



IND HEMP Refined Hemp Seed Oil and Premium Cottonized Fiber for Personal, Body, and Baby Care

A White Paper for Personal Care Brands and Private Label Manufacturers

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Table of Contents

1. Executive Summary	2
2. About IND HEMP: A Supply Chain Partner Built for Personal Care	3
3. The Development Story: From Exfoliating Wipe to a Smarter Market Entry	4
4. The Science and Formulation Value of IND HEMP Refined Hemp Seed Oil	6
4.1 Why Refined Hemp Seed Oil — and Why Now	
4.2 The Science Behind Refined Hemp Seed Oil	
4.3 Formulation Opportunities Across Personal, Body, and Baby Care	
5. Working with IND HEMP	9
6. Cited Works	11

1. Executive Summary

IND HEMP is a vertically integrated, certified U.S. hemp ingredient supplier — USDA Organic, Non-GMO, Kosher, SQF-certified, and a Certified B-Corp — operating two purpose-built processing facilities in Fort Benton, Montana with established supply chains serving markets across North America, South America, Europe, and Asia in food, feed, and fiber. IND HEMP brings the traceability, quality systems, and supply reliability that personal care brands and private label manufacturers require in an ingredient partner. This paper introduces two IND HEMP products with direct personal care application: Refined Hemp Seed Oil — produced via IND HEMP's proprietary RBD (Refining, Bleaching & Deodorizing) process — and Premium cottonized hemp fiber.

To understand how these products perform in real personal care manufacturing contexts, IND HEMP undertook a structured development program with the NC State University Nonwovens Institute and Southeast Nonwovens to prototype a novel hemp fiber exfoliating facial wipe. That program produced a critical insight — one that ultimately clarified the strongest near-term commercial fit for both products — and generated a body of application knowledge that positions IND HEMP as a ready, informed ingredient partner for personal care brands exploring hemp-based formulations. Refined hemp seed oil sits in a formulator's sweet spot: the natural-oil marketing story personal care consumers respond to, backed by a fatty acid profile with genuine clinical evidence, and a neutral color and odor profile that **integrates cleanly across virtually every personal care format — from facial serums and cleansing balms to baby care wipes and men's grooming products.**

2. Supply Chain Partner Built for Personal Care

IND HEMP operates America's most comprehensive purpose-built hemp grain and fiber processing campus, producing a portfolio of ingredients — hulled hemp seed hearts, Refined Hemp Seed Oil (RHSO), decorticated and cottonized hemp fiber in multiple grades, and hemp-based animal care and erosion control products — across food, feed, and fiber markets. The company's B-Corp certification, USDA Organic and Non-GMO credentials, SQF-certified oilseed facility, and field-to-facility supply chain traceability translate directly into what personal care brands need: a consistent, auditable, low-risk ingredient supply partner. IND HEMP's Refined Hemp Seed Oil begins as cold-pressed hemp seed oil, then undergoes a full RBD (Refining, Bleaching & Deodorizing) process — removing residual phospholipids, pigments, and volatile odor compounds — to yield a cosmetically elegant, color-neutral, odor-neutral oil with a 3.5:1 omega-6 to omega-3 fatty acid ratio and an extended shelf life suitable for commercial personal care production. Its Cottonized hemp fiber —processed to remove pectin and refined to a fineness comparable to cotton — has been validated for spunlace processing at the NC State University Nonwovens Institute, where it was successfully hydroentangled into wipe substrates in multiple blend ratios with cotton and lyocell. While both products are available at commercial scale today, personal care and cosmetics is a new market for IND HEMP — and one the company is actively pursuing with the rigor and infrastructure its existing customers already rely on.

3. The Development Story:

Exfoliating Wipe to a Smarter Market Entry

When IND HEMP began evaluating the personal care market, a novel entry point for hemp fiber was identified — specifically, its naturally abrasive texture as a mechanical exfoliant in a facial wipe format. The concept seemed well-positioned: the U.S. Microbead-Free Waters Act of 2015^[4] eliminated synthetic microplastic exfoliants from rinse-off personal care products, leaving formulators actively searching for plant-based, biodegradable alternatives. Hemp fiber, with its rough surface and renewable origin, looked like a compelling fit. IND HEMP engaged the NC State University Nonwovens Institute and Southeast Nonwovens to prototype a hemp fiber exfoliating facial wipe, evaluating multiple fiber grades in a variety of nonwoven constructions and assessing the resulting substrates for mechanical abrasiveness, skin feel, wettability, structural integrity, and biodegradability.

