Guide to substrates (or will it stick?)

The following few words of wisdom were culled from various sources and are presented here as a brief guide to the applicability of cut vinyl decals to particular substrates. It is not an exhaustive list but hopefully covers the most common and gives an insight into some of the problems associated with this process.

ABS	Generally a good substrate for self-adhesive films
Acrylic glass	Application of most standard adhesives causes no problems on these substrates - but certain types can suffer from 'outgassing', which causes bubbles beneath a self adhesive face film. Specifying a permeable cast face film, through which excess gas can escape, using the wet method of application, and avoiding high temperature exposure shortly after decal application will reduce the risk of outgassing.
Concrete	A permanent bond is not possible with self-adhesives on concrete.
Glass fibre reinforced plastics (GRP)	This material is based on glass fibre webbing saturated with polyester resins to which a hardener is added so that, after curing, it forms a rigid material that is often used in vehicle and boat building. Generally, a good substrate for self-adhesives provided that any agents used to release the plate from its mould are carefully removed. If the GRP contains a high level of solvent (monostyrene) residue, it may cause bubbles in a face film. The use of self-adhesive polyester films on GRP is not recommended, as they do not allow the escape of solvent residues.
Leather	Highly absorbent:- adhesives may be completely absorbed into the substrate. leaving a film with non-existent adhesion levels!
Nylon	Often requires an aggressive adhesive (see Polyethylene).
Paint	The variety of paint systems is almost limitless, so it is difficult to make general recommendations. However, most professional paint systems used on vehicles provide an excellent substrate for the application of self-adhesives - provided the basic rules are followed. - All paint systems must be built up according to the manufacturers' instructions. If wrong components are used, removal of self-adhesive decals after use may damage the paintwork. Paint must be completely dry and cured before attempting a self adhesive application: paints that still contain thinners can interact with the adhesive and the film and adversely affect their performance. Paints which are 'touch dry' may still contain a high proportion of thinner: as a general rule, follow these drying times:

Film type	Adhesive	Recommended drying at 20C
Retroreflective	Permanent	5 days
Monomeric plasticised	Removable	21 days
	Permanent	10 days
Polymeric plasticised	Removable	10 days
	Permanent	3 days

Residue car wax and polish must be completely removed before attempting a self adhesive application to ensure satisfactory contact between paint and adhesive. Note: application to nitrocellulose paint will change removable adhesives into permanent !

PMMA	Application of most standard adhesives causes no problems on these substrates - but certain types can suffer from 'outgassing', which causes bubbles beneath a self adhesive face film. Specifying a permeable cast face film, through which excess gas can escape, using the wet method of application, and avoiding high temperature exposure shortly after decal application will reduce the risk of outgassing.
Polycarbonate	This plastic substrate contains a small percentage of water which can in certain circumstances evaporate - with the result that any applied self adhesive decals may acquire bubbles in the face film. We suggest a cast film construction for application to poly-carbonates, since cast films are the most permeable and will facilitate the escape of any water vapour. Tests have also shown that in applications using the wet method the occurrence of bubbles is reduced.
Polyethylene	Applications to polyethylenes usually require special adhesives, which need to be applied at sufficiently high temperatures to achieve a satisfactory bond, using the dry application method.
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Polystyrene	Beware: it may change adhesive properties significantly, and can generate shrinkage of a self adhesive face film. Test prior to use.
Polyurethane	Often requires an aggressive adhesive (see Polyethylene).
Polyvinylchloride (PVC)	Good adhesion with most permanent adhesives can be achieved on rigid PVC, but it may contain components which can make removable adhesives permanent - test a panel in advance to be certain! Soft PVCs such as vehicle curtains and banners will require special adhesives; flexible substrates for backlit signage always require high-quality polymerically-plasticised films, otherwise decals will shrink or delaminate. Substrates used for banners can be acquired from many sources and unless specifically recommended for use with vinyl films can cause delamination and adhesive degradation.Always test before deployment.
Rubber	Not suitable for self adhesives: requires special glues.
Stainless steel	An excellent substrate for self adhesive films - only requires standard cleaning procedures.
Wood	Most woods that have been painted with a good quality paint system are a good substrate for self adhesive films. Cast films, which allow the wood to 'breathe', are often the best choice. Unpainted or badly painted wood will give very low adhesion values or values that reduce quickly following application. If in doubt, test the substrate first.