🧼 Enterprise Soap Production & GMP Master Batch Record

This system transitions a growing soap business into a fully compliant, scale-ready cosmetic manufacturing operation. It integrates Good Manufacturing Practices (GMP), absolute traceability, advanced formulation chemistry, and B2B financial modeling.

📑 1. Master Formula & Product Information File (PIF)

The immutable DNA of the product for regulatory compliance and brand consistency.

- **Product Name (Commercial):** [e.g., Lavender & Colloidal Oat Exfoliant]
- **Master Formula Number (MFN):** [e.g., MFN-LAV-OAT-v2.1]
- **SKU / Barcode:** [e.g., 001-LAV-89234]
- **Process Type:** [ ] Cold Process [ ] Hot Process [ ] Dual-Lye (Liquid/Cream)
- **Target Shelf Life (PAO):** [e.g., 24 Months from Cure]
- **Official INCI Label Declaration (Descending Order):**
  - *(e.g., Sodium Olivate, Sodium Cocoate, Sodium Shea Butterate, Aqua, Glycerin, Lavandula Angustifolia Oil, Avena Sativa Kernel Flour, Mica.)*

🧪 2. Advanced Formulation Chemistry & Metrics

Validating the chemical profile before production to ensure a consistent physical product.

A. Lye System & Ratios:

- **Lye Type & Purity:** [ ] NaOH (Bar) [ ] KOH (Liquid) | Purity %: [e.g., 99%]
- **Superfat (Lye Discount):** [e.g., 5%]
- **Lye Concentration % / Water:Lye Ratio:** [e.g., 33% / 2:1]
- **Total Batch Yield Target (Oil Weight + Liquid/Lye):** [ ] oz / [ ] g

B. Fatty Acid Profile & Soap Quality Targets:

(Run through advanced calculator to project bar qualities)

- **Hardness Target (Target 29-54):** [ ] | **Cleansing Target (Target 12-22):** [ ]
- **Conditioning (Target 44-69):** [ ] | **Bubbly/Lather (Target 14-46):** [ ]
- **INS Value (Target 136-165):** [ ]

C. Master Ingredient Bill of Materials (BOM):

INCI / Ingredient Name	Phase	% of Total	Weight (g/oz)	Safety/Usage Limits

e.g., Olea Europaea (Olive) Fruit Oil	Oil Phase	40%	16 oz	N/A
e.g., Lavandula Angustifolia EO	Frag/Cool down	3%	1.2 oz	Max 5.3% (IFRA Cat 9)
e.g., Titanium Dioxide (CI 77891)	Colorant	0.5%	0.2 oz	No Max - Cosmetic Grade

🏭 3. Raw Material Traceability (GMP Critical)

If a supplier recalls an oil or fragrance, you must know exactly which batches of your soap contain it.

Ingredient	Supplier	Supplier Lot / Batch #	Expiration Date	SDS on File?
Olive Oil	Supplier A	LOT-9982-A	2027-11-01	[x] Yes
Shea Butter	Supplier B	LOT-44B-2025	2026-08-15	[x] Yes
Lavender EO	Supplier C	LOT-LAV-009	2028-01-01	[x] Yes
Lye (NaOH)	Supplier D	LOT-CHEM-99	N/A	[x] Yes

📋 4. Manufacturing Standard Operating Procedure (SOP) & Log

Documenting the exact physical environment and step-by-step execution.

- **Batch Number (BPR):** [e.g., BATCH-20260710-LAV01]
- **Production Date & Time Started:** [YYYY-MM-DD] @ [HH:MM]
- **Lead Chemist/Maker:** [Name] | **Secondary QA Check:** [Name]
- **Ambient Environment:** Temp: [ ] °C/°F | Humidity: [ ] %

Execution Log:

- [ ] Workstation sanitized (70% IPA) & scales calibrated (QA Initial: ____)
- [ ] Lye Solution prepared outdoors/under ventilation. Final Temp: [ ] °C/°F
- [ ] Hard oils melted. Soft oils added. Master Oil Temp: [ ] °C/°F
- [ ] Emulsion temperature delta (Difference between Lye & Oils): [ ] °C/°F *(Target: <10°)*

- [ ] Additives incorporated at trace level: [ ] Emulsion [ ] Light [ ] Medium [ ] Heavy
- [ ] Poured into molds. Time: [HH:MM]
- [ ] Saponification Management: [ ] CPOP (Oven) [ ] Insulated [ ] Chilled to prevent gel

Deviations / Irregularities during production: *(e.g., "Fragrance caused rapid acceleration; had to hand-stir and spoon into molds.")*

⚖️ 5. Quality Control (QC), Shrinkage & Retain Samples

Tracking the physical transformation from wet batter to shelf-stable product.

Timeline & Curing:

- **Unmold / Cut Date:** [YYYY-MM-DD]
- **Total Bar Yield (Units):** [ ] Bars + [ ] End Pieces/Scrap
- **Wet Weight (Average per bar):** [e.g., 150g]
- **Cure End Date (Release for Sale):** [YYYY-MM-DD]
- **Dry Weight (Average per bar post-cure):** [e.g., 132g]
- **Total Water Shrinkage %:** [e.g., 12%] *(Wet Wt - Dry Wt) / Wet Wt*

QC Release Checklist:

- [ ] **pH Testing:** Method: [Meters/Strips/Phenolphthalein] | Result: [e.g., 9.2]
- [ ] **Organoleptic Testing:** Color, Odor, Appearance, and Skin-feel pass standard.
- [ ] **Retain Sample Secured:** [1-2 bars stored in climate-controlled archive for 2 years with Batch # attached. Critical for customer complaint validation].
- **Final Batch Status:** [ ] PASSED & RELEASED TO INVENTORY [ ] QUARANTINED

💼 6. Advanced Costing & B2B Financial Architecture

Pricing for enterprise scaling requires capturing hidden costs.

A. Comprehensive Cost of Goods Sold (COGS):

- **Raw Materials (Oils, Lye, Water, Scents, Colors):** $ [ ]
- **Direct Packaging (Boxes, Labels, Shrink Wrap):** $ [ ]
- **Direct Labor:** [ ] Hours @ $ [ ]/hr = $ [ ] *(Do not value your time at $0)*
- **Overhead Burden / Fixed Cost Allocation:** $ [ ] *(e.g., Flat $5 per batch for electricity, rent, tool depreciation)*
- **TOTAL BATCH COST: $ [ ]**

B. Unit Economics & Multi-Tier Pricing (Per Bar):

- **True Landed Cost Per Unit: $ [ ]** *(Total Batch Cost / Salable Yield)*

Pricing Tier	Multiplier	Price Point	Margin %	Target Buyer

Landed Cost	1.0x	**$ 2.50** (e.g.)	0%	N/A
Distributor / White Label	2.0x	**$ 5.00**	50%	Mega-Retailers purchasing >1,000 units
Standard Wholesale (B2B)	2.5x	**$ 6.25**	60%	Boutiques, Spas, Local Shops (MOQ: 50)
Direct to Consumer (B2C)	4.0x - 5.0x	**$ 10.00 - $12.50**	75 - 80%	Farmers Markets, Shopify, Etsy

📦 7. Inventory Burn Rate & Supply Chain Alerts

- **Current Active Inventory (This Batch):** [ ] Units
- **Current Global Inventory (All Batches of this SKU):** [ ] Units
- **Average Sales Velocity:** [e.g., 40 bars/month]
- **Months of Inventory on Hand (Runway):** [e.g., 3.5 Months]
- **Reorder Point for Raw Materials:** Trigger re-order when primary oil (e.g., Olive) drops below [ ] lbs/gallons.