

Comprehensive Review of Makeup Stick-Based Cosmetics; Shaping the Future of Beauty

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ABSTRACT

Makeup stick-based cosmetics, including blush sticks, lipsticks, and foundation sticks, have surged in popularity due to their convenience, portability, and ease of application. This comprehensive review delves into the formulation of these products, highlighting key ingredients, ideal characteristics, and common challenges faced in their development. It also examines the evaluation parameters used to assess their performance, advantages over traditional cosmetics, and potential limitations. Additionally, recent innovations in sustainable and multifunctional makeup stick formulations are explored, offering valuable insights for the development of enhanced and innovative stick-based cosmetics in the future. By addressing current market trends and consumer preferences, this paper aims to provide a thorough understanding of the advancements shaping the future of makeup sticks.

Keyword: Blush sticks, Lipsticks, Foundation stick, Highlighter stick, Eyeshadow stick, Key ingredients, Ideal characteristics, Formulation challenges, Evaluation parameters.

1. INTRODUCTION

Makeup stick cosmetics are cosmetic products in solid, stick form for convenient use. They are formulated to provide convenience and portability, enabling users to apply makeup while on the move without the use of extra tools or applicators. [1] Makeup stick-type cosmetics, including blush sticks, lipsticks, and foundation sticks, have revolutionized the beauty market by providing convenience and multifunctionality. [2] Their development includes choosing major ingredients to provide smooth application and long-lasting wear. New developments in sustainable and multifunctional formulations respond to environmentally friendly consumer demands. [3]

2. TYPES OF MAKEUP STICK- BASED COSMETIC

Makeup stick cosmetics are also favored for ease of use, portability, and mess-free application. Contrary to classical liquid or powdered products, these provide easy, accurate application. Some common makeup stick types include blush sticks to give a natural flush, lipstick for color as well as hydration, foundation sticks for build-up coverage, highlighter sticks to give a shining glow, and eyeshadow sticks for convenient eye makeup. With the innovation in formulation, these products nowadays contain skincare features such as moisturization and protection from the sun. [4]

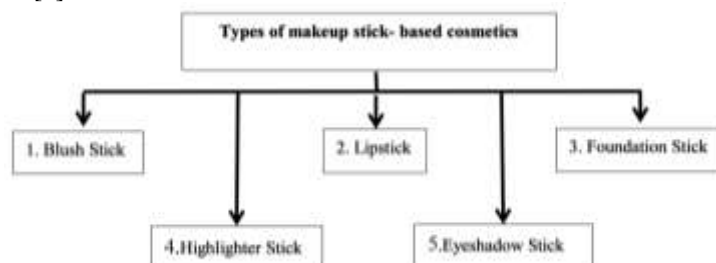


Fig 1: Types of Makeup Stick

2.1 Blush Stick

A blush stick is a cream-based face makeup product intended to leave color and a natural-looking flush on the cheeks. It typically comes in a retractable stick, making it convenient to apply directly on the skin. Blush sticks are also multipurpose, sometimes used as lip and eye color, and may come in several finishes such as matte, dewy, or shimmery depending on personal preferences. [5]



Fig 2: Blush Stick

2.1.1 Ingredients

Category	Ingredients	Function
Base Ingredients (Structure & Texture)	Beeswax, Carnauba wax, Candelilla wax, Ozokerite wax	Provide structure, solidify the formula
	Jobba oil, Castor oil, Squalane, Shea butter, Cocoa butter	Ensure smooth application, provide hydration
Pigments & Colorants (Provide Tint & Shade)	Red Iron Oxide (CI 77491), Carmine (CI 75470), Titanium Dioxide	Provide color and opacity
	Beetroot powder, Hibiscus extract, Annatto seed extract	Natural colorants for a plant-based formulation
Binding & Stabilizing Agents	Dimethicone, Cyclopentasil oxane	Improve spreadability and longevity
	Microcrystalline wax, Bentonite clay, Silica	Help maintain consistency and stability
Preservatives & Antioxidants	Phenoxyethanol, Ethylhexylglycerin	Prevent microbial growth and spoilage
	Vitamin E (Tocopherol), Green tea extract	Prevent oxidation and extend shelf life
Additional Functional Ingredients	Hyaluronic acid, Aloe vera extract	Provide extra hydration and skin benefits
	Rose oil, Vanilla extract	Add fragrance for sensory appeal
	Zinc oxide, Titanium dioxide	Provide sun protection (SPF benefits) [6]

2.1.2 Ideal characteristics :-

These are the perfect features of a blush stick, and they are listed below:

