APISARA

NATURAL ARTISANAL COSMETICS

Understanding, formulating and making safe, coherent and reproducible products

> Purpose of this guide Learn to reason through a cosmetic formulation rather than copy a recipe: understand ingredient functions, build a formula to 100%, choose a process, control hygiene, pH and preservation, and document every batch.

Audience: beginners, artisans, small production units, trainers and self-learners.

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Before you begin

Artisanal cosmetics can be simple to make, but a reliable formula is not merely a mixture of “natural” ingredients. As soon as a product contains water, microbiological control, pH, packaging and stability become essential issues. Essential oils, fragrances, some active ingredients and even very common raw materials may have conditions or limits of use.

> Warning This guide is an educational resource. It does not replace laboratory analysis, a Safety Data Sheet (SDS), supplier specifications, a cosmetic safety assessment, or the regulatory obligations applicable to the product and country concerned.

The word “natural” is therefore never used here as a synonym for “risk-free”. The Apisara approach favours formulations that can be explained, documented, reproduced and adapted to the resources actually available.

1. Reading and building a formulation

A professional or educational cosmetic formulation is generally expressed as a percentage by mass. The total formula must equal 100%. This makes it easy to change batch size without changing proportions.

Formula	Calculation
Mass of an ingredient	batch mass × percentage / 100
Percentage of an ingredient	ingredient mass / total mass × 100
Example	3% in a 500 g batch = 15 g

q.s. to 100% means “quantity sufficient to reach 100%”. It is often used for water or the main component when small quantities of other ingredients may vary.

> Practical rule Work by mass, using a scale suited to the required precision. Volumes are convenient in cooking, but not reliable enough for reproducible formulation.

2. Main product families

Family	Structure	Critical point
Balm / stick	Oil phase, no water	Texture, oxidation, heat
Oil / oil serum	Oils + oil-soluble actives	Oxidation, active dosage
Emulsion	Water + oil + emulsifier	Stability, pH, preservation
Aqueous gel	Water + gelling agent	Preservation, pH, viscosity
Cleansing product	Water + surfactants	Tolerance, pH, viscosity
Hair product	Varies with function	Compatibility, rinsing, pH

Anhydrous products are generally simpler microbiologically, but they are not automatically stable: fats and oils can oxidise, texture can change with temperature, and contamination with water during use may alter the risk profile.

3. Raw materials: think by function

Family	Main function	What to check
Oils and butters	Emollience, sensory feel, active carrier	Oxidation, origin, quality, sensory profile
Waxes / structurants	Consistency, hardness, film	Melting point, dosage, texture
Humectants	Help retain water in the superficial skin layers	Dosage, tackiness, compatibility
Emulsifiers	Stabilise water and oil	Complete system, supplier dosage, process

Family	Main function	What to check
Surfactants	Cleansing / foam	Type, active matter, mildness, pH
Gelling / thickening agents	Viscosity / suspension	Hydration, electrolytes, pH
Antioxidants	Slow oxidation	Do not replace an antimicrobial preservative
Preservatives	Limit microbial growth	Spectrum, pH, dosage, regulation
Fragrances / essential oils	Odour / sensory function	Allergens, limits, phototoxicity
Actives	Desired cosmetic effect	Evidence, dosage, solubility, stability

> Antioxidant ≠ preservative Vitamin E (tocopherol), for example, can help slow the oxidation of some oils. It does not protect an emulsion or gel against bacteria, yeasts and moulds.

4. Water, microbiology and preservation

A formula containing water available to microorganisms should be considered microbiologically sensitive. Floral water, an infusion, plant juice or an aqueous gel still count as water from the standpoint of microbiological risk.

- Use water of appropriate quality. Water quality affects stability and initial contamination.
- Reduce contamination during manufacture. Cleaning, suitable disinfection, dry equipment and clean handling are essential.
- Choose the preservative system for the actual formula. Its effectiveness depends on factors including pH, solubility, other ingredients and packaging.
- Do not infer shelf life by intuition. Normal appearance and smell do not prove the absence of contamination.
- For products placed on the market, follow applicable regulatory requirements and relevant testing, including safety, stability and microbiological protection.

