



## D2.5(b) WORKING WITH VINYL SHEET

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### ACKNOWLEDGEMENT

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### 1. STORAGE OF VINYL FILMS AND SHEETINGS

Following the correct procedures for storing, handling, maintaining and removing vinyl films and sheetings will maximize the life of the finished graphic. It will also help ensure that manufacturers' warranties are not invalidated in the event of graphics failure if the recommended procedures are not followed.

Unapplied vinyl graphics should be stored in a clean, dry area away from direct sunlight, excessive atmospheric moisture or humidity at an ambient temperature of less than 38°C and a relative humidity of less than 80%. Rolls should be stored horizontally in the shipping carton, whilst cut sheets should be stored lying flat, wrapped with polyethylene film and sealed to prevent moisture absorption by the liner which can lead to curling or rippling of the sheets.

Fabricated screen-printed or electronically-imaged vinyl sheets should be stored and shipped lying flat or rolled onto a core with a recommended minimum diameter of 125 mm for screen-printed graphics and 150 mm for electronically imaged graphics or larger.

### 2. HANDLING OF VINYL FILMS AND SHEETINGS

Applied vinyl graphics must be handled carefully during shipment and installation to prevent damage to the face of the graphic. If it is necessary to temporarily cover installed graphics (sometimes referred to as 'bagging'), special care should be taken to follow manufacturers' recommendations. Generally, it is important to avoid using any pre-mask tape which can quickly and permanently bond to the graphic, paper or plastic covers as a result of plasticiser migration. Clearly, also, it is important to avoid the use of fastening methods which may abrade the graphic.

### 3. REMOVAL OF VINYL FILMS AND SHEETINGS

The terms removable and permanent simply indicate the degree of ease or difficulty with which a film can be removed and how much adhesive remains on the substrate. For the best results, removable films should be removed within the time specified in the film product's instruction bulletin. The films can be removed with little or no heat and may have less than 30% adhesive residue. Although not designed for removal, permanent films can if necessary be removed by the use of heat and/or chemical aids but may leave significantly more than 50% adhesive residue.

The type of substrate/surface to which a particular film or sheeting is applied can affect both the initial and the ultimate adhesion and thus the ease or difficulty with which the applied film can be removed. Generally, vinyl graphics applied to a flat surface are easiest to remove, while those applied to surfaces with rivets are more difficult and those applied to surfaces with corrugations even more so.

It is particularly important to check manufacturers' warranties, as removal from substrates that have coatings (or anti-reflection and scratch-resistance functions) may not be covered and film removal in such situations may damage the substrate.



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### 4. APPLICATION TECHNIQUES

There are two types of application technique: wet and dry. The former is normally confined to transparent substrates such as glass and clear acrylic sheet where graphics are viewed from both sides. The latter is suitable for virtually all other applications.

#### 4.1 Application tapes

An application tape is a translucent material with an adhesive on one side. It is applied to the front of some graphics before application to the substrate. Application tapes assist both handling and application of the graphics as well as protecting their surface during installation. Since they have a lower adhesion to the film than does the film to the substrate, they are easy to remove.

Application tape is also called premask or prespace tape when referring to a specific type of application. It will also protect the graphic from staining when over-painted with most finish paints. Furthermore, use of an application tape to a prepared surface eliminates time-consuming layout of individual graphics elements. The surface of the tape can also carry application instructions and registration marks to aid vinyl positioning and final application.

### 5. SUBSTRATE SELECTION, PREPARATION AND CLEANING

To obtain a high-quality and long-lasting graphic, it is important to use the correct preparation and application techniques for each type of substrate. Vinyl film and sheeting can be applied to most substrates that are:

- clean (all substrates must be considered contaminated and be cleaned right up to the last cleaning process immediately before vinyl application);
- dry (any moisture trapped beneath the graphic will cause the graphic to fail prematurely due to loss of adhesion or freezing in cold environments);
- non-porous (porous materials absorb moisture which affects the ability of the film or sheeting to adhere to the substrate); and
- smooth (it is more difficult for the adhesive to make good contact with textured surfaces if the roughness is greater than that of 150 grit sandpaper).

There are three basic cleaning methods (general, solvent and isopropyl alcohol) and the type of substrate will determine which method to use. Care should be taken to avoid the use of improper cleaning methods and techniques because manufacturers' warranties could be invalidated.

General cleaning involves the use of a recommended detergent diluted water. Preparations that contain waxes, oils or lotions should be avoided, while chemicals used in some automated vehicle washing systems may interfere with adhesion. If using solvent cleaning, it is important to consult local air quality regulations as these may prohibit the use of surface preparations and cleaning materials based on solvent (VOC) content. Because it evaporates quickly, IPA (isopropyl alcohol) is not an appropriate cleaner if the substrate is warm or the conditions windy. A more general cleaning method should, in these circumstances, be adopted.

#### Substrate selection

Vinyl films and sheetings can be applied to virtually all substrates and the method of preparation will be determined by the type of substrate chosen for specific applications. The following is a list of selected commonly used signs and graphics substrates:

- Plastics materials (including acrylic, ABS, PETG, polycarbonate, polypropylene, polyethylene, polystyrene and styrene)
- Glass
- Composite materials (including GRP and aluminium composite sheet)
- Painted or primed substrates (including various paint systems)



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- Wood (including hardboard, plywood, sign-grade, high-density overlaid board, fibreboard and MDF)
- Metals (including stainless steel, steel, aluminium, anodised aluminium and chrome)
- Flexible substrates (including sign awnings and fascias, banners and curtain-sided trailer canvas)
- Building materials (including brick, sealed and painted concrete, wallboard, wall coverings, ceramic, marble and decorative stone).

### 6. CLEANING OF VINYL FILMS AND SHEETINGS

For cleaning graphics with an over-laminate film, use a chemical cleaner designed for high-quality painted surfaces. The cleaner must be wet, non-abrasive without strong solvents and possess a pH value between three and 11 (ie. neither strongly acidic nor strongly alkaline). Power or pressure washing may be used but care should be taken to avoid, aggressive washing which can damage the graphic by either allowing water to penetrate beneath the graphic or causing water to reduce graphic adhesion leading to lifting or curling of the graphic.

Some contaminants (typically, tar, oil, diesel smut, bituminous material, pollen, fungus and various forms of graffiti) may remain following normal cleaning procedures. However, these can be removed by a choice of recommended methods and preferably on a customer 'test and approve' basis.