

Black Phosphorus Market by Form (Crystal, Powder), Application (Electronic Devices, Energy Storage, Sensors), and Region (North America, Asia Pacific, Europe, South America, Middle East & Africa) - Global Forecast to 2027

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Abstracts

The black phosphorus market is estimated to grow to USD 83 million by 2027 from USD 13 million in 2022, at a CAGR of 43.1%. Critical industries such as oil & gas, chemical, mining, and power use gas sensors to detect and monitor the presence of combustible and toxic gases. A large number of gases, such as carbon monoxide, carbon dioxide, ammonia, hydrogen sulfide, and hydrocarbons, are released into the air by these critical industries. Excess emissions of these gases in the air can adversely affect human health. Moreover, there are some explosive gases such as methane, propane, and butane that might be released by these critical industries, thereby leading to the risk of fire accidents. All these factors is expected to drive the demand for black phosphorus in sensors application.

“Crystal black phosphorus is projected to be the fastest-growing during the forecast period.”

Crystal black phosphorus is projected to be the fastest-growing segment in terms of both value and volume during the forecast period. Most of the black phosphorus produced in the wet process is used to produce fertilizers. Black phosphorus is available in two types: crystal black phosphorus and powder black phosphorus. The structure of black phosphorus in crystal form can be changed with pressure according to its need.

“Electronic devices segment held the largest share, in terms of both value and volume, in 2021”

Black phosphorus is a layered semiconductor, which has great potential in optical and electronic devices. The electronic devices segment held the largest share, in terms of both value and volume, in 2021. Due to its high mobility, in-plane anisotropy, and direct band gap, black phosphorus is considered an excellent choice for next-generation electronic devices. The market for optoelectronic components is growing due to the extensive use of infrared components such as infrared LEDs, photodiodes, and phototransistors in consumer electronics and automobiles.

“North America was the largest black phosphorus market, in terms of value, in 2021”

North America is the largest black phosphorus market globally. North America is one of the most technologically advanced markets for optoelectronic components owing to the presence of prominent system suppliers, large semiconductor companies, and LED, laser, and sensor manufacturers in the region. The high standard of living and the competitiveness of military & aerospace, industrial, and medical original equipment manufacturers (OEMs) make this region a flourishing market for optoelectronic components, which is projected to drive the demand for black phosphorus during the forecast period.

By Company Type: Tier 1 - 46%, Tier 2 - 31%, and Tier 3 - 23%

By Designation: C-Level - 46%, Director Level - 27%, and Others - 27%

By Region: North America - 33%, Europe - 27%, APAC - 27%, South America - 7%, Middle East & Africa - 6%,

The key players profiled in the report include ACS Material LLC (US), 2D Semiconductors (US), Nanochemazone (Canada), American Elements LLC (US), Merck (Germany), HQ Graphene (Netherlands), Hunan Azeal Materials Co. Ltd. (China), Ossila Ltd. (UK), Stanford Advanced Materials (US) and Manchester Nanomaterials (UK) among others.

Research Coverage

This report segments the market for black phosphorus is based on form, application, and region, and provides estimations for the overall market size across various regions. A detailed analysis of key industry players has been conducted to provide insights into

their business overviews, products & services, key strategies, associated with the market for black phosphorus.

Reasons to Buy this Report

This research report is focused on various levels of analysis — industry analysis (industry trends), market share analysis of top players, and company profiles, which together provide an overall view on the competitive landscape; emerging and high-growth segments of the black phosphorus market; high-growth regions; and market drivers, restraints, and opportunities.

