

Vehicle Armor Materials Market by Type (Metals & Alloys, Ceramics, Composites, Fiberglass, Aramid Fibers), Application (Defense, Para Military, Police, Security Agencies, Personal), and Region (North America, Europe, APAC, ROW) - Global Forecast to 2029

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Abstracts

The vehicle armor materials market is projected to reach USD 9.3 billion by 2029, at a CAGR of 6.7% from USD 6.7 billion in 2024. The vehicle armor materials market is experiencing rapid expansion, driven by a combination of factors that reflect both the evolving nature of global security threats and technological advancements in material science. This growth is underpinned by increasing demand from military, law enforcement, and civilian sectors for vehicles that offer enhanced protection without compromising on performance or mobility. Firstly, the global landscape of security threats is continuously changing, with armed conflicts, terrorism, and urban violence presenting complex challenges. This unpredictable environment has necessitated the development of armored vehicles capable of providing superior protection against a wide array of threats, from high-velocity projectiles to explosive devices. As a result, defense forces and security agencies worldwide are investing significantly in upgrading their fleets with the latest armor technologies, fueling market growth. Secondly, technological advancements in materials science have led to the development of innovative armor materials that offer improved ballistic resistance while being lighter and more durable. Composite armors, incorporating ceramics, ultra-high molecular weight polyethylene (UHMWPE), and advanced metallic alloys, are at the forefront of these developments. These materials not only provide superior protection but also contribute to the overall vehicle performance by reducing weight, thereby enhancing fuel efficiency and speed. Additionally, the civilian sector's interest in personal security has spurred



demand for armored passenger vehicles, further broadening the market's scope. This demand is particularly pronounced in regions with high crime rates or political instability, where the safety of individuals and corporate assets is a paramount concern. Regulatory factors also play a significant role in the market's expansion. Governments and international bodies are implementing stringent safety standards and regulations, pushing manufacturers to adopt the latest armor technologies and materials to comply with these requirements. This regulatory pressure ensures a continuous cycle of innovation and adoption within the industry. Lastly, the market is witnessing increased collaboration between vehicle manufacturers, material scientists, and defense contractors. These partnerships aim to integrate armor solutions during the vehicle design phase, leading to the development of platforms that are optimized for protection, performance, and cost-effectiveness from the ground up.

"Composites, by type, accounts for the second-largest market share in 2024."

Composites represent the second largest material type in the vehicle armor materials market, standing out as a pivotal component due to their unique blend of properties that traditional materials like metals cannot match. This category has gained prominence for several reasons, which are integral to understanding its position and role in the market. The core advantage of composite materials lies in their exceptional strength-to-weight ratio. Composites can provide similar or superior levels of ballistic protection as metals while significantly reducing the overall weight of the armor. This reduction in weight is crucial for vehicle performance, allowing for greater mobility, increased payload capacity, and improved fuel efficiency — factors that are especially important in military operations where agility and endurance are paramount. Another key feature of composites is their versatility in protection capabilities. By adjusting the composition and layering of materials, manufacturers can tailor armor solutions to protect against a wide range of threats, from small arms fire to explosive devices. This customization enables the development of specialized armor systems for different operational requirements, enhancing the versatility and applicability of armored vehicles across various scenarios. Technological advancements have also propelled composites to the forefront of the vehicle armor materials market. Innovations in material science and manufacturing processes have led to the development of new composite materials that offer improved ballistic resistance, durability, and environmental resistance. These advancements not only enhance the protective capabilities of composites but also contribute to cost efficiency over the armor's lifecycle, considering factors like maintenance, repair, and replacement. Furthermore, the integration of composites in vehicle armor aligns with the growing emphasis on survivability and crew protection as primary design considerations. Composites can be engineered to absorb and disperse the energy from



impacts and blasts more effectively than traditional materials, reducing the risk of injury to occupants and ensuring the structural integrity of the vehicle in combat situations. The environmental impact of materials used in vehicle armor is increasingly becoming a concern, and here too, composites offer benefits. They are often more environmentally friendly to produce and dispose of than traditional armor materials, aligning with global efforts to reduce the environmental footprint of defense and security operations.

"Defense is expected to be the fastest growing at CAGR 6.9% for vehicle armor materials market during the forecast period, in terms of value."

The defense sector's position as the fastest-growing segment in the vehicle armor materials market is fundamentally linked to the evolving nature of global security challenges and the progressive adaptation of military requirements. This growth is fueled by several interconnected factors that underscore the sector's pressing need for advanced protective solutions. Firstly, the modern battlefield is characterized by an everchanging threat landscape, where adversaries deploy a variety of tactics and increasingly sophisticated weaponry. The imperative to safeguard military personnel and assets against a broad spectrum of threats, ranging from conventional ballistic attacks to improvised explosive devices (IEDs) and advanced anti-armor systems, drives the demand for innovative armor materials. These materials must offer not only enhanced ballistic protection but also reduced weight to improve vehicle mobility and fuel efficiency, which are critical in combat scenarios. Technological advancements in material science significantly contribute to the sector's growth. The development of new composite materials, advanced ceramics, and ultra-high-strength alloys has led to the creation of armor that combines superior protective capabilities with significant weight reductions. This dual benefit directly addresses the military's operational needs for vehicles that can swiftly maneuver in diverse terrains while ensuring the highest levels of protection. Such innovations also extend the service life of armored vehicles, offering better resistance to wear and environmental conditions, which is crucial for maintaining operational readiness. Another pivotal factor is the increase in defense budgets globally, with a considerable portion earmarked for the modernization and procurement of military vehicles. This financial backing facilitates the adoption of cutting-edge armor technologies, reflecting a widespread commitment to enhancing force survivability. Governments and defense departments recognize the strategic value of investing in advanced armor solutions as part of broader efforts to maintain a qualitative edge in military capabilities. Furthermore, there is an acute focus on personnel safety within the defense sector. The enhanced protection provided by advanced armor materials directly contributes to reducing casualties and injuries in conflict situations. This emphasis on survivability has catalyzed the integration of sophisticated armor systems into a wide



