



# **RHEINMETALL DEFENCE**

Tomorrow's security solutions, today



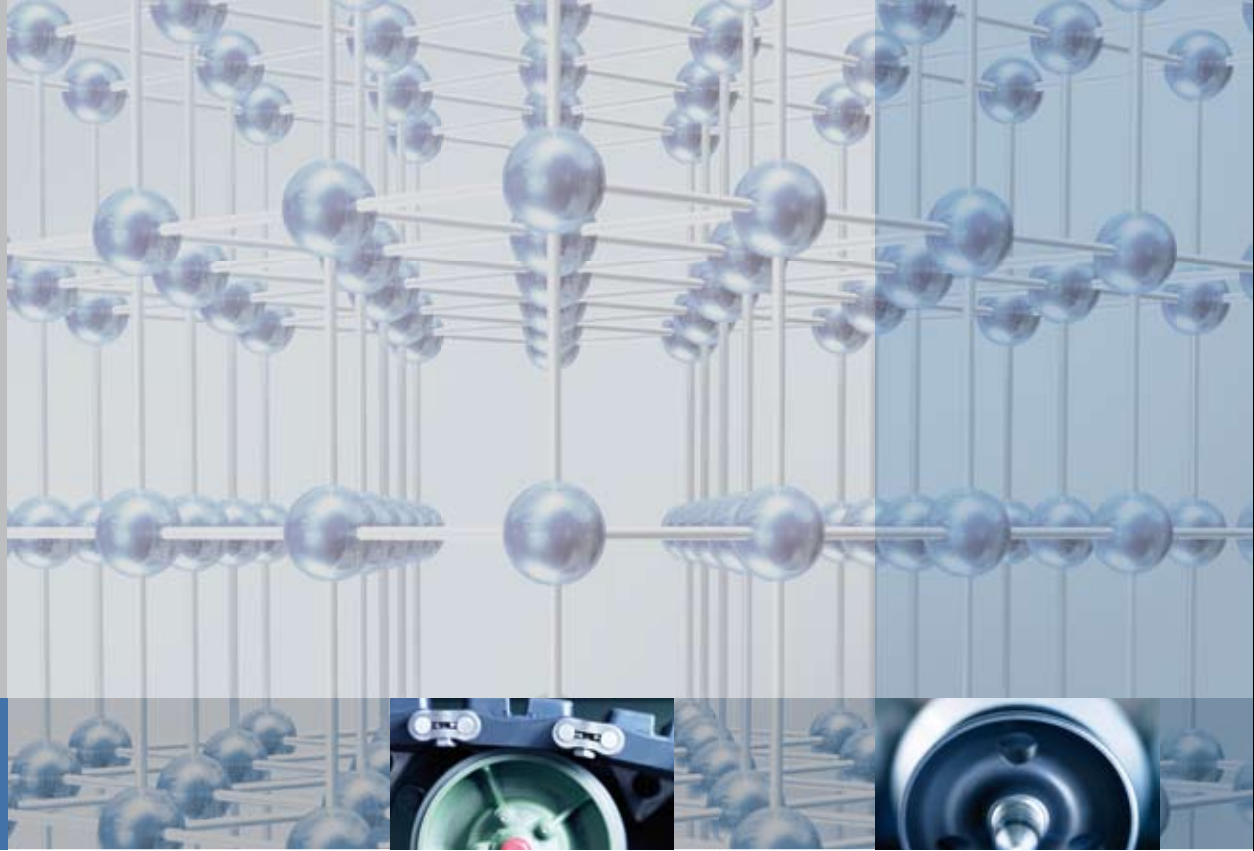




### **Rheinmetall Defence – Tomorrow’s security solutions, today**

In stark contrast to the hopefulness of the immediate post-Cold War era, the world of the 21st century turns out not to be such a safe place after all. True, the rewards of modern life still outweigh the risks. But exploiting the myriad opportunities of globalization means having to contend with a multitude of new threats to national and international security. Terrorism, organized crime, the proliferation of weapons of mass destruction, the fallout from failed states: these interlinked phenomena urgently require fresh responses and innovative peace enforcement and peacekeeping capabilities.

