

## **Mandom Develops New Hair Color Technology: “Gel that Turns into Bubbles When Rubbed In”**

**- Avoids the Spotty Coloring that Characterizes Many Foam-Type Hair Colors**

Mandom Corporation (Headquarters, Osaka; President Executive Officer: Motonobu Nishimura; hereafter, Mandom) has undertaken the development of new hair color technology wherein a gel changes into a frothy, bubbly foam for application. In doing so, Mandom has addressed a common drawback of foam-type hair colors—the newly developed technology allows complete, spot-free application all over the head, thereby enabling uniform coloration of the hair from root to tip.



Figure 1: Apply gel at the roots of hair.



Figure 2: By rubbing the gel until it turns into a thick, dense foam, all the hair will be evenly colored.

### 1. Areas in Which Consumers Would Like to See Foam-Type Hair Colors Improve

Several years ago, when foam-type hair colors entered the hair color market, they were dispensed from their containers as foam, and this foam was applied by hand to one's hair. These products were met with approval by consumers, who mentioned that they “seemed easy to use,” and that it “seemed like the bubbles would go all through my hair, evenly and cleanly dyeing it the way I want.” These foam-type hair colors have become ubiquitous in the hair color market.

However, despite appearing easy to apply to the hair, consumers have come to be dissatisfied with foam-type hair colors because of the following reasons.

- ① Getting the product to permeate all the way down to the roots of the hair to achieve that “newly grown” look requires some degree of technique and skill.
- ② Given the properties of the bubbles that comprise foam, the liquor ratio\* at the roots of foam-type colors is lower than that of milky liquid-type or gel-type colors. Consumers state that “the roots don't dye well,” “hair doesn't dye evenly all over,” and that “spotty coloring” often results.
- ③ They are troublesome to use: “Repeatedly dispensing the foam onto your hand and then applying it to your hair gets tiresome.”

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\*Liquor ratio: The amount of the product that adheres to a part of the hair. Generally, a higher liquor ratio implies greater dyeing power of the product.

2. Developing Hair Color Technology as a Gel that Turns into Bubbles When Rubbed In

Thus, we applied ourselves to developing hair color technology for average consumers who do not possess any special hair coloring technique, with the goal of addressing user dissatisfaction. We wanted our new product to possess the “adherence to the roots” property of milky liquid-type and gel-type products, but also the “ease of use” of foam-type products. Thus, we aimed to develop a new type of formulation—one which starts as a gel during application and will adhere tightly to the roots of the hair, but through the normal rubbing and kneading action performed during hair coloring, will turn into a foam and spread to cover the hair evenly and completely.

We proceeded with a formulation that achieves gelling through the mutual interaction of the sort of common anionic, amphoteric, and nonionic surfactants that are often included in shampoo. However, gels formed through only the interaction of common surfactants tend to produce coarse, watery foam. We had to deal with the fact that the dyeing power of this sort of foam tends to be weak, and if left alone, it droops and ultimately falls off the head. Thus, we incorporated polymers with three different kinds of charge—ionic, cationic, and amphoteric—into our formulation. These compounds form a polymer network inside the foam, enabling the production of “thick, dense foam” that spreads evenly and completely throughout the hair.

Furthermore, by using a sulfobetaine-type amphoteric surfactant with strong lipid emulsifying power as a surfactant, as well as a branched-chain nonionic surfactant with a branched lipophilic group, our formulation foams wonderfully. It forms bubbles almost instantly, even in hair that has been treated with hair wax, and thus spreads evenly and completely through the hair (Figure 3).

Finally, because our gel can be applied throughout the hair all at once and then foamed, the action of “repeatedly dispensing the foam onto your hand and then applying it to your hair” is no longer necessary, greatly reducing application time.

3. Sales of Speedy Root-to-Tip, Even, and Clean Hair Color

By applying this new technology to our products, we have been able to realize a line of products with “speedy root-to-tip, even, and clean hair color” action.

<Reference Materials>



Figure 3: Hair wax has been applied to only the left half of this wig. Afterwards, our newly developed formulation was applied to both sides of the wig and foamed. Thick foam can be seen throughout the hair on this wig, regardless of whether or not wax was applied.

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