

# **High power laser weapon system**





## Overview

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What is a high-energy laser system?

The high-energy laser systems that are finding military applications are based on solid-state lasers that use special crystals to convert the input electrical energy into photons.

What are high-energy lasers & high-powered radiofrequency (HPM) weapons?

Yet after decades of low-power devices being rolled out globally, recent years have seen increasing military investment and technological advances in high-energy lasers (HEL) and high-powered radiofrequency (HPRF) or microwave (HPM) systems. These emerging categories of weapons are designed for a variety of targets.

What is a high power laser?

These beams are of such low power that they simply reflect off a surface without damaging it. Higher-power laser systems are used to cut through biological tissue in medical procedures. The highest-power lasers can heat, vaporize, melt, and burn through many different materials and are used in industrial processes for welding and cutting.

Will high-powered laser weapons reduce military risk?

Proving this capability will reduce risk for the Department of Defense acquisition and fielding of high-powered laser weapon systems for all six military branches. "OUSD (R&E) has invested to mature high energy lasers in support of America's warfighters.

Does the Air Force have a high energy laser weapon system?

Photo courtesy of U.S. Army. In 2019, the U.S. Air Force deployed our first High-Energy Laser Weapon System, HELWS, overseas, and it has more than 25,000 hours of operation. Certified for use in combat, multiple additional systems are now in theater.



What is a high energy laser Integrated Optical-dazzler & Surveillance (HELIOS)?

(PEO IWS Approval #2021-0011) The High Energy Laser with Integrated Optical-dazzler and Surveillance, or HELIOS, provides the U.S. Navy with game-changing directed energy capability through integration of high energy laser and optical dazzler technology into the ship and combat system.



## High power laser weapon system

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### Directed Energy: The Focus on Laser Weapons Intensifies

Directed energy weapons offer a more cost-efficient means of dealing with fast-proliferating threats. If the technology can be matured, such systems could tip both the military and economic calculus of modern warfare in their users' favor.

### Navy Conducts Historic Test of New Laser Weapon System

ARLINGTON, Va.--The ground-based laser system homed in on the red drone flying by, shooting a high-energy beam invisible to the naked eye. Suddenly, a fiery orange glow flared on the drone, smoke



### High-energy laser weapons ready for the front lines

NASHUA, N.H. - High-energy and laser weapons seem to be perpetually on the metaphorical horizon. This project also assumes the directed energy weapon system's pod will be equipped on a F-15



### High-energy laser weapons: A defense expert explains

The high-energy laser systems that are finding military applications are based on solid-state lasers that use special crystals to convert the input electrical energy into photons.



### Lockheed Martin's Advanced Test High Energy Asset (ATHENA) laser weapon

To counter this menace, Lockheed Martin's Advanced Test High Energy Asset (ATHENA) laser weapon system has emerged as a groundbreaking solution, showcasing unparalleled effectiveness and versatility.

### What are high-energy laser weapons, and how do they work?

The DragonFire laser directed-energy weapon achieved the U.K.'s first high-power firing of the weapon type against an aerial target. (Photo provided/British Defence Ministry) (THE CONVERSATION) Nations around the world are rapidly developing high-energy laser weapons for military missions on land and sea, and in the air and space.



### US Navy Readies 300 kW HELCAP Laser System for ...

At the core of the Laser Weapon Testbed will be a 300+ kW class sourced from the Office Secretary of Defense's High Energy Laser Scaling Initiative (HELSEI), which has funded industry teams to deliver several 300+ kW ...



### High-Energy Lasers: New Advances in Defense Applications

In 2014, the U.S. Navy announced that the high-energy Laser Weapon System (LaWS) is ready for installation in late summer 2014 on the USS Ponce for 12 months of at-sea testing in the Persian Gulf. The LaWS system prototype, designed to be operated by a



#### [Inside the Lockheed Martin Laser Technology](#)

The LLD is a proven ground-based high-power laser weapon system capable of countering targets ranging from unmanned aerial systems and fast-attack boats to cruise missiles. Its high

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### New High-Energy Lite Beam Laser from Rafael to Neutralize ...

Israeli defense company Rafael Advanced Defense Systems has announced the deployment of the latest version of its high-energy laser weapon system, LITE BEAM, at the 2024 Association of the United States Army (AUSA) event in Washington, D.C. Designed for the rapid and precise neutralization of aerial threats, including drone swarms, LITE BEAM represents a

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#### [Welcome to the Laser Wars , WIRED](#)

The weapon, known as the Palletized High Energy Laser (P-HEL) and developed by the American defense contractor BlueHalo based on the company's 20-kilowatt Locust Laser Weapon System, first



### The Army Has Officially Deployed Laser Weapons

The Army's Palletized High Energy Laser, or P-HEL, during testing at Yuma Proving Ground, Arizona, in April 2022. Based on BlueHalo's LOCUST Laser Weapon System, the P-HEL was recently deployed to

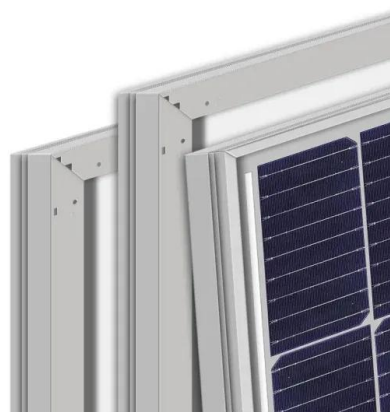


### High-Energy Laser Weapon System fired from UK ...

London, (22 July) - Raytheon UK, Defence Science and Technology Laboratory (Dstl) and Defence Equipment and Support (DE& S) have successfully tested Raytheon's High-Energy Laser Weapon System (HELWS) integrated onto a ...

