Living in a safe environment

in a country enjoying freedom and security as part of daily life
We long for peace and security.

Armed forces are deployed worldwide to prevent conflicts, to overcome crises, to combat terrorism and to support humanitarian missions. They act on behalf of governments and the international community. Soldiers protect people and institutions, ward off attacks, and must assert themselves in global hot spots. Their missions are dangerous, their training and equipment are crucial for survival and success in operations.
In development labs and production centers, Diehl’s engineers, technicians and other experts face the daily task of providing products and services meeting the challenges of modern armed forces. Cutting-edge technologies approach the limits of what is possible.

We are good listeners. The forces’ field reports regarding operational performance of our products help facilitate continuous improvements. Our mission: providing the required equipment at the appropriate time within the agreed cost frame. We assume this responsibility for the benefit of successful force operations and a life in security.
Diehl Defence combines the Diehl Group’s activities in defence and security. Diehl companies are important partners of the German and international armed forces. Diehl Defence is among the global technology leaders regarding the development and production of advanced guided missiles and ammunition for armies, air forces and navies as well as system solutions for ground-based air defence. Its product range includes innovative solutions for reconnaissance, surveillance, training and protection.

Development and production of high-performance infrared modules, fuzes and fusing systems as well as special batteries ensure independence in key components.

Long-term strategic cooperation with multi-national partners strengthens our equipment expertise and provides access to global markets. Our continuous commitment to research and development, reliability and loyalty towards customers as well as our qualified, motivated employees constitute the basis of the company’s many years of success.

As a holding company, Diehl Defence coordinates the activities of a number of subsidiaries, programs and affiliated companies:

Air Missions

Pilots in fighter aircraft fly sorties to monitor airspace and international borders in order to provide support for land and naval operations in global missions round the clock. In case of an alert, every minute counts, every move has to be accurate. Pilots must be able to fully trust in their onboard weapon systems – in air combat, in precise, long-distance engagement of ground targets, and, last but not least, for their own protection.

Owing to its broad product portfolio of advanced guided missiles, Diehl Defence makes a vital contribution to the protection and effectiveness of national and allied armed forces.

The highly efficient precision weapons can be integrated onto a variety of carrier platforms for air-, ground or naval missions.

**IRIS-T guided missile**

Worldwide, IRIS-T (Infrared Imaging System-Tail/thrust Vector Controlled) is among the most advanced short-range, air-to-air guided missiles. IRIS-T is produced within a European cooperation program under the industrial leadership of Diehl Defence. The guided missile was selected as standard weaponry for the Eurofighter/Typhoon, F-16, F-18, Tornado and Gripen fighters.

IRIS-T has a high-resolution infrared seeker with a wide field of view enabling airborne engagement at close and very short ranges, but interception at greater distances as well. The target can be assigned by onboard radar or the pilot’s helmet visor.

State-of-the-art image processing technologies ensure precise control in real-time with optimal accuracy as well as excellent EMC resistance also covering modern blinding lasers. Simultaneously, thrust vector control provides unrivaled maneuverability allowing engagement of targets behind the aircraft. IRIS-T’s exceptional precision in combination with a radar proximity fuze also permits interception of adversaries’ missiles.

Sensor technology

Development and production of seeker heads focus on passive and active electro-optical sensors over the entire wavelength range. Dual-color seeker heads allow target detection at greater distances and in difficult scenarios. Intelligent processing of sensor and image signals is crucial for EMC resistance and targeting precision. Scalable electronics support development of modular missile architectures.
Ground-based air defence

Population centers, facilities and objects, such as military camps of international forces in crisis and combat zones, are exposed to a variety of airborne threats. Ground-based air defence units contribute to safeguarding airspace as well as protection of civilians and deployed troops.

IRIS-T SLM – modern air defence missile system

Based on the new IRIS-T SL (surface-launched) guided missile, Diehl Defence offers armed forces an entire air defence system as a modern, economical solution. The highly mobile, all-terrain capable, medium-range system provides comprehensive 360° protection against aircraft, helicopters, cruise missiles and guided weapons. It enables simultaneous engagement of multiple targets from very short to medium-range within extremely brief reaction times.