The report provides insights on the following pointers:

Market Penetration: Comprehensive information on black phosphorus offered by top players in the global market

Market Development: Comprehensive information about lucrative emerging markets — the report analyzes the markets for black phosphorus across regions

Market Diversification: Exhaustive information about new products, untapped regions, and recent developments in the global black phosphorus market

Competitive Assessment: In-depth assessment of market shares, strategies, products, and manufacturing capabilities of leading players in the black phosphorus market

Contents

1 INTRODUCTION

1.1 STUDY OBJECTIVES

1.2 MARKET DEFINITION

1.3 INCLUSIONS AND EXCLUSIONS

1.3.1 MARKET DEFINITION AND INCLUSIONS, BY FORM

1.3.2 MARKET DEFINITION AND INCLUSIONS, BY APPLICATION

1.4 STUDY SCOPE

1.4.1 MARKET SEGMENTATION

1.4.2 REGIONS COVERED

1.4.3 YEARS CONSIDERED

1.5 CURRENCY CONSIDERED

1.6 UNITS CONSIDERED

1.7 STAKEHOLDERS

2 RESEARCH METHODOLOGY

2.1 RESEARCH DATA

FIGURE 1 BLACK PHOSPHORUS MARKET: RESEARCH DESIGN

2.1.1 SECONDARY DATA

2.1.2 PRIMARY DATA

2.1.2.1 Primary interviews—Demand and supply sides

2.1.2.2 Key Industry Insights

2.1.2.3 Breakdown of primary interviews

2.2 MARKET SIZE ESTIMATION

2.2.1 BOTTOM-UP APPROACH

FIGURE 2 MARKET SIZE ESTIMATION METHODOLOGY: APPROACH 1 (SUPPLY SIDE): COLLECTIVE SHARE OF TOP PLAYERS

FIGURE 3 MARKET SIZE ESTIMATION METHODOLOGY: APPROACH 1 (SUPPLY SIDE): COLLECTIVE REVENUE OF ALL PRODUCTS

FIGURE 4 MARKET SIZE ESTIMATION METHODOLOGY: APPROACH 2 (DEMAND SIDE)

