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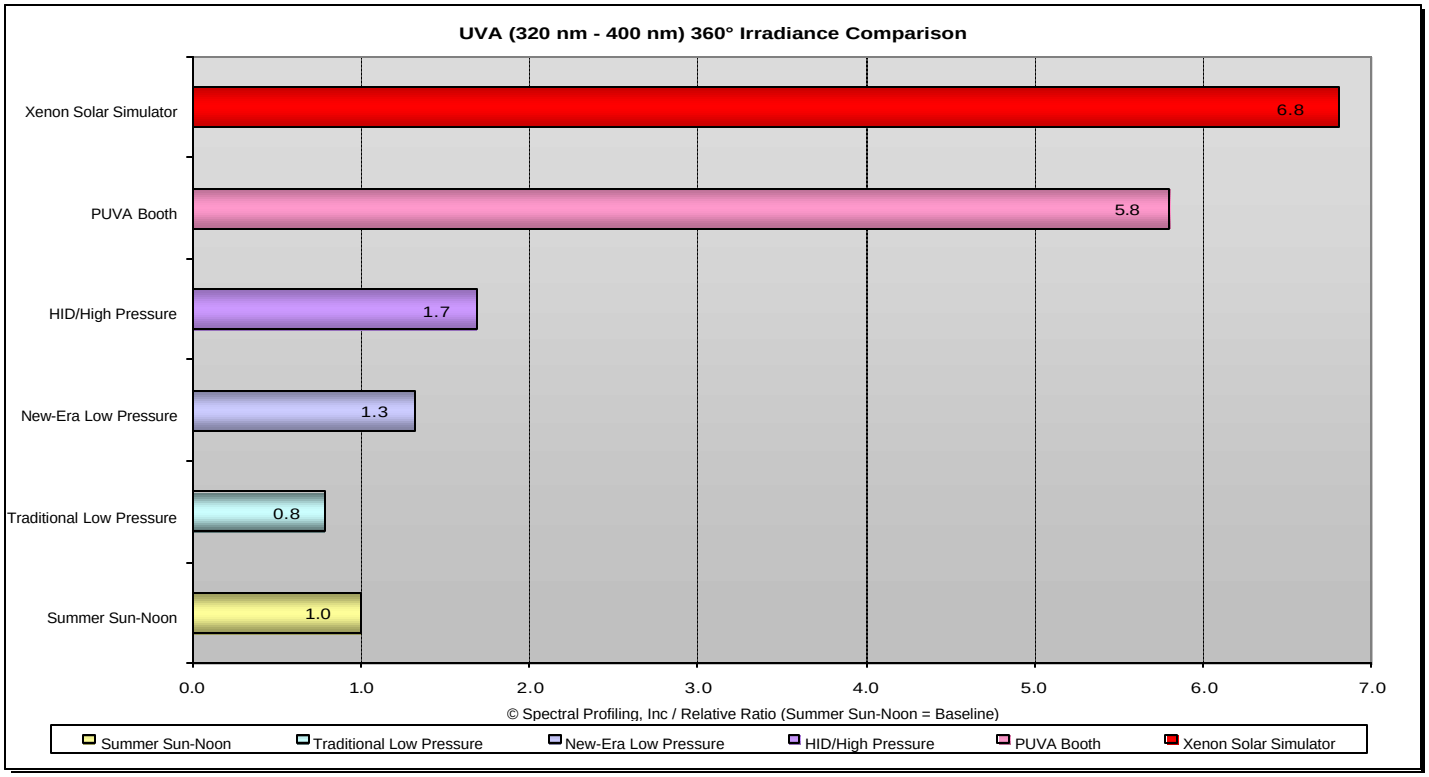
Sunlight vs Sunbeds: The Truth About UVA