### Laser Weapon Systems

High Energy Laser Weapon System Proven technology for high energy solid state laser systems Designed for all warfighting environments 100 kW-class laser scalable to 300 kW and larger Lightweight, efficient thermal management Shorter dwell times and rapid





### A defense expert explains how high-energy laser ...

The high-energy laser systems that are finding military applications are based on solid-state lasers that use special crystals to convert the input electrical energy into photons.



### Here's Our First Look At A HELIOS Laser-Armed ...

The U.S. Navy's Arleigh Burke class destroyer USS Preble is now armed with a High-Energy Laser with Integrated Optical Dazzler and Surveillance system, or HELIOS. Preble is the first of the service's ships to be ...



### NEW ADVANCES IN DEFENSE APPLICATIONS HIGH-ENERGY ...

high-energy Laser Weapon System (LaWS) is ready for installation in late summer 2014 on the USS Ponce for 12 months of at-sea testing in the Persian Gulf. The LaWS system prototype, designed to be operated by a single sailor for defense against UAVs and

### laser weapons high-power microwaves high-energy ...

Dubbed the High Energy Laser with Integrated Optical Dazzler and Surveillance (HELIOS) system, it has at least double the power of its predecessor. The company said HELIOS was rated at more than





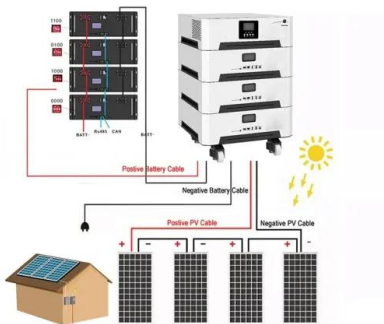
### Excelitas Technologies White Paper on High Energy Laser Optics

Page 2 of 18 1 Introduction High Energy Laser (HEL) systems have been in development for many decades, but recently are gaining traction as a viable military tool . As modern weapons become mo re powerful, transportable, and effective, it is



### High-Energy Laser Weapon System Fired from Military Vehicle

High-Energy Laser Weapon System Fired from Military Vehicle Raytheon's High-Energy Laser Weapon System has been integrated onto a British Army combat vehicle, and was successfully test fired for the first time in the UK raytheon-uk News By Abi Wylie / 30 Jul 2024



### C-UAS Directed Energy

Operationally deployed with proven lethality and reliability. End-to-end engineering elegance coupled with advanced AI, the LOCUST Laser Weapon System (LWS) enables and enhances the directed energy "kill chain"-- tracking, identifying, and engaging a wide variety of targets with hard-kill High Energy Laser.

### High-energy laser weapons move quickly from prototype to ...

Raytheon has installed the prototype High Energy Laser Weapon System (HELWS) aboard a Polaris MRZR all-terrain vehicle to defend military forces from enemy unmanned aircraft. However, researchers





### High Energy Laser Weapon

The HEL weapon has been developed as a component of the EOS Titanis counter-UAS system, with its primary mission to effectively disable UAS in Groups 1, 2, and 3, while also neutralising UAS sensors from extended ranges. The core power source of the HEL



### High-energy laser weapons: How they work, what they are used for

Nations around the world are rapidly developing high-energy laser weapons for military missions on land and sea, and in the air and space. Visions of swarms of small, inexpensive drones filling the skies or skimming across the waves are motivating militaries to develop and deploy laser weapons as an alternative to costly and potentially overwhelmed ...



### 'On-the-go' high-energy laser weapon system counters drone ...

kW) high-energy laser (HEL) weapon system, is designed for the U.S. Air Force to be easily portable and protect against short-range aerial threats (see Fig. 1 and video). It can target, track, and destroy Class 1 or Class 2--small- to medium-sized but

### HIGH ENERGY LASER WEAPON SYSTEM

High Energy Laser with Scalable Output High Energy Laser with Scalable Output General Atomics Electromagnetic Systems (GA-EMS) advanced solid state High Energy Laser (HEL) Weapon System provides proven laser technologies to enable ...





### Directed Energy: The Focus on Laser Weapons ...

Yet after decades of low-power devices being rolled out globally, recent years have seen increasing military investment and technological advances in high-energy lasers (HEL) and high-powered radiofrequency ...

### High-Energy Lasers , Raytheon

The 300kW-class High-Energy Laser Weapon System (HELWS) is being developed as part of the US Department of Defense's (DoD) High Energy Laser Scaling Initiative (HELSI) programme to develop high-performance ...



### High-Energy Laser Weapon System fired from UK ...

This ground-breaking test, conducted at Dstl's range in Porton Down, saw the laser weapon fired at full power whilst integrated onto a British Army Wolfhound armoured vehicle. The lightweight, portable HELWS is the ...

### No longer science & technology projects, high-energy laser weapons ...

The Air Force system -- a counter-UAS, High Energy Laser Weapon System, or HELWS -- is a lower-power system up to 15 kilowatts. We've delivered four of those systems to the Air Force that are





### **Lockheed Martin works to scale high-energy laser weapons to ...**

Under the second phase of the DoD's High-Energy Laser Scaling Initiative, Lockheed Martin is working to scale its 300-kilowatt (kW) laser to 500 kW. The goal: Increase laser power while achieving excellent beam quality and optimizing efficiency, size, weight, and volume for these continuous-wave HEL sources.

### **High energy laser weapons: Technology overview**

Figure 3. The components of a High Energy Laser (HEL) weapons system. DoD currently funds three kinds of laser device technology for High Energy Laser weapons: chemical, solid-state and free electron.



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