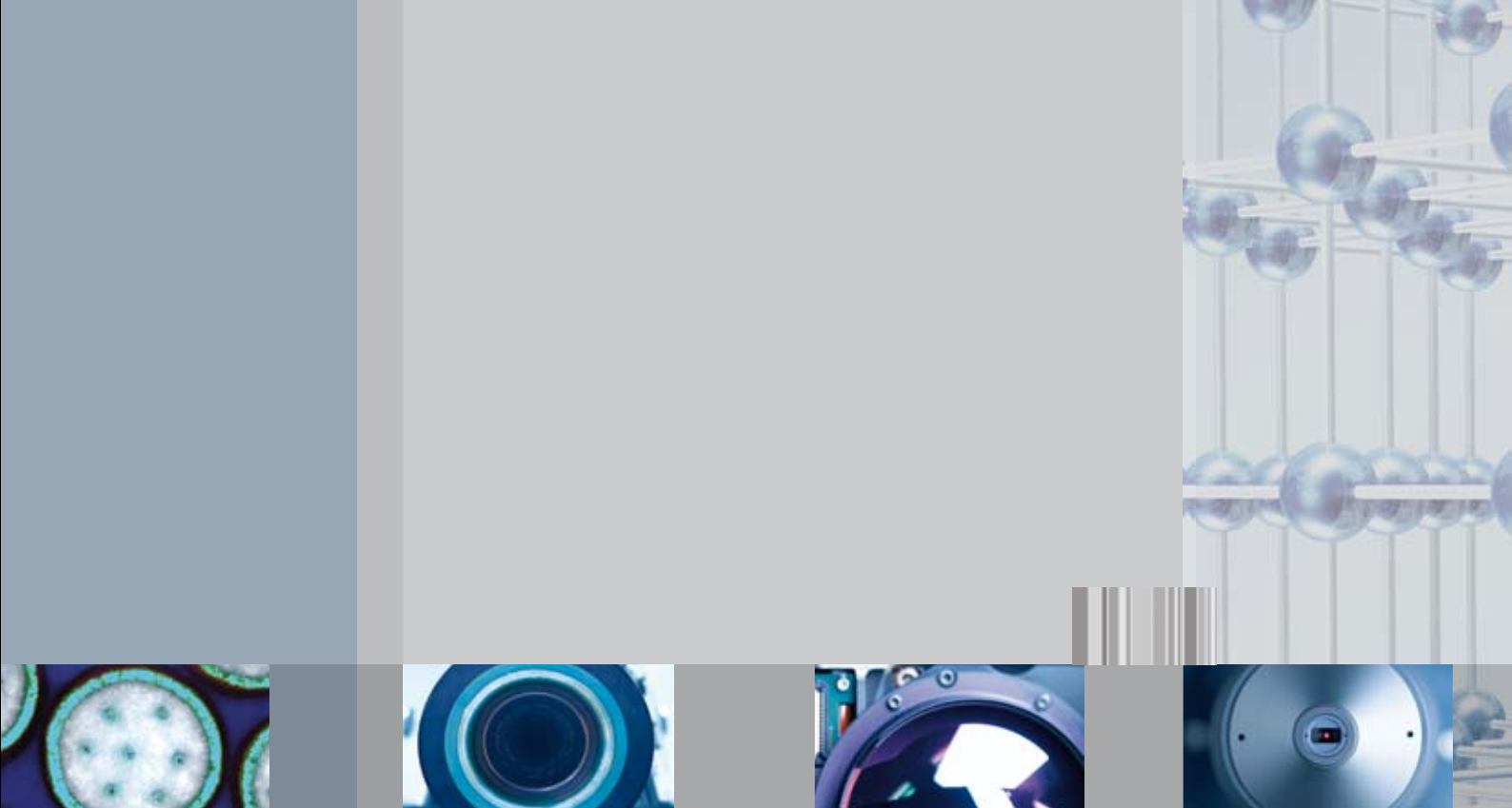
The rapidly evolving threats to our internal and external security, along with the changing nature of modern conflict, make Force Transformation a key imperative. This calls for new equipment, training and structures. Sourcing and integrating these systems and services is not easy: indeed, optimizing the ability of the armed forces to protect our societies takes a defence contractor with the experience and innovative strength of Rheinmetall.



### **A leading supplier of security and defence technology**

Part of the globe-spanning Rheinmetall Group – also a major supplier of automotive components – Rheinmetall Defence has long been a prominent member of the international defence and security industry. Last year, Rheinmetall Defence's 9,000 employees generated annual sales of 1.8 billion. As a top European supplier of army technology, we offer an extensive array of military hardware that enhances the mobility, reconnaissance capabilities, lethality and survivability of troops deployed in harm's way, and also enables the networking of national and international systems. Rheinmetall has spent years pioneering new technologies for protecting friendly forces, systematically expanding its range of products in this critical field.

