

## Creating and Measuring Light: An Illuminating Experience

**T**hree factors are probably the most important in producing a useful, powerful light beam: LED/lamp quality and power rating (in watts); beam pattern/quality; and LED lumen rating.

All of the headlamps tested except the Black Diamond Icon rate the LED(s) in lumens, the standard unit of luminous flux, which is a measure of the total omnidirectional brightness at the source. Lumens are a product of the bulb/LED and the electricity supplied to drive it—akin to horsepower in an engine. And the headlamp assembly itself—the reflector, power controls, lens, filters—are like the rest of the power train in a car.

Of course, power is supplied by batteries, which vary in capacity, discharge curves, and the effects of tempera-

ture on performance, etc.

The factors mentioned above all have an impact on the intensity of the incident light or luminance (measured in lux) on a target surface; the type and quality of the beam; and how long the battery cells can sustain a specific level of brightness. The difference between a lux level at the surface being lit and the lumen rating of the bulb/LED also takes into account the area over which the luminous flux is spread, and the distance to the target. Lux is equal to 1 lumen per square meter.

When it comes down to it, the most desirable light is better evaluated by the human eye rather than a light meter.