2.3 DATA TRIANGULATION

FIGURE 5 BLACK PHOSPHORUS MARKET: DATA TRIANGULATION

2.4 GROWTH RATE ASSUMPTIONS/GROWTH FORECAST

2.4.1 SUPPLY SIDE

FIGURE 6 SUPPLY-SIDE MARKET CAGR PROJECTIONS

2.4.2 DEMAND SIDE

FIGURE 7 DEMAND-SIDE MARKET GROWTH PROJECTIONS: DRIVERS AND OPPORTUNITIES

2.5 FACTOR ANALYSIS

2.6 RESEARCH ASSUMPTIONS

2.7 RESEARCH LIMITATIONS

2.8 RISK ASSESSMENT

3 EXECUTIVE SUMMARY

FIGURE 8 ELECTRONIC DEVICES APPLICATION LED BLACK PHOSPHORUS MARKET IN 2021

FIGURE 9 CRYSTAL FORM TO LEAD BLACK PHOSPHORUS MARKET DURING FORECAST PERIOD

FIGURE 10 NORTH AMERICA ACCOUNTED FOR LARGEST MARKET SHARE IN 2021

4 PREMIUM INSIGHTS

4.1 BRIEF OVERVIEW OF BLACK PHOSPHORUS MARKET

FIGURE 11 BLACK PHOSPHORUS IN CRYSTAL FORM TO DRIVE MARKET

4.2 BLACK PHOSPHORUS MARKET SIZE, BY REGION

FIGURE 12 NORTH AMERICA TO BE LARGEST MARKET FOR BLACK PHOSPHORUS DURING FORECAST PERIOD

4.3 NORTH AMERICA: BLACK PHOSPHORUS MARKET, BY APPLICATION AND COUNTRY, 2021

FIGURE 13 ELECTRONIC DEVICES SEGMENT AND US ACCOUNTED FOR LARGEST SHARES

4.4 BLACK PHOSPHORUS MARKET SIZE, APPLICATION VS. REGION

FIGURE 14 ELECTRONIC DEVICES APPLICATION LED MARKET ACROSS REGIONS IN 2021

4.5 BLACK PHOSPHORUS MARKET, BY MAJOR COUNTRIES

FIGURE 15 MARKET IN CHINA TO GROW AT HIGHEST CAGR DURING FORECAST PERIOD

5 MARKET OVERVIEW

5.1 INTRODUCTION

5.2 MARKET DYNAMICS

FIGURE 16 DRIVERS, RESTRAINTS, OPPORTUNITIES, AND CHALLENGES IN BLACK PHOSPHORUS MARKET

5.2.1 DRIVERS

5.2.1.1 High demand for gas sensors in critical industries

5.2.1.2 Implementation of various health and safety regulations globally

TABLE 1 LIST OF GOVERNMENT REGULATIONS/ACTS FOR AIR QUALITY MONITORING

5.2.1.3 Increased use of infrared components in consumer electronics and automobiles

5.2.2 RESTRAINTS

5.2.2.1 High cost of production

5.2.3 OPPORTUNITIES

5.2.3.1 Increasing demand from energy storage segment

5.2.4 CHALLENGES

5.2.4.1 Scalable process for mass production

5.3 PORTER'S FIVE FORCES ANALYSIS

FIGURE 17 BLACK PHOSPHORUS MARKET: PORTER'S FIVE FORCES ANALYSIS

5.3.1 THREAT OF NEW ENTRANTS

5.3.2 THREAT OF SUBSTITUTES

5.3.3 BARGAINING POWER OF SUPPLIERS

5.3.4 BARGAINING POWER OF BUYERS

5.3.5 INTENSITY OF COMPETITIVE RIVALRY

TABLE 2 BLACK PHOSPHORUS MARKET: PORTER'S FIVE FORCES ANALYSIS

5.4 KEY STAKEHOLDERS & BUYING CRITERIA

5.4.1 KEY STAKEHOLDERS IN BUYING PROCESS

FIGURE 18 INFLUENCE OF STAKEHOLDERS IN BUYING PROCESS FOR TOP 3 APPLICATIONS

TABLE 3 INFLUENCE OF STAKEHOLDERS IN BUYING PROCESS FOR TOP 3 APPLICATIONS (%)

5.4.2 BUYING CRITERIA

FIGURE 19 KEY BUYING CRITERIA FOR TOP 3 APPLICATIONS

TABLE 4 KEY BUYING CRITERIA FOR TOP 3 APPLICATIONS

5.5 MACROECONOMIC INDICATORS

5.5.1 GDP TRENDS AND FORECASTS FOR MAJOR ECONOMIES

TABLE 5 GDP TRENDS AND FORECASTS OF MAJOR ECONOMIES, 2019–2027 (USD BILLION)

6 INDUSTRY TRENDS

6.1 SUPPLY CHAIN ANALYSIS

FIGURE 20 BLACK PHOSPHORUS MARKET: SUPPLY CHAIN

6.1.1 RAW MATERIALS

6.1.2 MANUFACTURERS

6.1.3 DISTRIBUTION NETWORK

6.1.4 END USERS

6.2 BLACK PHOSPHORUS MARKET: REALISTIC, PESSIMISTIC, OPTIMISTIC, AND NON-COVID-19 SCENARIOS

FIGURE 21 MARKET SIZE UNDER REALISTIC, PESSIMISTIC, OPTIMISTIC, AND NON-COVID-19 SCENARIOS

TABLE 6 BLACK PHOSPHORUS MARKET FORECAST SCENARIO, 2019–2027 (USD THOUSAND)

6.2.1 NON-COVID-19 SCENARIO

6.2.2 OPTIMISTIC SCENARIO

6.2.3 PESSIMISTIC SCENARIO

6.2.4 REALISTIC SCENARIO

6.3 PRICING ANALYSIS

6.3.1 AVERAGE SELLING PRICE OF KEY PLAYERS, BY APPLICATION

FIGURE 22 AVERAGE SELLING PRICE BY KEY PLAYERS FOR TOP 3 APPLICATIONS

TABLE 7 AVERAGE SELLING PRICE BY KEY PLAYERS FOR TOP 3 APPLICATIONS (USD THOUSAND/KG)

6.3.2 AVERAGE SELLING PRICE, BY REGION

FIGURE 23 AVERAGE SELLING PRICE OF BLACK PHOSPHORUS, BY REGION

TABLE 8 AVERAGE SELLING PRICE OF BLACK PHOSPHORUS, BY REGION (USD THOUSAND/KG)

