SCHOOL of NATURAL SKINCARE International

5.4 FORMULATING LIGHTWEIGHT SHEER COVERAGE LIQUID FOUNDATION

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In this lesson, we will cover:

1. **How to formulate sheer coverage liquid foundation.**
2. **Examples on the market.**
3. **Formulation template for sheer coverage liquid foundation.**
4. **Formulation example for oil-free sheer coverage foundation.**
5. **Adjusting the formula.**

HOW TO FORMULATE SHEER COVERAGE LIQUID FOUNDATION

Sheer coverage liquid foundations are normally formulated as low to medium pigmented **emulsions**.

To ensure a light skin feel, conventional foundations often contain volatile silicones, or, for natural versions, natural esters and/or light vegetable oils.

Emulsion-based foundations can use different types of packaging – squeeze tubes, jars, lotion pumps, airless pumps, etc.

Natural liquid foundations normally contain light emollients, emulsifiers, a water phase, preservatives and often dispersants.

Emollients act as the main carrier in which the pigments are dispersed. Many different kinds of lipids can be used – from vegetable butters and oils, to light feeling esters. Liquid foundation can be formulated as oil-free products by omitting vegetable oils and just using naturally derived esters as the main emollients.

Just as in other emulsion formulas, the water phase contains water and other water soluble ingredients, eg humectants, water-phase thickeners, film-formers, etc.

In order to ease the dispersion of pigments, dispersants like polyhydroxystearic acid can also be used in a liquid foundation formula.

Liquid foundations are often formulated as W/O emulsions as this allows for better pigment dispersion and higher pigment load. However, for lighter products with a lower degree of coverage, O/W emulsions can also be used. Our example formula in this lesson is an O/W emulsion.

Because liquid foundations are emulsions, they require a broad-spectrum preservative system.

Liquid foundations can be applied to the skin using fingertips, makeup brushes or makeup sponges.

Our example formula is packaged into a bottle with a treatment pump closure.

EXAMPLES ON THE MARKET

BENECOS NATURAL LIGHT FLUID FOUNDATION

£8.95 per 30ml

https://benecos.uk

Product highlights/description:

"This Light Fluid Foundation provides a light coverage for those effortless "I woke up like this" days. Ideal for combination to oily skin, it creates the perfect natural glow and smooths out your complexion."

INCI: Aqua, Salvia Sclarea (Clary) Flower/Leaf/Stem Water, Glycerin, Polyglyceryl-10 Myristate, Persea Gratissima (Avocado) Oil, Helianthus Annuus (Sunflower) Seed Oil, Cetearyl Olivate, Sorbitan Olivate, Octyldodecyl Stearoyl Stearate, Magnesium Aluminum Silicate, Cetyl Palmitate, Tocopherol, Argania Spinosa Kernel Oil, Glyceryl Caprylate, Sorbitan Palmitate, Sodium Anisate, Parfum (Fragrance), Sodium Levulinate, Xanthan Gum, Linalool, Chamomilla Recutita (Matricaria) Flower Extract, Limonene, Benzyl Benzoate, Benzyl Cinnamate. May contain +/- CI 77891 (Titanium Dioxide), CI 77491 (Iron Oxides), CI 77492 (Iron Oxides), CI 77499 (Iron Oxides).

Our analysis:

This cream light liquid foundation is an O/W type of emulsion that uses Olivem 1000 (INCI: Cetearyl Olivate (and) Sorbitan Olivate) and polyglyceryl-10 myristate as emulsifiers. The water phase consists of water, clary sage hydrosol, glycerin, xanthan gum and magnesium aluminum silicate (a smectite clay derivative) as a thickener and stabilizer. The oil phase contains avocado oil, sunflower oil, argan oil and octyldodecyl stearoyl stearate (light ester), as well as cetyl palmitate (an ester that also functions as a thickener). The foundation is preserved with sodium anisate and sodium levulinate (found in commercial blend Dermosoft 1388) and uses glyceryl caprylate as a preservative booster. The product also contains Vitamin E as an antioxidant and a natural fragrance. The pigments used in this foundation are titanium dioxide and iron oxides.

BURT'S BEES GOODNESS GLOWS LIQUID FOUNDATION

£14.99 per 29.5ml

www.burtsbees.co.uk

Product highlights/description:

"Our 98.9% natural, full coverage liquid makeup evens and smoothes skin for a radiant, natural-looking finish. Made with responsibly sourced meadowfoam seed oil, known for its moisturising benefits, it gives you beautiful results inside and out."