Globally acclaimed, Rheinmetall Defence's core competencies stand for capabilities-oriented innovation: new generations of vehicles with optimized protection concepts, network-enabled sensors and optronics, platform-independent weapon systems, C-RAM-capable air defence and high-performance ammunition, including non-lethal variants. It makes no difference whether the task at hand relates to your country's ground, air or naval forces or all three, or whether what is at stake is your external or internal security: Rheinmetall's unrivalled capability of integrating individual components into network-based total solutions makes us a natural partner for the world's armed forces and security services of Germany, its allies and other like-minded nations.



### **Making an active contribution to Force Transformation**

Rheinmetall Defence is an active, much sought-after participant in the process of Force Transformation, turning territorial defence armies into hard-hitting rapid deployment forces capable of intervening in remote theatres of operation. To reinforce our leading position in the market we regularly augment the development work we do on behalf of customers with our own independently financed research and development activities.

Rheinmetall Defence has a fully functional Concept Development & Experimentation (CD&E) system for creating and testing networked-enabled capabilities in a state-of-the-art experimental environment: the NECLab. In a context of virtual real-time simulation, the system generates the background environment necessary for testing the behaviour of network-based solutions under highly realistic conditions – a major advantage for concept development prior to investing in new hardware. Rheinmetall Defence is taking part in current efforts to create open IT interfaces for networking high-performance technical solutions in the sensor-to-shooter chain or between platforms belonging to different branches of the military.

Other high-priority Force Transformation projects at Rheinmetall include integrated system solutions for protecting convoys and forward operating bases. Marketed under the name Protective Shield, these systems combine high-precision weaponry with advanced reconnaissance, protection and networking technology.

## SIX DIVISIONS – ONE GOAL: CREATING MISSION-ORIENTED CAPABILITIES TODAY FOR THE

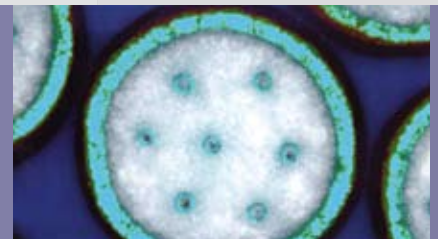
In this era of Force Transformation, creating new capabilities for the armed forces requires more than just close and timely cooperation between customer and contractor. Far more, it calls for new forms of networked thinking and working which link the company's specialized divisions not only to each other but to other contractors as well. Rheinmetall Defence's



**Land Systems**



**Weapon and Munitions**



**Propellants**

- Armoured vehicles
- Turrets and weapon stations
- Support vehicles
- Command and functional vehicles
- Services/Logistics

- Direct fire
- Indirect fire
- Infantry
- Protection systems
- Plant engineering

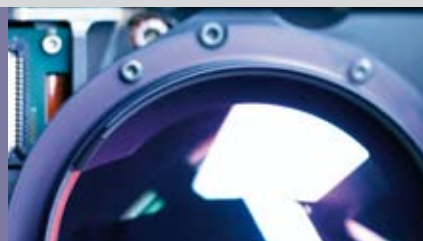
- Propellant systems
- Civil chemistry

## SECURITY CHALLENGES OF TOMORROW.

internal structure is oriented not merely to the needs of the market, but to creating mission-driven capabilities, in turn fostering system-oriented thinking. The company's innovative strengths are channelled into six specialized divisions, acting in unison to develop the defence solutions of tomorrow.