range of military vehicles, from front-line combat platforms to support and logistics vehicles, ensuring comprehensive protection for troops across all operational contexts. Additionally, the demand for multi-mission capabilities in military operations necessitates vehicles that are adaptable and can be quickly reconfigured with different armor packages to meet the requirements of specific missions, whether in urban combat, reconnaissance, or peacekeeping roles. The defense sector's need for modular and scalable armor solutions underscores the importance of versatility in vehicle design and protection, driving continuous innovation in the vehicle armor materials market. Lastly, regulatory and standardization efforts by military organizations and international defense standards bodies play a crucial role in shaping the market. These entities regularly update protection requirements, pushing manufacturers to continuously refine and enhance their armor offerings to comply with the latest standards. This ensures that military vehicles are equipped with the most effective and up-to-date protective technologies, ready to face current and future threats on the battlefield.

"Based on region, Europe was the second largest market for vehicle armor materials market in 2024."

Europe holds the position of the second largest market for vehicle armor materials, a status underpinned by several key factors that reflect the region's unique geopolitical, economic, and technological landscape. Firstly, Europe's complex security environment, marked by evolving threats both within and at the borders of the continent, necessitates advanced protective solutions for military and civilian vehicles alike. This need is accentuated by ongoing tensions in various regions, the rise in terrorism, and the need for peacekeeping and humanitarian missions, driving demand for armored vehicles equipped with the latest material innovations. Moreover, Europe boasts a robust industrial base with some of the world's leading defense contractors and material science companies. This industrial ecosystem fosters significant research and development activities, leading to technological advancements in armor materials that cater to the stringent requirements of both European and global defense markets. European companies are at the forefront of developing innovative composite materials, ceramics, and lightweight alloys, contributing to the global supply chain of advanced armor solutions. The region's commitment to regulatory standards and collaborative defense initiatives also plays a crucial role. European countries, through frameworks like the European Defence Agency (EDA), actively pursue standardization and interoperability in defense procurement, including vehicle armor. This encourages harmonization in defense spending and fosters a market environment conducive to innovation and cross-border collaboration. Economic factors, including sustained defense spending among European NATO members committed to meeting their



defense investment pledges, further stimulate the vehicle armor materials market. These investments are directed towards modernizing military fleets, enhancing national and collective defense capabilities, and ensuring the safety of military personnel, all of which require the latest in vehicle armor technology. Lastly, the civilian sector in Europe contributes to the demand for armored vehicles, driven by concerns over personal security and the protection of assets in regions with high rates of crime or political instability. This civilian market segment, although smaller than the military sector, underscores the diverse applications of vehicle armor materials and the broad spectrum of protection needs across the continent.

In the process of determining and verifying the market size for several segments and subsegments identified through secondary research, extensive primary interviews were conducted. A breakdown of the profiles of the primary interviewees is as follows:

By Company Type: Tier 1 - 40%, Tier 2 - 30%, and Tier 3 - 30%

By Designation: C-Level - 20%, Director Level - 10%, and Others - 70%

By Region: North America - 20%, Europe -30%, Asia Pacific - 30%, Middle East & Africa - 10%, and South America-10%

The key players in this market are DuPont De Nemours, Inc. US), Saint-Gobain SA (France), ATI, Inc. (US), Honeywell international Inc. (US), Teijin Limited (Japan), Alcoa Corporation (US), Tata Steel Limited (India), Ceramtec (Germany), SSAB AB (Sweden), Morgan Advanced Materials (UK) etc.

Research Coverage

This report segments the market for the vehicle armor materials market on the basis of type, application, form, end-use industry and region. It provides estimations for the overall value of the market across various regions. A detailed analysis of key industry players has been conducted to provide insights into their business overviews, products & services, key strategies, new product launches, expansions, and mergers & acquisitions associated with the market for the vehicle armor materials market.

Key benefits of buying this report

This research report is focused on various levels of analysis — industry analysis



(industry trends), market ranking analysis of top players, and company profiles, which together provide an overall view of the competitive landscape, emerging and highgrowth segments of the vehicle armor materials market; high-growth regions; and market drivers, restraints, opportunities, and challenges.

The report provides insights on the following pointers:

Analysis of key drivers: Technological advancements in the electronics industry coupled with rise in demand for hydrogen peroxide in the semiconductor industry.

Market Penetration: Comprehensive information on the vehicle armor materials market offered by top players in the global vehicle armor materials market.

Product Development/Innovation: Detailed insights on upcoming technologies, research & development activities, and new product launches in the vehicle armor materials market.

Market Development: Comprehensive information about lucrative emerging markets — the report analyzes the markets for the vehicle armor materials market across regions.

Market Diversification: Exhaustive information about new products, untapped regions, and recent developments in the global vehicle armor materials market.

Competitive Assessment: In-depth assessment of market shares, strategies, products, and manufacturing capabilities of leading players in the vehicle armor materials market.