6.4 TRENDS/DISRUPTIONS IMPACTING CUSTOMERS' BUSINESSES

6.4.1 REVENUE SHIFTS & REVENUE POCKETS IN BLACK PHOSPHORUS MARKET

FIGURE 24 REVENUE SHIFT FOR BLACK PHOSPHORUS MARKET

6.5 CONNECTED MARKETS: ECOSYSTEM

TABLE 9 BLACK PHOSPHORUS MARKET: ECOSYSTEM

FIGURE 25 BLACK PHOSPHORUS: CONNECTED MARKET

6.6 TECHNOLOGY ANALYSIS

6.6.1 TWO-DIMENSIONAL (2D) MATERIALS

6.7 TRADE DATA STATISTICS

6.7.1 IMPORT SCENARIO OF BLACK PHOSPHORUS

FIGURE 26 IMPORT OF BLACK PHOSPHORUS, BY KEY COUNTRIES (2014–2021)

TABLE 10 BLACK PHOSPHORUS IMPORTS, BY REGION, 2014–2021 (USD

THOUSAND)

6.7.2 EXPORT SCENARIO OF BLACK PHOSPHORUS

FIGURE 27 EXPORT OF BLACK PHOSPHORUS, BY KEY COUNTRIES (2014–2021)

TABLE 11 BLACK PHOSPHORUS EXPORTS, BY REGION, 2014–2021 (USD THOUSAND)

6.8 REGULATORY LANDSCAPE

6.8.1 REGULATORY BODIES AND REGULATIONS RELATED TO BLACK PHOSPHORUS

6.9 KEY CONFERENCES & EVENTS IN 2022–2023

TABLE 12 BLACK PHOSPHORUS MARKET: DETAILED LIST OF CONFERENCES & EVENTS

6.10 PATENT ANALYSIS

6.10.1 APPROACH

6.10.2 DOCUMENT TYPE

TABLE 13 TOTAL NUMBER OF PATENTS DURING 2011–2021

FIGURE 28 PATENTS REGISTERED IN BLACK PHOSPHORUS MARKET, 2011–2021

FIGURE 29 PATENT PUBLICATION TRENDS, 2011–2021

FIGURE 30 LEGAL STATUS OF PATENTS FILED IN BLACK PHOSPHORUS MARKET

6.10.3 JURISDICTION ANALYSIS

FIGURE 31 MAXIMUM PATENTS FILED IN JURISDICTION OF US

6.10.4 TOP APPLICANTS

FIGURE 32 SEMICONDUCTOR ENERGY LAB REGISTERED MAXIMUM NUMBER OF PATENTS BETWEEN 2011 AND 2021

TABLE 14 LIST OF PATENTS BY SEMICONDUCTOR ENERGY LAB

TABLE 15 LIST OF PATENTS BY PIONEER HI-BRED INTERNATIONAL

TABLE 16 LIST OF PATENTS BY FUJIFILM CORPORATION

TABLE 17 TOP 10 PATENT OWNERS IN US, 2011–2021

7 BLACK PHOSPHOROUS MARKET, BY FORM

7.1 INTRODUCTION

FIGURE 33 CRYSTAL FORM TO DOMINATE BLACK PHOSPHORUS MARKET DURING FORECAST PERIOD

TABLE 18 BLACK PHOSPHOROUS MARKET SIZE, BY FORM, 2017–2020 (KILOGRAM)

TABLE 19 BLACK PHOSPHOROUS MARKET SIZE, BY FORM, 2021–2027 (KILOGRAM)

TABLE 20 BLACK PHOSPHOROUS MARKET SIZE, BY FORM, 2017–2020 (USD THOUSAND)

TABLE 21 BLACK PHOSPHOROUS MARKET SIZE, BY FORM, 2021–2027 (USD THOUSAND)

7.2 CRYSTAL

7.2.1 HIGH DEMAND FROM ELECTRONIC DEVICES AND SENSORS SEGMENTS TO DRIVE MARKET

7.3 POWDER

7.3.1 INCREASING USE IN BIOMEDICAL APPLICATIONS TO BOOST MARKET

8 BLACK PHOSPHORUS MARKET, BY APPLICATION

8.1 INTRODUCTION

FIGURE 34 ELECTRONIC DEVICES SEGMENT TO DOMINATE BLACK PHOSPHORUS MARKET DURING FORECAST PERIOD

TABLE 22 BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (KILOGRAM)