**Air Defence**



**C4ISTAR**

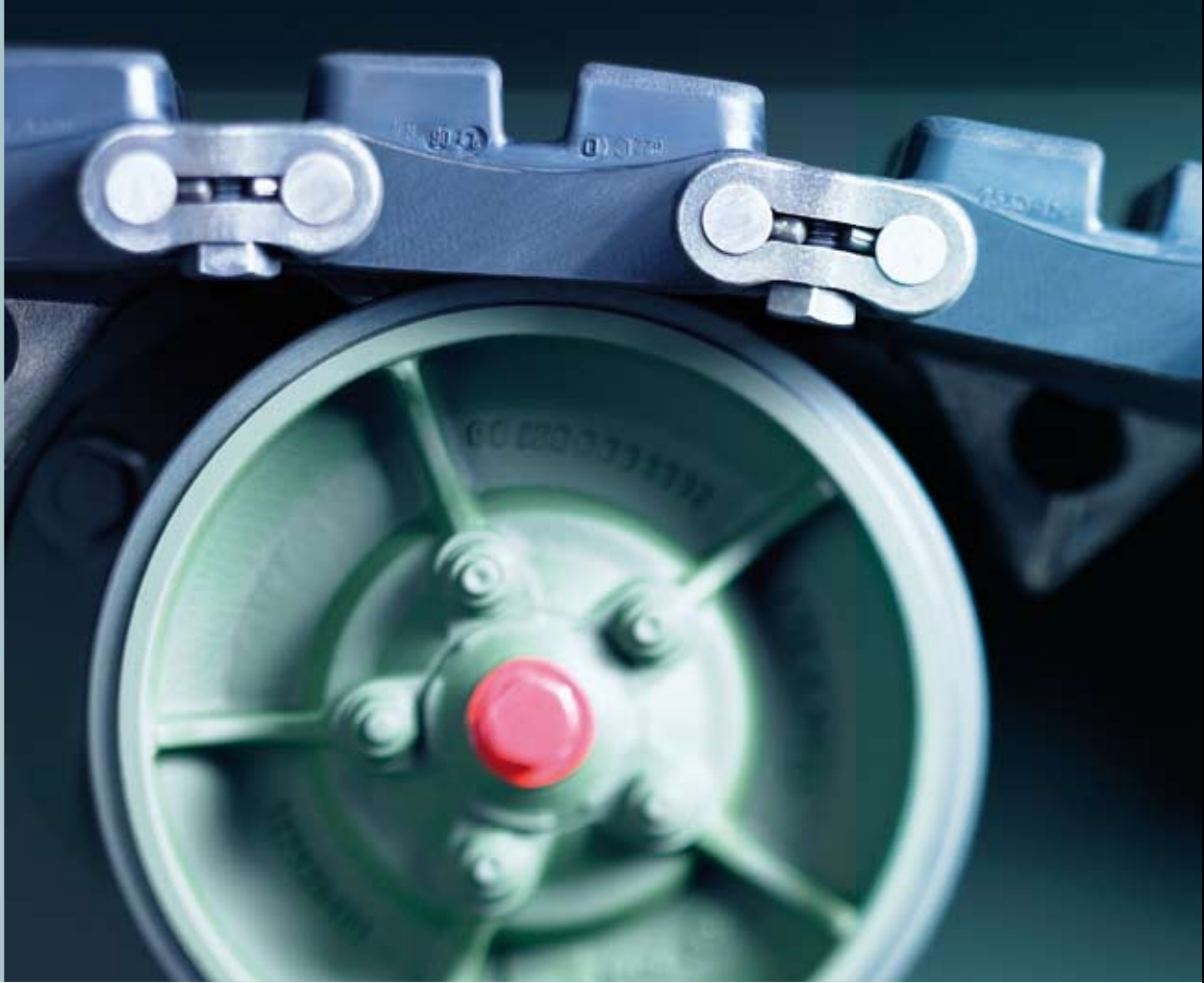


**Simulation and Training**

- Ground based air defence
- Naval air defence
- Services

- Reconnaissance
- Command
- Fire control
- Airborne systems

- Flight simulation
- Land simulation
- Maritime and process simulation



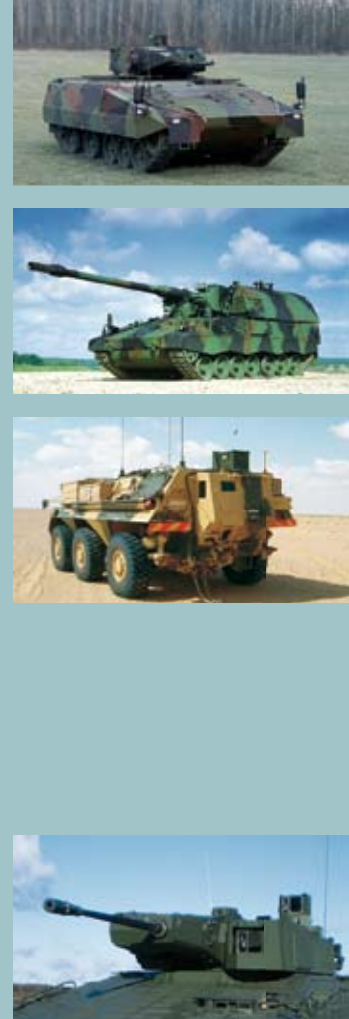
## LAND SYSTEMS

### **Mobility, Lethality, Survivability**

Today's armed forces face a whole host of highly demanding operational parameters, confronting designers of modern military vehicles with major challenges. On the one hand, tactical vehicles require better protection from a variety of new threats; on the other, they have to be readily deployable to remote corners of the globe. Moreover, they need to be extremely manoeuvrable when operating off-road, carry a large payload and pack plenty of firepower; having a network-enabled warfare capability is likewise critically important. Responding to these challenges, Rheinmetall has created new families of modularly engineered, multi-mission-capable vehicles, thus simultaneously streamlining military logistics.

