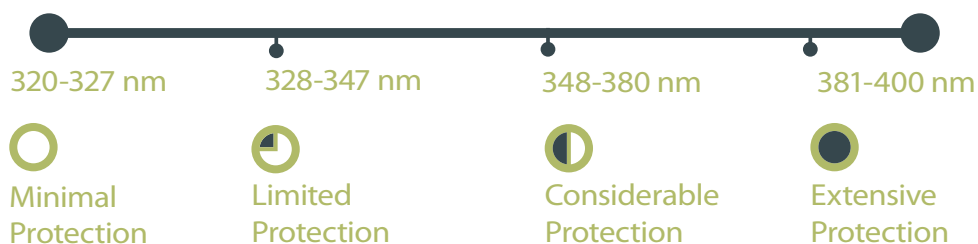


## UVA Wavelength Guide

Acts directly on cell structure

Direct and indirect effects occur

Indirect effects occur



320-327 nm

328-347 nm

348-380 nm

381-400 nm



Minimal Protection



Limited Protection



Considerable Protection



Extensive Protection

Product lines are labeled with a symbol based on the UVA Wavelength Guide to represent how effectively the concentration % of active ingredients protect from UVA rays, along with whether direct and/or indirect effects from UVA rays occur to DNA cell structure.

Note that though products in the Directory may have considerable to extensive protection, sunscreens should be applied at least every two hours for adequate protection due to the sun's breakdown of ingredients. 95% of solar UV energy consists of UVA rays. The additional 5% comes from UVB rays.

No FDA-approved measurement standards exist in the US. Most consider a "critical wavelength" (a UVA measuring method) over 370 nm to be a good broad-spectrum sunscreen.

## UVA Ingredient Key Facts

**Avobenzene (Parsol® 1789):** chemical ingredient that protects fully (310-400 nm) against UVA. No UVB protection is provided. The downfall of avobenzene: it decomposes 50-90% in sunlight after an hour of exposure. UVB active ingredients like octocrylene make avobenzene more stable.

**Benzophenones:** includes chemical derivatives like oxybenzone, dioxybenzone, and sulisobenzene. Protects from both UVB and UVA rays, and is found in numerous sunscreen fabrics. Ingredients supply considerable protection (up to 380 nm) but can also cause irritation. These ingredients are not water resistant.

**Ecamsule:** terephthaliidene dicamphor sulfonic acid; patented as Mexoryl® Sx. This chemical compound protects against UVA and UVB, and is stable when exposed to sunlight.

**Physical:** consists of zinc oxide and titanium dioxide. These ingredients are photostable and do not become disabled when combined with additional ingredients. Zinc oxide provides full protection (up to 400 nm) and titanium dioxide provides considerable protection (up to 360 nm).

### Sunscreen Application:

- Apply sunscreen 30 minutes prior to sun exposure
- Sunscreen testing is 2 mg/cm<sup>2</sup> of exposed skin

Example: 5'4"/163 cm, 150 lb, 32"/82 cm waist - Adult (including bathing suit)  
Apply 29 g (approximately 1 oz) evenly to the uncovered body area. Face requires about 1/4 -1/3 tsp for the average adult. Larger individuals should scale these quantities accordingly.

### Water Resistant vs. Waterproof:

- Water resistant - provides protection in the water for up to 40 minutes
- Waterproof - provides protection in the water for up to 80 minutes

Active Ingredient	Max. FDA-approved Concentration %	Protects Against:
Aminobenzoic Acid	15	UVB
Avobenzene (Parsol 1789)	3	UVA - up to 400 nm
Cinoxate	3	UVB
Dioxybenzone	3	UVB, UVA - up to 380 nm
Ecamsule (Mexoryl Sx)	3	UVA - up to 400 nm
Ensulizole (Phenylbenzimidazole Sulfonic Acid)	4	UVB
Homosalate	15	UVB
Meradimate (Menthyl Anthranilate)	5	UVA - up to 360
Octocrylene	10	UVB
Octinoxate (Octyl Methoxycinnamate)	7.5	UVB
Octisalate (Octyl Salicylate)	5	UVB
Oxybenzone	6	UVB, UVA - up to 350 nm
Padimate O	8	UVB
Sulisobenzene	10	UVB, UVA - up to 380 nm
Titanium Dioxide	25	UVB, UVA - up to 360 nm
Trolamine Salicylate	12	UVB
Zinc Oxide	25	UVB, UVA - up to 400 nm

### SPF/UVB Protection:

SPF	% of UVB Absorption
8	87.5
15	94
30	96.7
50	98
100	99

UVA Wavelength Guide is not approved by the FDA.  
MSRP and Total # of Products in product lines are subject to change.