TECHNICAL BULLETIN 1.2

Removal of self-adhesive films

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Introduction
Removability of self-adhesive films is **NOT a property of the adhesive only**: it is a combination of properties of facefilm, adhesive, substrate and exposure conditions that "build" the perceived ease of removal. In order to understand this property of self-adhesive films better, would like to present some definitions, their meaning for our materials as well as some external influences on removability characteristics

Definitions:

Removability : a self-adhesive film has a good removability if it can be removed easily, in large pieces and without leaving any residues on the application surface.

Removable adhesives: adhesives that have been designed to have a relatively low adhesion level to facilitate removal after the period of use.

Permanent adhesives: adhesives that have been designed to have a relatively high adhesion level to prevent easy removal during the period of use.

If self-adhesive films have to be removed after the period of use, the remover wishes the following properties to be present:

- low adhesion level
- high tensile strength to prevent the film to break
- no adhesive residues
- if adhesive residues are present: easy removal

Good removability of permanent self-adhesive films is a contradiction following the above definitions and descriptions: the bond of such films has to be high during the period of use and after that: low. At the moment a project is planned, one should seriously consider what type of adhesive is to be used. The exposure conditions as well as the type of substrate also influence the ease of removal of self-adhesive films. All these aspects shall be taken into consideration, so: good removal is only possible if well planned at the moment of application!!

Planning:
We have noticed that a number of substrates may interact with a self-adhesive film. This interaction includes solvent migration, out-gassing, plasticizer migration or combinations thereof.

The consequences for removable adhesives are very often an increase in adhesion level, which may even reach to a level similar to that of permanent adhesives. This self-adhesive film will then NOT show the expected and required removability. Substrates that may react with adhesives include:

- Nitrocellulose paints, ABS, Polystyrene, (fresh) screenprinting inks, certain types of PVC, Polycarbonate, PMMA or other, non-inert plastic.
- Freshly brushed or sprayed paints in general.
- (Fresh) repair spots on cars or trucks

In case of doubt, please do some tests or consult Avery Dennison Graphics Division (Eu).

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Generally speaking, on freshly painted vehicles the paint needs a certain period for drying and curing. This may be different per type of paint. We recommend to apply removable self-adhesive films only after the indicated drying/curing cycles and in addition that the paints are dried at the prescribed temperatures (generally 20°C) for a period of at least 10 days.
On 2-Pack PU lacquers a drying time of 5 days after the drying cycle at elevated temperature will generally give the required inertness of the substrate.

Important:
As in a correctly applied paint system the bond between the individual layers is much higher than the adhesion of Avery films on the top paint layer, Avery Dennison will not entertain paint damage complaints.

Removal procedure for decals with removable adhesives:
These are generally easy removable within the period indicated in the Technical Data sheet of the product. Just lift a corner point and start to remove the decal from the substrate. Keep the angle between removed film and substrate between 45° and 80°: angles over 90° may increase the risk that adhesive may stay on the surface.

Removal procedure for decals with permanent adhesives:
These are generally NOT easy removable, but following certain procedures it is possible for most permanent films to be removed. Also here it is advisable to ascertain that the paints are well dried and cured.

Tools:
To heat the film a hair dryer or industrial hot air device can be used (or: infrared dryer, hot water, wallpaper steamer); knife, cloth, squeegee, Avery Adhesive Remover and Avery Surface Cleaner.

Procedure

A cold film breaks easier than a warm one, so: heat a corner area of the film to a temperature of 50-60 °C, lift it carefully with the knife and start to remove it slowly. (At this elevated temperature, the film is more flexible and allows easier removal). Proceed with heating the next area of the film and continue removal. During removal, the film should make an angle with the substrate of 60° to 90°: a larger or sharper angle may result in the film to break easier. Slow removal of the film results in less adhesive residues left on the substrate. Proceed with heating and removal till all film has been removed.

Removal of adhesive residues
In case some adhesive residue is present after the removal of the film, the adhesive can be removed according to the instructions given in Technical Bulletin 1.10.

Warning: Check prior to adhesive removal that the fluid does not damage the substrate (painted) surface.

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