Rheinmetall's Land Systems division is the Group's competence centre for tracked and wheeled armoured vehicles, turret systems and weapon stations. To date, the division has supplied more than 14,000 vehicles and subsystems to customers from 36 nations. Rheinmetall Defence is one of Europe's leading makers of light- and medium-weight systems, infantry fighting vehicles, combat support systems and self-propelled howitzers.

Our customer-oriented logistics services guarantee optimum operational readiness and a long service life for all products supplied by Rheinmetall Defence. The company's logistical reach spans the globe, to include in-theatre support for NATO and UN missions in conflict zones and crisis regions.



#### **Armoured vehicles**

- Main battle tanks
- Armoured infantry fighting vehicles
- Reconnaissance and combat vehicles
- Self-propelled howitzers
- Command reconnaissance and effect system mortar

#### **Turrets and weapon stations**

- Modular turret systems
- Lightweight weapon stations

#### **Support vehicles**

- Armoured recovery vehicles
- Combat engineering vehicles
- Armoured bridge-laying vehicles
- Mine clearing systems

- NBC-recon systems and field laboratory

#### **Command and functional vehicles**

- Advanced protective vehicle systems
- Multi-role vehicles
- Command vehicles
- Transport vehicles

#### **Services/Logistics**

- Training
- Technical publications
- Logistic support analysis
- Spare parts supply
- Maintenance



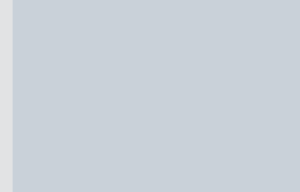
## WEAPON AND MUNITIONS

### **Weapon and protection technology on the global cutting edge**

Rheinmetall Defence's Weapon and Munitions division specializes in developing and manufacturing large- and medium-calibre weapons as well as the accompanying families of ammunition. The main armament of the Leopard 2, the world's top-performing tank – and of the PzH 2000 self-propelled howitzer – bears the Rheinmetall hallmark, as do the company's state-of-the-art MLG27 light naval gun, the MK30-2/ABM automatic cannon for Germany's new Puma infantry fighting vehicle and the latest generation of enhanced-range ammunition. And these are just a few of the outstanding products that make the Weapon and Munitions division one of the world's most innovative and trusted suppliers of army technology today.

Rapid technological advances mean that the threat of effective and intelligent weapon systems is smarter and deadlier than ever. Our Weapon and Munitions division has specialized for many years in developing and producing high-quality components and innovative systems for protecting people, vehicles, aircraft, ships and installations. Furthermore, the division is a global leader in the field of non-lethal weapons for rapid reaction forces and border control officers during peacekeeping and peace enforcement operations.

Furthermore, the division is actively working to develop and market a variety of forward-looking new technologies. These include non-lethal weapons and systems for safeguarding critical infrastructure and other assets, as well as facilities for recycling and disposing of ammunition.



### **Direct Fire**

- Smoothbore guns for main battle tanks
- Ammunition for main battle tanks
- Automatic cannons
- Aircraft cannons
- Light naval gun systems
- Medium calibre ammunition

### **Indirect Fire**

- Artillery guns
- Artillery ammunition
- Sensor fused ammunition
- Mortar weapon systems
- Mortar ammunition
- Grenade launchers

### **Infantry**

- 40 mm ammunition
- Illumination and signal devices
- Coloured and screening smoke