Contents

1 INTRODUCTION

1.1 STUDY OBJECTIVES
1.2 MARKET DEFINITION
1.3 INCLUSIONS & EXCLUSIONS
1.4 MARKET SCOPE
FIGURE 1 VEHICLE ARMOR MATERIALS MARKET SEGMENTATION
1.4.1 REGIONS COVERED
1.4.2 YEARS CONSIDERED
1.5 CURRENCY CONSIDERED
1.6 UNITS CONSIDERED
1.7 LIMITATIONS

1.8 STAKEHOLDERS

2 RESEARCH METHODOLOGY

2.1 RESEARCH DATA

FIGURE 2 VEHICLE ARMOR MATERIALS MARKET: RESEARCH DESIGN

- 2.1.1 SECONDARY DATA
- 2.1.1.1 Key data from secondary sources
- 2.1.2 PRIMARY DATA
 - 2.1.2.1 Primary data sources
- 2.1.2.2 Key vehicle armor material manufacturers
- 2.1.2.3 Breakdown of interviews with experts
- 2.1.2.4 Key industry insights
- 2.2 BASE NUMBER CALCULATION
 - 2.2.1 APPROACH 1: SUPPLY-SIDE ANALYSIS
 - 2.2.2 APPROACH 2: DEMAND-SIDE ANALYSIS
- 2.3 FORECAST NUMBER CALCULATION
 - 2.3.1 SUPPLY SIDE
 - 2.3.2 DEMAND SIDE
- 2.4 MARKET SIZE ESTIMATION

FIGURE 3 MARKET SIZE ESTIMATION METHODOLOGY: REVENUE OF MARKET PLAYERS

2.4.1 BOTTOM-UP APPROACH

2.4.2 TOP-DOWN APPROACH

2.5 DATA TRIANGULATION



FIGURE 4 VEHICLE ARMOR MATERIALS MARKET: DATA TRIANGULATION 2.6 ASSUMPTIONS 2.7 RECESSION IMPACT 2.8 GROWTH FORECAST 2.9 RISK ASSESSMENT

3 EXECUTIVE SUMMARY

FIGURE 5 METALS & ALLOYS SEGMENT TO DOMINATE MARKET BETWEEN 2024 AND 2029 FIGURE 6 DEFENSE APPLICATION TO LEAD MARKET BETWEEN 2024 AND 2029 FIGURE 7 ASIA PACIFIC TO DOMINATE MARKET DURING FORECAST PERIOD

4 PREMIUM INSIGHTS

4.1 ATTRACTIVE OPPORTUNITIES FOR PLAYERS IN VEHICLE ARMOR
MATERIALS MARKET
FIGURE 8 GROWING DEMAND FROM DEFENSE AND PARAMILITARY SECTORS
TO DRIVE MARKET
4.2 VEHICLE ARMOR MATERIALS MARKET, BY TYPE
FIGURE 9 METALS & ALLOYS TO BE FASTEST-GROWING SEGMENT DURING
FORECAST PERIOD
4.3 VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY
FIGURE 10 INDIA TO BE FASTEST-GROWING MARKET DURING FORECAST
PERIOD

5 MARKET OVERVIEW

- 5.1 INTRODUCTION
- 5.2 MARKET DYNAMICS

FIGURE 11 DRIVERS, RESTRAINTS, OPPORTUNITIES, AND CHALLENGES IN VEHICLE ARMOR MATERIALS MARKET

5.2.1 DRIVERS

- 5.2.1.1 Military modernization programs in developed economies
- 5.2.1.2 Growing security concern for commercial vehicles
- 5.2.1.3 Growing urban warfare and asymmetric threat

5.2.2 RESTRAINTS

5.2.2.1 Stringent regulatory framework

5.2.3 OPPORTUNITIES



5.2.3.1 Developments in defense & military sector

5.2.3.2 Need for customized armored vehicles

5.2.3.3 Changing battlefield scenario

5.2.4 CHALLENGES

5.2.4.1 High cost of lightweight armor materials

5.3 PORTER'S FIVE FORCES ANALYSIS

TABLE 1 VEHICLE ARMOR MATERIALS MARKET: PORTER'S FIVE FORCES ANALYSIS

5.3.1 THREAT OF SUBSTITUTES

5.3.2 THREAT OF NEW ENTRANTS

5.3.3 BARGAINING POWER OF SUPPLIERS

5.3.4 BARGAINING POWER OF BUYERS

5.3.5 INTENSITY OF COMPETITIVE RIVALRY

FIGURE 12 PORTER'S FIVE FORCES ANALYSIS: VEHICLE ARMOR MATERIALS MARKET

5.4 TRENDS/DISRUPTIONS IMPACTING CUSTOMER BUSINESS

5.4.1 REVENUE SHIFT AND NEW REVENUE POCKETS FOR VEHICLE ARMOR MATERIAL MANUFACTURERS

FIGURE 13 REVENUE SHIFT AND NEW REVENUE POCKETS IN VEHICLE ARMOR MATERIALS MARKET

5.5 ECOSYSTEM MAP

TABLE 2 VEHICLE ARMOR MATERIALS MARKET: ROLE IN ECOSYSTEM5.6 TARIFF AND REGULATORY LANDSCAPE

5.6.1 REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS

TABLE 3 NORTH AMERICA: LIST OF REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS

TABLE 4 EUROPE: LIST OF REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS

TABLE 5 ASIA PACIFIC: LIST OF REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS

TABLE 6 MIDDLE EAST & AFRICA: LIST OF REGULATORY BODIES,

GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS

TABLE 7 SOUTH AMERICA: LIST OF REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS

