

Glabridin Mass Production Finished Product Formula Manual from HiSiaddi

For Domestic Special Cosmetic Permits, EU EC1223, South Korea KFDA & Japan PMDA Compliance

Base Raw Material: 95% HPLC Glabridin Crystalline Powder

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1 Universal Pre-Formula Process Specifications

1.1 Mandatory Standard Dissolution Operation

1. Preferred carrier solvent: 1,3-butanediol; minimum mass ratio powder : polyol = 1:10
2. Dissolve at 45–60°C water bath with slow stirring for 10–20 mins until fully clear
3. Cool mixture below 40°C before feeding; prolonged holding above 70°C causes over 30% activity loss and yellowing
4. Water-based formulas require additional 0.5–2% PEG-40 Hydrogenated Castor Oil / Polysorbate 20 as solubilizer

1.2 Mandatory Stable pH Range

Optimal pH: 5.0–6.0

- pH <4.5: Flavonoid structure decomposes, obvious yellowing and whitening activity loss within 1 month storage
- pH >7.0: Rapid browning with brown precipitate and complete loss of melanin inhibition capacity

1.3 Standard Feeding Timing

1. Creams & Emulsions: Add pre-dissolved Glabridin post-emulsification below 40°C, homogenize 3 mins
2. Toners & Mask Liquids: Slowly drip pre-dissolved mixture into cooled water phase (≤40°C) under high-speed stirring

3. Oil-Based Serums: Directly dissolve into oil phase at 50°C, cool then fill

1.4 Mandatory Anti-Oxidation Stabilizer System

Add 0.05–0.1% Tocopheryl Acetate + 0.02% BHT to all formulas to prevent light/temperature oxidation

Finished products must use amber glass, aluminum foil pouches or opaque hoses; transparent packaging cuts shelf life by half

1.5 Regional Maximum Permitted Dosage (95% Purity Conversion)

表格

Region	Leave-On Product Cap	Rinse-Off Product Cap
China Mainland Spot Special Permit	0.12%	0.5%
EU SCCS Recommended	0.3%	0.5%
South Korea KFDA Functional Whitening Hard Limit	0.1%	0.3%
Japan PMDA Quasi-Drug	0.1%	0.3%

2 8 Complete Mass-Production Formulas

Formula 1 Gentle Whitening Spot Serum

Glabridin Dosage: 0.05%

Phase A Water Phase (Heat to 80°C for dissolution)

Deionized Water 77.40

Glycerin 5.00

Panthenol 2.00

Sodium Hyaluronate 0.15

Xylitol 1.00

Phase B Pre-Dissolved Phase (Prepare Separately, Cool After 55°C
Dissolution)

1,3-Butanediol 4.00

Glabridin (95%) 0.05

PEG-40 Hydrogenated Castor Oil 1.00

Tocopheryl Acetate 0.10

Phase C Functional Phase (Add at ≤40°C)

Tranexamic Acid 3.00

Niacinamide 2.00

Ectoin 1.00

Ethylhexylglycerin 0.30

Phenoxyethanol 0.10

Disodium EDTA 0.05

Process: Cool water phase to 40°C under homogenization, add Phase B dropwise and stir 10 mins, then add Phase C; adjust pH 5.3–5.8 with citric acid, filter and fill into amber bottles (24-month shelf life)

Formula 2 Whitening Spot Cream (Domestic Special Permit & EU High-End Line)

Glabridin Dosage: 0.08%; Reduce to ≤0.09% for South Korea export

Oil Phase (Melt & Homogenize at 75°C)

Caprylic/Capric Triglyceride 6.00

Cetyl Alcohol 2.00

Steareth-21 2.50

Steareth-2 1.50

Squalane 2.00

Tocopheryl Acetate 0.10

Water Phase (Dissolve at 75°C)

Deionized Water 74.42

Glycerin 6.00

Betaine 2.00

Ceramide NP 0.10

Xanthan Gum 0.15

Disodium EDTA 0.08

Functional Pre-Dissolved Phase (Add at ≤40°C)

1,3-Butanediol 3.00 + Glabridin 0.08 (pre-dissolved to clear)