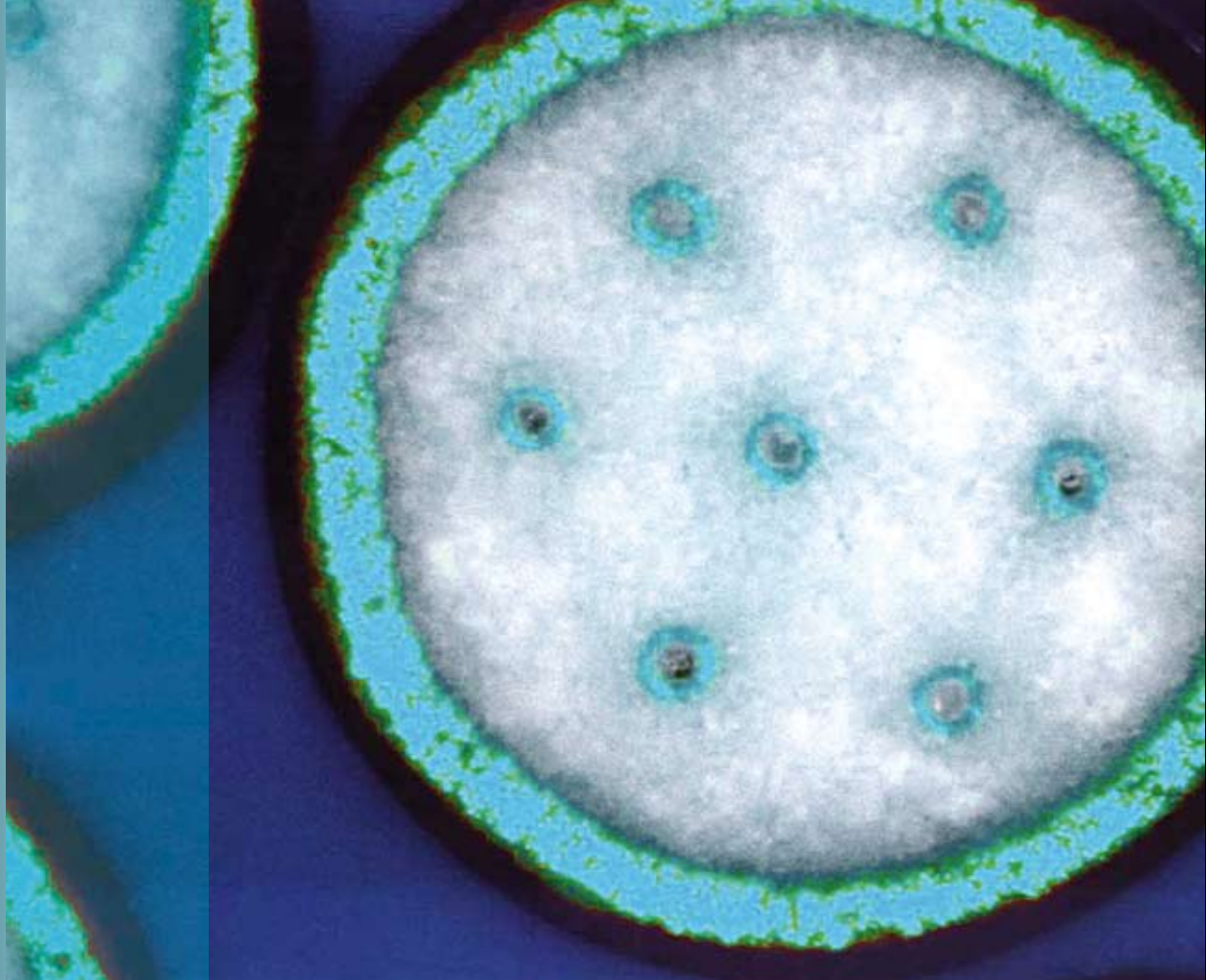
- Stun grenades
- Irritant cartridges

### **Protection systems**

- Naval multi ammunition softkill systems
- Airborne advanced flares
- Light vehicle protection systems
- Multispectral smoke grenades
- High-performance microwave technology
- Armour systems

### **Plant engineering**

- Protection systems for facilities and installations
- Ammunition recycling and disposal facilities
- Lifecycle services



## PROPELLANTS

### **High-performance components for the military market**

Faced with daunting performance expectations, advanced weapon systems depend on an optimum combination of gun barrel, ammunition and charge. Propellant systems thus form another important core competence of Rheinmetall Defence. The Propellant division's Nitrochemie Group is an innovative partner in defence technology projects and a key source of high-grade, serially produced propellant products.

