



TECHNICAL INFO N° 7

SELF-ADHESIVE MATERIALS FOR PLASTIC SURFACES

**KEY WORDS : - INHIBITING COMPONENTS - MIGRATORY COMPONENTS
- RECYCLING - SURFACE ENERGY**

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), housewares, 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.

Specifically there are a few questions that you may want to ask 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.

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

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

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.

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.

3) Does the plastic contain inhibiting components ?

Some plastics in some specific end-uses 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) 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 PE label should be used on a PE object and so on. Please contact our Marketing Department for advice.

The following information is available about the recycling combinations (label/substrate) possibilities :

LABELS	SUBSTRATES					
	PVC	PS	PE	PP	PET	CARD-BOARD
PAPER	NO	NO	NO	NO	NO	+/-
PE	NO	NO	OK	OK	NO	NO
PP	NO	NO	OK	OK	NO	NO
PET	NO	NO	NO	NO	OK	NO
PVC	OK	NO	NO	NO	NO	NO
PS	NO	OK	NO	NO	NO	NO

All the above recommendations are of a general nature as the compatibility for recycling depends (on top of technical limitations) on the end-use of the recycled material.