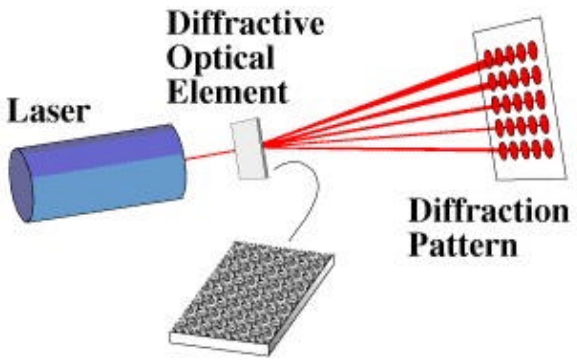
Diffractive Optical Elements (DOEs)

Diffractive optics employ constructive and destructive interference to manipulate light. This is different from conventional optics, which either bend light using refraction or reflect light. By selectively creating constructive and destructive interference, we can design an optical component that will produce many useful results that are impossible to produce using conventional optics. These may include patterns of spots or lines, a modified intensity distribution to a laser or even holographic images.



Diffractive optics have many applications, including:

- Telecommunications where they can accurately shape laser beams for coupling to a fiber or to separate wavelengths in a WDM (Wavelength Division Multiplexing) application
- Displays where they can be used to construct custom outputs, such as spot patterns
- Imaging systems to correct for chromatic aberrations.

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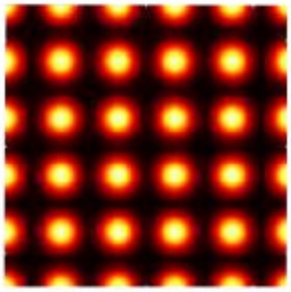
Reflexite Instrumentation Optics employs several proprietary software packages for designing DOEs. These software packages evaluate the source and the desired output. They use methods such as Gerchberg-Saxton, simulated annealing and rigorous electromagnetic theory to construct a surface that will convert the known input into the desired output.



Spot Pattern Generator

The diffractive optical element (DOE) is created by encoding a relief pattern directly on the surface of the optical component. This pattern is constructed using minature features. These features may be constructed using techniques such as diamond turning or photolithography. The phase of incoming light is manipulated according to the thickness of the features and the index of refraction of the material.

Reflexite Instrumentation Optics can design, tool and fabricate the appropriate DOE component your application.

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