5.6.2 REGULATIONS RELATED TO VEHICLE ARMOR MATERIALS MARKET TABLE 8 LIST OF REGULATIONS FOR VEHICLE ARMOR MATERIALS MARKET 5.7 VALUE CHAIN ANALYSIS

FIGURE 14 VEHICLE ARMOR MATERIALS MARKET: VALUE CHAIN ANALYSIS



5.7.1 RAW MATERIAL SUPPLIERS

5.7.2 RESEARCH AND DEVELOPMENT

5.7.2.1 Material processing and development

5.7.2.2 Design and engineering

5.7.3 APPLICATION/FORMULATORS

5.7.3.1 Manufacturing and production

5.7.3.2 Testing and certification

5.7.3.3 Distribution, integration, and installation

5.7.3.4 Aftermarket support and services

5.7.4 END USERS

5.8 INVESTMENT AND FUNDING

FIGURE 15 INVESTMENT AND FUNDING SCENARIO: VEHICLE ARMOR

MATERIALS MARKET

5.9 TECHNOLOGY ANALYSIS

TABLE 9 TECHNOLOGIES USED IN VEHICLE ARMOR MATERIALS MARKET 5.10 PRICING ANALYSIS

5.10.1 AVERAGE SELLING PRICE TREND, BY REGION

TABLE 10 AVERAGE SELLING PRICE, BY REGION, 2020–2029 (USD/KG) FIGURE 16 VEHICLE ARMOR MATERIALS MARKET: AVERAGE SELLING PRICE TREND, BY REGION

5.10.2 AVERAGE SELLING PRICE, BY TYPE

TABLE 11 AVERAGE SELLING PRICE, BY TYPE, 2020–2029 (USD/KG)

5.10.3 AVERAGE SELLING PRICE OF KEY PLAYERS, BY TOP THREE TYPES TABLE 12 AVERAGE SELLING PRICE OF KEY PLAYERS, BY TYPE, (USD/KG) FIGURE 17 AVERAGE SELLING PRICE OF KEY PLAYERS, BY TOP THREE TYPES 5.11 PATENT ANALYSIS

5.11.1 METHODOLOGY

5.11.2 PATENTS GRANTED WORLDWIDE, 2014–2024

TABLE 13 VEHICLE ARMOR MATERIALS MARKET: TOTAL NUMBER OF PATENTS 5.11.3 PATENT PUBLICATION TRENDS

FIGURE 18 NUMBER OF PATENTS GRANTED (2014?2023)

5.11.4 INSIGHTS

5.11.5 LEGAL STATUS OF PATENTS

FIGURE 19 VEHICLE ARMOR MATERIALS MARKET: LEGAL STATUS OF PATENTS 5.11.6 JURISDICTION ANALYSIS

FIGURE 20 PATENTS ANALYSIS FOR VEHICLE ARMOR MATERIALS, BY JURISDICTION (2014?2023)

5.11.7 TOP COMPANIES/APPLICANTS

FIGURE 21 TOP 10 COMPANIES WITH HIGHEST NUMBER OF PATENTS IN LAST



10 YEARS

TABLE 14 LIST OF MAJOR PATENT OWNERS FOR VEHICLE ARMOR MATERIALS 5.11.8 LIST OF MAJOR PATENTS

TABLE 15 MAJOR PATENTS FOR VEHICLE ARMOR MATERIALS

5.12 TRADE ANALYSIS

5.12.1 IMPORT SCENARIO

FIGURE 22 IMPORT OF VEHICLE ARMOR MATERIALS, BY COUNTRY, 2019–2022 (USD MILLION)

5.12.2 EXPORT SCENARIO

FIGURE 23 EXPORT OF VEHICLE ARMOR MATERIALS, BY COUNTRY, 2019–2022 (USD MILLION)

5.13 CASE STUDY ANALYSIS

5.13.1 ADOPTION OF DESIGN FOR ARMORING TO OPTIMIZE PROTECTION

5.13.1.1 Objective

5.13.1.2 Solution statement

5.13.1.3 Conclusion

5.14 KEY CONFERENCES & EVENTS, 2024–2025

TABLE 16 VEHICLE ARMOR MATERIALS MARKET: DETAILED LIST OF

CONFERENCES & EVENTS

5.15 KEY STAKEHOLDERS AND BUYING CRITERIA

5.15.1 KEY STAKEHOLDERS IN BUYING PROCESS

FIGURE 24 INFLUENCE OF STAKEHOLDERS ON BUYING PROCESS FOR TOP THREE APPLICATIONS

TABLE 17 INFLUENCE OF STAKEHOLDERS ON BUYING PROCESS FOR TOP THREE APPLICATIONS (%)

5.15.2 BUYING CRITERIA

FIGURE 25 KEY BUYING CRITERIA FOR TOP THREE APPLICATIONS

TABLE 18 KEY BUYING CRITERIA FOR TOP THREE APPLICATIONS

6 VEHICLE ARMOR MATERIALS MARKET, BY TYPE

6.1 INTRODUCTION

FIGURE 26 METALS & ALLOYS TO ACCOUNT FOR LARGEST SHARE OF VEHICLE ARMOR MATERIALS MARKET

TABLE 19 VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 20 VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 21 VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2020–2023



(KILOTON)

TABLE 22 VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2024–2029

(KILOTON)