By Patricia E. Reykdal & Donald L. Smith

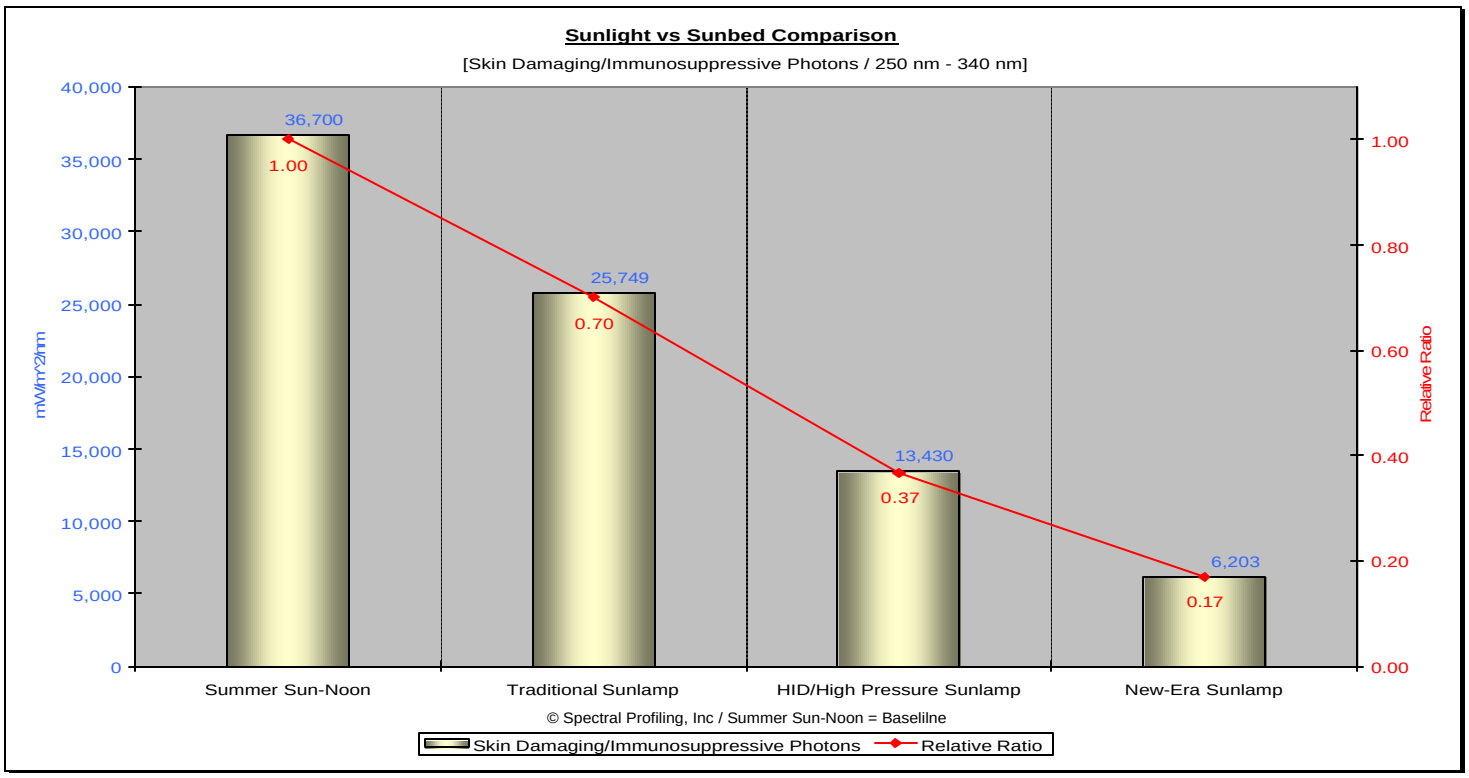
One of the most pervasive and damaging lies told by dermatologists about sunbeds is that they have 6 – 30 times more UVA than does sunlight. This article will "set the record straight" about how low pressure and HID/high pressure sunbeds *really* compare to sunlight, the PUVA booths used by the dermatology community and the Xenon solar simulators used in sunscreen testing.

Since none of the pseudoscientific articles written by dermatologists disclose the spectral characteristics of either the sunlight and/or sunbed being compared, it is absolutely and categorically impossible for them to make a valid scientific comparison. The data for the irradiance sources shown in the graph below, on the other hand, has been normalized so that they all have (a) the same spectral output, i.e., they all have a 12.0 UVI (Ultraviolet Index) and (b) for 360° (whole body) coverage which makes it possible – for the first time – to make a valid comparison between sunlight and sunbed UVA emission. When valid data is compared, we find that a sunbed equipped with traditional low pressure sunlamps emits 20% less UVA than sunlight; a sunbed equipped with a new-era sunlamp emits only 30% (1.3 times) more UVA than sunlight; and a HID/high pressure sunbed emits only 70% (1.7 times) more UVA than sunlight. However, a PUVA booth like those used by the dermatology community emits 5.8 times (580%) more UVA than sunlight and a xenon solar simulator like those used for sunscreen testing emits 6.8 times (680%) more UVA than sunlight.

Therefore, when the irradiance is controlled in order to make possible a valid comparison, we find that both low pressure and HID/high pressure sunbeds emit an amount of UVA very comparable to sunlight on a typical Midwestern summer day at noon but the PUVA booths used by dermatologists and the xenon solar simulators used to test sunscreens emit many more UVA photons than sunlight.



UVA is made up of two components, UVA^2 (320 nm – 340 nm) and UVA^1 (340 nm – 400 nm) and the former (UVA^2) acts biologically like UVB (280 nm – 320 nm) and UVC (250 nm – 280 nm) which means that it is immunosuppressive (i.e., it will suppress our immune defense system) and has more power to damage the skin while the latter (UVA^1) has much less power to damage the skin and is immunostimulatory (i.e., it stimulates our immune defense system). Therefore, a more meaningful comparison of sunlight and sunbeds can be made by looking at the irradiance in the wavelengths between 250 nm and 340 nm (a) that are immunosuppressive, and, (b) that have the most power to damage the skin. As you can see from the graph below a sunbed equipped with a traditional low pressure sunlamp has *30% less skin damaging photons* than does sunlight on a typical Midwestern summer day at noon; a HID/high pressure sunbed has *63% less*; and a sunbed equipped with a new-era low pressure sunlamp has reduced the potential to damage the skin (and suppress our immune defense system) by *an incredible 83%*.



The "bottom line" is that – when the irradiance is controlled – we find that both low pressure and HID/high pressure sunbeds emit about the same number of UVA photons as does sunlight on a typical Midwestern summer day at noon while the PUVA booths used by dermatologists and the xenon solar simulators used in sunscreen testing emit far more UVA photons than does sunlight on a typical Midwestern summer day at noon. Therefore, the often repeated claim by the dermatology community that sunbeds emit 6 – 30 times more UVA than does sunlight on a typical Midwestern summer day at noon can be seen as just another in a long series of lies made in order to financially damage the indoor tanning industry.

More importantly, it can be seen from the graph above that sunlight on a typical Midwestern summer day at noon has more potential to cause damage to our skin and to suppress our immune defense system than does a sunbed equipped with either low pressure or HID/high pressure sunlamps.