- Even application
- Moisturizing formula
- Long-lasting
- Non-greasy
- Even distribution of color
- Buildable
- Non-comedogenic
- Stable across different temperatures
- Harmless ingredients
- Easy blending [7]

2.1.3 Formulation challenges:-

- Texture and Consistency: Balance smoothness and firmness.
- Pigment Dispersion: Provide uniform color.
- Stability: Provide stability across temperatures.
- Preservation: Select effective preservatives.
- Sensory Properties: Provide a good feel.
- Color Matching: Create shades for different skin tones.
- Compatibility: Provide ingredient compatibility.
- Packaging: Select protective packaging.
- Regulatory Compliance: Adhere to cosmetic regulations. [8]

2.1.4 Evaluation Parameters for Blush Stick:-

- **Organoleptic Properties:**
 - Color: Consistency and stability of the color.
 - Odor: Pleasant and acceptable fragrance.
 - Texture: Smooth and creamy application.
- **Homogeneity:** Uniform distribution of ingredients.
- **pH:** Suitable pH range for skin application (typically 4.5-6.5).
- **Spreadability:** Ease of application and even distribution on the skin.
- **Adhesion:** Ability to adhere to the skin and stay in place.
- **Stability:** Stability of the formulation under different conditions (temperature, humidity).
- **Antioxidant Activity:** Presence of antioxidants to protect the skin.
- **Breakage Test:** A blush stick breakage test evaluates its resistance to breaking under applied force, ensuring durability and quality.[9]

2.1.5 Advantages and Disadvantages:

Advantages	Disadvantages
Convenient and portable; easy to carry in a handbag	Can melt or break in high temperatures
Effortless application; no brushes or tools needed	Limited product quantity compared to powder blushes
Creamy texture blends easily, giving a natural finish	Not ideal for oily skin; may feel greasy[10]

2.2 Lipstick:

Lipstick is a popular cosmetic that enhances lip appearance by providing color, texture, and protection. It is made from pigments, oils, waxes, and emollients, ensuring a smooth texture and functionality. Modern lipsticks often include natural ingredients for safety, along with added benefits like hydration and UV protection. [11]



Fig 3: Lipstick

2.2.1 Ingredients:

Category	Ingredient	Function
Waxes	Beeswax, Carnauba Wax	Provides structure and stability, helps in forming the shape of the lipstick.
Oils	Castor Oil, Jojoba Oil	Acts as a moisturizer, adds shine, and carries color.
Pigments	Iron Oxides, Dyes	Provides color and a wide range of shades.
Emollients	Shea Butter, Cocoa Butter	Softens and smooths lips, enhances spreadability and moisture content.
Preservatives	Parabens, Phenoxyethanol	Extends shelf life, prevents microbial growth.
Antioxidants	Vitamin E, Rosemary Extract	Protects the formula and lips from oxidative damage.
Fragrance	Essential Oils, Synthetic Fragrances	Adds scent to enhance sensory experience.
Film-formers	Acrylates Copolymer	Provides a lasting finish and helps lip color adhere longer.
Active Ingredients	Titanium Dioxide, SPF Agents	Offers sun protection or additional benefits like anti-aging. [12]

2.2.2 Ideal Characteristics:

These are the perfect features of a lipstick, and they are listed below:

- Smooth Texture
- Moisturizing Properties
- Long-lasting Color
- Non-toxic Ingredients
- Stability
- Non-irritant
- Pleasant Fragrance
- Sun Protection
- Wide Range of Shades
- Eco-friendly Packaging[13]

2.2.3 Formulation challenges:

- **Color Stability:** Maintaining pigments in a stable state and preventing fading or color change over time.
- **Texture Consistency:** Creating a smooth and even texture without graininess.
- **Moisturizing vs. Longevity:** Balancing moisturizing properties with long-wearing performance.
- **Melting Point:** Creating lipsticks that do not melt in hot climates but are still easy to apply.
- **Ingredient Compatibility:** Ensuring all ingredients mix well without separation or instability.
- **Allergen-Free Formulation:** Preventing the use of ingredients that cause irritation or allergic reactions.
- **Cost Efficiency:** Sustaining quality at affordable production costs.
- **Environmental Concerns:** Sourcing sustainable and environmentally friendly ingredients and packaging.[14]