Critically, the original concept was never conceived as a fiber-only product. From the outset, IND HEMP envisioned Refined Hemp Seed Oil and hemp fiber as complementary ingredients, working in concert within the same application. Mechanical exfoliation — by its nature — produces a temporary inflammatory response: the mild redness, warmth, and sensitivity that follow any effective exfoliating treatment are well-documented physiological reactions to disruption of the stratum corneum. IND HEMP's insight was that the anti-inflammatory properties of Refined Hemp Seed Oil — specifically its GLA and linoleic acid content, which inhibit pro-inflammatory arachidonic acid metabolites and support skin barrier repair^[2] — could be applied simultaneously to calm and restore the skin in the same application step. The result would have been a single-format product delivering two complementary benefits: mechanical exfoliation via hemp fiber and immediate post-exfoliation anti-inflammatory recovery via the oil. It was a genuinely differentiated concept, and understanding why it required a pivot makes the updated strategy more compelling, not less.

⚠ KEY TECHNICAL FINDING

Performance and sensory testing revealed that hemp fiber loses substantially all of its abrasive character when saturated with water or aqueous solution — the standard in-use condition for a personal care wipe product. This finding was consistent across multiple fiber grades, processing methods, and prototype iterations, confirming it as a fundamental material property of hemp cellulosic fiber rather than an isolated batch or processing issue.

Follow-on investigation confirmed this finding was not a batch or processing artifact — it is an intrinsic material property of hemp cellulosic fiber. Natural cellulosic fibers are hygroscopic: they absorb water into their structure, causing fiber swelling and softening that neutralizes surface roughness on contact. Blending with stiffer fibers, surface treatments, and basis weight adjustments each produced partial improvement, but none closed the performance gap to a commercially viable level. Hemp fiber, in its available forms, is not a suitable mechanical exfoliant in wet personal care applications.

What this finding did do was clarify exactly where IND HEMP's products belong in the personal care market — and it pointed directly to two better-fit opportunities. First, Ind Hemp's cottonized fiber's softness in the wet state is not a liability for spunlace applications; it is an asset. A gentle, skin-conforming, biodegradable spunlace substrate for wipes, sheet masks, and hygienic products is a product the market is actively seeking, and one IND HEMP's fiber is already validated to produce. Second, and more immediately, the exploration redirected attention to Refined Hemp Seed Oil (RHSO) — a chemically distinct ingredient derived from the hemp seed, not the stalk — whose performance profile is entirely independent of fiber's wet-state limitations and is supported by a robust and growing clinical evidence base.

 STRATEGIC INSIGHT

Consumer and formulator receptivity to hemp-derived cosmetic ingredients has accelerated significantly when supported by clinical evidence. The acne, eczema, and anti-aging categories have proven to be particularly strong market entry points, where RHSO's documented anti-inflammatory, barrier-repair, and sebum-regulating properties align directly with unmet consumer needs and growing demand for plant-based actives.

4. The Science and Formulation Value of RHSO

4.1 Why Refined Hemp Seed Oil — and Why Now

Personal care brands and private label manufacturers are under sustained pressure to respond to consumer demand for plant-based, clean-label, and efficacy-backed ingredients — without sacrificing formulation performance, shelf stability, or supply chain reliability. IND HEMP Refined Hemp Seed Oil addresses all three. Because it undergoes a full RBD process, it arrives at the formulator's bench free of the green color, grassy odor, and phospholipid load that make cold-pressed hemp oil difficult to work with at scale. Its clean INCI (International Nomenclature of Cosmetic Ingredients) nomenclature (Cannabis Sativa Seed Oil) sits comfortably on ingredient decks without triggering consumer confusion, and its compatibility across water-in-oil emulsions, oil-in-water systems, and anhydrous formats makes it one of the most versatile botanical actives available to formulators today.^[1]