6.2 METALS & ALLOYS

6.2.1 NEED FOR EXTENSIVE SHIELDING ON TANKS AND VEHICLES TO DRIVE DEMAND FOR METAL ARMOR

- 6.2.2 TITANIUM
- 6.2.3 ALUMINIUM
- 6.2.4 HIGH-DENSITY STEEL
- 6.3 CERAMICS

6.3.1 PROVIDE HARDNESS AS WELL AS HEAT RESISTANCE PROPERTIES TO ARMOR

- 6.3.2 ALUMINUM OXIDE
- 6.3.3 SILICON CARBIDE
- 6.3.4 BORON CARBIDE
- 6.3.5 CERAMIC MATRIX COMPOSITES
- 6.3.6 OTHERS
- 6.4 COMPOSITES

6.4.1 DEMAND FOR COMPOSITES IN VEHICLE ARMOR DRIVEN BY THEIR

- LIGHTWEIGHT, STRENGTH, AND FLEXIBILITY
 - 6.4.2 FIBERS
 - 6.4.3 FABRICS
 - 6.4.4 MATRIX MATERIALS
 - 6.4.5 PREPREGS
 - 6.4.6 HYBRID COMPOSITES
 - 6.4.7 3D COMPOSITES

6.5 ARAMID FIBER

6.5.1 DEMAND FOR ARAMID FIBER INCREASING IN VEHICLE ARMOR DUE TO ITS FLEXIBILITY

6.6 FIBERGLASS

6.6.1 AUTOMOTIVE INDUSTRY EXTENSIVELY USING FIBERGLASS FOR VEHICLE ARMOR DUE TO ITS LIGHTWEIGHT NATURE

6.7 OTHER TYPES

7 VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION

7.1 INTRODUCTION FIGURE 27 DEFENSE TO BE LARGEST APPLICATION OF VEHICLE ARMOR MATERIALS MARKET



TABLE 23 VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 24 VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

7.2 DEFENSE

7.2.1 DEFENSE TO BE FASTEST-GROWING END USER OF VEHICLE ARMOR MATERIALS

7.3 PARAMILITARY

7.3.1 ARMORED VEHICLES WIDELY USED TO SAFEGUARD PERSONNEL IN HIGH-RISK ENVIRONMENTS

7.4 POLICE

7.4.1 INCREASING CONCERN FOR SAFETY AND PROTECTION OF LAW ENFORCEMENT OFFICERS TO DRIVE GROWTH

7.5 SECURITY AGENCIES

7.5.1 DEMAND FOR ARMOR MATERIAL TO WITNESS SIGNIFICANT GROWTH IN SECURITY AGENCIES SEGMENT

7.6 PERSONAL

7.6.1 HIGH CRIME RATES AND ACCIDENTS DRIVING DEMAND FOR SAFE AND ARMORED VEHICLES

7.7 OTHER APPLICATIONS

8 VEHICLE ARMOR MATERIALS MARKET, BY REGION

8.1 INTRODUCTION

FIGURE 28 ASIA PACIFIC TO BE FASTEST-GROWING MARKET DURING

FORECAST PERIOD

TABLE 25 VEHICLE ARMOR MATERIALS MARKET, BY REGION, 2020–2023 (USD MILLION)

TABLE 26 VEHICLE ARMOR MATERIALS MARKET, BY REGION, 2024–2029 (USD MILLION)

TABLE 27 VEHICLE ARMOR MATERIALS MARKET, BY REGION, 2020–2023 (KILOTON)

TABLE 28 VEHICLE ARMOR MATERIALS MARKET, BY REGION, 2024–2029 (KILOTON)

TABLE 29 VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 30 VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 31 VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2020–2023



(KILOTON)

TABLE 32 VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2024–2029 (KILOTON)

TABLE 33 VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 34 VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.2 ASIA PACIFIC

8.2.1 RECESSION IMPACT

FIGURE 29 ASIA PACIFIC: VEHICLE ARMOR MATERIALS MARKET SNAPSHOT TABLE 35 ASIA PACIFIC: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2020–2023 (USD MILLION)

TABLE 36 ASIA PACIFIC: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2024–2029 (USD MILLION)

TABLE 37 ASIA PACIFIC: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2020–2023 (KILOTON)

TABLE 38 ASIA PACIFIC: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2024–2029 (KILOTON)

TABLE 39 ASIA PACIFIC: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 40 ASIA PACIFIC: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 41 ASIA PACIFIC: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2020–2023 (KILOTON)

TABLE 42 ASIA PACIFIC: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2024–2029 (KILOTON)

TABLE 43 ASIA PACIFIC: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 44 ASIA PACIFIC: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.2.1.1 China

8.2.1.1.1 Significant capital investment to drive market

TABLE 45 CHINA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 46 CHINA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.2.1.2 JAPAN

8.2.1.2.1 Technological developments to drive market

TABLE 47 JAPAN: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION,



2020-2023 (USD MILLION)

TABLE 48 JAPAN: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.2.1.3 SOUTH KOREA

8.2.1.3.1 Growing private sector and investment by public companies to drive market

TABLE 49 SOUTH KOREA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 50 SOUTH KOREA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.2.1.4 INDIA

8.2.1.4.1 Increasing demand for cash-in-transit and VIP protection vehicles to drive market

TABLE 51 INDIA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 52 INDIA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.2.1.5 Rest of Asia Pacific

TABLE 53 REST OF ASIA PACIFIC: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 54 REST OF ASIA PACIFIC: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.3 NORTH AMERICA

8.3.1 RECESSION IMPACT

FIGURE 30 NORTH AMERICA: VEHICLE ARMOR MATERIALS MARKET SNAPSHOT TABLE 55 NORTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2020–2023 (USD MILLION)