2.2.4 Evaluation Parameters for Lipstick:

- **Color Test:** Maintains constant and stable color.
- **Texture Test:** Assesses smoothness and homogeneity.
- **pH Test:** Verifies compatibility with the skin (optimal pH is approximately 5.5).
- **Melting Point Test:** Verifies stability under different temperatures.
- **Spreadability Test:** Judges ease of application.
- **Breaking Point Test:** Identifies the hardness and hardness-retention of the lipstick.
- **Perfume Stability Test:** Verifies stability of the fragrance with time.
- **Aging Test:** Judges product stability throughout the shelf life.[15]

2.2.5 Advantages and Disadvantages:

Advantages	Disadvantages
Enhances the appearance of lips	May cause dryness or irritation with prolonged use
Provides hydration and protection to lips	Synthetic ingredients can lead to allergic reactions
Offers a variety of shades to suit preferences	Some pigments may fade or change color over time
Can include SPF for sun protection	May contain harmful chemicals in non-herbal formulations
Easy to apply and portable	Environmental concerns due to non-biodegradable packaging. [16]

2.3 Foundation Stick:

A foundation stick is a cosmetic that allows for easy application of foundation in a solid, portable stick format. It covers up skin blemishes, smooths out skin tone, and gives a mess-free, convenient application. Foundation sticks usually contain moisturizing ingredients to avoid dryness and are perfect for on-the-go touch-ups. [17]



Fig 4: Foundation Stick

2.3.1 Ingredients:

Category	Ingredients	Function
Waxes	Synthetic Wax, Microcrystalline Wax	Provides structure and stability to the stick form.
Oils	Caprylic/Capric Triglyceride, Mineral Oil	Acts as emollients, providing smooth application and hydration.
Pigments	Iron Oxides, Titanium Dioxide	Provides color and coverage, with Titanium Dioxide also offering sun protection.
Moisturizers	Glycerin, Sodium Hyaluronate	Hydrates and maintains skin moisture.
Preservatives	Phenoxyethanol, Tocopheryl Acetate	Extends shelf life and protects against microbial growth.
Viscosity Agents	Dimethicone, Polyisobutene	Controls the consistency and ensures smooth application.
Fragrance	Aroma Compounds	Adds a pleasant scent to the product. [18]

2.3.2 Ideal characteristics:

These are the perfect features of a foundation stick, and they are listed below:

- Smooth and Even Application
- Long-lasting Wear
- Full or Buildable Coverage
- Matte or Dewy Finish
- Skin-friendly Ingredients
- Hydration and Moisture Retention
- Sun Protection
- Transfer-Resistant
- Comfortable and Lightweight Formula
- Versatility for Different Skin Types[19]

2.3.3 Formulation challenges:

- Achieving the Proper Texture: Balancing smooth feel with firm consistency.
- Ensuring Lasting Wear: Formulating to be durable and resistant to fading.
- Balancing Coverage and Blendability: Providing adequate coverage without caking.
- Maintaining Skin Compatibility: Producing a non-comedogenic formula for multiple skin types.
- Adding Sun Protection: Including SPF without sacrificing texture.
- Preventing Caking or Creasing: Preventing product buildup in fine lines.
- Formulation for Various Skin Types: Satisfying different skin requirements (oily, dry, combination).
- Stability of Active Ingredients: Maintaining the shelf life of sensitive ingredients.
- Preventing Skin Irritation: Evading irritants without losing efficacy.
- Formulating Transfer-Resistant Properties: Rendering the product transfer-resistant.[20]

3.3.4 Evaluation Parameters for Foundation Stick:-

- **Texture and Consistency:** Guarantees smooth and even application without graininess.
- **Coverage:** Tests the capacity to cover up flaws and achieve an even complexion.
- **Spreadability:** Tests ease of application and blending on the skin.
- **Thermal Stability:** Tests the stability of the product under different temperatures.
- **Breaking Point:** Tests the hardness and resistance of the stick.
- **Moisturizing Properties:** Tests hydration levels and dryness prevention.
- **Non-comedogenic Test:** Verifies that the product does not clog pores.
- **Shade Matching:** Provides a broad spectrum of shades to accommodate various skin tones.
- **Durability:** Examines the product's long wear and smudge resistance.
- **pH Test:** Verifies skin compatibility (optimal pH is approximately 5.5).[21]

2.3.5 Advantages and Disadvantages:

Advantages	Disadvantages
Portable and convenient for on-the-go application	May not blend as seamlessly as liquid foundations
Provides buildable coverage from light to full	Can feel heavy on the skin if over-applied
Long-lasting and smudge-resistant	May not suit very dry or very oily skin types
Easy to apply directly without additional tools	Limited shade range in some brands
Compact and travel-friendly packaging	Can melt or break in high temperatures. [22]

