

LARGE AREA OPEN PATH CHEMICAL DETECTION

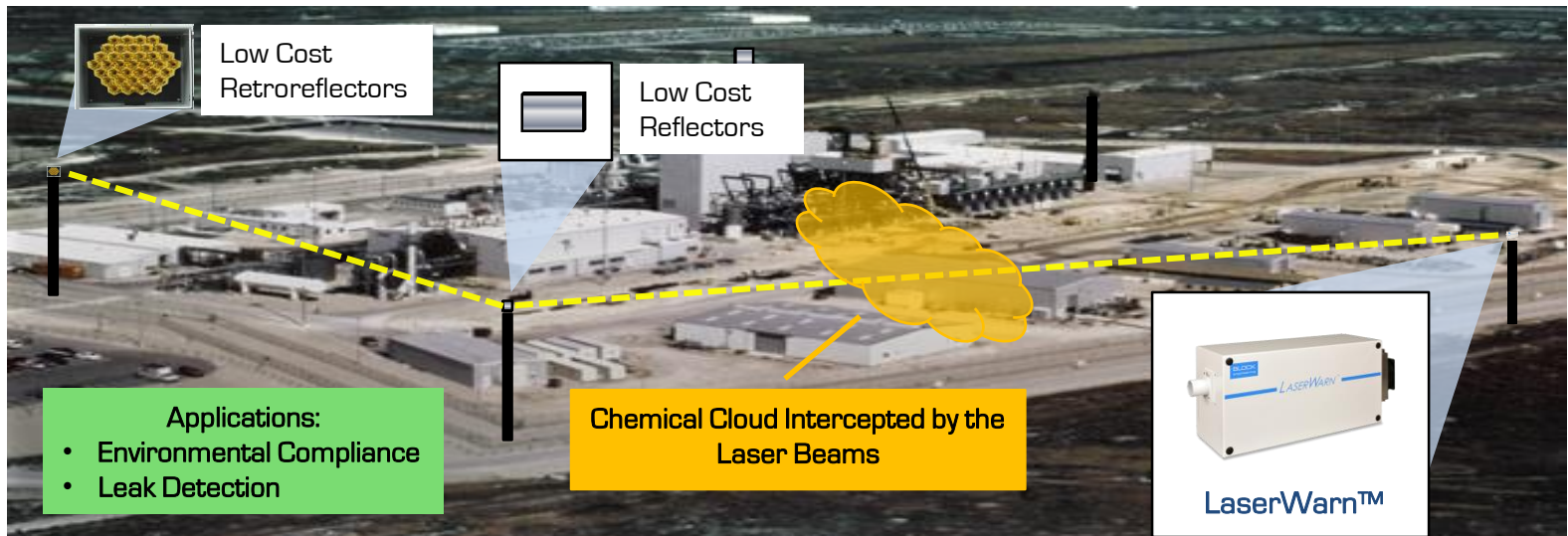
Key Features

- ▣ Real-time 24/7 Monitoring
 - ▶ Fenceline Monitoring for Industrial Chemicals
 - ▶ Environmental Monitoring in Chemical Production Facilities and Controlled Environments
 - ▶ Leak Detection at Storage Facilities
- ▣ Fixed or Portable Configurations
- ▣ Outdoor Operation
- ▣ Low Cost Retroreflectors and Mirrors

Laser Based Chemical Detection



Chemical Detection to Limit Hazards and Errant Emissions

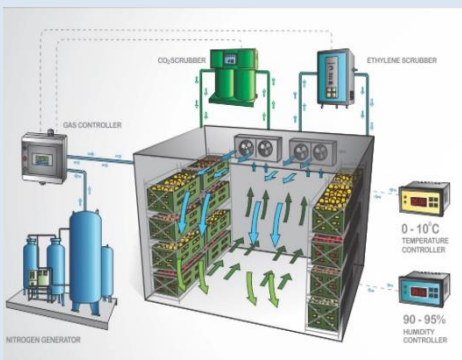


Key Benefits and Advantages

- ▣ Operation in the mid-infrared spectrum where most gases have strong and unique spectral signatures
- ▣ Greatly increased sensitivity and area coverage compared to current area protection systems
- ▣ Expandable library of chemicals to match specific operational requirements
- ▣ No consumables required, allowing for minimal maintenance
- ▣ Eye-safe laser beams for operation in areas with people
- ▣ Sub-second readings for rapid detection and immediate warning alerts



Chemical Plants



Controlled Atmospheres



Superfund Sites (Remediation)



Oil/Gas Leak Detection



Air Quality Monitoring

LASERWARN™ Principle of Operation

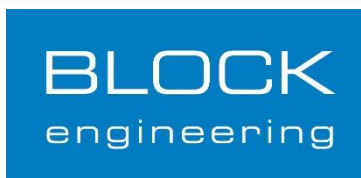


LASERWARN™ Specifications

Maximum Distance	Standard Range: 500-m round-trip
Gases detected	Industrial Chemicals such as benzene, formaldehyde, and acrolein. Hundreds of gases detectable.
Sensitivity	Varies with gas and distance in path (e.g., ppb over 500 m)
Response time	1 second (typical)
Detection method	Mid-Infrared Absorption Spectroscopy
Communication Options	Ethernet; Wireless; Cellular available Other options upon request
Communication Interface	Readily available interface to security systems via SOAP and MODBUS
Dimensions	Approx. 10 x 37 x 14 inches
Weight	55 lbs
Electrical Power	100 - 240 Volts (50/60 Hz), 90 Watts (typical)
Temperature Range	-40°C to 50°C (custom enclosures may be required)
Retro-reflector	3 and 5 inch options available

Sample Chemical (100's more available)	Calculated LOD (ppm) 25m standoff distance
Benzene (C ₆ H ₆)	2.08
Formaldehyde (CH ₂ O)	4.40
Acrolein (C ₃ H ₄ O)	0.66
Ethane (C ₂ H ₆)	8.06
n-Butane (C ₄ H ₁₀)	6.85
Carbonyl sulfide (COS)	2.44
Methane (CH ₄)	0.23
Acrylonitrile (CH ₂ CHCN)	0.66
Ethylene (C ₂ H ₄)	0.26
Nitrous oxide (N ₂ O)	0.50

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