

## Mascara

# Filming agent gives eyes **a striking look**



The new Baycusan C product line which is being launched at the In-Cosmetics exhibition (see page 26 ff.) is the result of research in the field of cosmetics by Bayer Material Science, a division with expertise polyurethane synthesis and production. The new range consists of four filming agents which are based on aqueous polyurethane dispersions and

a polyurethane powder that is suitable for use as a sensory additive. Dr. Sophie Viala, head of applications technology for cosmetics, here presents two polyurethane dispersions, Baycusan C 1000 and Baycusan C 1004, and explains their action as filming agents in mascara products.



*Easy-to-use new filming agents provide improved moisture resistance, long-lasting swirling lashes and good abrasion resistance for mascaras*

**B**aycusan C 1000 and Baycusan C 1004 (INCI names Polyurethane-34 and Polyurethane-35) exhibit improved moisture and in mascara formulations are easier to handle than other commercially available conventional ingredients.

Unlike conventional filming agents, such as polyvinylpyrrolidone or polyacrylate, the two new ingredients are significantly easier to use in practice. They do not have to be neutralised, and because they are suitable for cold processing they also offer significant energy savings. They can be used in a wide pH range and are compatible with most cosmetics ingredients. It is recommended that the new filming agents are added to the aqueous

phase, or introduced at the end of the production process.

Thanks to a unique production and filling process the aqueous polyurethane dispersions are supplied free of preservatives. All of the products in the range are free from co-solvents such as ethanol or N-methylpyrrolidone

### Improved moisture-resistance

Water resistant and waterproof mascara formulations are mostly based on one of two technologies – either a water-free formulation or an O/W stearic acid emulsion where the water resistance is achieved by the use of filming agents. Vinylpyrrolidone copolymers or acrylate copolymers are often used here. When compared with

the known filming agents it is seen that the new products in the Baycusan-C range exhibit significantly better moisture resistance.

Both products were included in an O/W stearic acid emulsion at 5% by weight of solids with reference to the total formulation. To evaluate the moisture resistance of the new filming agents a special in vitro method was developed.

Cotton wool samples were impregnated with the mascara formulation under standardised conditions. After subsequent drying the samples were immersed in a water bath at 25 °C and stirred for 30 minutes. The water resistance was determined photometrically by measuring the L\* component

(colour brightness in the CIE L\*a\*b colour evaluation system) before and after the water bath. The loss of colour corresponds directly to the water resistance of each formulation.

The results show that both of the new filming agents significantly improve the moisture resistance of O/W mascara formulations in comparison with conventional filming agents. The loss of colour was 22 percent in the case of an O/W mascara formulation containing no filming agent. If however the same formulation contains 5 percent by weight of solids (with reference to the total formulation) of one of the two new filming agents the colour loss is only 4.7 or 8.1 percent.

Despite much better water resistance the mascara formulations can be conveniently removed with a commercially-available make-up remover designed for waterproof mascara.

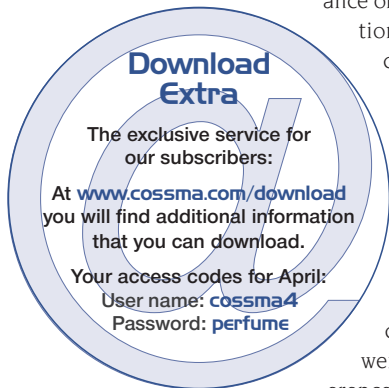
### Long-lasting swirling lashes

But Baycusan C 1000 offers more than improved moisture resistance. In comparison with conventional filming agents the new ingredient forms a homogeneous and very elastic film at room temperature. Its particular mechanical properties have been demonstrated using research methods such as the „Omega Loop“ and the „High Humidity Curl Retention“ measurements on hair strands, which are used as standard methods to evaluate styling polymers. The results of the Omega Loop tests confirm that the filming agent produces a very elastic film on hair strands. When used in mascara it produces a similar homogenous coating on the lashes as well as a stronger curl effect. To assess its long-term performance a High Humidity Curl Retention Test was carried out. After a test period of 4 hours excellent retention of about 90 percent was achieved.

### Improved abrasion resistance

The two new filming agents have different mechanical properties. In comparison with Baycusan C 1000, Baycusan C 1004 produces a harder polymer film which nevertheless is much more elastic than that formed by conventional filming agents. Hence not only good moisture resistance but also good abrasion resistance can be achieved, which makes the product particularly suitable for waterproof mascara.

\* Further information can be found on the Internet (see Internet button)



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## VIP of the Month

Dr. Sophie Viala of  
Bayer Material Science:  
Filming agents for  
visually striking eyes