MICROVISION

Benefits of Lasers in Real World Applications

Laser technology helps save lives, map the human genome, and accurately measure the distance between the earth and the moon. Lasers have evolved from modern marvels to a staple of modern life with laser based levels and laser pointers becoming commonplace.

The benefits of laser technology are well known and widely used. Lasers produce a beam of light that is monochromatic, coherent, small and straight. More simply put, lasers generate a single color or wavelength. Most common laser based products use a small laser that emits red light. This works well for many applications like laser levels, bar code scanners, and conventional DVD players.

It is laser technology that has made possible jumps in storage capacity from vinyl to CD to currently available DVDs. CD's introduced digital music and video reproduction to replace noisy, fragile and low capacity analog recordings. Developments in laser technology will continue to enable leaps in storage capacity. Recent announcements reveal that to make next generation DVDs hold even more data, manufacturers use a shorter wavelength provided by a blue laser.

NEW LASERS LEAD TO NEW OPPORTUNITIES

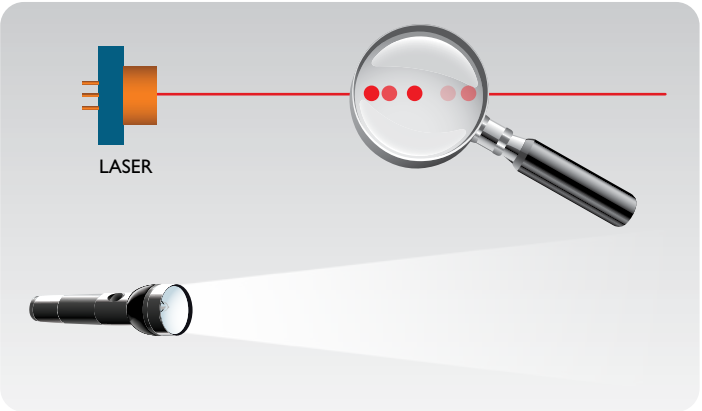
Laser technology also offers advantages for generating images. Lasers are smaller and brighter than alternative light sources. Light from most sources spreads out as it travels so that much less of it hits a given area as it moves farther from its source. Laser light doesn't behave this way. The beam can be directed or scanned with precision and can even be "pixel" sized.

Three primary colors, (red, green, blue) are used to generate the full-color images we commonly see in televisions, computers, and video displays. Red lasers are established and widely available in commercial products today; blue and green lasers are coming shortly. Developments in these compact blue and green lasers will enable a new generation of products capable of generating full color images.

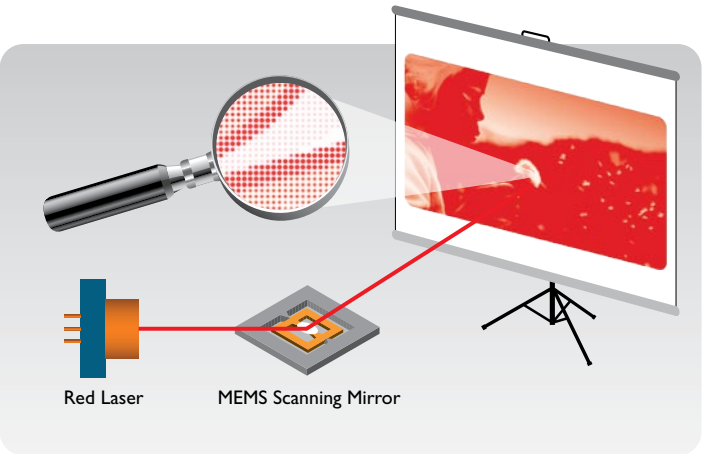
Laser technology can generate bright full color images from a battery powered micro-sized device. This is why Microvision chose laser light sources for the ultra-miniature PicoP™ display engine.

The PicoP enables manufacturers of hand-held devices to create next generation products that provide consumers with the ability to project full color, high resolution images from their mobile phones, laptop computers, personal media players, and other portable devices.

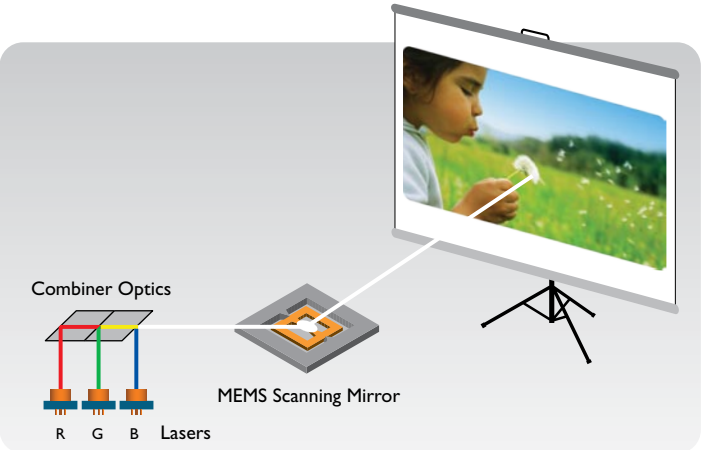
To see how the PicoP display engine works, go to:
http://www.microvision.com/technology/picop.html



Laser beams are small, uniformly straight and bright. A laser can generate "pixel pulses" of varying intensity and frequency. Light from other light sources spreads out and loses brightness as it travels.



Microvision's MEMS scanning mirror scans the modulated laser beam to generate an image pixel-by-pixel.



Virtually all visible colors can be produced by some combination of the three primary colors.