Different multi-function radar systems can be integrated in the IRIS-T SLM air defence system. IRIS-T SLM is suited for both mobile and stationary deployment. Its high degree of automation makes it ideal for permanent operation with minimum staff requirements.

Diehl Defence was contracted for the development of the new IRIS-T SL surface-launched guided missile by the German armed forces for tactical air defence. It is designed for easy integration into a wide scope of existing and future air defence systems due to standardized and softbase-based/open interfaces providing seamless connection to fire control systems. Moreover, all functionalities for employing IRIS-T SL have been implemented in corresponding launchers. This permits utmost flexibility, regardless of the sensors and command and control systems in use.

IRIS-T SLS – IRIS-T in a surface-to-air role

Based on IRIS-T SL’s flexible architecture, the IRIS-T air-to-air guided missile can also be employed in a surface-to-air role. Contracted by the Försvarets Materialwerk (FMV) procurement authority, Diehl equips the Swedish army with IRIS-T SLS systems. Highly mobile tracked vehicles serve as carriers in combination with an integrated network comprising sensors and a new fire control system.

System engineering

Ground-based air defence design focuses on flexible and modular system configurations. Standardized interfaces provide easy connection of the missile system to existing and future fire control components.

In missile and air defence system engineering, developers deal with aerodynamic and flight mechanical design, flight control as well as performance assessment of guided missiles. Further major work areas include missile integration into the higher-level weapon system as well as reliability and technical safety of this system.
Missile for land and naval forces

Due to their outstanding precision, advanced guided missiles ensure effective engagement of land and naval targets over long distances. As multi-functional weapons, missiles are capable of proving their strengths in so-called MOUT (Military Operations in Urban Terrain) scenarios as well. Concerning even future submarine armament involving submerged starts of the IDAS (Interactive Defence and Attack System) missile, the operator is capable of precise determination of the point of impact, regardless of airborne, naval or coastal targets.

RBS15 Mk3 – Engagement of naval and land targets at long-range distances

Diehl Defence supplies the RBS15 Mk3 anti-ship missile as the main weapon for the German Navy’s new K130 corvette. A special feature of the ultra-modern German-Swedish missile is its capability of precise engagement of land targets.

The long-range, fire-and-forget missile demonstrates high maneuverability and low-level flight directly above the water surface or around and over islands at distances of more than 200 km. It is extremely resistant to electronic countermeasures and characterized by high robustness against air defences employing guided and tube weapons, for instance, by performing unpredictable evasive maneuvers during terminal approach. RBS15 Mk3 is the result of successful collaboration with industrial partner Saab Dynamics and is a refinement of the RBS15 Mk2 system which has proved its worth in the Swedish and other countries’ navies. RBS15 Mk3 also comes in an air-to-ship version for arming modern fighters.

IDAS (Interactive Defence and Attack System) is a joint submarine armament project of ThyssenKrupp and Diehl.

The SPICE guided missile was selected for arming the PUMA armored personnel carrier, among other applications. It is supplied by EuroSpike GmbH, a joint venture of Diehl, Rheinmetall and Rafael.

The RAM-Block-2 guided missile has a performance-enhanced radar seeker head and highly improved agility compared to previous missile generations.

Integration center

In Nonnweiler, Germany, the missiles’ various assemblies are integrated into the overall system. These include the drive and warhead. In Überlingen, Germany, the launchers for ground-based air defence systems are equipped with the technology needed for loading and firing guided missiles.
Ammunitions – Effectiveness in combat

International force contingents operate in global hot spots. Besides providing humanitarian assistance and participating in peace-keeping missions, troops must also be in a position to prevail in highly intensive combat. Innovative ammunition provides the opportunity of engaging high-value targets at long distances while largely avoiding accompanying damage. Ammunitions’ effectiveness against targets under and behind cover helps soldiers prevail in case of ambush. Diehl Defence offers medium and large caliber ammunition for land, air and naval forces.