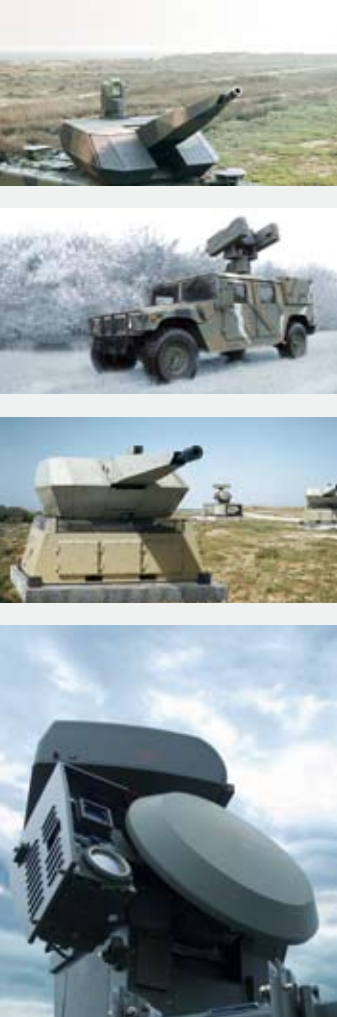
Beside artillery and mortar charge systems and propellant powder for small-, medium- and large-calibre applications, the division develops and produces propellant components, combustible cast parts and related production materials. These products include modular propelling charges for rapid-fire, long-range self-propelled howitzers and field guns, and EI propellant, developed for use in modern mortar propelling systems with combustible containers or increments.

In addition, the division supplies all types of single- and multi-based propellant powders (with and without surface treatment) for all types of ammunition, including propellant powder for hunting rifles and small-calibre sport weapons. It also manufactures and markets nitrocellulose and propellant pastes as intermediate products for the defence industry.



### **Propellant systems**

- Modular charge systems for artillery
- High-performance propellants for small-, medium-, and large-calibre ammunition systems
- Charge systems for mortar ammunition
- Nitrocellulose and propellant pastes
- Special applications for propellant technology



## AIR DEFENCE

### Guarding against the threat from above

The complex requirements imposed on short- and very short-range air defence have become much more complex in recent years. Both quantitatively and qualitatively, the air threat continues to mutate and multiply. Increasingly, the emphasis is on unmanned air vehicles and precision guided munitions that are smaller, faster and more agile than ever: only the most sophisticated air defence systems can stop them. Today, civil infrastructure needs to be defended too, particularly from terrorist attacks.

Rheinmetall Defence's Air Defence division is one of the world's foremost makers of advanced air defence systems. The company leads the global market in automatic cannon-based air defence, and is the sole system supplier able to offer fire control technology, automatic cannon, integrated guided missiles and Ahead airburst ammunition – all from a single source.

The ground forces of over forty nations count on Rheinmetall's state-of-the-art air-defence solutions. Fully automated and extremely effective, our high-performance systems are ideal for protecting forward operating bases and other high-value assets from modern asymmetric threats. Thanks to the company's newly developed Ahead technology, they can take out even the smallest RAM-type targets.

Rheinmetall Defence advises and supports clients on fielding and maintaining new and existing weapon systems. We include training programmes, and supply combat performance upgrades to extend the useful service life of systems and equipment. For example, aging automatic cannons can be retrofitted with advanced Ahead technology. Ammunition, individual weapons and complete air defence systems all undergo comprehensive testing at the company's proving ground at Ochsenboden in Switzerland.



#### **Ground based air defence**

- C-RAM capable air defence systems
- Mobile gun systems
- 35mm and Ahead ammunition
- Missile launchers
- Radar systems
- Fire control systems
- Battle management systems
- Target allocation kits

#### **Naval air defence**

- Naval gun systems
- Ahead ammunition

- Multi-sensor tracking modules
- Three-dimensional search and acquisition radars
- Target designation sights

#### **Services**

- Training
- Logistics
- Upgrades and retrofits
- Lifecycle management



## C4ISTAR

### **Smart systems for today's armed forces**

The demands imposed on the capabilities profile of contemporary armed forces are constantly changing: the machinery and modalities of modern warfare require constant streamlining and optimization. New technologies have turned information into a key factor in determining the outcome of military operations. Transforming real-time information superiority into command superiority is crucial in gaining and maintaining the upper hand on the modern battlefield.

Ground-based reconnaissance systems, unmanned air vehicles, fire control technology, C4I systems, the ability to incorporate military assets into IT networks: these are crucial features of Force Transformation and priority items for modernization.

