

# G-Block™

A Cleaner Choice  
for Mineral SPF Protection



Create Possibilities





# G-Block™

UV-Grade Dispersions



## The invisible protection & performance customers want.

One of the more difficult challenges in crafting a quality natural sunscreen is the delicate balance between skin transparency, broad spectrum protection. G-Block products are natural dispersions engineered to provide the most efficient combination of high transparency, broad spectrum protection, and SPF performance in a very stable dispersion. This stability not only speeds up the transition from laboratory batch to large-scale production, but also helps ensure that the SPF and critical wavelength levels remain consistent from one batch to another.

### 🍏 100% Natural Ingredients

Approved by Cosmos, Ecocert, and the Natural Product Association.

### 🍏 Excellent Active Loading

High zinc oxide and titanium dioxide active concentrations while still retaining an easy-to-disperse viscosity profile.

### 🍏 Globally compliant broad spectrum protection

Meets the FDA broad spectrum labeling requirements as well as EU COLIPA and Japanese PF standards.

### 🍏 Stress-free stability

No separation or settlement, resulting in consistent SPF and critical wavelength from batch to batch.





## Features & Benefits

**Don't just make a better product—make it faster, too.**

G-Block™ is a series of natural physical UV dispersions aimed to significantly reduce the amount of formulating, testing, and manufacturing needed to create sunscreens that meet global broad spectrum labeling regulations.

They are engineered to be as functional and efficacious as possible without compromising on transparency, sensory, and natural product requirements.



### Superb Active Concentration

- 🍏 Hit SPF requirements more easily.
- 🍏 Increased product flexibility.
- 🍏 Better control over product texture & feel.
- 🍏 Shear-thinning rheology, pourable viscosity.



### Stability Equals Consistency

- 🍏 ***Never need to remix dispersion before use.***
- 🍏 Consistent active concentration from one product run to the next—crucial for FDA approval.
- 🍏 Reproducible SPF and broad spectrum performance.



### Meet Global Standards

- 🍏 US FDA; Health Canada; Mercosur; China, South Korea; and Australian (AUS/NZ).
- 🍏 Compliant with EU broad spectrum 1/3 UVA/PF requirements.
- 🍏 Achieve broad spectrum PA ++ to +++ for JCIA compliance



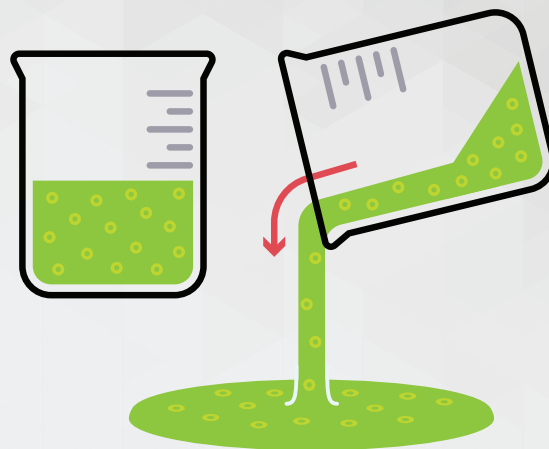
## Clean Sourcing for Clean Beauty

Applechem is happy to provide all ingredient origin information to help satisfy your clean beauty standard requirements. All G-Block dispersions are naturally sourced, and will **not** contain any ethoxylated ingredients, preservatives, phthalates, GMO's, sulfates, or synthetic fragrances. G-Block dispersions have not been tested on animals, do not contain any ingredients sourced from major allergen groups, and are tested safe for sensitive skin.

A



B



## Superior Stability, Every Time

You never need to remix a G-Block dispersions before use, making it far more likely you meet your SPF targets from one production batch to the next.

### Standard Zinc Oxide Dispersion (A)

The typical zinc oxide dispersion features low active content and poor stability, leading to formulators constantly battling settlement issues along with inconsistent SPF results.

### G-Block Dispersions, Stable & Consistent (B)





G-Block dispersions are engineered to be extremely stable compounds, with no separation or synerisis developing over time.

## Product INCI

TRADE NAME	INCI
<b>G-Block DT 200 CCT</b> Solid - 55%/ Active - 45%	Titanium Dioxide (and) Caprylic/Capric Triglyceride (and) Isostearic Acid (and) Alumina (and) Polyhydroxystearic Acid (and) Stearic Acid (and) Polyglyceryl-3 Polyricinoleate (and) Lecithin
<b>G-Block DTB 300 CCT</b> Solid - 64%/ Active - 60%	Titanium Dioxide (and) Caprylic/Capric Triglyceride (and) Alumina (and) Stearic Acid (and) Polyhydroxystearic Acid (and) Isostearic Acid (and) Polyglyceryl-3 Polyricinoleate (and) Lecithin
<b>G-Block DZ 370 CCT</b> Solid - 70%/ Active - 70%	Zinc Oxide (and) Caprylic/Capric Triglyceride (and) Polyhydroxystearic Acid (and) Polyglyceryl-3 Polyricinoleate (and) Isostearic Acid (and) Lecithin
<b>G-Block DZ 480 CCT</b> Solid - 80%/ Active - 80%	Zinc Oxide (and) Caprylic/Capric Triglyceride (and) Polyhydroxystearic Acid (and) Polyglyceryl-3 Polyricinoleate (and) Isostearic Acid (and) Lecithin