Tranexamic Acid 2.50

Panthenol 1.00

Phenoxyethanol Alternative Preservative (Phenethyl Alcohol + Hexanediol) 0.67

Process: Emulsify oil & water phases at 75°C for 5 mins homogenization; cool batch to 40°C and add Glabridin pre-solution and functional ingredients; adjust pH 5.4–5.9, fill into opaque hoses

Formula 3 Brightening Repair Lotion (40% Crude Extract Compatible Mass Market Formula)

Raw Material Swap Guide: Replace 0.05% 95% Glabridin with 0.12% 40% crude extract for equivalent activity

Phase A Water Phase

Deionized Water 82.73

Glycerin 4.00
Panthenol 1.50
Sodium Hyaluronate 0.12
Phase B Oil Phase
Isohexadecane 3.00
Cetyl Alcohol 1.20
Polyglyceryl-4 Oleate 1.80
Phase C Pre-Dissolved Phase
Propylene Glycol 3.00 + 95% Glabridin 0.04
PEG-20 Glyceryl Triisostearate 0.80
Tocopherol 0.06
Phase D Cooling Functional Phase
Dipotassium Glycyrrhizate 0.30
Niacinamide 1.50
Compound Preservative 0.45
Adjust pH to ~5.5 for matte lightweight oily-skin lotion
Formula 4 Brightening Sheet Mask Liquid (Southeast Asia Mass Export)
Glabridin 0.03%
Deionized Water 86.82
Glycerin 5.00
1,3-Butanediol 3.50 (dissolution carrier)
Glabridin (95%) 0.03
Polysorbate 20 0.60
Sodium Hyaluronate 0.10
Asiaticoside 0.15
Dipotassium Glycyrrhizate 0.40
Phenethyl Alcohol / Hexanediol Preservative 0.70
Disodium EDTA 0.05
Citric acid pH adjustment to 5.2–5.7, fill into amber mask pouches (18-month ambient shelf life)
Formula 5 Soothing Anti-Photoaging Sunscreen Lotion
Glabridin Dosage: 0.02% to reduce UV pigmentation
Oil Phase (75°C)
Zinc Oxide 6.00
Octocrylene 3.00
Ethylhexyl Methoxycinnamate 5.00

Caprylic/Capric Triglyceride 4.00

Stearic Acid 1.80

Tocopheryl Acetate 0.10

Water Phase

Deionized Water 73.23

Glycerin 5.00

Betaine 2.00

Xanthan Gum 0.15

Disodium EDTA 0.07

Add at $\leq 40^{\circ}\text{C}$

Propylene Glycol 2.50 + Glabridin 0.02 (pre-dissolved)

Panthenol 1.00

Phenoxyethanol + Ethylhexylglycerin Preservative 0.45

Benefit: Inhibits UV inflammation, no mandatory night-only use

Formula 6 Acne Redness Relief Serum (Salon Professional Line)

Glabridin 0.06% + Glycyrrhetic Acid 0.12% for dual acne & redness control

Deionized Water 80.17

Glycerin 4.00

1,3-Butanediol 3.80 (dissolution carrier)

Glabridin 0.06

18 β -Glycyrrhetic Acid 0.12

PEG-40 Hydrogenated Castor Oil 1.20

Panthenol 1.50

Salicylic Acid Alternative (Oleanolic Acid) 0.20

Polysorbate 80 0.80

Preservative 0.35

Disodium EDTA 0.05

pH 5.6–6.0 for inflammatory acne and red acne marks

Formula 7 Brightening Alcohol-Free Toner

Glabridin 0.02%, solubilized clear water-based formulation

Deionized Water 88.23

Glycerin 3.50

1,3-Butanediol 3.00

Glabridin 0.02

Polysorbate 20 1.00

Niacinamide 1.20

Panthenol 1.00

Sodium Hyaluronate 0.10

Centella Asiatica Extract 0.50

Compound Preservative 0.40

Disodium EDTA 0.05

Citric acid adjust pH 5.3 for daily brightening & wet compress use

Formula 8 Full-Body Brightening Lotion (Cross-Border Mass Market)

