

FORMULATION GUIDELINES

How to formulate with Phycora.

C-phyococyanin is a protein. Treat it like one: keep it cool, keep it above pH 5.5 in solution, and keep it sealed from light and moisture. The dosage matrix, the order of addition, the starter formulas, and the things that go wrong, on the pages that follow.

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APPLICATIONS & DOSAGE

Where Phycora goes.

DOSAGE FORM	LOADING	INCORPORATION PHASE	PROCESS NOTE
Tablet • direct compression	50–300 mg / tab	Pre-mix with excipients	Anti-caking agent; flows well in DC, no heat
Tablet • wet granulation	50–300 mg / tab	Granulation phase	Keep drying below 60 °C
Hard capsule • gelatin / HPMC	100–500 mg / cap	Direct fill	Disperses easily; no special handling
Gummy • pectin (preferred)	5–50 mg / unit	Cool phase before set	Pectin runs cooler than gelatin — favored
Powder stick pack	100–500 mg / 3 g	Direct blend	Excellent cold-water dispersibility
RTD shot & beverage	50–300 mg / serve	Cool water phase	Hold finished pH above 5.5; opaque pack

PH WINDOW

Optimal 5.5 to 7.5 in solution. Acceptable to 5.0 with reduced retention. Below 4.5 unprotected, expect color and activity loss.

TEMPERATURE

Add below 60 °C. Brief excursions tolerated; avoid sustained heat above 75 °C.

PACKAGING

Opaque or foil-laminate for liquids; keep powder sealed against light and moisture.

INCORPORATION METHOD

Order of addition.

STANDARD METHOD

- 01 For solids, sieve through 40-mesh. For liquids, pre-disperse as a 5 to 10% w/w cool-water pre-mix.
- 02 Build the formulation phase and cool it below 60 °C.
- 03 Add Phycora at the latest cool point under low shear.
- 04 Confirm finished-product pH stays above 5.5; buffer with citrate if needed.
- 05 Hold acid and high-moisture components separate until the final blend.
- 06 Fill into opaque, moisture-barrier primary packaging.

LIMITS & COMPATIBILITY

ADD TEMP	Below 60 °C (75 °C brief max)
PH FLOOR	4.5 (5.5+ preferred)
SHEAR	Low to moderate
SOLVENT	Water soluble; not oil
MOISTURE	Hygroscopic; keep dry
COMPATIBLE	Vitamin C, B-complex, zinc, MCC, pectin, citrate

RULE OF THUMB

It is a protein. Cool, dark, above pH 5.5. Every loss mechanism traces back to one of those three.

COMPATIBILITY & CO-ACTIVES

COMPATIBLE

Vitamin C, B-complex, zinc, MCC, maltodextrin, citrate buffers, natural flavors, pectin systems.

FORMULATE WITH CARE

Strong organic acids in solution, gelatin gummy at high temperature, high-heat extrusion, transparent packaging.

AVOID

Sustained pH below 4.5 without encapsulation, process holds above 75 °C, strong oxidizers.

STARTER FORMULA

Immune blue capsule.

REFERENCE FORMULA • HPMC SIZE 0 • PER CAPSULE

Vitamin C (ascorbic acid)	200 mg
Zinc citrate	25 mg
Microcrystalline cellulose	q.s.
Silicon dioxide	0.5%
Magnesium stearate	1.0%

Phycora

60% C-PC • sieved, dry

250 mg

TARGET • DEEP BLUE CAPSULE

FILL WEIGHT

~500 mg

dry blend • no heat, no water

PROCESS

- 01 Sieve Phycora through 40-mesh to break soft agglomerates.
- 02 Dry-blend Phycora with MCC and silicon dioxide, 10 min.
- 03 Add vitamin C and zinc citrate; blend to uniform.
- 04 Add magnesium stearate; blend a further 3 to 5 min.
- 05 Fill HPMC size 0 shells; verify weight uniformity.

THINGS THAT GO WRONG

- 00 **Poor flow:** add glidant and anti-caking agent; sieve to break agglomerates.
- 01 **Moisture pickup:** acid plus moisture dulls color on shelf. Keep the blend dry.
- 02 **Segregation:** match diluent particle size to avoid blend separation.
- 03 **Clear shells:** light fades the blue. Use opaque or pigmented shells.