2.4 Highlighter Stick:

A cosmetic highlighter stick is a makeup product designed to enhance facial features by adding a luminous glow to areas like the cheekbones, brow bones, and nose bridge. It typically comes in a stick form for easy application and is often formulated with light-reflecting particles to create a radiant effect.[23]



Fig 5: Highlighter Stick

2.4.1 Ingredients:

Category	Ingredients	Function
Base/Structure	Beeswax, Candelilla Wax, Carnauba Wax	Provides structure and stability to the stick formulation; allows for smooth application.
Oils & Emollients	Jojoba Oil, Mineral Oil, Caprylic/Capric Triglyceride	Adds moisture and helps in smooth application, prevents drying of the product.
Pigments & Colorants	Titanium Dioxide, Iron Oxides, Mica, Bismuth Oxychloride	Provides color and light-reflecting properties, giving the skin a glowing or luminous effect.
Light Reflectors	Mica, Silica, Nylon-12	Reflects light and gives a shimmery or dewy finish to the skin.
Preservatives	Phenoxyethanol, Ethylhexylglycerin	Prevents microbial growth and maintains the product's shelf life.
Stabilizers/Thickeners	Stearic Acid, Polyethylene, Hydrogenated Polyisobutene	Helps stabilize the formula and gives it the right texture, preventing separation.
Fragrance	Fragrance (optional)	Provides a pleasant scent, if desired in the formulation.
Antioxidants	Vitamin E, Tocopherol	Protects the skin and the product from oxidative damage. [24]

2.4.2 Ideal characteristics:

These are the perfect features of a Highlighter stick, and they are listed below:

- Smooth Application
- Blendability
- Long-Lasting Effect
- Light-Reflecting Properties
- Skin-Friendly Ingredients
- Pleasant Sensory Experience
- Eco-Friendly Packaging [25]

2.4.3 Formulation challenges:

- **Luminosity & Texture:** Achieving balanced pigments for a radiant, smooth finish.
- **Stability:** Avoiding phase separation and microbial growth.
- **Packaging Compatibility:** Insuring that formulation is stable in packaging.
- **Sustainability:** Conquering issues of consistency with natural colorants.
- **Emollient & Wax Balance:** Promoting smooth application without being too soft or hard.[26]

2.4.4 Evaluation Parameters for Highlighter Stick:

- **Smoothness and texture:** Determine the sensation of the product on the skin.
- **Melting and softening points:** Impacts stability and ease of use.
- **Breaking point:** Quantifies product strength and resistance to breakage.
- **pH compatibility with skin:** Guarantees compatibility without irritation.
- **Stability under different temperatures and humidity:** Preserves product integrity in changing conditions.
- **Spreadability:** Determines how smoothly the product spreads on the skin.
- **Longevity and smudging resistance:** Checks for wear time and smudge resistance.
- **Tests for skin irritation and allergenicity:** This test ensures no reactions are produced by the product.
- **Microbial contamination analysis:** It verifies safety of the product by testing against harmful microbes.
- **Shine or glow effect:** Specifies the level of luminance or matte appearance. [27]

2.4.5 Advantages and Disadvantages:

Advantages	Disadvantages
Ease of Application: Highlighter sticks are user-friendly and allow precise application directly onto the skin.	Not Ideal for Oily Skin: They may accentuate shine on oily skin, making it appear greasier.
Portability: Compact and travel-friendly, they are easy to carry in makeup kits.	Limited Blendability: Some formulas may be harder to blend compared to liquid or powder highlighters.
Pigmentation: Often highly pigmented, providing an intense glow with minimal product.	Melting Risk: In hot climates, the stick may soften or melt, affecting its usability.
Versatility: Can be used on various areas like cheekbones, brow bones, and collarbones for a radiant look.	Hygiene Concerns: Direct application to the skin may lead to contamination if not cleaned regularly.
Time-Saving: Quick to apply, making them ideal for on-the-go touch-ups.	Limited Shades: May not offer as wide a range of shades as other highlighter types.[28]

2.5 Eyeshadow Stick:-

An eyeshadow stick in cosmetics is a product of eye makeup that is specially designed in stick form for simplicity in application. It is generally a creamy or powder-based formula contained in a twist-up or retractable stick package. The eyeshadow stick is convenient and portable relative to the common eyeshadows in pans or pots, and it is particularly famous for smooth application and extended wear.[29]