Glabridin 0.04%

Oil Phase: Petrolatum 2.00, Shea Butter 1.50, Emulsifier 3.00

Water Phase: Deionized Water 81.11, Glycerin 6.00, Betaine 2.00

Pre-Dissolved Phase: Propylene Glycol 3.00 + Glabridin 0.04

Functional Additives: Niacinamide 2.00, Panthenol 1.00, Tocopherol 0.06,
Preservative 0.29

Gentle formulation for elbow/knuckle dark spot improvement

3 Regional Dosage Adjustment Cheat Sheet for Foreign Trade

1. South Korea KFDA Functional Whitening Products: 95% Glabridin capped at 0.1% maximum; tighten heavy metal standard Pb $\leq$ 5ppm
2. Japan PMDA Quasi-Drugs: Spot-lightening formulas limited to $\leq$ 0.1%; general skincare up to 0.15% with full irritation/phototoxicity test reports
3. EU & UK: No legal mandatory cap; SCCS recommends leave-on $\leq$ 0.3%; export with bilingual REACH SDS
4. China Mainland Special Spot Cosmetics: Maximum finished product dosage 0.12%; require 28-day human efficacy clinical trial reports
5. All Rinse-Off Products (Cleanser, Shampoo, Body Wash): Global uniform safe cap 0.5%, minimal regulatory oversight

4 Four High-Efficacy Synergistic Blending Systems

System 1 Gentle Sensitive Skin Whitening

Glabridin 0.03–0.06% + Tranexamic Acid 2–3% + Panthenol 2% + Ectoin 1%

Function: Melanin inhibition + barrier repair to reduce whitening ingredient irritation for post-procedure pigmentation

System 2 Anti-Oxidation Anti-Blue Light Anti-Dullness

Glabridin 0.04–0.08% + 3-O-Ethyl Ascorbic Acid 3% + Ferulic Acid 0.1% + Carnosine 0.5%

Triple antioxidant complex for glycation dullness and photoaging fine line improvement

System 3 Acne & Redness Dual-Action System

Glabridin 0.05–0.07% + 18 β -Glycyrrhetic Acid 0.1–0.15% + Oleanolic Acid 0.20%

Eliminates inflammatory papules and fades new/old red/black acne marks while regulating sebum secretion

System 4 Organic Clean Beauty Minimalist Blend (ECOCERT/USDA Eligible)

Glabridin 0.03–0.05% + Organic Asiaticoside + Organic Panthenol + Natural Tocopherol

PEG-free, synthetic-preservative-free formula for COSMOS organic finished product registration

5 Formula Debugging Guide for Common Production Defects

Defect 1 Water-Based Formulation Cloudiness & White Precipitation

Root Causes: Insufficient polyol carrier, missing solubilizer, low feeding temperature

Solutions: Boost 1,3-butanediol to $\geq 3\%$; add 1% Polysorbate 20; fully homogenize at 45°C

Defect 2 Yellow/Brown Discoloration Within 1–3 Months Storage

1. Light Exposure: Switch to fully opaque amber packaging, warehouse dark storage
2. pH Imbalance: Adjust to 5.0–6.0 with citric acid
3. Missing Antioxidants: Supplement 0.1% Tocopherol + 0.02% BHT
4. High-Temperature Feeding: Strictly add active ingredients only after batch cools below 40°C

Defect 3 No Visible Brightening After 28-Day Use

1. Insufficient Glabridin Dosage: Minimum leave-on effective concentration $\geq 0.03\%$
2. Low-Purity Crude Extract Misused as High-Purity Raw Material
3. High-temperature feeding destroys whitening activity
4. High fruit acid/alkaline raw materials degrade Glabridin structure

Defect 4 Cream Emulsion Water-Oil Separation

Root Cause: Incomplete Glabridin pre-dissolution, poor oil compatibility

Solutions: Extend pre-dissolution stirring duration; adopt medium-chain triglycerides as primary oil carrier

Defect 5 Stinging & Redness for Sensitive Skin Users

Root Cause: Over-concentration of alcohol/free acid irritants

Solutions: Reduce irritant loading; blend Panthenol, Ceramide and Ectoin to soothe skin