STARTER FORMULA

Antioxidant blue gummy.

REFERENCE FORMULA • PECTIN • PER GUMMY

Pectin / sugar / glucose base	q.s.
Citrate buffer (pH ≥ 5.5)	to spec
Natural blueberry flavor	0.3%
Citric acid (held separate)	to taste
Deposit temperature	≤ 70 °C

Phycora 25 mg
60% C-PC • cold pre-dispersed

TARGET • BRIGHT BLUE PECTIN GUMMY

TARGET PH

5.5–6.5

pectin preferred; runs cooler than gelatin

PROCESS

- 01 Cook pectin / sugar / glucose base; buffer to pH ≥ 5.5.
- 02 Cool the slurry to ≤ 70 °C.
- 03 Pre-disperse Phycora in a small cool water portion.
- 04 Add the pre-mix at the latest cool point under low shear.
- 05 Add flavor; meter citric acid separately just before deposit.
- 06 Deposit quickly; minimize hold time at temperature.

THINGS THAT GO WRONG

- 00 **Gelatin above 70 °C:** color bleeds. Use pectin and a low deposit temperature.
- 01 **Acid shock:** citric acid added early drops local pH below 4.5. Hold it separate.
- 02 **Long hot-hold:** sustained heat dulls the shade. Deposit promptly.
- 03 **Clear pack:** light fades the blue. Opaque wrap or jar only.

STARTER FORMULA

Beauty-from-within shot.

REFERENCE FORMULA • 60 ML •
OPAQUE • PER SHOT

Marine / vegan collagen peptides	2.5 g
Vitamin C	80 mg
Cool water phase	ad 60 mL
Natural flavor & sweetener	to taste
Citrate buffer (finished pH)	5.5–7.0

Phycora 200 mg
60% C-PC • cold pre-dispersed

TARGET • VIVID BLUE LIQUID
SHOT

FINISHED PH

5.5–7.0

opaque bottle • cold-side process

PROCESS

- 01 Confirm finished-product pH stays above 5.5; buffer with citrate if needed.
- 02 Build the cool water phase; keep below 60 °C throughout.
- 03 Disperse collagen and vitamin C; mix until clear.
- 04 Pre-disperse Phycora in a cool water portion under shear.
- 05 Add the Phycora slurry to the batch; low shear, no aeration.
- 06 Fill into opaque bottles; cold-side process only.

THINGS THAT GO WRONG

- 00 **Hot fill / HTST:** sustained heat above 75 °C denatures phycocyanin. Process cold-side.
- 01 **Flavor acids:** low-pH flavor systems drop the batch below 5.5. Buffer and re-check.
- 02 **RTD haze:** incomplete dispersion. Pre-disperse cold under shear.
- 03 **Clear bottle:** UV bleaches the blue. Opaque packaging only.

COMMON CHALLENGES & SOLUTIONS

When it misbehaves.

COLOR BLEED

Cause: gelatin gummy above 70 °C or sustained heat. Fix: switch to pectin, lower the deposit temperature, add late and cool.

DULL SHADE

Cause: low pH or oxidation. Fix: buffer above 5.5, specify opaque packaging, and minimize hot-hold time in process.

POOR FLOW / RTD HAZE

Cause: soft agglomerates or incomplete dispersion. Fix: sieve and pre-disperse as a 5 to 10% cold pre-mix; add glidant in solids.

SHELF FADE

Cause: light and oxygen over shelf. Fix: opaque or foil-laminate packaging, seal powder, and consider an antioxidant system.

PACK, STORE, LABEL

Store 20–25 °C sealed, away from light and oxygen. 24-month shelf life. Aluminum-lined HDP or steel drum, 1 / 5 / 25 kg. Declare total phycocyanin per dose; carry the per-lot CoA value, not the label dose, into in-process checks.

NEED A HAND?

Send your dosage form, target dose, and process constraints. We will return a calibrated inclusion rate and a benchtop protocol, and ship a sample alongside.