TABLE 56 NORTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2024–2029 (USD MILLION)

TABLE 57 NORTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2020–2023 (KILOTON)

TABLE 58 NORTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2024–2029 (KILOTON)

TABLE 59 NORTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 60 NORTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 61 NORTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2020–2023 (KILOTON)



TABLE 62 NORTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2024–2029 (KILOTON)

TABLE 63 NORTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 64 NORTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.3.1.1 US

8.3.1.1.1 High military spending and constant research for upgrading military equipment to drive market

TABLE 65 US: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 66 US: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.3.1.2 Canada

8.3.1.2.1 Increasing investment in industrial sectors to drive market TABLE 67 CANADA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 68 CANADA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.3.1.3 Mexico

8.3.1.3.1 Increasing presence of armor manufacturing companies to drive market TABLE 69 MEXICO: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 70 MEXICO: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.4 EUROPE

8.4.1 RECESSION IMPACT

FIGURE 31 EUROPE: VEHICLE ARMOR MATERIALS MARKET SNAPSHOT TABLE 71 EUROPE: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2020–2023 (USD MILLION)

TABLE 72 EUROPE: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2024–2029 (USD MILLION)

TABLE 73 EUROPE: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2020–2023 (KILOTON)

TABLE 74 EUROPE: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY,2024–2029 (KILOTON)

TABLE 75 EUROPE: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 76 EUROPE: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2024–2029



(USD MILLION)

TABLE 77 EUROPE: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2020–2023 (KILOTON)

TABLE 78 EUROPE: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2024–2029 (KILOTON)

TABLE 79 EUROPE: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 80 EUROPE: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.4.1.1 Germany

8.4.1.1.1 Increasing procurement of defense equipment and vehicles to drive market TABLE 81 GERMANY: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 82 GERMANY: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.4.1.2 Italy

8.4.1.2.1 Heightened internal security and rising demand for civilian armored vehicles to drive market

TABLE 83 ITALY: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 84 ITALY: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.4.1.3 France

8.4.1.3.1 Heightened geopolitical tensions and internal security to drive market TABLE 85 FRANCE: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 86 FRANCE: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.4.1.4 UK

8.4.1.4.1 Global economic recovery and development of new technologies to drive market

TABLE 87 UK: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 88 UK: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.4.1.5 RUSSIA

8.4.1.5.1 Strong domestic demand for armor materials to drive market TABLE 89 RUSSIA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)



TABLE 90 RUSSIA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.4.1.6 SPAIN

8.4.1.6.1 Technological advancement and collaborative efforts to support market growth

TABLE 91 SPAIN: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 92 SPAIN: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.4.1.7 Rest of Europe

TABLE 93 REST OF EUROPE: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 94 REST OF EUROPE: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.5 MIDDLE EAST & AFRICA

8.5.1 RECESSION IMPACT

TABLE 95 MIDDLE EAST & AFRICA: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2020–2023 (USD MILLION)

TABLE 96 MIDDLE EAST & AFRICA: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2024–2029 (USD MILLION)

TABLE 97 MIDDLE EAST & AFRICA: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2020–2023 (KILOTON)

TABLE 98 MIDDLE EAST & AFRICA: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2024–2029 (KILOTON)

TABLE 99 MIDDLE EAST & AFRICA: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 100 MIDDLE EAST & AFRICA: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 101 MIDDLE EAST & AFRICA: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2020–2023 (KILOTON)

TABLE 102 MIDDLE EAST & AFRICA: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2024–2029 (KILOTON)

TABLE 103 MIDDLE EAST & AFRICA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 104 MIDDLE EAST & AFRICA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.5.1.1 SAUDI ARABIA

8.5.1.1.1 R&D investments and technological innovations to drive market TABLE 105 SAUDI ARABIA: VEHICLE ARMOR MATERIALS MARKET, BY



APPLICATION, 2020–2023 (USD MILLION)

TABLE 106 SAUDI ARABIA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.5.1.2 UAE

8.5.1.2.1 Defense to be largest and fastest-growing application during forecast period

TABLE 107 UAE: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 108 UAE: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.5.1.3 REST OF GCC

8.5.1.3.1 Increased defense investments to drive market for vehicle armor materials TABLE 109 REST OF GCC: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 110 REST OF GCC: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.5.1.4 SOUTH AFRICA

8.5.1.4.1 Government initiatives and investments to drive market TABLE 111 SOUTH AFRICA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 112 SOUTH AFRICA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.5.1.5 Rest of Middle East & Africa

TABLE 113 REST OF MIDDLE EAST & AFRICA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 114 REST OF MIDDLE EAST & AFRICA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.6 SOUTH AMERICA

8.6.1 RECESSION IMPACT

TABLE 115 SOUTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2020–2023 (USD MILLION)

TABLE 116 SOUTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2024–2029 (USD MILLION)

TABLE 117 SOUTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2020–2023 (KILOTON)

TABLE 118 SOUTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY COUNTRY, 2024–2029 (KILOTON)

TABLE 119 SOUTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2020–2023 (USD MILLION)



TABLE 120 SOUTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 121 SOUTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2020–2023 (KILOTON)

TABLE 122 SOUTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY TYPE, 2024–2029 (KILOTON)

TABLE 123 SOUTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 124 SOUTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.6.1.1 Brazil

8.6.1.1.1 Security challenges, military modernization efforts, and economic diversification to drive market

TABLE 125 BRAZIL: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 126 BRAZIL: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