6 ECOCERT Organic Clean Beauty PEG-Free Simplified Whitening Serum

USDA/COSMOS Eligible, No Synthetic Preservatives

Deionized Water 81.42

Organic Glycerin 5.00

Organic 1,3-Butanediol 4.00

95% Glabridin 0.05

Coco-Glucoside Plant Solubilizer 1.50

Organic Panthenol 1.20

Organic Centella Asiatica Extract 0.80

Natural Tocopherol 0.10

Plant-Derived Preservative (Hexanediol + Caprylyl Glycol) 0.53

Citric acid pH adjustment to 5.4 for organic finished product filing

Supporting Document Delivery Package

1. English Full Version Glabridin Finished Product Formulation Guide for Foreign Trade
2. Matching TDS/COA/SDS templates for each formula
3. Regional Dosage Adjustment One-Page Cheat Sheet
4. Standard SOP for Glabridin Dissolution Production Operation

Technical Comparison Manual: Three Core Licorice Active Ingredients from HiSiaddi

Glabridin / Glycyrrhizic Acid / Glycyrrhetinic Acid

For overseas raw material buyers, formula R&D, brand supply chain selection & REACH/COSMOS compliance filing

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1 Chemical & Raw Material Source Comparison Table

表格

Item	Glabridin	Glycyrrhizic Acid	Glycyrrhetinic Acid (18β-GA)
INCI Name	Glabridin	Glycyrrhizic Acid	Glycyrrhetinic Acid
CAS Number	59870-68-7	1405-86-3	471-53-4
Chemical Class	Isoflavone Polyphenol	Triterpene Saponin	Triterpene Aglycone
Molecular Formula	C ₂₀ H ₂₀ O ₄	C ₄₂ H ₆₂ O ₁₆	C ₃₀ H ₄₆ O ₄
Molecular Weight	324.37	822.9	470.69
Exclusive Licorice Source	Glycyrrhiza glabra only	Glycyrrhiza uralensis / Glycyrrhiza inflata	Produced via glycyrrhizic acid hydrolysis, all licorice varieties usable
Natural Root Content	Extremely low: 0.02–0.04% dry root	High: 7–11% dry root	Zero natural content, fully industrial hydrolysis product
Signature Feature	Lipophilic core whitening agent	Water-soluble, strong sweet taste, basic soothing agent	Lipophilic, stronger anti-acne anti-inflammation, no sweetness

Key Source Explanation

1. Glabridin exclusively exists in Glycyrrhiza glabra; Glycyrrhiza uralensis contains zero Glabridin. Higher cultivation cost and limited global supply
2. Glycyrrhizic Acid has the largest global production capacity, low-cost raw material for mass-market soothing skincare
3. Glycyrrhetic Acid has no natural occurrence; industrial process:
Glycyrrhizic Acid alkaline hydrolysis → purification & crystallization

2 Native Content, Extraction Yield & Production Cost Comparison

(Based on 1 ton dry licorice raw material)

表格

Indicator	95% High-Purity Glabridin	98% Glycyrrhizic Acid / Dipotassium Glycyrrhizate	99% Glycyrrhetic Acid
Natural Dry Root Content	~0.03%	~9%	0%
Crude Extraction Yield	0.022%	7.5%	3.2% post- hydrolysis from 7.5% glycyrrhizic acid
Total Purification Yield (Including Recrystallization Loss)	0.010–0.013% (1 ton raw yields only 10– 13kg high-purity powder)	4.0–4.8% (1 ton raw yields 40– 48kg pure product)	2.8–3.4% (1 ton raw yields 28– 34kg final product)
Extraction Difficulty	Extremely high: Ethanol extraction + macroporous resin separation + repeated recrystallization with massive material loss	Moderate: Ammonia water reflux + acid precipitation, mature mass- production process	Moderately high: Additional hydrolysis, de- sugaring and decolorization steps
Energy & Solvent Cost Per Ton Raw	Highest	Lowest (water- based extraction	Medium