TABLE 23 BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (KILOGRAM)

TABLE 24 BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (USD THOUSAND)

TABLE 25 BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (USD THOUSAND)

8.2 ELECTRONIC DEVICES

8.2.1 HIGH MOBILITY, IN-PLANE ANISOTROPY, AND DIRECT BAND GAP TO DRIVE MARKET

TABLE 26 ELECTRONIC DEVICES: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2017–2020 (KILOGRAM)

TABLE 27 ELECTRONIC DEVICES: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2021–2027 (KILOGRAM)

TABLE 28 ELECTRONIC DEVICES: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2017–2020 (USD THOUSAND)

TABLE 29 ELECTRONIC DEVICES: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2021–2027 (USD THOUSAND)

8.3 SENSORS

8.3.1 INCREASING DEMAND FOR GAS SENSORS TO MONITOR AIR QUALITY TO BOOST MARKET

TABLE 30 SENSORS: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2017–2020 (KILOGRAM)

TABLE 31 SENSORS: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2021–2027 (KILOGRAM)

TABLE 32 SENSORS: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2017–2020 (USD THOUSAND)

TABLE 33 SENSORS: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2021–2027 (USD THOUSAND)

8.4 ENERGY STORAGE

8.4.1 GROWING INVESTMENTS IN RENEWABLE ENERGY TO SUPPORT MARKET GROWTH

TABLE 34 ENERGY STORAGE: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2017–2020 (KILOGRAM)

TABLE 35 ENERGY STORAGE: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2021–2027 (KILOGRAM)

TABLE 36 ENERGY STORAGE: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2017–2020 (USD THOUSAND)

TABLE 37 ENERGY STORAGE: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2021–2027 (USD THOUSAND)

8.5 OTHERS

TABLE 38 OTHER APPLICATIONS: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2017–2020 (KILOGRAM)

TABLE 39 OTHER APPLICATIONS: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2021–2027 (KILOGRAM)

TABLE 40 OTHER APPLICATIONS: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2017–2020 (USD THOUSAND)

TABLE 41 OTHER APPLICATIONS: BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2021–2027 (USD THOUSAND)

9 BLACK PHOSPHORUS MARKET, BY REGION

9.1 INTRODUCTION

FIGURE 35 NORTH AMERICA TO LEAD BLACK PHOSPHORUS MARKET DURING FORECAST PERIOD

TABLE 42 BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2017–2020 (KILOGRAM)

TABLE 43 BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2021–2027 (KILOGRAM)

TABLE 44 BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2017–2020 (USD THOUSAND)

TABLE 45 BLACK PHOSPHORUS MARKET SIZE, BY REGION, 2021–2027 (USD THOUSAND)

THOUSAND)

9.2 ASIA PACIFIC

FIGURE 36 ASIA PACIFIC: BLACK PHOSPHORUS MARKET SNAPSHOT

9.2.1 ASIA PACIFIC: BLACK PHOSPHORUS MARKET, BY APPLICATION

TABLE 46 ASIA PACIFIC: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (KILOGRAM)

TABLE 47 ASIA PACIFIC: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (KILOGRAM)

TABLE 48 ASIA PACIFIC: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (USD THOUSAND)

TABLE 49 ASIA PACIFIC: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (USD THOUSAND)

9.2.2 ASIA PACIFIC: BLACK PHOSPHORUS MARKET, BY COUNTRY

TABLE 50 ASIA PACIFIC: BLACK PHOSPHORUS MARKET SIZE, BY COUNTRY, 2017–2020 (KILOGRAM)

TABLE 51 ASIA PACIFIC: BLACK PHOSPHORUS MARKET SIZE, BY COUNTRY, 2021–2027 (KILOGRAM)

TABLE 52 ASIA PACIFIC: BLACK PHOSPHORUS MARKET SIZE, BY COUNTRY, 2017–2020 (USD THOUSAND)

TABLE 53 ASIA PACIFIC: BLACK PHOSPHORUS MARKET SIZE, BY COUNTRY, 2021–2027 (USD THOUSAND)