INCI: Aqua, Octyldodecanol, Isoamyl Laurate, Glycerin, Helianthus Annuus Seed Oil, Caprylyl Caprylate/Caprate, Polyglyceryl-4 Caprate, Glyceryl Stearate SE, Squalane, Cetearyl Alcohol, Cetearyl Glucoside, Limnanthes Alba Seed Oil, Mel, Bambusa Arundinacea Stem Extract, Glycine Soja Oil, Jojoba Esters, Tocopherol, Lecithin, Xanthan Gum, Alumina, Silica, Alcohol, Parfum, Maltodextrin, Glyceryl Caprylate, Sodium Phytate, Glyceryl Undecylenate, Sodium Stearoyl Glutamate, Polyglyceryl-3 Stearate, Trihydroxystearin, Potassium Sorbate, Phenoxyethanol, Amyl Cinnamal, Citral, Citronellol, Limonene, Linalool. May contain +/- CI 77491, CI 77492, CI 77499, CI 77891.

Our analysis:

Another O/W type of emulsion – it contains glyceryl stearate SE, polyglyceryl-4 caprate, sodium stearoyl glutamate, polyglyceryl-3 stearate and cetearyl alcohol with cetearyl glucoside (commercial emulsifier blend under name Montanov 68) as an emulsifier system. The emollients are very light feeling ones that are quick to absorb – octyldodecanol, isoamyl laurate, sunflower oil, caprylyl caprylate/caprate, squalane, meadowfoam oil, soybean oil and jojoba esters. Water is used as the main solvent which also contains glycerin and xanthan gum. The foundation also contains bamboo extract. It is preserved with glyceryl undecylenate, glyceryl caprylate, potassium sorbate and phenoxyethanol. It contains titanium dioxide and iron oxide as pigments to achieve color and coverage.

INIKA ORGANIC LIQUID FOUNDATION

£42.00 per 30ml

https://uk.inikaorganic.com

Product highlights/description:

"Create a flawless, luminous finish on nourished skin with this stay-all-day foundation. The INIKA Organic Liquid Foundation is made with complexion-loving botanical extracts offering skincare benefits alongside dewy, natural coverage. This creamy yet weightless formula minimises signs of skin ageing thanks to antioxidant green tea extract to soothe and repair while harnessing the benefits of hyaluronic acid, which holds a thousand times its weight in water, for skin elasticity and plumpness. Housed in sustainable aluminium packaging, The INIKA Organic Liquid Foundation is further boosted by argan oil, rich in essential fatty acids, which serves to brighten and rejuvenate. Achieve a perfect glowing base and enjoy the benefits of antioxidants, vitamins and minerals with this natural formula."

INCI: Aloe Barbadensis (Aloe Vera) Leaf Juice, Titanium Dioxide, Persea Gratissima (Avocado) Oil, Simmondsia Chinensis (Jojoba) Seed Oil, Cetearyl Alcohol, Glyceryl Stearate Citrate, Cetearyl Olivate, Aqua (Water), Glycerin, Butyrospermum Parkii (Shea) Butter, Glycerin, Sorbitan Olivate, Lecithin (Soya), Theobroma Cacao (Cocoa) Seed Butter, Cocos Nucifera (Coconut) Oil, Tocopherol (Vitamin E), Sodium Levulinate, Glyceryl Caprylate, Sodium Hyaluronate (Hyaluronic Acid), Camellia Sinensis (Green Tea) Leaf Extract, Argania Spinosa (Argan) Kernel Oil, Terminalia Ferdinandiana (Kakadu Plum) Fruit Extract, Camellia Oleifera Seed Oil, Olea Europaea (Olive) Fruit Oil, Rosa Eglentaria (Rosehip) Seed Oil, Oenothera Biennis (Evening Primrose) Oil, Cananga Odorata (Ylang Ylang) Flower Oil, Pelargonium Roseum/Graveolens (Geranium) Leaf Oil, Calendula Officinalis Flower, Cymbopogon Martini (Palmarosa) Oil, Lavandula Angustifolia (Lavender) Oil, Calophyllum Inophyllum (Tamanu) Seed Oil, Chamomilla Recutita (Matricaria) Flower Extract, Cetearyl Glucoside, Oleyl Oleate, Sodium Anisate, Lactic Acid, Geraniol, Linalool, Citronellol, Benzyl Benzoate, Isoeugenol, Benzyl Salicylate, Farnesol, Eugenol, Citral. May contain +/- Iron Oxides (CI 77491, CI 77492, CI 77499).