Indicator	95% High-Purity Glabridin	98% Glycyrrhizic Acid / Dipotassium Glycyrrhizate with solvent recovery)	99% Glycyrrhetinic Acid
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Relative Raw Material Cost (Glycyrrhizic Acid = Benchmark 1)	28–35×	1	6–9×
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Supply & Procurement Risk Notes

- 1. Glabridin: Limited global high-purity output concentrated in Northwest China; long lead times and volatile pricing, only suitable high-end premium lines with limited bulk orders
- 2. Glycyrrhizic Acid Dipotassium: Annual ten-thousand-ton domestic capacity, stable stock and pricing for mass-market masks, body care and daily toners
- 3. Glycyrrhetinic Acid: Medium production volume, exclusively for salon acne, barrier repair and medical skincare lines with mid-range pricing

3 Core Efficacy & Functional Strength Contrast

3.1 Whitening & Melanin Inhibition

Glabridin

Triple-action mechanism: Competitive tyrosinase inhibition, α-MSH signal blockage, melanosome transport suppression + antioxidant anti-pigmentation
Tyrosinase inhibitory activity equivalent to 960× Arbutin, 80× VC derivatives, 140× Niacinamide

Optimal for chloasma, acne marks, sun tanning and post-procedure hyperpigmentation; the only licorice monomer with primary whitening function

Glycyrrhizic Acid

Minimal whitening capacity; only mild antioxidant faint brightening with no direct tyrosinase inhibition. Merely auxiliary improvement for inflammatory dullness, cannot be used as core whitening ingredient

Glycyrrhetinic Acid

Virtually no whitening function; only indirectly reduces inflammatory dark spots via anti-inflammatory effects, disqualified for whitening special cosmetic claims

3.2 Anti-Inflammation & Sensitive Skin Relief

1. Glycyrrhetic Acid (Strongest Anti-Inflammatory)

Inhibits both COX & LOX pathways, blocks histamine, IL-6 and TNF- α ; anti-inflammatory efficacy ~1/10 hydrocortisone without hormonal side effects. Top choice for rosacea, hormone-damaged skin, broken barrier and post-procedure severe redness relief

2. Glycyrrhizic Acid

Mild broad-spectrum soothing; reduces TEWL transepidermal water loss and stabilizes barrier for daily maintenance, children's skincare and mild sensitivity. Anti-inflammatory strength ~1/3 Glycyrrhetic Acid

3. Glabridin (Balanced Anti-Inflammation + Whitening)

Moderate anti-inflammatory activity; unique advantage of simultaneous redness reduction and melanin fading for red-black acne marks and sunburn hyperpigmentation

3.3 Anti-Acne & Antibacterial Activity

- Glycyrrhetic Acid: Strong antibacterial against Cutibacterium acnes & Staphylococcus aureus, regulates overactive sebum secretion for papule and pustule clearing
- Glycyrrhizic Acid: Weak antibacterial function; only auxiliary acne redness relief with no oil control capacity
- Glabridin: Mild bacteriostasis, primarily targets residual acne marks with limited efficacy on active inflammatory pimples

3.4 Antioxidation & Anti-Photoaging

- Glabridin: Strongest radical scavenger, inhibits lipid peroxidation against UV & blue light damage to reduce yellow dullness and photoaging fine lines
- Glycyrrhetic Acid: Moderate antioxidant activity focused on inflammatory oxidative skin damage
- Glycyrrhizic Acid: Stable low-strength antioxidant for basic daily skin protection

Core Efficacy Selection Cheat Sheet

表格

Functional Requirement	Top Choice	Secondary Option	Not Recommended
Whitening & Spot Fading	Glabridin	Glycyrrhetic Acid (auxiliary redness relief only)	Glycyrrhizic Acid
Daily Mild Sensitive Skin Maintenance	Dipotassium Glycyrrhizate	Glabridin	Glycyrrhetic Acid (mild irritation risk)
Severe Redness, Hormone-Damaged & Post-Procedure Skin	Glycyrrhetic Acid	Glabridin	Glycyrrhizic Acid
Acne Control & Oil Regulation	Glycyrrhetic Acid	Glabridin (acne marks only)	Glycyrrhizic Acid
Anti-Photoaging & Anti-Dullness	Glabridin	Glycyrrhetic Acid	Glycyrrhizic Acid
Low-Cost Mass Market Masks & Body Lotion	Dipotassium Glycyrrhizate	Pre-Dissolved Labridin Liquid	Glycyrrhetic Acid