MICROVISION

LASER ADVANCES CHANGE OUR PERSPECTIVE

Every advance in laser technology seems to lead to new and novel applications. Often the adoption is so fast and widespread that we quickly forget what we did before. Most people forget that laser based bar code scanners eliminated the need to put pricing labels on every product in the supermarket. Lasers enabled the first digital audio and video on CD's and DVD's that replaced analog records and cassette tapes. Laser based vision correction surgery eliminates the need to wear glasses. These laser based applications have changed the way we work and live.

As with many lasers used in new ways, they are initially regarded with uncertainty. Indeed, some lasers are designed to produce an "invisible" beam powerful enough to cut through metal. However, most laser products pose little hazard, like Microvision's ROV™ bar code scanner and the PicoP display engine. To mark the differences, lasers are classified according to their degree of optical hazard.

LASER CLASSIFICATIONS

Since the early 1970's lasers have been classified by wavelength and maximum output power into four primary classes, ranging from 1 to 4. Microvision's ROV Laser Bar Code Scanner is a class 1 laser product and the PicoP display engine is a class 2 product. Both are designed to optimize the benefits that lasers provide while adhering to standard guidelines for safe use.

To keep up with changes in technology, a committee* of over 50 international experts meets each year to review and revise their laser safety standards. They have designated classifications that match the power and potential of a laser with its hazard potential. Class 2 is a good example of this. People have a natural blink or aversion response to bright visible light, like the sun. That is why this class is distinct from classes 1, 3 and 4. The committee recognizes that visible laser products can be more powerful without introducing a hazard much different than we experience every time we step out into the sunlight.

Microvision is working diligently with its business partners to make a new generation of mobile devices that offer full color, high resolution projection capability. Just as lasers have provided us with increased storage capacity, enabled us to level and align our artwork and reduce our reliance on pointing with wooden sticks, lasers are poised to improve our viewing experiences around mobile television, movies, personal videos, photographs, web surfing, and more. Microvision continues to forge ahead with its vision of "Illuminating Information." Leveraging the advantages of laser technology further enables this vision.

*The International Electrotechnical Commission (IEC) is a leading standards organization. To learn more about laser classifications, see IEC 60825-1, Safety of Laser Products - Equipment Classification and Requirements.

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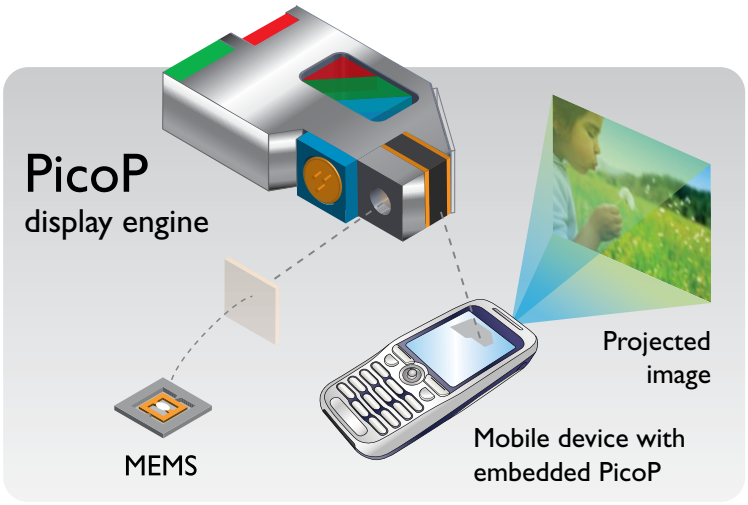

Microvision's PicoP display engine uses small lasers to generate high-quality, full color images from a device small enough to fit inside a mobile phone.

LASER PRODUCTS & IEC CLASSIFICATIONS*

	LASER CHARACTERISTICS	PRODUCT EXAMPLES
CLASS 1	**Lower Power Invisible or Visible Light** » Considered safe under all reasonable conditions of use including continuous viewing. Includes products with a higher power embedded laser whose beam is confined within product.	» CD & DVD's – small, durable discs replaces noisy analog cassettes and records. » Laser printers – introduced digital imaging to printing and copying.
CLASS 2	**Low Power, Visible Light** » Considered safe due to a person's natural blink or aversion response to bright visible light. Like many conventional higher intensity light sources (and the sun), intentionally staring into the light source for a prolonged time could be hazardous.	» Laser Based Levels – replaced unwieldy levels and plumb lines. » Laser Bar Code Scanners – simplifies pricing and inventory management. » Microvision's PicoP Display Engine – generates full color from a small package.
CLASS 3R	**Intermediate Power, Invisible or Visible Light** » Considered safe if handled correctly. The risk of injury is limited because of built-in safety margins and a person's natural aversion response to bright visible light.	» Laser pointers – replaces "wooden stick" pointers with a bright, straight, highly visible beam extending reach and precision.
CLASS 3B	**High Power, Invisible or Visible Light** » Normally hazardous when viewed directly. Viewing diffuse reflections is normally safe. Laser-protective eyewear is needed. Small or focused beam can injure.	» Medical Lasers – reduces complications and pain over conventional treatments from vision correction to tumor removal (also class 4.)
CLASS 4	**Very High Power, Invisible or Visible Light** » Considered hazardous to eyes and skin even when exposed to diffuse reflections. Laser protective eyewear and skin protection needed. Fire hazard.	» Industrial Lasers – can cut and weld metals with higher speed and are easier to automate. » Scientific Lasers – can explore the interaction between materials and molecules to characterize and identify them (spectroscopy.)