# Product Applications

TRADE NAME	PRIMARY APPLICATION	SECONDARY APPLICATION	FEATURES
 <b>G-Block</b> DT 200 CCT	<ul style="list-style-type: none"> <li>• Color Cosmetics with SPF protection</li> <li>• BB, CC, DD creams</li> </ul>	<ul style="list-style-type: none"> <li>• SPF 50 in combination with organic UVB filters</li> <li>• Mass market natural sunscreens</li> <li>• Premium natural sunscreens</li> </ul>	<p>DT 200 CCT is a complementary dispersion, to be used primarily as a transparency and critical wavelength modifier. Use it in combination with other G-Block dispersions and organic UV filters to adjust transparency levels.</p> <p>Approved by Ecocert and the Natural Product Association.</p>
 <b>G-Block</b> DTB 300 CCT	<ul style="list-style-type: none"> <li>• SPF 30+ in combination with organic UVB filters</li> <li>• Color cosmetics with SPF protection</li> <li>• BB, CC, DD creams</li> <li>• Mass market natural sunscreens</li> </ul>	<ul style="list-style-type: none"> <li>• Premium natural sunscreens</li> </ul>	<p>Our DTB 300 CCT is our flagship titanium dioxide dispersion for those who wish to avoid using zinc oxide. It is most suited for efficiently hitting high SPF targets as a primary UV filter and also works very well in combination with the DT 200 CCT and DZ 370 CCT to reach high levels of SPF 35 to 50.</p> <p>Approved by the Natural Product Association.</p>
 <b>G-Block</b> DZ 370 CCT	<ul style="list-style-type: none"> <li>• Premium Natural Sunscreens</li> <li>• Lip Balm</li> <li>• Mass Market Natural Sunscreens</li> </ul>	<ul style="list-style-type: none"> <li>• Color Cosmetics with SPF Protection</li> <li>• BB, CC, DD creams</li> <li>• SPF 50 in combination with organic UVB filters</li> </ul>	<p>For premium formulations, DZ 370 CCT has the best transparency and sensory performance, followed by DZ 480 CCT. The DZ 370 CCT is engineered to provide the best balance between transparency and broad spectrum protection.</p> <p>COSMOS, Ecocert, and Natural Product Association approved.</p>
 <b>G-Block</b> DZ 480 CCT	<ul style="list-style-type: none"> <li>• Mass market natural sunscreens</li> <li>• SPF 30+ in combination with organic UVB filters</li> <li>• SPF 50 in combination with organic UVB filters</li> <li>• Color cosmetics with SPF protection</li> <li>• BB, CC, DD creams</li> </ul>	<ul style="list-style-type: none"> <li>• Premium natural sunscreens</li> <li>• Lip balm</li> </ul>	<p>For mass market formulas, DZ 480 CCT is the most cost-effective solution for boosting SPF and critical wavelength, especially in combination with organic UV filters. The DZ 480 CCT is designed for mass market formulations, where the goal is hitting SPF and broad spectrum benchmarks at efficient price points without sacrificing much on sensory and transparency.</p> <p>COSMOS, Ecocert, and Natural Product Association approved.</p>

## Need Samples?

We believe sample requests should be provided generously. We understand trying, testing, and evaluating our ingredients and intermediates are all critical to your research, development, and production processes. So go ahead, ask and you shall receive.

Visit **Applechem.com** or call **862.210.8344** to Get Samples Sent

# How to Use G-Block™

Formulation guidelines and tips to help you create the best sun-screen that fits your marketing and regulatory requirements.

## Formulation Usage Guidelines

TRADE NAME	SPF PER 1% ACTIVE	CRITICAL WAVELENGTH	NANOPARTICLE STATUS*
G-Block DT 200 CCT	• 3.0 - 3.2	• 365 nm	• EU 2011/696; EU 1223/2009: Nano • French Decree: Nano • COSMOS: Nano • Cosmetics Europe: Non-nano
G-Block DTB 300 CCT	• 3.0 - 3.2	• 376 - 379 nm	• EU 2011/696; EU 1223/2009: Nano • French Decree: Nano • COSMOS: Nano • Cosmetics Europe: Nano
G-Block DZ 370 CCT	• 1.5 - 1.7	• 370 - 371 nm	• EU 2011/696; EU 1223/2009: Non-nano • French Decree: Non-nano • COSMOS: Non-nano • Cosmetics Europe: Non-nano
G-Block DZ 480 CCT	• 1.5 - 1.7	• 379 nm	• EU 2011/696; EU 1223/2009: Non-nano • French Decree: Non-nano • COSMOS: Non-nano • Cosmetics Europe: Non-nano

### 🍏 Mix and Match

Sunscreens requiring SPF 15 to 35 with high transparency can use either G-Block DZ 370 CCT (highest transparency) or combine DZ 370 CCT with DZ 480 CCT for more cost efficiency. G-Block DT 200 CCT can be combined with zinc oxide dispersions for increased SPF efficiency while balancing broad spectrum requirements. G-Block DTB 300 CCT is recommended for formulations targeting SPF 50 and above, and can be used with DZ 370 CCT for better transparency.