The regulatory environment is also favorable. The Agriculture Improvement Act of 2018^[5] removed hemp and its derivatives from the Controlled Substances Act, enabling lawful domestic cultivation and commercialization — and IND HEMP's SQF-certified, USDA Organic, Non-GMO, and B-Corp-certified supply chain gives brand partners the documentation trail that major retailers and certification bodies require. For brands already formulating with hemp-derived ingredients, or evaluating entry into the category, IND HEMP offers a domestic, audit-ready supply of Refined Hemp Seed Oil available at commercial scale.

4.2 The Science Behind Refined Hemp Seed Oil

The scientific rationale for IND HEMP Refined Hemp Seed Oil (RHSO) as a premium cosmetic active centers on its exceptional fatty acid composition: a 3.5:1 ratio of omega-6 (linoleic acid) to omega-3 (alpha-linolenic acid) — closely mirroring healthy human skin lipids.^[8] Linoleic acid is a critical structural component of stratum corneum ceramides; its deficiency is directly linked to compromised barrier function, elevated TEWL, and conditions including atopic dermatitis and acne.^[2] The gamma-linolenic acid (GLA) content of RHSO acts as a potent anti-inflammatory agent via inhibition of pro-inflammatory arachidonic acid metabolites, addressing eczema, psoriasis, seborrheic dermatitis, and rosacea. Callaway et al. (2005) demonstrated in a 20-week randomized crossover trial that hempseed oil significantly reduced skin dryness, itchiness, and TEWL alongside decreased dermal medication usage^[2] — outcomes directly applicable to topical cosmetic formulations. Importantly, the RBD refining process preserves the key active fatty acids responsible for these effects — linoleic, alpha-linolenic, and gamma-linolenic acid — while removing the color and odor compounds that limit cold-pressed oil's utility in mainstream personal care formulations.^[8]

Clinical evidence for topical IND HEMP Refined Hemp Seed Oil continues to expand. A split-face, double-blinded RCT evaluating topical hemp seed extract cream twice daily for 12 weeks achieved a statistically significant reduction in acne lesion count in mild-to-moderate acne patients, with sebum levels reduced by 44.79% from baseline^[6] and no serious adverse effects observed.^[6] RHSO is well-characterized as non-comedogenic and sebum-regulating,^[8] critical attributes for acne-prone skin. A 2023 microparticle delivery study confirmed that hemp oil formulations penetrate to the epidermis layer,^[7] opening premium encapsulated delivery formats (serums, micro-emulsions, treatment patches). Hemp seed oil also demonstrates in vitro antimicrobial activity against *Staphylococcus aureus* and multiple other strains,^[9] adding a functional anti-infective dimension to its dermatological profile. IND HEMP's RBD production process produces an oil that meets the purity, stability, and cosmetic elegance standards required for all of these applications. One technical consideration for formulators is oxidative stability: as a polyunsaturated oil, Refined Hemp Seed Oil requires antioxidant protection to maintain freshness across commercial shelf-life windows. IND HEMP addresses this proactively — its Refined Hemp Seed Oil is supplied pre-blended with tocopherol (Vitamin E) for enhanced oxidative stability and extended shelf life, ready for direct integration into formulation. Formulators may need to further specify oxygen-barrier or opaque packaging and, where needed, blend with more stable carrier oils to meet format-specific shelf-life targets.

IND HEMP Refined Hemp Seed Oil Property	Clinical/Scientific Evidence	Primary Application Benefit
3.5:1 omega-6 to omega-3 ratio	Mirrors healthy skin lipid profile; supports stratum corneum ceramide synthesis	Barrier repair, hydration, TEWL reduction