INIKA Organic/uk.inikaorganic.com

Our analysis:

Another example of an O/W emulsion-based liquid foundation. This one uses Olivem 1000 (INCI: Cetearyl Olivate (and) Sorbitan Olivate), glyceryl stearate citrate and lecithin as emulsifiers, with cetearyl alcohol as a thickener and stabilizer. The foundation uses natural oils as the main emollients – avocado oil, jojoba oil, shea butter, cocoa butter, coconut oil, argan oil, camellia oil, olive oil, rosehip oil and evening primrose oil. It also contains botanical extracts (green tea, kakadu plum, chamomile) and essential oils (ylang ylang, geranium, palmarosa, lavender). The water phase consists of aloe vera juice, water and humectants (glycerin, hyaluronic acid). The foundation is preserved with sodium levulinate, glyceryl caprylate and sodium anisate. It uses lactic acid as the pH adjuster. The pigments in this foundation include titanium dioxide and iron oxides.

FORMULATION TEMPLATE FOR SHEER COVERAGE LIQUID FOUNDATION

Let us have a look at a formulation for sheer coverage liquid foundation. We will start with the formulation template.

Ingredient type	Function	w/w%
Emollients (eg oils, butters, esters)	Solvent	5-50
Lipid thickeners (eg waxes, fatty alcohols, silica, etc)	Increases viscosity	1-10
Emulsifier	Combines oils and water	3-10
Purified water (deionized), or hydrosols, aloe vera juice	Solvent	30-80
Water-phase thickeners (eg gums)	Increases viscosity	0-3
Stabilizers for W/O emulsion (eg magnesium chloride) – if needed	Stabilizes W/O emulsions	0-1
Humectants – optional	Moisturizes the skin	Up to 3
Pigment mixture	Provides tint/color	Up to 10
Dry powders (eg starch, clay) – optional	Creates a dry skin feel	Up to 5
Dispersant – optional	Eases pigment dispersion	Up to 2
Film-formers (eg acacia gum)	Provides longevity	Up to 10
Fragrance/essential oils – optional	Masking agent for raw materials	Up to 1
Preservative	Prevents spoilage via microbial growth	q.s.*
Antioxidant (eg Vitamin E)	Prevents oxidation	0.05-0.10

*The abbreviation q.s. stands for 'quantum satis' or 'quantum sufficit', meaning an amount which is enough, or an amount which suffices. This is a term used in template formulas because the amount of preservative depends on the preservative itself and the formula.

This template can be used for either a W/O or O/W foundation. We have provided two different **Product Development Briefs** and **Formulation Worksheets** (one for W/O emulsions and one for O/W emulsions) where you can find guidance specific to each type of emulsion.

It is worth noting that W/O emulsions are an advanced emulsion type. When you are ready to formulate your own W/O product we recommend studying our Formulating Water-in-Oil (W/O) Emulsions class which provides more detailed guidance on this advanced formula type.

FORMULATION EXAMPLE FOR OIL-FREE SHEER COVERAGE FOUNDATION

PRODUCT DEVELOPMENT QUESTIONS

Product type:
Sheer coverage liquid foundation (O/W emulsion).

Are you formulating to meet a particular standard or certification?
We are using natural ingredients, accepted by COSMOS.

Who is your target audience?
People of all ages, looking for a natural sheer foundation, especially people with oily skin looking for a light foundation.

What is the purpose/function of your product?
To provide light coverage for imperfections and even out skin tone.

What properties and qualities do you want your product to have?
Low to medium viscosity, creamy O/W emulsion.
Medium pigmentation.

What packaging will your product go in?
30ml bottle with a treatment pump closure.

Which solvents are you using and why?
Purified water (deionized), as it is easily accessible and easy to use.

Which water thickeners are you using and why?
Xanthan gum because it is effective and easy to find.

Which humectants are you using and why (if any)?
We are making a light, hydrating, oil-free foundation, so we are using multiple humectants – glycerin, sodium PCA and sodium lactate.

Which emollients are you using and why?
This is designed as an oil-free foundation, so we will not be using any vegetable oils. Instead we are using natural esters for a light skin feel – coco caprylate and isoamyl laurate.

Which lipid thickeners are you using and why?
None, as we want the emulsion to be fairly fluid.

Which emulsifiers are you using and why?
We are using Montanov 202 which is suitable for a wide range of emulsions, from fluid, medium viscosity to thicker, high viscosity emulsions.

Which pigments are you using and why?
We are using a blend of matte mineral pigments.

Which other ingredients specific to this product type are you using and why?
We are using polyhydroxystearic acid as a dispersant – it helps in preventing mineral pigments from clumping up. Refer to **Lesson 5.1 Introduction to formulating natural concealer and foundation** for more information on, and suppliers of, polyhydroxystearic acid.

We are also including Vitamin E as an antioxidant and Geogard 221 as a preservative.

We added pentylene glycol as a humectant and a preservative booster to this formula.

