

TL no 5 SELF-ADHESIVE MATERIALS for PLASTIC SURFACES

Plastics, which are so common in our daily life, **differ tremendously because of their:**

- Chemical composition.
- Manufacturing process.
- End-use, either as a flexible packaging film or as a rigid or semi-rigid object such as those used for the packaging of liquids (food and non-food applications), homeware, furniture, electronics etc...

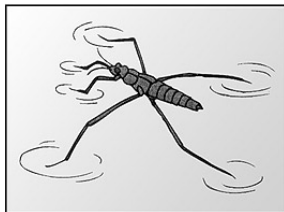
End-use conditions may include:

- Hot or cold labelling.
- Wet or dry surface.
- Smooth or rough surface.
- Flat or curved surface.
- Outdoor or indoor use.
- Long-term or short-term application.



It is therefore essential to test the self-adhesive material on the specific substrate and in the correct end-use conditions.

Specially there are a few questions that you may want to ask your customer (i.e. the printer → the packaging or plastic manufacturer) to help you choose the right self-adhesive product for the job.



1. Is the surface high or low energy?

The energy level of the surface will affect adhesion.

High energy surfaces such as polyesters, PVC or polycarbonates usually pose no problems.

However it may be more difficult to get good label adhesion on plastics with low energy surfaces such as polyethylene or polypropylene, also called polyolefins.

A rubber based adhesive may provide stronger adhesion on low energy surfaces than most acrylics.

But if the product will be used outdoors or will be exposed to UV light then opt for a high tack acrylic.

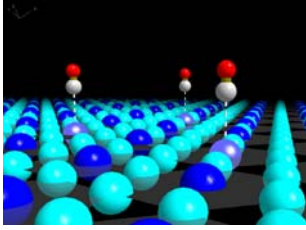
Type of plastic	(symbol)	Energy level (dynes/cm)
Polyethylene	(PE)	31 - 32
Polypropylene	(PP)	29 - 30
Hard Vinyl	(PVC)	38
Soft Vinyl	(PVC)	35
Polystyrene	(PS)	32 - 36
Acrylic glass	(PMMA)	40 - 44
Polycarbonate	(PC)	42 - 44
Polyester	(PET)	42

This table gives a comparison between the energy levels of certain plastics.

The surface energy of a plastic can be increased by a **Corona** (electrical discharge on the surface) or **Flame treatment**.

This will drastically improve the adhesion of the label, provided its application takes place just after treatment.

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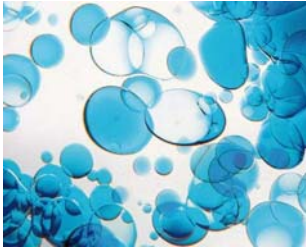
2. Does the plastic contain migratory components?

The most frequent and dangerous examples are the plasticizers that are added to vinyls to make them soft and flexible.

These plasticizers will migrate to the surface and can inhibit adhesion or adversely affect the performance of the adhesive.

A coated or possibly a synthetic face stock will also be a better choice for such an application.

3. Does the plastic contain inhibiting components?

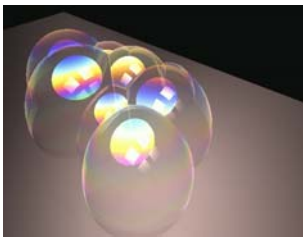


Some plastics intended for certain specific end-use purposes, contain protective coatings (e.g. air or moisture barriers, anti-scratch products, anti-dust products etc...) which can prevent the adhesive from sticking properly.

A typical example is objects that are injection moulded. These objects can have a mould release agent (for easy removal of the object from the mould) that decreases the adhesion of the label unless they are cleaned off.

To find out, run a test by wiping off the surface with alcohol or white spirit to remove any possible residue and stick the label on again. If it sticks better, it means one of the components is causing the problem.

4. Does the plastic object emit gas bubbles?



Some plastics, like polystyrene, emit gases than can result in bubbles under the label face-stock.

Other plastics, like acrylic glass or polycarbonate are to some extent micro-porous and are permeable to moisture at temperatures above room temperature.

If your application falls into this category a paper face stock, because it is more porous, is preferred to most films.

Vinyls or polyesters especially will trap bubbles. Also uncoated papers are more porous than many coated papers and may therefore produce a better looking label.

5. Is the plastic recyclable?



If the plastic product is recyclable, the end-user may want a label that is recyclable with the plastic.

Ideally in such a case a PVC label on a PVC object or a PE label on a PE object etc. should be considered.

Please contact our Marketing Department for advice.