40 mm infantry ammunition family

The Diehl 40 mm ammunition family is employed to engage hard and soft targets at distances of up to 1,800 meters. Different ammunition types are available for soldiers in combat: one fragmentation-effect variant, one hollow-charge and one airburst variant. The airburst ammunition type was designed specifically for engaging targets behind cover. The various ammunition types can be fired from all 40 mm grenade launchers. A modern, high-performance fuze with a pyrotechnical self-destruction device ensures that soldiers and civilians are not endangered by duds after the end of hostilities. In addition, the use of insensitive explosives helps protect soldiers in combat. Diehl Defence’s 40 mm infantry ammunition is currently in service with the German Bundeswehr and numerous partner nations.

Ammunition technology

Design of powder drives, calculation of flight paths, terminal guidance, and warhead simulations are also part of effectiveness technology for ammunitions and missile applications, as is the use of insensitive explosives to reduce the damage caused by external shelling.
Guided artillery ammunitions – Precision in indirect fire

Armed forces’ new requirements underscore the need to engage stationary and moving targets accurately and at a distance in indirect fire. VULCANO guided artillery ammunitions meet this demand. They provide extraordinarily high target precision as well as the option of mission abort after fire command.

The new VULCANO guided ammunition family — 155 mm for armies and 127 mm for navies — offers the world’s most precise artillery ammunition. The combination of GPS navigation with laser and infrared sensors for terminal guidance allows VULCANO guided ammunition to engage even small stationary and moving land and sea targets at distances up to 100 km.

VULCANO 155 mm guided artillery munitions

The 155 mm guided army artillery ammunition can be fired against land targets from the Self-Propelled Howitzer 2000 (PzH2000), the FH-70 and M-777-A2 field howitzers, and the CAESAR and M109 tank howitzers. The guided ammunitions are designed as a dual-mode system: At long distances, they achieve precision using GPS navigation and semi-active lasers (SAL) for terminal guidance. While purely GPS-guided ammunitions fly merely to preprogrammed target coordinates and cannot compensate for target location errors, SAL-guided ammunition hits the target with one shot. Combination of the laser sensor with a pre-formed, high-performance warhead and insensitive explosives make for effective strikes at targets.

VULCANO 127 mm guided naval ammunition

For naval applications, the semi-active SAL sensor is replaced with a FarIR infrared sensor for autonomous target engagement. Moreover, the mission can also be carried out only with GPS-guided terminal homing to the pre-specified target coordinates using multi-function programmable sensors. The 127 mm VULCANO’s mission includes maritime fire support, as well as precise strikes against stationary and moving targets at land and sea.

VULCANO guided ammunition technology

Development and production of VULCANO guided ammunition focus on aerodynamic and mechanical design, and on control and navigation for semi-active lasers (SAL) and infrared (FarIR) guided ammunition types.
Reconnaissance and Protection

Terrorist-, bomb and rocket attacks, hidden improvised explosive devices: health hazards and lethal threats facing soldiers in missions are omnipresent.

Flexible monitoring sensors offer precise reconnaissance regarding activities in the air, at sea or on land. Image processing technologies provide a high level of automation to relieve troops. Innovative developments in the field of non-lethal effectors offer new possibilities for protecting forces and facilities.

SIMONE ship monitoring system

SIMONE (Ship Infrared Monitoring and Observation Equipment) is optimized for early detection of threats facing vessels from pirate and terrorist attacks. The system’s strengths come into play during port calls and in coastal areas providing options for potential attacks from land or sea. In these scenarios, conventional radar systems quickly meet their limits.

SIMONE tracks even the smallest suspicious objects, such as inflatable rubber dinghies or swimmers, providing 24-hour/360° monitoring of the vessel’s immediate vicinity. Automatic monitoring of the ship’s vicinity also allows safe, reliable detection of man-over-board incidents. The monitoring system is suited for yachts, freighters, passenger and naval ships. Its IR technology provides excellent image quality at night as well and can also be used as a navigation assistant.

SIMONE employs sensor modules which, depending on the configuration, consist of different imaging infrared sensors or visual cameras. An additional sensor with high-resolution optics and rangefinder verifies tracked objects and provides necessary fire control data for a weapon system. The first series-produced devices are being delivered to the German Navy in early 2013 for integration in the F125 frigate.

