

## Bonding properties of labels

The great variety of ways and places where labels can be used requires a broad range of combinations of different materials and adhesives. In the following text, a glimpse into the basic properties and differences between label adhesives will be provided.

**To enable you to make the right choice for your particular application quickly and efficiently, we have set out the most important selection criteria diagrammatically in our flowchart.**

### Adhesion: powers of attraction between two materials

Adhesion can be described, in principle, as the ability of the adhesive to form a bond with the surface of the surface of the material (substrate). The influencing factors for optimum bonding of the label are the quality of the surface of the material and the creep ability of the adhesive. The crucial factor is the proportion of the surface which is actually to be wetted by

### Adhesive basis

HellermannTyton currently uses acrylate and synthetic rubber as adhesive bases. Acrylate adhesives belong to the family of thermoplastic resins and at normal temperatures they provide high and lasting adhesion. When considering the final bonding of acrylate adhesives, however, it must be noted that the relatively high final bonding is only attained after a certain curing period. This is especially true of labelling materials which may be used for rating plates. So, for example, the adhesive for material types 796 or 950 must harden for at least 48 hours on the surface without loading.

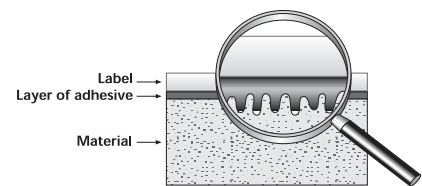
### Initial and final bonding

In principle there are two different bonding conditions for labels: The initial bonding which occurs immediately after the label and surface are brought together and the final bonding which represents the permanent bonding status between label and surface following the application, pressing on and curing of the adhesive. The bonding of labels is measured in a defined test process (FINATFTM) and stated in N/mm.

the adhesive. Most surfaces appear – from a microscopic point of view – like a mountain range with peaks and valleys; i.e. the effective surface is much bigger than that seen by the naked eye. No matter how smooth and flat a substrate may appear to be, there is always some roughness. The more thinly the adhesive flows into the valleys, the more bonding points it can form and the better the adhesive will bond to the surface. A thicker layer of adhesive does allow these

The initial bonding (or tack) describes the bonding ability of the label after it has been applied to the surface, without being pressed down. The final bonding of labels is ultimately affected by the combined factors of material quality, adhesive basis, curing time, pressure applied and surface tension.

uneven areas to be filled in better, but a thicker coat of adhesive has negative effects when labels are processed by machine (e.g. leakage of the adhesive or limited storage life).



Only after this period does the safety measure become apparent, for example, when an attempt is made to pull off the rating plate (triangles remain on the 796 material, "VOID" imprint on the 950).

Synthetic rubber-based adhesives, unlike acrylate-based adhesives, are distinguished by their high initial bonding. But this adhesive technology does not achieve a final bonding comparable to acrylate adhesives (see graph). Special mixtures of synthetic rubber are used in labelling technology, for example for removable labels, e.g. HellermannTyton material type 265 and 270.