IND HEMP Refined Hemp Seed Oil Property	Clinical/Scientific Evidence	Primary Application Benefit
Gamma-linolenic acid (GLA) content	Anti-inflammatory via arachidonic acid pathway inhibition (Callaway et al., 2005)	Eczema, psoriasis, seborrheic dermatitis, rosacea
Sebum regulation / non-comedogenic	44.79% sebum reduction in 12-week RCT; no pore occlusion	Acne, oily/combination skin
Epidermal penetration (microparticle)	Yariv et al., 2023 — confirmed epidermal delivery	Advanced delivery formats, enhanced bioavailability
Antimicrobial activity	In vitro efficacy vs. <i>S. aureus</i> and multiple strains	Anti-acne, skin infection prevention
Phytosterol content	Inhibition of matrix metalloproteinases; supports COL1A1/COL1A2 collagen gene expression	Anti-aging, collagen support
Tocopherol (Vitamin E) content	Antioxidant; protection against UV-induced oxidative stress	Anti-aging, photoprotection

4.3 Formulation Opportunities Across Personal, Body, and Baby Care

IND HEMP Refined Hemp Seed Oil's neutral sensory profile, clinically supported fatty acid composition, and compatibility across all major personal care formats make it a credentialed active across the following product categories:

1. Hydrating and Barrier-Repair Serums and Moisturizers

Refined Hemp Seed Oil's 3.5:1 omega-6 to omega-3 ratio directly addresses the lipid deficiencies driving dry, sensitive, and eczema-prone skin. As a non-comedogenic, lightweight hero active in serums, body lotions, and barrier-repair creams, it pairs synergistically with ceramides, niacinamide, and hyaluronic acid — enabling multi-benefit product storytelling that resonates with the fastest-growing segment in personal care.

2. Acne-Targeted Treatments

Backed by a 12-week split-face RCT showing 44.79% sebum reduction^[6] and significant acne lesion reduction with no adverse effects,^[6] Refined Hemp Seed Oil offers personal care brands a clinically

credentialed, plant-based active for spot treatments, gel cleansers, and oil-control moisturizers. The evidence base supports both OTC drug monograph positioning and cosmeceutical claims — both of which command premium shelf placement.

3. Scalp Care and Anti-Dandruff Products

Refined Hemp Seed Oil's GLA content and anti-inflammatory mechanism address the inflammatory component of seborrheic dermatitis, chronic dry scalp, and scalp irritation — conditions affecting an estimated 50% of adults globally. Hemp seed oil-based shampoo formulations have demonstrated clinically significant reductions in erythema, itching, and burning, differentiating them from both conventional anti-dandruff treatments and general natural hair care.

4. Anti-Aging and Skin Rejuvenation Products

Refined Hemp Seed Oil's phytosterol content inhibits matrix metalloproteinases and supports COL1A1/COL1A2 collagen gene expression, while its phytocannabinoid content reduces beta-galactosidase activity (a cellular aging marker) and protects against UV-induced collagen degradation via the PI3K/Akt pathway.^[8] Tocopherol (Vitamin E) — pre-blended by IND HEMP for oxidative stability — adds antioxidant and photoprotective benefit in anti-aging formulations, rounding out a multi-mechanism profile well-suited for prestige face oils, overnight creams, and eye contour treatments.

5. Sustainable Nonwoven and Novel Delivery Format Innovation

IND HEMP's Platinum-grade cottonized fiber has already been hydroentangled into spunlace wipe substrates in collaboration with NC State University, in multiple blend ratios with cotton and lyocell. For personal care manufacturers, this means IND HEMP can supply a validated, biodegradable, plant-based spunlace fiber that is ready for scale-up — and that the same fiber substrate can serve as a delivery vehicle for Refined Hemp Seed Oil in sheet masks, eye patches, and treatment cloths, creating a fully hemp-derived, ingredient-plus-substrate system with documented epidermal penetration.^[7]

6. Cleansing Oils, Balms, and Makeup Removers

Refined Hemp Seed Oil's spreadability, skin-compatible fatty acid profile, and absence of hemp odor — a direct benefit of the RBD process — make it an ideal base for oil-to-milk cleansers, cleansing

balms, and makeup-remover formulations. It blends cleanly with MCT oil, squalane, esters, and sunflower oil, and consumers consistently respond positively to the lightweight, non-greasy skin feel. This is one of the easiest near-term commercial applications for brands looking to introduce a hemp-derived hero ingredient in a familiar, consumer-accepted product format.