HPEMcarStop

Vehicle-integrated effector for non-violent stopping of escape vehicles in moving traffic.

Counter-IED: Vehicle with front-mounted HPEM effector system for protecting military convoys against IEDs.

Laser systems protect transport aircraft against missile attacks

HPEM: High-Power Electro-Magnetics
EMV: electromagnetic compatibility

High-frequency and pulse technology

Activities range from development of electromagnetic effector and protection systems to high-frequency sensors, antenna systems and EMV analyses.

Moreover, the company has many years of experience in precise laser guidance, system integration of laser weapon systems, and in the effect of blinding lasers on guided missile seeker heads.
Successful missions require a high level of qualification aimed at safe handling of equipment and appliances. Tough training and intensive preparation in view of envisaged threats in the zone of operation enable soldiers to master difficult tasks. Diehl Defence’s advanced training and simulation systems support armed forces in realistic operational scenarios thus saving costs, independent of time and location.

**Air-Combat Training System Flight Profile Recorder (FPR)**

Diehl Defence’s Flight Profile Recorder (FPR) has become NATO standard for air-combat training systems in Europe. The German air force as well as the air forces of more than a dozen European nations use the system for pilot air-combat training.

FPR consists of pods mounted to the aircraft and ground stations for real-time representation of training operations. The data link provides a network for all aircraft in the training zone as well as the ground control station. More than 200 aircraft can participate in exercises for targeted skills training. The data link connecting all aircraft in the training zone permits realistic simulation of various weapon applications and defensive measures. The ground station is able to analyze and evaluate all flight maneuvers with the participants to achieve optimal training results. Automatic collision warning and acoustic warning of the pilot before leaving the training zone make an important contribution to flight safety.
In Customer and Product Support, a team of engineers, physicists, graphic designers, technologists, technical editors and IT specialists cooperate to help customers best use our products throughout their life cycle. Thanks to years of experience in product life cycle management, Customer Support is the competent partner for meeting these challenges.

Integrated logistical support
First, care and maintenance of equipment are vital during the design phase. This process involves logistical analyses to simplify maintenance and ensure environmental compatibility, etc. Subsequent development and construction of logistical support systems promote optimal use of the product and efficient maintenance in cooperation with customers.

Interactive training
In addition to computer- and web-based training programs, we develop individual educational applications. These activities are supplemented by multi-media lecture halls including procurement and installation of the required hard- and software.

In-service support
Customer Support offers comprehensive technical and logistical product support. Our long standing expertise includes services concerning not only maintenance, repair, supply and management of spare parts and upgrading of guided missiles, but document management and training for the entire product life as well.

Finally we support our customers in products at the end of service life with economical, eco-friendly processes.

Our goal: High product availability at reasonable cost.

Diehl Customer Support assists its customers long after purchase. Continuous logistical support and close cooperation with users yield important knowledge for product improvements and new plans.
Key components and packaging

High-performance infrared technology

The affiliate AIM Infrarot-Module provides Diehl Defence with long-term access to infrared technology. The product portfolio ranges from standard modules to customer-specific solutions for target seekers, thermal imaging devices, warning systems and drones for the German Bundeswehr and international armed forces. They also include infrared detectors for civilian satellite programs. The high-tech company concentrates all core capabilities in electronics, micro-electronics, semiconductor technology, crystal growing, optics and precision engineering under a single roof.

Ammunition fuze a single safety

Safe, reliable fuze systems are a main component of ammunition solutions. JUNGHANS Microtec is a leader in developing and producing fuzes and safety devices for guided missiles, rockets and ammunitions. State-of-the-art micro-mechanics and highly integrated electronics provide the basis for developing and producing modern fuzes for the German Bundeswehr and international armed forces.

Special batteries for defence and space technology

Diehl Defence’s development and production facilities meet the needs of electric energy storage devices for missiles, ammunitions and other special applications. The affiliate Diehl & Eagle Picher manufactures thermal batteries for military applications, fuze batteries in lithium-thionyl chloride technology as well as customer-specific battery packs in lithium, nickel-cadmium and nickel hybrid technology for the defence, electronics and communications industries.