8.6.1.2 Argentina

8.6.1.2.1 Favorable business conditions and government incentives to support market growth

TABLE 127 ARGENTINA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 128 ARGENTINA: VEHICLE ARMOR MATERIALS MARKET, BY

APPLICATION, 2024–2029 (USD MILLION)

8.6.1.3 Rest of South America

TABLE 129 REST OF SOUTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2020–2023 (USD MILLION)

TABLE 130 REST OF SOUTH AMERICA: VEHICLE ARMOR MATERIALS MARKET, BY APPLICATION, 2024–2029 (USD MILLION)

9 COMPETITIVE LANDSCAPE

9.1 INTRODUCTION

9.1.1 OVERVIEW OF STRATEGIES ADOPTED BY KEY VEHICLE ARMOR MATERIAL MANUFACTURERS

9.2 MARKET SHARE ANALYSIS

9.2.1 RANKING OF KEY MARKET PLAYERS, 2022

FIGURE 32 RANKING OF TOP FIVE PLAYERS IN VEHICLE ARMOR MATERIALS MARKET, 2022



9.2.2 MARKET SHARE OF KEY PLAYERS

TABLE 131 VEHICLE ARMOR MATERIALS MARKET: DEGREE OF COMPETITION FIGURE 33 SHARE OF KEY PLAYERS IN VEHICLE ARMOR MATERIALS MARKET, 2022

9.2.2.1 Tata Steel Limited

- 9.2.2.2 Honeywell International Inc.
- 9.2.2.3 Saint-Gobain SA
- 9.2.2.4 Alcoa Corporation
- 9.2.2.5 DuPont de Nemours, Inc.

9.3 REVENUE ANALYSIS

FIGURE 34 REVENUE ANALYSIS OF TOP 5 PLAYERS, 2020–2024

9.4 COMPANY EVALUATION MATRIX: KEY PLAYERS, 2023

9.4.1 STARS

9.4.2 EMERGING LEADERS

9.4.3 PERVASIVE PLAYERS

9.4.4 PARTICIPANTS

FIGURE 35 VEHICLE ARMOR MATERIALS MARKET: COMPANY EVALUATION MATRIX, 2022

9.4.5 COMPANY FOOTPRINT: KEY PLAYERS, 2023

TABLE 132 COMPANY TYPE FOOTPRINT (10 COMPANIES)

TABLE 133 COMPANY APPLICATION FOOTPRINT (10 COMPANIES)

TABLE 134 COMPANY REGION FOOTPRINT (10 COMPANIES)

9.5 COMPANY EVALUATION MATRIX: STARTUPS/SMES, 2023

9.5.1 PROGRESSIVE COMPANIES

9.5.2 RESPONSIVE COMPANIES

9.5.3 DYNAMIC COMPANIES

9.5.4 STARTING BLOCKS

FIGURE 36 VEHICLE ARMOR MATERIALS MARKET: START-UPS/SMES EVALUATION MATRIX, 2022

9.5.5 COMPETITIVE BENCHMARKING

9.5.5.1 DETAILED LIST OF KEY START-UPS/SMES

TABLE 135 VEHICLE ARMOR MATERIALS MARKET: DETAILED LIST OF KEY START-UPS/SMES

9.5.5.2 Competitive benchmarking of key start-ups/SMEs

TABLE 136 START-UPS/SMES COMPANY APPLICATION FOOTPRINT (15 COMPANIES)

TABLE 137 START-UPS/SMES COMPANY TYPE FOOTPRINT (15 COMPANIES) TABLE 138 START-UPS/SMES COMPANY REGION FOOTPRINT (15 COMPANIES) FIGURE 37 VEHICLE ARMOR MATERIALS MARKET: COMPANY OVERALL



FOOTPRINT

9.5.6 VALUATION AND FINANCIAL METRICS OF KEY VEHICLE ARMOR MATERIAL VENDORS FIGURE 38 EV/EBITDA OF KEY VENDORS FIGURE 39 YEAR-TO-DATE (YTD) PRICE TOTAL RETURN 9.6 COMPETITIVE SCENARIO AND TRENDS 9.6.1 PRODUCT LAUNCHES TABLE 139 VEHICLE ARMOR MATERIALS MARKET: PRODUCT LAUNCHES (2019–2023) 9.6.2 DEALS TABLE 140 VEHICLE ARMOR MATERIALS MARKET: DEALS (2019–2023) 9.6.3 OTHER DEVELOPMENTS TABLE 141 VEHICLE ARMOR MATERIALS MARKET: OTHER DEVELOPMENTS

(2019–2023)

10 COMPANY PROFILES

(Business overview, Products offered, Recent Developments, MNM view)* 10.1 KEY PLAYERS

10.1.1 DUPONT DE NEMOURS, INC.

TABLE 142 DUPONT DE NEMOURS, INC.: COMPANY OVERVIEW FIGURE 40 DUPONT DE NEMOURS, INC.: COMPANY SNAPSHOT TABLE 143 DUPONT DE NEMOURS, INC.: PRODUCT OFFERINGS TABLE 144 DUPONT DE NEMOURS, INC.: PRODUCT LAUNCHES, 2019–2023 TABLE 145 DUPONT DE NEMOURS, INC.: DEALS, 2019–2023

10.1.2 SAINT-GOBAIN SA

TABLE 146 SAINT-GOBAIN SA: COMPANY OVERVIEW FIGURE 41 SAINT-GOBAIN SA: COMPANY SNAPSHOT TABLE 147 SAINT-GOBAIN SA: PRODUCT OFFERINGS TABLE 148 SAINT-GOBAIN SA: DEALS, 2019–2023