4 Physicochemical Solubility & Formula Compatibility Comparison

表格

Physicochemical Item	Glabridin	Glycyrrhizic Acid / Dipotassium Glycyrrhizate	Glycyrrhetic Acid
Polarity	Lipophilic flavonoid, practically insoluble in water	Highly water-soluble triterpene salt, soluble in cold water	Lipophilic, difficult to dissolve in pure water
Preferred Solvents	1,3-Butanediol, Propylene Glycol, Ethanol, Vegetable Oils, DMSO	Deionized Water, Glycerin, Polyol Aqueous Solutions	Ethanol, Vegetable Oils, Solubilizer Systems

Physicochemical Item	Glabridin	Glycyrrhizic Acid / Dipotassium Glycyrrhizate	Glycyrrhetinic Acid
Stable pH Range	5.0–6.5; prone to decomposition & yellowing under strong acid/alkali	4.0–7.5 wide stable pH	5.0–7.0; precipitation under acidic conditions
Light Stability	Poor; mandatory opaque packaging, easy oxidation & discoloration	Excellent, no discoloration under light exposure	Moderate; light-proof storage recommended
Formula Limitations	Solubilizer required for water toners; avoid high-concentration fruit acid blending	Universal compatibility for all dosage forms	Solubilizer/liposome delivery mandatory for water-based formulas
Irritation Potential	Extremely low, non-sensitizing & non-phototoxic	Ultra-mild, safe for infants	Mild irritation risk on broken damaged skin

Universal Raw Material Incompatibility Rules

1. Glabridin: Avoid pH <4.5 strong acid environments, high free fruit acid concentrations and strong alkalis
2. Glycyrrhetinic Acid: High ethanol concentrations amplify skin irritation; restrict usage on broken barrier skin
3. Dipotassium Glycyrrhizate: No significant formula incompatibility, widest formulation tolerance

5 Global Regulatory Compliance Guide for Import Filing

EU REACH / CosIng / SCCS

1. Glabridin: Fully listed on CosIng, not included in Annex II banned or Annex III restricted ingredient lists with no statutory maximum dosage limits. Whitening efficacy claims require B16 cell assay + human clinical trial data; SCCS approves safe topical use

2. Glycyrrhizic Acid / Dipotassium Glycyrrhizate: REACH Annex IV permitted raw material; maximum 0.4% leave-on dosage per CIR safety assessment; eligible for COSMOS organic certification
3. Glycyrrhetic Acid: Approved cosmetic ingredient; maximum recommended leave-on dosage 0.2% for high-concentration anti-acne formulations

USA CIR / FDA

All three ingredients receive CIR safety evaluation approval for leave-on and rinse-off cosmetics; Dipotassium Glycyrrhizate has no strict concentration limits for mass-market wash-off products

Japan PMDA Quasi-Drugs

1. Glabridin eligible for whitening quasi-drug registration with complete tyrosinase inhibition & human brightening clinical trial data
2. Dipotassium Glycyrrhizate general soothing raw material with simplified filing procedures
3. Glycyrrhetic Acid approved for anti-acne & anti-redness quasi-drug claims

Procurement Regulatory Guidance

Select ≥95% high-purity Glabridin for EU/Japan high-end whitening export lines; Dipotassium Glycyrrhizate for affordable mass market organic skincare; Glycyrrhetic Acid for salon acne and barrier repair formulations

6 End Product Buyer Selection Guide

Selection 1 Affordable Mass Market Masks, Toners & Body Care

Primary Choice: Dipotassium Glycyrrhizate

Advantages: Low unit cost, water-soluble simple formulations, low filing cost, abundant spot inventory

Positioning: Basic soothing & irritation reduction only, no whitening efficacy claims, limited mild dullness improvement