Fig 6: Eyeshadow Stick

2.5.1 Ingredients

Category	Ingredients	Function
Pigments/Colorants	Iron Oxides, Titanium Dioxide, Mica, Ultramarine Blue	Provide pigmentation and shimmer effects. Enhance color intensity and finish (e.g., matte, shimmer, metallic).
Emollients	Dimethicone, Cyclopentasiloxane, Caprylic/Capric Triglyceride, Castor Oil	Provide smooth application, emolliency, and moisture to the skin. Improve spreadability and prevent dryness.
Waxes	Candelilla Wax, Carnauba Wax, Beeswax, Microcrystalline Wax	Give structure to the stick format, help the product stay solid and intact. Improve product adherence.
Binders	Stearic Acid, Glyceryl Stearate, Polyethylene	Help bind the other ingredients together for a smooth and consistent formulation.
Film Formers	Dimethicone, Trimethylsiloxysilicate, Cyclohexasiloxane	Form a film on the eyelid, ensuring the eyeshadow stays in place and resists fading or creasing.
Stabilizers	Tocopheryl Acetate (Vitamin E), BHT (Butylated HydroxyToluene)	Prevent oxidation of oils and pigments, maintaining color and product stability over time.
Preservatives	Phenoxyethanol, Ethylhexylglycerin, Potassium Sorbate	Prevent microbial growth, extending the shelf life of the product.
Thickeners	Silica, Magnesium Stearate, Nylon-12	Increase the thickness of the product to achieve a desired consistency, improving application.
Antioxidants	Ascorbic Acid (Vitamin C), Green Tea Extract, Tocopherol (Vitamin E)	Protect the skin from oxidative stress and help preserve the product's quality.
Fragrance	Perfume (Fragrance), Linalool, Limonene	Provide a pleasant scent, although some formulations may be fragrance-free to prevent skin irritation.
Humectants	Glycerin, Propylene Glycol, Butylene Glycol	Retain moisture and prevent dryness by attracting water molecules to the skin.
Solvents	Isododecane, Cyclohexasiloxane	Solvents that dissolve other ingredients, making the formula easier to apply and blend.[30]

2.5.2 Ideal characteristics:

These are the perfect features of a Highlighter stick, and they are listed below:

- Smooth Application and Texture
- Long-lasting Wear and Adhesion
- Pigment Intensity and Color Uniformity
- Skin Compatibility and Safety
- Convenient and Portable Packaging
- Bendability and Buildability
- Moisturizing and Comforting Properties [31]

2.5.3 Formulation challenges:

- Texture: Balancing creamy application with stick solidity.
- Pigment Dispersion: Ensuring uniform color application.
- Stability: Preventing melting or hardening under different conditions.
- Longevity: Avoiding creasing, smudging, and fading.
- Skin Compatibility: Safe for sensitive skin.
- Eco-Friendly Formulation: Using sustainable ingredients effectively. [32]

2.5.4 Evaluation Parameters for Eyeshadow Stick:

- **Color Uniformity:** Assures uniform pigmentation and uniform color application.
- **Texture and Smoothness:** Assesses the application ease and the skin feel.
- **Water Resistance:** Tests the resistance of the product to water and its ability to retain its appearance.
- **Transfer Resistance:** Assesses if the product remains in position without smudging or transferring.
- **Longevity:** Assesses the duration for which the eyeshadow lasts without fading or creasing.
- **Skin Compatibility:** Assures the product is safe on sensitive skin and does not irritate.
- **Adhesion:** Tests the product's ability to stick to the skin for extended wear.[33]

2.5.5 Advantages and Disadvantages:

Advantages	Disadvantages
Compact and travel-friendly, reducing the risk of breakage during travel.	May not suit all skin types, especially oily eyelids, without a primer.
Versatile for creating both subtle and bold looks.	Limited precision for intricate designs compared to brushes.
Often infused with nourishing ingredients for skin care benefits.	Can be more expensive per gram compared to traditional eyeshadows.
Reduces the need for additional tools like brushes.	Some formulas may dry out quickly, reducing shelf life.[34]

3 CONCLUSIONS

In conclusion, makeup stick-based cosmetics have become a prominent segment in the beauty industry, valued for their convenience and ease of application. This review has examined the essential ingredients, ideal characteristics, and formulation challenges associated with blush sticks, lipsticks, foundation sticks, highlighter sticks, and eyeshadow sticks. It also emphasized the evaluation parameters necessary for assessing product performance. Recent innovations in sustainable and multifunctional formulations highlight the industry's commitment to meeting consumer demands while promoting environmental consciousness.

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