As a longstanding partner of dozens of the world's armed forces, Rheinmetall Defence possesses a broad technological base in the field of defence electronics: working in close cooperation with our customers, we conceptualize and create new products and system solutions. The division's range of products extends from reconnaissance, fire control and command technology to guided missile platforms and drone systems for a variety of missions. Moreover, their potential inclusion in a complex network-based environment can be tested for customers under realistic conditions using NECLab, the division's "Concept Development & Experimentation" facility. Networking is also a key aspect of various Future Soldier programs underway around the world in which Rheinmetall Defence is participating.



### Reconnaissance and Fire Control

- Automatic target acquisition and tracking devices
- Observation and reconnaissance systems
- Close-up range reconnaissance systems
- Stabilized electro-optical sighting systems
- Multi sensor platforms
- 360° infrared search and track reconnaissance sensors
- Cooled and non-cooled thermal imaging systems
- Satellite radio reconnaissance systems
- Fire control systems
- Modular laser fire control systems
- Optronic sighting systems

- Laser light modules
- Friend enemy target recognition systems

### Command

- System solutions – Future Soldier
- Command and control systems
- Soldier command systems

### Airborne systems

- Reconnaissance and target detection UAVs
- Ground control stations
- Systems for standoff engagement of individual targets
- Cargo loading systems



## SIMULATION AND TRAINING

### **Realistic training under laboratory conditions**

Simulators spare real-world equipment from wear-and-tear and exposure to the elements, as well as enabling training in extreme situations that would be virtually impossible to practise in the field. Moreover, they can be used under all weather conditions and around the clock. Simulators lend themselves extremely well to ground, air and naval forces as well as civil sector users, recreating a realistic environment for training individual operators and crews. Moreover, they can be used to train entire units in tactical operations to prepare troops for out-of-area peace enforcement missions.

Packed with state-of-the-art technology, combat simulators from Rheinmetall Defence enable digital transmission of all sequences, movements and weapon effects to the exercise control cell, where the current situation is continuously depicted and events can be reproduced at any time for evaluating and reviewing the exercise.

From urban combat exercises for infantrymen in our MOUT centre to tactical drills for submarine crews in a full-scale operations centre to our innovative Avior® laser projection system for training pilots – whose advanced laser technology generates extraordinary contrast, colour variety, absolute colour stability and constant colour convergence – Rheinmetall Defence is one of the world's leading suppliers and operators of simulation and training systems.



### **Flight simulation**

- Fast jet simulators
- Helicopter simulators
- Night vision cockpit procedure trainer
- Laser projection systems
- Computer based training

### **Land simulation**

- Combat training centres
- Direct fire weapons effect simulators
- CTC-player units
- MOUT training systems

- Tactical simulation systems
- Tank driving simulators
- Police simulators

### **Maritime and process simulation**

- Anti submarine warfare
- Mine hunting simulators
- Combat information centres
- Ship handling simulators
- Ship engine simulators
- Safety and security training environments
- Power plant and process simulators

# OUR INTERNATIONAL PRESENCE IS POWERING FUTURE GROWTH



Rheinmetall Defence is an increasingly global enterprise. Beside subsidiaries in Europe, North America, South Africa and Asia, the Group maintains a densely woven network of local offices and representatives worldwide. While the German armed forces continue to be an important reference and Rheinmetall Defence's largest customer, exports now account for over 60% of sales.

## Germany

Duesseldorf	Neuenburg
Aschau	Nuremberg
Berlin	Oberndorf
Bonn	Rostock
Bremen	Schneizdreuth
Gersthofen	Silberhuetten
Ismaning	Stockach
Kassel	Trittau
Kiel	Unterlues
Koblenz	

## Greece

Athens

## India

New Delhi

## Italy

Rome  
Lainate

## Canada

Saint-Jean-sur-Richelieu

## Malaysia

Malacca

## The Netherlands

Amsterdam

## Austria

Schwanenstadt

## Poland

Warsaw



**Switzerland**

Zurich  
Altdorf  
Studen  
Urdorf  
Wimmis  
Lohn-Ahmansegg

**Singapore**

Singapore

**South Africa**

Pretoria

**Turkey**

Ankara

**USA**

Camden  
Quantico

**UAE**

Abu Dhabi



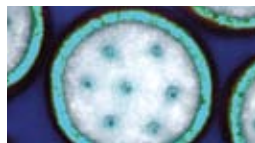
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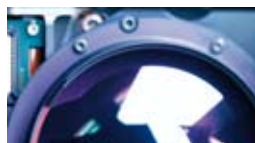
#### **Propellants**

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