Selection 2 High-End Whitening Serums, Spot Creams & Special Permit Skincare

Primary Choice: 95% High-Purity Glabridin

Core Selling Point: Natural "Whitening Gold", potent low-dose melanin inhibition, dual whitening + anti-redness efficacy for sensitive skin post-procedure brightening

Procurement Notes: Higher budget, smaller order volume required, 30–45 day production lead time

Selection 3 Anti-Acne Creams, Rosacea Dressings & Post-Procedure Repair Creams

Primary Choice: 99% Glycyrrhetic Acid

Advantages: Dual powerful anti-inflammatory & antibacterial activity for rapid papule/pustule redness fading and sebum regulation

Disadvantages: Higher cost than glycyrrhizate; solubilizer mandatory for all water-based formulations

Selection 4 Premium Multi-Efficacy All-In-One Serums (Whitening + Repair + Acne Control)

Blend Formula: Glabridin + Glycyrrhetic Acid

Simultaneous spot fading, redness reduction and acne clearing – mainstream formulation for global high-end efficacy skincare brands

7 High-Sales Synergistic Blending Combinations

1. Gentle Sensitive Skin Whitening

Glabridin 0.05% + Dipotassium Glycyrrhizate 0.3% + Tranexamic Acid 2–3%

Mechanism: Melanin inhibition + barrier repair to lower whitening ingredient irritation and post-inflammatory pigmentation

2. Anti-Acne Redness Relief

Glycyrrhetic Acid 0.15% + Dipotassium Glycyrrhizate 0.2% + Panthenol 2%

Mechanism: Antibacterial sebum control + mild soothing for inflammatory acne

3. After-Sun Anti-Oxidation Protection

Glabridin 0.03% + Glycyrrhetic Acid 0.08% + Tocopherol 0.1%

Mechanism: Dual UV-induced tanning & redness blockage with full-spectrum radical scavenging

4. Low-Cost Daily Stabilization Formulation

Dipotassium Glycyrrhizate only 0.2–0.5% for toners, masks and children's skincare

8 Raw Material Quality Control & Procurement Risk Prevention

8.1 Glabridin QC Mandatory Standards

1. HPLC purity minimum $\geq 95\%$; 40% crude extract lacks potent whitening activity and cannot support official whitening claims
2. Heavy metal limits: Pb $\leq 10\text{ppm}$, As $\leq 2\text{ppm}$, Hg $\leq 1\text{ppm}$, Cd $\leq 5\text{ppm}$

3. Appearance screening: Reject yellow discolored batches due to oxidation and activity loss
4. Mandatory supporting documents: TDS, COA, bilingual SDS, extraction process specification, REACH registration/exemption certificate

8.2 Dipotassium Glycyrrhizate QC Standards

1. Glycyrrhizic Acid purity $\geq 98\%$, pH range 6.0–7.5
2. Solubility & sweetness index verification for bulk mass-market production

8.3 Glycyrrhetic Acid QC Standards

1. 18β -Glycyrrhetic Acid isomer purity $\geq 99\%$; low-grade 18α variant delivers negligible anti-inflammatory efficacy
2. Complete solubility test in ethanol with no precipitate formation

8.4 Common Procurement Fraud Risks

1. Raw Material Source Misrepresentation: Substitute Glycyrrhiza uralensis extract for Glycyrrhiza glabra Glabridin with drastically reduced whitening activity
2. Purity Dilution Fraud: Adulterate high-purity powder with glucose/dextrin; COA lab test data inconsistent with actual batch analysis
3. Packaging Degradation Risk: Transparent packaging causes over 40% activity loss during long-term transit; all export shipments require sealed aluminum foil/aluminum can light-proof packaging

Manual Summary One-Sentence Buyer Decision Guide

1. Prioritize Glabridin for premium whitening & brightening claims (highest cost, lowest extraction yield, strongest efficacy differentiation)
2. Prioritize Dipotassium Glycyrrhizate for low-cost mass-market basic soothing (highest extraction yield, stable supply, optimal cost performance)
3. Prioritize Glycyrrhetic Acid for salon anti-acne & severe barrier repair (strongest anti-inflammatory antibacterial efficacy, mid-tier procurement cost)