FORMULA

Phase	INCI name	Trade name	Function	w/w%
A	Aqua	Purified water (deionized)	Solvent, carrier	65.4
A	Sodium PCA	Sodium PCA	Humectant	2.0
A	Sodium Lactate	Sodium lactate	Humectant	2.0
A	Pentylene Glycol	Pentylene glycol	Solvent, preservative booster	3.0
A1	Xanthan Gum	Xanthan gum	Thickener	0.3
A1	Glycerin	Glycerin	Humectant	2.0
B	Arachidyl Alcohol, Behenyl Alcohol, Arachidyl Glucoside	Montanov 202	Emulsifier	3.0
B	Isoamyl Laurate	Dermofeel Sensolv	Emollient	7.0
B	Coco Caprylate	Coco caprylate	Emollient	4.0
B	Various	Pigment mixture	Colorant	8.0
B	Polyhydroxystearic Acid	Polyhydroxystearic acid	Dispersant	2.0
C	Benzyl Alcohol, Dehydroacetic Acid	Geogard 221	Preservative	0.8
C	Various	Fragrance	Fragrance	0.5

INSTRUCTIONS

1. Prepare your pigment mixture.
2. Weigh phase A into a beaker.
3. Premix all phase A1 ingredients into a separate beaker and stir until all the powder is dispersed.
4. Add phase A1 ingredients to phase A, while mixing.
5. Weigh the phase A beaker containing the phase A and A1 ingredients. Record this weight to be used for water loss calculations later. Alternatively, you can cover the beaker with plastic wrap or a silicone cover to prevent evaporation.
6. Heat phase A to 75°C using a water bath or hot plate.
7. Weigh phase B ingredients and combine them in a beaker. Stir with a spatula to ensure the pigments are fully dispersed.
8. Heat phase B to 75°C using a water bath or hot plate.
9. Once both phases are at the required temperature, remove them from the heat. If the phase A beaker was not covered, weigh this beaker and calculate the difference between this weight and the initial weight. This value represents water lost through evaporation. Add this amount of purified water lost back into the beaker.
10. Blend phase B with a stick (immersion) blender until smooth.
11. Add phase A into phase B, and homogenize with a stick blender until an emulsion forms.
12. Cool the mixture to 50°C, stirring occasionally to help the batch cool consistently, and add phase C ingredients. Mix thoroughly.
13. Adjust the pH to 4.5-5.5.
14. Transfer into a bottle.
15. Allow to cool at room temperature.

PRODUCT SPECIFICATIONS

Appearance: Opaque emulsion in a bottle.

Viscosity: Medium viscosity emulsion.

Color: Various.

Odor: Typical for the fragrance.

pH: 4.5-5.5. The pH of our product was 5.8, which we adjusted to 5.4 using 0.05g of a 30% citric acid solution.

ADJUSTING THE FORMULA

Using different types of emollients and thickeners will create different structures and skin feels. As this is an O/W emulsion, the emulsifier can be substituted with other O/W emulsifiers. The formula can be adapted so that it is no longer oil-free by using vegetable oils instead of esters.

PET RESULTS

This product passed Preservative Efficacy Testing with a Criteria A pass. The results can be found on the following page.

SUMMARY

In this lesson we explained how to formulate sheer coverage liquid foundation. We shared examples of natural liquid foundations on the market and provided a formulation template and an example formula for an oil-free liquid foundation.

PET RESULTS

HAMILTON

ANNEX NO. 1 TO THE TEST REPORT L43002/22/JSHS

RESULTS

Microorganisms	Log reduction					
	T 7	criteria	T 14	criteria	T28	criteria
Escherichia coli	**4,80**	≥ 3	**4,80**	≥ 3 and NI	**4,80**	≥ 3 and NI
Staphylococcus aureus	**4,81**	≥ 3	**4,81**	≥ 3 and NI	**4,81**	≥ 3 and NI
Pseudomonas aeruginosa	**4,79**	≥ 3	**4,79**	≥ 3 and NI	**4,79**	≥ 3 and NI
Candida albicans	**3,73**	≥ 1	**3,73**	≥ 1 and NI	**3,73**	≥ 1 and NI
Aspergillus brasiliensis	**3,74**	-	**3,74**	≥ 0	**3,74**	≥ 1 and NI

$Rx = lg\ N_0 - lgNx$

N_o- number of micro-organisms inoculated at time t_0

Nx- number of surviving micro-organisms at each sampling time t_x

NI- no increase in the count from the previous contact time T7,T14,T28 days

Conclusion: The test confirmed the efficacy of the antimicrobial protection of a cosmetic product. The product meets criteria A.

Annex date: 06.06.2022