this Bulletin. Additional Bulletins may be needed as indicated in the 3M Related Literature section of other 3M components you use.

Bulletin types: PB = Product Bulletin; PB-IB = Product & Instruction Bulletin; IB = Instruction Bulletin

Subject	Type	Bulletin No.
3M Graphic Protection Products overview of all graphic protection products and specific information on most overlaminates	PB	GP-1
Application, substrate selection, preparation and substrate-specific application techniques	IB	5.1
Application, general procedures for indoor and outdoor dry applications	IB	5.5
Storage, handling, maintenance, removal	IB	6.5
3M Graphics Center Warranty Brochure		go to <a href="http://3Mgraphics.com">3Mgraphics.com</a> , Warranties

3M and Scotchlcal are trademarks of 3M.

## Bulletin Change Summary

Regarding fabrication of graphics, be aware that using sheeting film on a flat-bed piezo inkjet printer may produce printing defects.



Regional Phone Numbers:  
North East: 1-800-729-9942  
South East: 1-800-537-4606

Midwest: 1-800-736-7636  
West: 1-800-252-7767  
Mexico: 011-52-55-47-77-19-00

[www.SourceOneOnline.com](http://www.SourceOneOnline.com)  
[custserv@SourceOneOnline.com](mailto:custserv@SourceOneOnline.com)