Packaging systems for hazardous materials transports

Diehl Defence develops and produces premium packaging systems for tank ammunition, mortar shells, anti-tank weapons, fuzes and hand grenades. We also supply hazardous materials packaging to the automotive industry for lithium-ion batteries.
**JUNGHANS Microtec**
JUNGHANS Microtec GmbH is a world leader in ammunition fuzes and safety devices. The company is a joint venture between Diehl and THALES. JUNGHANS Microtec owns the French subsidiary JUNGHANS T2M S.A.S., as well as the German company DynITEC GmbH, which develop and produce military ignition devices, energetic materials and electronic fuzing systems.

**AIM Infrarot-Module**
AIM Infrarot-Module GmbH develops and produces premium infrared detectors and thermal imaging devices, as well as Stirling cooling systems. AIM products are used not only by armed forces, but are also employed in research, industrial processes, safety engineering and environmental protection. Space-based applications are a new segment.

**Diehl BGT Defence**
Diehl BGT Defence GmbH & Co. KG is one of Europe’s leading providers of modern guided missile systems. Its portfolio ranges from air-, land- and sea-based missile solutions to ground-based air defence systems. The product range also includes medium and large-caliber ammunitions, sensors and systems for reconnaissance, monitoring and protection. Products and services for training, customer service and packaging complement the portfolio.

**Diehl Raytheon Missile Systeme**
Diehl Raytheon Missile Systeme GmbH — a joint venture of Diehl and Raytheon, USA — is the exclusive provider of Sidewinder AIM-9 legacy missiles. The services provided include upgrade and lifetime extension programs as well as logistical support, training, repair and supply of spare parts.

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### Companies of Diehl Defence

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### Key Components and Packaging

- **Companies**
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  - AIM Infrarot-Module
  - JUNGHANS Microtec
  - Diehl & Eagle Picher
  - DynITEC
  - EuroSpike
  - PARSYS
  - RAM-System

- **Portfolio Overview**
  - Ignition devices
  - Fuzes
  - Packaging
  - Infrared detectors
  - Thermal imaging devices
  - Training systems
  - Smoke devices
  - Non-lethal weapons
  - Ammunitions
  - Warheads
  - Flares/decoys
  - Batteries (special)
  - Artillery rockets
  - Reconnaissance sensors
  - Convoy protection
  - HPEM effector systems
  - Guided missiles
  - Missiles service & support
  - Ammunition
  - Air defence, ground-based
  - Ground-based air defence
  - Guided missiles
  - Convoy protection

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### Management systems and quality standards

#### Integrated management system – Certifications

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<th>ISO 9001 Quality management system (QM system)</th>
<th>EN 9100 QM systems – (aerospace and defence)</th>
<th>DIN EN ISO 14001 Environmental management systems</th>
<th>ISO 27001 IT security – Information security management systems</th>
<th>AQAP 2110 NATO Quality Assurance Requirements for Design, Development and Production</th>
<th>AQAP 2210 NATO Supplementary Software Quality Assurance Requirements to Luftergung §30 ZDv 19/1 Certificate of approval as a contractor for Bundeswehr aircraft systems</th>
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**Diehl & Eagle Picher**

Diehl & Eagle Picher GmbH — a joint venture of Diehl and Eagle Picher Technologies, USA — makes defence-related battery systems. Its product range includes thermal batteries for missiles and ammunition, activatable lithium-thionyl chloride (fuze batteries) and battery packs for military and civilian use.

**EuroSpike**

EuroSpike GmbH is a program company marketing the Israeli-developed Spike guided missile in Europe. Its partners include the companies Diehl, Rheinmetall and Rafael.

**PARSYS**

PARSYS GmbH is the prime contractor for the PARS 3 LR guided missile — the main weaponry for the German army’s Tiger support helicopter. PARSYS GmbH is a joint venture of Diehl and MBDA Deutschland.

**RAMSYS**

RAM-System GmbH (RAMSYS) — a joint venture of Diehl and Airbus — is responsible for program management of the RAM (Rolling Airframe Missile) in Europe and markets the naval self-defence system in selected countries. The company is also involved in the US’s Evolved Sea Sparrow Missile (ESSM) and Standard Missile SM-2 programs.