### 🍏 SPF Projections Made Easy

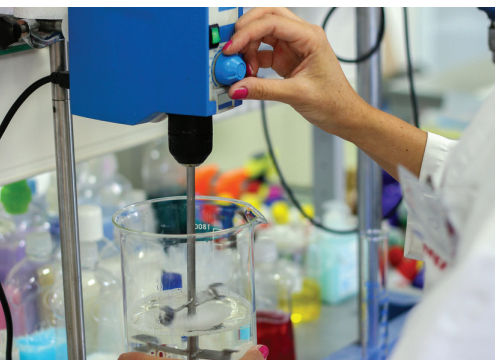
Ask for a copy of our prediction calculator and optimize your R&D time. G-Block makes it easier to project SPF and critical wavelength values so you spend less time and money on testing and reformulating.

### 🍏 pH Constraints

Zinc oxide dispersions should only be used in a pH environment of around 7.5. Titanium Dioxide dispersions can be used at any pH level.

## \*More On Nanoparticles

Nanoparticle definitions and labeling requirements are an evolving issue on the global regulatory stage. We encourage sunscreen formulators to study existing global regulations as well as independent non-government organizations to determine if G-Block products are suitable for their internal and external requirements. Please contact us for more information.



# Formulations

## Sheer Invisible Sunscreen

No chemical UV filters, uses only Zinc Oxide, designed for outdoor sports, for babies and people with sensitive skin.

Incredibly light sensory, blends instantaneously into the skin with no greasy sensory or white residue.

Great spreadability simplifies formulation development and manufacturing process with great sensory profile.

### SPF Specifications:

- 🍏 SPF 34 (In-vivo, FDA protocol, 2 subjects). CW = 370 nm
- 🍏 COLIPA: SPF 32, UVAPF 11.99, CW 370. UVAPF/SPF = 0.374 > 1/3
- 🍏 Asia: PA +++

## Processing Method

1. Stir Phase A with propeller mixer (500-700 rpm) for 10 minutes and homogenize at 4000 rpm for 10 minutes at RT until Vivapur COS-5 is fully dissolved, and then heat up to 80C.
2. Mix and heat Phase B at 300-500 rpm until mixture reaches 80C.
3. Slowly add Phase B into Phase A with propeller mixer for 5 mins, and then homogenize 4000-4500 rpm at 75-80 C for 5 minutes.
4. Switch to a propeller mixing while cooling down to RT. Add water that may evaporate during process.

PHASE	INCI NAME (TRADE NAME)	PREMIUM (WT%)	MASS MARKET (WT%)
A	Distilled Water	48.60	50.20
	Silver Ear Mushroom Extract (Phytocare HA CG 1M)	0.12	0.12
	Microcrystalline Cellulose (and) Cellulose Gum (Vivapur COS-5)	1.00	1.00
	Glycerine	3.00	3.00
	Phenoxyethanol (and) Ethylhexyl Glycerin (Euxyl PE 9010)	0.70	0.70
B	G-Block DZ 370 CCT	28.6	—
	G-Block DZ 480 CCT	—	27.0
	Cetearyl Alcohol (and) Coco Glucoside (Montanov 82)	3.00	3.00
	Cetearyl Alcohol (and) Cetearyl Glucoside (Montanov 68)	1.00	1.00
	Coco Glucoside (and) Glyceryl Oleate (Lamsoft PO 65)	1.00	1.00
	Caprylic/Capric Triglyceride	7.00	7.00
	Ethyl Macadamiate (Floramac 10)	6.00	6.00



## Get More Formulations

We all need to begin somewhere, and Applechem formulations can give you a head start on your new project. These formulations have been tested for stability and efficacy, giving you a strong base for tailoring to your customer's specifications.

Visit [Applechem.com/formulations](https://applechem.com/formulations) or call **862.210.8344**



G-Block

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**applechem**

*Applechem was founded in 2003 by Dr. Samuel Lin in a tiny laboratory within a tech incubation center in northern New Jersey. Yet even after transitioning from a one-man startup to a stable, global supplier, we've never forgotten our roots as a small, spirited business with big ideas.*

*We recognize that every personal connection should be valued and validated with responsive customer service coupled with strong technical aptitude. Moreover, we promise to continue expanding the range of possibilities in the formulation space, creating functionality where none existed before and putting an improved spin on traditional ingredient technologies.*

## Get in touch with us.

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