10.1.3 ALLEGHENY TECHNOLOGIES INCORPORATED (ATI INC.)

TABLE 149 ALLEGHENY TECHNOLOGIES, INCORPORATED (ATI, INC.): COMPANY OVERVIEW

FIGURE 42 ALLEGHENY TECHNOLOGIES INCORPORATED (ATI INC.): COMPANY SNAPSHOT

TABLE 150 ALLEGHENY TECHNOLOGIES INCORPORATED (ATI INC.): PRODUCT OFFERINGS

TABLE 151 ALLEGHENY TECHNOLOGIES INCORPORATED (ATI INC.): DEALS, 2019–2023



10.1.4 HONEYWELL INTERNATIONAL INC. TABLE 152 HONEYWELL INTERNATIONAL INC.: COMPANY OVERVIEW FIGURE 43 HONEYWELL INTERNATIONAL INC.: COMPANY SNAPSHOT TABLE 153 HONEYWELL INTERNATIONAL INC .: PRODUCT OFFERINGS TABLE 154 HONEYWELL INTERNATIONAL INC.: PRODUCT LAUNCHES, 2019–2023 TABLE 155 HONEYWELL INTERNATIONAL INC.: DEALS. 2019–2023 10.1.5 TEIJIN LIMITED TABLE 156 TEIJIN LIMITED: COMPANY OVERVIEW FIGURE 44 TEIJIN LIMITED: COMPANY SNAPSHOT TABLE 157 TEIJIN LIMITED: PRODUCT OFFERINGS TABLE 158 TEIJIN LIMITED: PRODUCT LAUNCHES, 2019-2023 TABLE 159 TEIJIN LIMITED: DEALS, 2019-2023 TABLE 160 TEIJIN LIMITED: OTHER DEVELOPMENTS, 2019–2023 **10.1.6 ALCOA CORPORATION** TABLE 161 ALCOA CORPORATION: COMPANY OVERVIEW TABLE 162 ALCOA CORPORATION: PRODUCT OFFERINGS **10.1.7 TATA STEEL LIMITED** TABLE 163 TATA STEEL LIMITED: COMPANY OVERVIEW TABLE 164 TATA STEEL LIMITED: PRODUCT OFFERINGS 10.1.8 SSAB TABLE 165 SSAB: COMPANY OVERVIEW TABLE 166 SSAB: PRODUCT OFFERINGS TABLE 167 SSAB: DEALS, 2019-2023 **10.1.9 CERAMTEC** TABLE 168 CERAMTEC: COMPANY OVERVIEW FIGURE 45 CERAMTEC: COMPANY SNAPSHOT TABLE 169 CERAMTEC: PRODUCT OFFERINGS **10.1.10 MORGAN ADVANCED MATERIALS** TABLE 170 MORGAN ADVANCED MATERIAL: COMPANY OVERVIEW TABLE 171 MORGAN ADVANCED MATERIALS: PRODUCT OFFERINGS TABLE 172 MORGAN ADVANCED MATERIAL: EXPANSIONS, 2019–2023 **10.2 OTHER PLAYERS 10.2.1 PPG INDUSTRIES** TABLE 173 PPG INDUSTRIES: COMPANY OVERVIEW 10.2.2 COORSTEK INC. TABLE 174 COORSTEK INC .: COMPANY OVERVIEW **10.2.3 CERCO CORPORATION** TABLE 175 CERCO CORPORATION: COMPANY OVERVIEW

10.2.4 AGY HOLDING CORP.



TABLE 176 AGY HOLDING CORP.: COMPANY OVERVIEW 10.2.5 SAFARILAND, LLC TABLE 177 SAFARILAND, LLC: COMPANY OVERVIEW 10.2.6 LEECO STEEL TABLE 178 LEECO STEEL: COMPANY OVERVIEW **10.2.7 ARMORWORKS ENTERPRISES LLC** TABLE 179 ARMORWORKS ENTERPRISES LLC: COMPANY OVERVIEW **10.2.8 WACO COMPOSITES** TABLE 180 WACO COMPOSITES: COMPANY OVERVIEW 10.2.9 AT&F ADVANCED METALS LLC TABLE 181 AT&F ADVANCED METALS LLC: COMPANY OVERVIEW 10.2.10 PROTECTIVE STRUCTURES. LTD. TABLE 182 PROTECTIVE STRUCTURES, LTD.: COMPANY OVERVIEW 10.2.11 CPS TECHNOLOGIES, CORP. TABLE 183 CPS TECHNOLOGIES, CORP.: COMPANY OVERVIEW **10.2.12 JPS COMPOSITES MATERIALS** TABLE 184 JPS COMPOSITES MATERIALS: COMPANY OVERVIEW **10.2.13 SCHUNK CARBON TECHNOLOGY** TABLE 185 SCHUNK CARBON TECHNOLOGY: COMPANY OVERVIEW **10.2.14 SURMET CORPORATION** TABLE 186 SURMET CORPORATION: COMPANY OVERVIEW 10.2.15 3M

TABLE 187 3M: COMPANY OVERVIEW

*Details on Business overview, Products offered, Recent Developments, MNM view might not be captured in case of unlisted companies.

11 APPENDIX

11.1 DISCUSSION GUIDE

11.2 KNOWLEDGESTORE: MARKETSANDMARKETS' SUBSCRIPTION PORTAL

- **11.3 CUSTOMIZATION OPTIONS**
- 11.4 RELATED REPORTS
- 11.5 AUTHOR DETAILS



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