



## Ecological Adhesives: providing effectiveness and versatility to sustainability

Today's society is increasingly aware that today's decisions determine the future, and choosing sustainable solutions is one of the logical steps in the evolution of large-format digital printing. In this article, we talk about ecological adhesives and how decal® contributes to sustainability through the ones we develop together with BASF to ensure high-performance eco-friendly products.

### 1. Adhesives

#### 1.1. A vast world of applications

Adhesives are present in everyday life often without awareness. The world of visual communication, decoration, and labeling applications is vast, ranging from billboards and shop windows in promotional campaigns to papers for wall and furniture decoration, passing through informative labels and signage.

#### 1.2. Pressure-Sensitive Adhesives (PSA)

Currently, pressure-sensitive adhesives (PSA) come in various formulations and performance ranges, from ultra-removable adhesion to ultra-permanent adhesion. The most eco-friendly choices include hotmelt and hotmelt UV adhesives and water-based adhesives, which share the market with solvent-based adhesives.

#### 1.3. Differences that make a difference

##### 1.3.1. Hotmelt adhesives

UV-curable hotmelt adhesives become liquid when heated and react to ultraviolet light, returning to a solid state when cooled. They have a strong adhesive power and high resistance to high temperatures, chemicals, UV, oxidation, and moisture. Short, medium, and long-term applications exhibit superior clarity and color stability.

### **1.3.2. Water-based adhesives**

Water-based adhesives dissolve in water and form a dry layer when heat is applied and the water evaporates. Water replaces harmful solvents, and the production process is more cost-effective than solvent-based adhesives. They have the possibility of coloring the liquid adhesive to generate opacity (greyback) and are suitable for short-term applications.

### **1.3.3. Solvent-based adhesives**

Solvent-based adhesives involve dissolving polymers in solvents through agitation and heating. They are chosen for their strength and adhesive capacity, but they are less sustainable and safe for human health and the environment due to the emission of volatile organic compounds (VOCs), for example.

## **1.4. What determines adhesion**

Adhesion is determined by three fundamental properties that influence material behavior. These properties are the material's ability to adhere at the time of application (Tack), the force required to detach or remove the material adhesive (Peel Adhesion), and the cohesion of the bonded materials. All are tested in the laboratory and combined to determine the most suitable formulas for each application type.

### **1.4.1. Tack**

Initial adhesion (Tack) ensures that the adhesive remains in the correct position during application. Higher tack means stronger initial adhesion to the surface, which is useful when immediate and firm adhesion is needed. On the other hand, lower tack is preferable when adjustments or repositioning are required before final application.

### **1.4.2. Peel Adhesion**

This property refers to the adhesion and force required to remove the adhesive material from the surface, influenced by factors such as surface roughness, temperature, and environmental conditions. Higher peel adhesion is more suitable for permanent applications, while lower peel adhesion is suitable for temporary applications.

### **1.4.3. Cohesion**

Cohesion is related to the strength of the bond between the adhesive material and the surface, determining the breaking point between them. It is essential for cases where the adhesive material is subjected to forces applied in opposite directions, stretching and elongating it, and cutting during application.

## **2. decal® Sustainability**

### **2.1. Ecological evolution with BASF quality**

As we mentioned earlier, the growing awareness of the need to change behaviors and reduce the ecological footprint has led to the emergence of adhesives produced in an environmentally responsible manner. This is the case with decal® adhesives, developed in conjunction with BASF, which have conquered the market with environmentally friendly solutions for a wide variety of applications.

### **2.2. Effective and versatile sustainability**

Our ecological line for printing and laminating includes the PVC-Free range and provides confidence to customers with certified self-adhesive products that combine sustainability, quality, and versatility. Our UV-curable hotmelt and water-based adhesives (permanent and removable) optimize and make work more profitable with options such as High Tack, GreyBack, Removable Smooth Surface, Dot Matrix, and Bubble Free.

### **2.3. Changing the future now**

The future is not distant and unattainable. It is built now with solid and conscious decisions, and one of them is choosing more ecological solutions. In visual communication, decoration, and labeling applications, choosing products with adhesives that respect the environment without neglecting quality and competitiveness ensures sustainability at all levels. The planet and businesses appreciate it.