

# OcuForce™ Blue

**Supports Eye Health and the Natural Ability  
to Filter Blue Light\***



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OcuForce™ Blue provides a targeted blend of macular-supportive nutrients and antioxidants specifically formulated to support the eyes and their natural ability to filter blue light, and it may help shield the eye from the effects associated with extended screen-time exposure.\* This formula is a synergistic combination of macular carotenoids (lutein and zeaxanthin isomers), maqui berry, ginkgo, bilberry, astaxanthin, and vitamin E isomers delta- and gamma-tocotrienols designed to support the antioxidant status within the eyes, helping to protect the eyes from oxidative stress generated by photo-oxidation.\* OcuForce™ Blue is ideal for teenagers through late adulthood, or for anyone with prolonged exposure to blue light from screens who is seeking a preventative approach to help maintain healthy vision.\*

## Formula Highlights

- Includes Lutemax® 2020, a non-GMO, GRAS-certified carotenoid extract naturally derived from marigold flowers that uses an enhanced micro-encapsulated form for superior stability, absorption, and bioavailability
- Lutemax® 2020 provides all three macular carotenoids — lutein, zeaxanthin, and meso-zeaxanthin — in clinically relevant doses (20 mg lutein and 4 mg zeaxanthin per serving) and at the same 5:1 ratio naturally found in the diet
- Botanical extracts standardized to meet efficacious amounts of bioactive ingredients
- Includes 200 mg of wild-harvest, organic-certified, maqui berry extract (as MaquiCare™)
- Provides 50 mg of vitamin E isomers (as DeltaGold® delta- and gamma-tocotrienols)
- Contains 2 mg of astaxanthin (as AstaREAL®)
- Does not contain gluten, dairy, or soy, and is non-GMO.

## Ingredient Highlights

Light-induced ocular damage occurs through acute exposure to intense radiation (e.g., ultraviolet [UV]-A and UV-B) that causes an inflammatory response, or by chronic exposure to less intense radiation (e.g., blue light from digital devices and indoor lighting) through photo-oxidation.<sup>1</sup> Absorption of ambient UV light occurs primarily in the cornea and crystalline lens, but high-energy, short wavelength, visible blue light penetrates much deeper in the retinal pigment layer, and due to its high metabolic rate and exposure to blue light, the retinal epithelial cells are primary targets of photo-oxidative damage.<sup>1,2</sup> In photo-oxidation reactions, chromophores in the eye absorb the light, stimulating the production of reactive oxygen species (ROS), which can contribute to deteriorating eye health, cataracts, and retinal degeneration over time.<sup>1</sup>

### Lutein and Zeaxanthin (as Lutemax® 2020)

Lutein and its isomer, zeaxanthin, are yellow-orange carotenoid pigments found in foods such as egg yolks and dark green leafy vegetables that have been shown to have protective effects against photo-induced damage to the eyes, along with potent antioxidants.<sup>1,3</sup>

## Benefits\*

- May help reduce the risk of age-related blue light damage to the lens and retina
- Supports overall retinal health and visual performance
- May help reduce the risk of macular degeneration
- Supports the antioxidant status within the eye
- May help protect the retina and optic nerve from oxidative stress
- May help alleviate eye strain and fatigue associated with lengthy screen-time exposure
- May help support dry eyes
- May improve macular pigment optical density
- May help improve visual acuity, contrast sensitivity, and disability glare
- May promote blood flow within the eyes

## Supplement Facts

Serving Size 2 capsules

Servings Per Container 30

Amount Per Serving	% Daily Value
Maqui Berry Extract (MaquiCare™) ( <i>Aristotelia chilensis</i> ) (whole fruit, pomace) [Standardized to contain 7% delphinidins]	200 mg *
Ginkgo Extract ( <i>Ginkgo biloba</i> ) (leaf) [Standardized to contain 24% ginkgoflavonolglycosides and 6% terpene lactones]	120 mg *
Bilberry Extract ( <i>Vaccinium myrtillus</i> ) (fruit) [Standardized to contain 25% anthocyanidins]	80 mg *
Vitamin E Isomers (as DeltaGold® delta and gamma tocotrienols)	50 mg *
Lutein (from Marigold Extract [Lutemax® 2020])	20 mg *
Zeaxanthin Isomers (from Marigold Extract [Lutemax® 2020])	4 mg *
Astaxanthin (AstaREAL®) (from <i>Haematococcus pluvialis</i> algae extract)	2 mg *

\*Daily Value not established.

**Other Ingredients:** Cellulose (capsule), dicalcium phosphate, vegetable stearate, microcrystalline cellulose, silicon dioxide.

