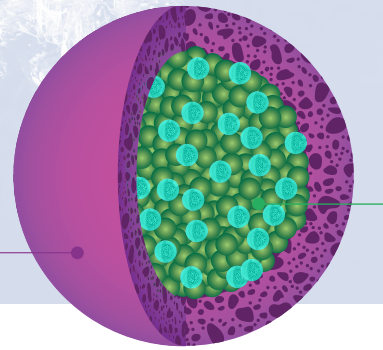




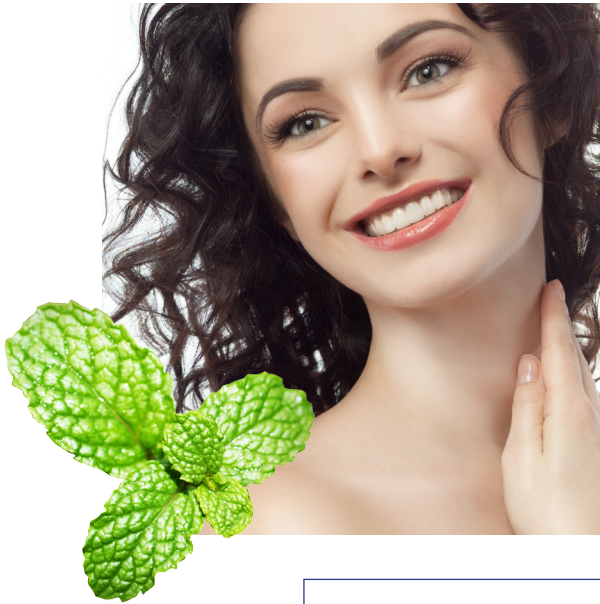
MultiSal[®] Menthol (MS ME)

Enhances the stability and performance of menthol for long-lasting cooling.



Shell **Core Menthol**

Figure 1: The structure of MS ME, a microsphere composed of a shell with water-triggered release properties, and infused with sub-micron spheres containing menthol.



MS ME is specifically designed to enhance menthol stability and performance. It enables the production of processes that require higher temperature, such as the extrusion of soap bars, and the molding of solid AP sticks and lip balms. MS ME is used to enhance the production of body powders, reducing the odor and loss which occurs during the process, all while retaining more menthol in the product.



UNIQUE FEATURES

- LONG-LASTING COOLING**
MS ME slowly releases menthol while protecting it from premature evaporation.
- REDUCED ODOR (VAPORS)**
MS ME reduces the initial menthol odor.
- WATER-TRIGGERED ACTIVATION**
A burst of fresh menthol is released when activated by water.

HOW THE TECHNOLOGY HELPS YOU

MS ME is a double encapsulation delivery system. The core is fused with menthol that is first encased in sub-micron spheres, then encapsulated again within an outer microsphere shell (Figure 1). The outer layer degradation allows for the release.

LONG-LASTING COOLING SENSATION

Temperature (°C)	MultiSal [®] Menthol (%)	Free Menthol (%)
0	100	100
10	100	100
20	100	100
30	100	100
40	95	70
50	95	45
60	95	10

Figure 2: The amount of menthol retained with external temperatures up to 160°C. MS ME compared to free menthol. Data measured by Thermal Gravimetric Analysis.

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LONG-LASTING COOLING SENSATION

The cooling sensation from MS ME was compared to free menthol from a body powder application (Figure 3). MS ME shows significant and consistently higher performance in terms of extending the cooling benefits of menthol over time.

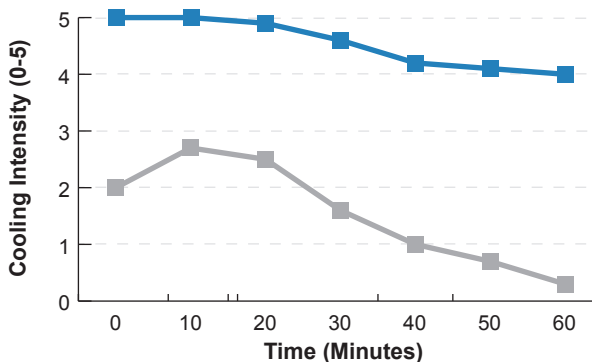


Figure 3: Cooling intensity evaluated by a panel of volunteers. Cooling intensity was measured on a scale of 0-5, with 5 being the most intense cooling sensation.

WATER-TRIGGERED RELEASE

The effect of water on menthol odor intensity was evaluated in an anhydrous stick application on a scale of 0-5, with 5 being the most intense odor (Figure 4).

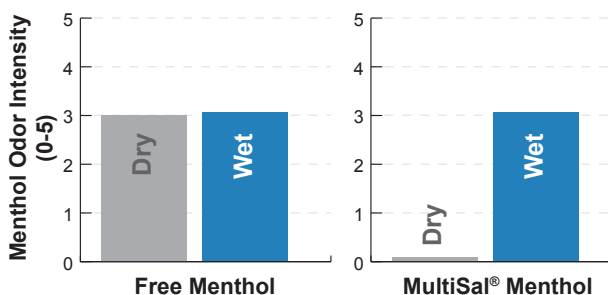


Figure 4: Odor intensity from a deodorant stick containing MS ME and a deodorant stick containing free menthol. The stick with MS ME has no odor in the dry form. Free menthol exhibits similar odor intensity in both dry and wet conditions. The deodorant stick containing MS ME, however, results in a significantly higher menthol odor burst after it is activated by water.

ENHANCED HEAT STABILITY

MS ME demonstrates greater thermal stability compared when compared to free menthol, losing only 6% of its initial mass at 160°C. Without the protection of the technology, free menthol begins to evaporates at just 80°C, with complete loss occurring at 130°C.

FORMULATION

Ingredients	(W/W %)
MultiSal [®] Menthol	8
HydroSal [®] SalCool	2
Salvona Pre-Mix A #5019	20
DI Water	69
Preservative	1

TECHNICAL DATA

Appearance @ 20°C	Free flowing powder
Applications	Lotions, body powders, foot care, lip care, analgesics, soap bars, and deodorant sticks
Color	Off-white
Odor	Characteristic
pH (1 % solution)	4.0 ± 1.0
Shelf Life (months)	24
Usage Level (wt%)	Lip care: 1 Skin care: 2-5 Pain relief: 4-8 Foot care: 7-20
Storage (°C)	Closed container at 12-32° with <45% RH