Water activity (aw) describes the fraction of water actually available for reactions and microbial growth. It is not the same as the simple percentage of water. Measuring it requires suitable equipment; it should not be estimated visually.

5. pH: measure, do not guess

pH concerns the aqueous phase. It affects skin tolerance, the stability of certain ingredients and the effectiveness of many preservative systems. The target pH depends on the product type and formulation; there is no universal value suitable for every cosmetic.

- Prefer a properly calibrated pH meter when accuracy matters.
- Measure using a consistent, documented procedure.
- Make adjustments gradually with suitable solutions rather than approximate additions.
- Recheck after equilibration when the formulation or supplier information makes this appropriate.

6. Building a formula: the Apisara method

Step	Question to resolve
1. Product brief	For whom? What use? Rinse-off or leave-on? Texture? Climate? Packaging?
2. Dosage form	Balm, oil, emulsion, gel, cleanser?
3. Functions	Emollience, humectancy, cleansing, fragrance, viscosity, etc.
4. Ingredients	Which ingredient performs each function and at what permitted/recommended level?

Step	Question to resolve
5. Calculation	Does the formula total exactly 100%?
6. Process	Phases, temperatures, order of addition, mixing, cooling.
7. Prototype	Small, identified and fully documented batch.
8. Checks	Appearance, mass, pH where relevant, viscosity/texture, observable stability.
9. Correction	As far as possible, change one variable at a time.
10. Validation	Confirm safety, stability and obligations before distribution/sale.

7. Manufacturing: basic good practices

- Prepare a manufacturing record before starting and assign a batch number.
- Identify raw materials and record supplier, reference and batch number where available.
- Clean the work area and use equipment compatible with the ingredients.
- Weigh each ingredient separately and record the quantities actually used.
- Follow the planned order of addition and temperatures.
- Limit unnecessary handling after cooling.
- Use clean, compatible packaging suited to the intended use.
- Label prototypes immediately: formula/version, batch, date and observations.

8. Troubleshooting: problem → causes → checks → corrections

Problem	Possible causes	Check / correct
Emulsion separates	Unsuitable emulsifying system, phase ratio, process, temperature	Review supplier guidance, weighing, temperatures and mixing
Product too fluid	Too little thickener, poor hydration, interactions	Check dosage, hydration method, pH and electrolytes
Grains in a balm	Crystallisation of some butters, cooling profile	Review melting, heat holding and cooling rate
Rancid odour / colour change	Oxidation, light, heat, degraded raw material	Check oils, storage, packaging, suitable antioxidant
pH outside target	Calculation error, acidic/basic ingredient, drift	Measure correctly, adjust gradually, recheck
Viscosity drops	pH, salts, surfactants, polymer incompatibility	Test each factor and consult technical data
Suspected contamination	Hygiene, inadequate preservation, packaging	Do not try to “rescue” a batch intended for use; investigate the cause

9. Five educational formulations

The following examples are intended to teach formula architecture. They are not an authorisation to place a product on the market. Specifications and supplier recommendations take precedence, particularly for emulsifiers, preservatives and surfactants.

A. Simple anhydrous balm - 100 g

Component	Proportion
Stable vegetable oil	55%

Component	Proportion
Vegetable butter	30%
Wax	14.5%
Tocopherol	0.5%

Gently melt the butter and wax, add the oil according to its heat sensitivity, homogenise, incorporate tocopherol at an appropriate temperature, then fill the packaging. The oil/butter/wax ratio strongly determines texture and should be adapted to climate and packaging.

B. Simple care oil - 100 g

Component	Proportion
Vegetable oil A	60%
Vegetable oil B	39.5%
Tocopherol	0.5%

Mix cold in a clean, dry vessel. Choose oils according to stability, sensory feel and intended use. Packaging that limits light and air can improve protection.