Of all the macular carotenoids found in nature, only lutein and zeaxanthin (and their metabolites) accumulate in the macular retina (where they are found in the highest concentration in the human body), as their hydroxyl group allow them to cross the blood-ocular barrier.<sup>1,4</sup> The body cannot produce macular carotenoids endogenously; therefore, dietary or supplemental intake is required to support optimal levels in ocular tissues. Age- and diet-related insufficiencies increase phototoxic damage to the human eye.<sup>1</sup> Due to the high concentration of macular carotenoids in the lens and retina, they help to absorb blue light and limit the amount of blue light that reaches the underlying structures involved in vision, thereby protecting against light-induced oxidative damage that occurs in the pathology of age-related macular degeneration.<sup>2,5</sup>

Lutein and zeaxanthin help protect the ocular tissues against singlet oxygen and lipid peroxide damage from blue light due to their conjugated double-bond chemical structure that can absorb visible blue light.<sup>1,6,7</sup> According to the B.L.U.E. study, 48 healthy young adults with high screen-time exposure supplemented with Lutemax® 2020 (20 mg of lutein and 4 mg of zeaxanthin isomers) for 6 months and reported significant improvements in macular pigment ocular density (MPOD), all visual performance measures, sleep quality, eye strain, visual fatigue, and frequent headaches compared to a placebo.<sup>2</sup> Results from a double-blind, placebo-controlled trial showed that 12-month supplementation with 10 mg of lutein and 2 mg of total zeaxanthin significantly improved the recovery of repeated exposure to photostress, disability glare thresholds, and MPOD from baseline compared to a placebo.<sup>8</sup> In young adults with a minimum of 4 hours of screen-time, Lutemax® 2020 supplementation for 6 months resulted in significant improvements in MPOD, critical flicker fusion, contrast sensitivity, sleep quality, reduced eye fatigue, eyestrain, and headaches compared to a placebo.<sup>9</sup>

#### **Maqui Berry (as MaquiCare™)**

Maqui berry, as MaquiCare™, is a deep purple super fruit from South America with the highest known oxygen radical absorbance capacity (ORAC), containing high concentrations of polyphenols and anthocyanins.<sup>10</sup> The maqui berry extract (MBE) in OcuForce™ Blue has been standardized to contain 7% delphinidins, the primary anthocyanins in MBE, which are reported to exert superior antioxidant and anti-inflammatory effects.<sup>10</sup> In a murine cell model, MBE significantly suppressed visible light-induced photoreceptor cell death by inhibiting ROS via the inhibition of the phosphorylated p38 signaling pathway.<sup>11</sup>

#### **Astaxanthin (as AstaREAL®)**

Astaxanthin, as AstaREAL®, a xanthophyll carotenoid, is a fat-soluble antioxidant whose unique molecular structure and “conjugated” carbon chain configuration enables it to remove high-energy electrons from damaging free radicals.<sup>12</sup> Due to its arrangement, astaxanthin provides superior membrane protection, as it can trap radicals at both the phospholipid membrane surface and inside the membrane.<sup>12</sup> In animal and cell studies, astaxanthin has been shown to help inhibit the formation of pro-inflammatory mediators and proteins, including nitric oxide, prostaglandin E2, interleukin-1, interleukin-6, nuclear factor- $\kappa$ B, and tumor necrosis factor- $\alpha$ .<sup>12</sup>

#### **Bilberry**

The bilberry extract used in OcuForce™ Blue is a standardized extract containing 25% anthocyanidins. According to research, anthocyanosides, which have antioxidant activity, have a stabilizing effect on collagen, prevent capillary fragility, and improve microcirculation, as they have a particular affinity for eye and vascular tissue.<sup>13,14</sup> Clinical evidence shows that bilberry helps with glaucoma, cataracts, retinopathy, diabetes mellitus, and dry eye disease.<sup>13-16</sup> The beneficial effects of bilberry are associated with the antioxidant activity of its anthocyanins and their ability to increase blood supply to the retina and to inhibit retinoic phosphodiesterases, which are the enzymes responsible for the decay of visual impulses.<sup>14</sup>

#### **Ginkgo**

The ginkgo biloba in this formula is standardized to contain 24% ginkgo flavonol glycosides and 6% terpene lactones, phytochemicals that may help protect the eye against oxidative stress.\* In human clinical trials, ginkgo biloba has been shown to slow the progression of visual field damage and improve ocular blood flow and visual function in patients with normal-tension glaucoma.<sup>17</sup>

#### **Vitamin E Isomers (as DeltaGold®)**

Antioxidants are abundant in the food supply, but vitamin E is uniquely shaped to reside within cell membranes to protect the integrity of the structural lipids, including retinal cells. The antioxidant efficiency of tocotrienols was evaluated as the ability of the compounds to inhibit lipid peroxidation and ROS production. Delta-tocotrienol was found to have the greatest antioxidant properties among the tocotrienol isomers.<sup>18</sup> In lipid ORAC studies, delta- and gamma-tocotrienols had the highest antioxidant values of all vitamin E isomers at 5.5 and 3 times the potency of the alpha-tocopherol, respectively.<sup>19</sup>

**Recommended Use:** Take 2 capsules per day with meals or as directed by your health-care practitioner.



MaquiCare™ is a trademark of HP Ingredients Corp. Lutemax® 2020 is a registered trademark of OmniActive Health Technologies, Ltd. DeltaGold® is a registered trademark of American River Nutrition, LLC and protected by US Patent Number 8,586,109. AstaREAL® is a registered trademark of Fuji Chemical Industry Co., Ltd.

*For a list of references cited in this document, please visit:*

<http://www.designsforhealth.com/techsheet-references/ocuforce-blue-references.pdf>

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