7. Body Oils, Massage Oils, and After-Sun Products

Body oils and massage oils may represent the most immediately accessible commercial use for Refined Hemp Seed Oil. The omega-rich botanical story, lightweight absorption, and calming positioning translate directly into after-sun products, bath oils, and body oil blends that command premium pricing in natural wellness retail. The RBD process reduces staining risk and eliminates odor — two practical barriers for body care formulations — and the oil's anti-inflammatory GLA content supports genuine post-exposure skin recovery claims for after-sun positioning.

8. Baby Care and Sensitive Skin Wipes

Refined Hemp Seed Oil's mild formulation profile, low irritation potential, and clean INCI make it well-suited for baby care wipes and sensitive-skin applications — a finding consistent with its characterization in professional cosmetic ingredient assessments.^[2] IND HEMP's existing spunlace trial work with the NC State University Nonwovens Institute provides a direct pathway to hemp-fiber substrate wipes saturated with Refined Hemp Seed Oil, creating a fully plant-based, biodegradable baby wipe system. IND HEMP's Refined Hemp Seed Oil is supplied pre-blended with tocopherol for oxidative stability, and oxygen-barrier packaging is recommended for baby-care format shelf-life targets.

9. Lip Care

Hemp seed oil's softer skin feel relative to heavy wax systems makes it a natural fit for lip oils, lip balms, and overnight lip masks — and the RBD process is essential here, since crude hemp oil's flavor and odor are unacceptable in lip applications. Refined Hemp Seed Oil's barrier-repair fatty acids support genuine lip conditioning claims, and its lightweight texture is consistent with the current consumer shift from heavy petrolatum-based lip balms toward lighter, botanical alternatives.

10. Men's Grooming

Beard oils, aftershave balms, and tattoo moisturizers represent a growing and under-served segment for hemp-derived ingredients, where the branding angle is strong: plant-based, non-greasy, modern wellness. Refined Hemp Seed Oil's anti-inflammatory profile supports post-shave or post-tattoo skin-calming claims, and its lightweight texture avoids the heavy residue that limits castor oil in grooming applications. IND HEMP's domestic, certified supply chain is well-suited for the premium positioning this segment commands.

5. Working with IND HEMP

IND HEMP's Refined Hemp Seed Oil is available on a commercial scale, with full fatty acid documentation, and field-to-facility traceability already in place. For brand partners and private label manufacturers ready to formulate, the immediate next step is extending that documentation into a cosmetic-grade ingredient specification — covering minimum thresholds for linoleic, alpha-linolenic, and GLA concentrations; cosmetic purity standards (heavy metals, pesticides, microbial limits); and stability data — aligned to ISO 16128, EU Cosmetics Regulation (EC No 1223/2009), and FDA cosmetic ingredient guidelines. IND HEMP welcomes co-development conversations with formulation partners at any stage of that process.

For brands seeking clinically validated formulations, IND HEMP is positioned to support clinical studies targeting endpoints that map directly to the existing hemp seed oil literature^{[2][6]} — specifically TEWL reduction for barrier-repair positioning, and acne lesion count reduction for acne-targeting SKUs. For manufacturers interested in nonwoven applications, IND HEMP's existing spunlace trial data and established relationship with Southeast Nonwovens provide a near-term co-development pathway for Refined Hemp Seed Oil-infused delivery formats — sheet masks, cleansing cloths, and treatment pads — where fiber and oil work together as an integrated system.

IND HEMP's B-Corp certification, domestic supply chain, and multi-industry track record make it a stable, transparent, and audit-ready ingredient partner. For brands assessing regulatory positioning — including the nuanced decision between OTC drug monograph status and cosmeceutical claims for acne-targeting SKUs, or mapping EU and Asia-Pacific market entry requirements — IND HEMP is prepared to engage regulatory affairs specialists alongside its brand partners. For brands building proprietary formulations, IND HEMP will work collaboratively on IP strategy, including trade secret protection of formulation compositions and evaluation of provisional patent opportunities on novel delivery system formats. To explore a partnership, contact IND HEMP at indhemp.com.

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