C. Educational emulsion - architecture

Component	Proportion
Aqueous phase	≈ 70-80%
Oil phase	≈ 15-25%
Emulsifier / co-emulsifiers	according to system
Humectant	a few %
Preservative	according to supplier
Adjusters / actives	q.s. to 100%

This architecture illustrates the reasoning, not a universal recipe. The emulsifier should be chosen as a complete technical system. The preservative, pH and testing must be compatible with the final formula.

D. Educational aqueous gel - architecture

Component	Proportion
Water	q.s. to 100%
Humectant	a few %
Gelling agent	according to technology
Preservative	according to supplier
Water-soluble actives	according to specifications

The process depends strongly on the gelling agent: dispersion, hydration, possible neutralisation and sensitivity to electrolytes. Preservation is essential whenever required by the formula.

E. Mild liquid cleanser - architecture

Component	Proportion
Water	q.s. to 100%
Surfactant system	according to active matter and use

Component	Proportion
Humectant	optional
Thickener	according to system
Preservative	according to supplier
pH adjuster	q.s. to target

Compare surfactants by active matter, not only by commercial product mass. Viscosity can depend strongly on pH, salts and interactions between surfactants.

10. Substituting an ingredient without unbalancing the formula

A sound substitution is not simply replacing one ingredient with another at the same percentage. First identify its function: structure, emulsification, preservation, sensory feel, solubilisation, viscosity, fragrance, and so on.

- Replacing one oil with another can alter sensory feel, colour, odour and oxidative stability.
- Changing emulsifier may require rebuilding the system and process.
- Changing preservative requires checking pH, solubility, spectrum, dosage and restrictions.
- Changing surfactant requires recalculating active matter and may change viscosity.
- Changing gelling agent may alter the process, required pH and tolerance to salts.

11. Batch control and documentation

What to record	Examples
Identification	Formula name, version, batch, date, operator
Materials	Name, supplier, reference, batch, planned/actual quantity
Process	Order, temperatures, time, mixing, incidents
Checks	Appearance, odour, colour, mass, pH where relevant, texture
Packaging	Type, reference, size, known compatibility
Follow-up	Observations at D+1, D+7, D+30 or according to a defined protocol

Simple but rigorous documentation makes it possible to understand a failure, reproduce a success and progressively build internal data.

12. What an artisan can observe - and what they should not claim to demonstrate

Accessible in a workshop	Requires suitable resources / validation
Weighing, appearance, odour, colour, pH with suitable equipment, behaviour at different temperatures	Microbiological identification, challenge testing, analytical assay of actives, clinical evidence
Comparison of prototypes and documented monitoring	Formal demonstration of shelf life or a claim
Control of materials and process	Complete regulatory assessment where required

Precautionary principle A home or workshop test that is useful for comparing prototypes does not automatically become proof of safety or efficacy. Distinguish between artisanal observation, internal control and regulatory/laboratory validation.

13. Designing for resource-limited settings

Reliable artisanal cosmetics do not necessarily require industrial equipment, but they do require knowing what can actually be controlled with the resources available. In a small workshop, priorities include cleanliness, reliable weighing, material identification, appropriate water, a reproducible process, suitable packaging and clear documentation.

- Prefer relatively simple formulas and well-documented raw materials.
- Limit the number of ingredients when an addition has no clear function.
- Account for climate: heat and humidity affect texture, storage and packaging.
- Avoid processes whose safety cannot reasonably be verified with the resources available.
- Keep technical sheets, specifications and supplier information available offline where Internet access is irregular.

14. Pre-manufacturing checklist

- The formula totals exactly 100%.
- The function of every ingredient is understood.
- Dosages are compatible with supplier information and applicable regulations.
- The preservative system is coherent with the formula when preservation is required.
- The target pH and measurement method are defined where relevant.
- The process, temperatures and order of addition are written down.
- Equipment and packaging are ready and clean.
- The batch record is ready.
- Acceptance criteria and prototype follow-up are defined.

15. Apisara resources

This guide is the introductory document in the Natural Artisanal Cosmetics collection. Future specialist guides may explore emulsions, preservation, raw materials, surfactants, hair products, hygiene, stability and artisanal formulation in greater depth.

Find free guides, technical sheets and tools at APISARA.ORG.

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