

The Difference between Laser pointer and the Laser Flare

The Australian Customs and Border Protection was willing to allow the importation of the Rescue Lasers without a permit --- even though they are over 1 mW --- because the specialized lens in a Rescue Laser that expands the single point of laser light (as in what you find in a laser pointer) over a line. As such, the intensity is reduced at any point along the line from what it would be if it were a single point. The mathematical illustration is included in the FAQ section referred to above.

6. They won't stun the pilot/captain whose attention I'm trying to get?

When the fan of light crosses your target's vision it will appear as a brilliant flash in the distance and will in no way impair their night vision.

Comparison of cockpit illumination power densities of Rescue Laser Flare® emergency signalling device vs. typical laser pointer

Let's compare the amount of laser light power which illuminates an aircraft cockpit from the Rescue Laser to that of a typical laser pointer, at a common signalling distance of 1.5 miles. The laser power level illuminating the cockpit and hitting the pilot's eye from the Rescue Laser is about one trillionth of a watt. This power level is very low because the Rescue Laser begins with a very small amount of laser light and then creates a very long 2 dimensional fan (line) of light further reducing the power density of the light. This level can be easily detected, but will not obscure pilot vision in any way.

However, because the light from the laser pointer remains in a relatively small one-dimensional pencil thin beam, the laser beam spot size at the aircraft is about 240CM (8 ft) in diameter. Because all of this light is concentrated in a relatively small spot, rather than spread out in a long line like the Rescue Laser, the power density impinging on the pilot's eye is about 1,000 times greater from the laser pointer, at this distance.

Therefore, although the signalling capability of the Rescue Laser emergency rescue and signalling device remains effective for signalling SAR aircraft, the power levels (brightness) of the Rescue Laser is reduced by one thousand times, this is a level where visual flight acuity is not affected.

It should be noted that even the laser pointer's output although bright, is still about ten thousand times lower than the power level where eye injury can occur, at this distance.

See attached Calculations

Supporting Analysis:

Rescue Laser Flare ®

7mW

5 degree fan angle (87 mrad)

1mrad narrow axis divergence angle

1.5 miles = 2,414 meters

Area of laser line at 2,414 meters = 5.07 Million cm²

Watts/cm² = .007 / 5,070,000 cm² = 1.30 x 10⁻⁹ W/cm² =

0.0000000014 W/cm²

Typical Laser Pointer

5mW

1mrad divergence angle

1.5 miles = 2,414 meters

Area of spot at 2,414 meters = 45,745 cm²

Watts/cm² = .005 / 45,745 cm² = 1.1 x 10⁻⁷ W/cm² =

0.0000001 W/cm²

The laser light power density from the laser pointer is 1,000 times higher than that from the Laser Flare, when both measured at 1.5 miles.