9.2.2.1 China

9.2.2.1.1 Large consumer base to fuel market

TABLE 54 CHINA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (KILOGRAM)

TABLE 55 CHINA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (KILOGRAM)

TABLE 56 CHINA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (USD THOUSAND)

TABLE 57 CHINA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (USD THOUSAND)

9.2.2.2 Japan

9.2.2.2.1 Electric passenger cars to drive demand for black phosphorus

TABLE 58 JAPAN: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (KILOGRAM)

TABLE 59 JAPAN: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (KILOGRAM)

TABLE 60 JAPAN: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (USD THOUSAND)

TABLE 61 JAPAN: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (USD THOUSAND)

9.2.2.3 South Korea

9.2.2.3.1 Increasing FDI to generate high demand from end-use industries

TABLE 62 SOUTH KOREA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (KILOGRAM)

TABLE 63 SOUTH KOREA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (KILOGRAM)

TABLE 64 SOUTH KOREA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (USD THOUSAND)

TABLE 65 SOUTH KOREA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (USD THOUSAND)

9.3 NORTH AMERICA

FIGURE 37 NORTH AMERICA: BLACK PHOSPHORUS MARKET SNAPSHOT

9.3.1 NORTH AMERICA: BLACK PHOSPHORUS MARKET, BY APPLICATION

TABLE 66 NORTH AMERICA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (KILOGRAM)

TABLE 67 NORTH AMERICA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (KILOGRAM)

TABLE 68 NORTH AMERICA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (USD THOUSAND)

TABLE 69 NORTH AMERICA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (USD THOUSAND)

9.3.2 NORTH AMERICA: BLACK PHOSPHORUS MARKET, BY COUNTRY

TABLE 70 NORTH AMERICA: BLACK PHOSPHORUS MARKET SIZE, BY COUNTRY, 2017–2020 (KILOGRAM)

TABLE 71 NORTH AMERICA: BLACK PHOSPHORUS MARKET SIZE, BY COUNTRY, 2021–2027 (KILOGRAM)

TABLE 72 NORTH AMERICA: BLACK PHOSPHORUS MARKET SIZE, BY COUNTRY, 2017–2020 (USD THOUSAND)

TABLE 73 NORTH AMERICA: BLACK PHOSPHORUS MARKET SIZE, BY COUNTRY, 2021–2027 (USD THOUSAND)

9.3.2.1 US

9.3.2.1.1 Growing automotive industry and strong customer base to boost market

TABLE 74 US: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (KILOGRAM)

TABLE 75 US: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (KILOGRAM)

TABLE 76 US: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020

(USD THOUSAND)

TABLE 77 US: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027

(USD THOUSAND)

9.3.2.2 Mexico

9.3.2.2.1 Increasing industrialization to drive market

TABLE 78 MEXICO: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (KILOGRAM)

TABLE 79 MEXICO: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (KILOGRAM)

TABLE 80 MEXICO: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (USD THOUSAND)

TABLE 81 MEXICO: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (USD THOUSAND)

9.3.2.3 Canada

9.3.2.3.1 Rising demand from electronic devices and sensors segments to boost market

TABLE 82 CANADA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (KILOGRAM)

TABLE 83 CANADA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (KILOGRAM)

TABLE 84 CANADA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (USD THOUSAND)

TABLE 85 CANADA: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (USD THOUSAND)

9.4 EUROPE

FIGURE 38 EUROPE: BLACK PHOSPHORUS MARKET SNAPSHOT

9.4.1 EUROPE: BLACK PHOSPHORUS MARKET, BY APPLICATION

TABLE 86 EUROPE: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (KILOGRAM)

TABLE 87 EUROPE: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (KILOGRAM)

TABLE 88 EUROPE: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (USD THOUSAND)

TABLE 89 EUROPE: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (USD THOUSAND)

9.4.2 EUROPE: BLACK PHOSPHORUS MARKET, BY COUNTRY

TABLE 90 EUROPE: BLACK PHOSPHORUS MARKET SIZE, BY COUNTRY, 2017–2020 (KILOGRAM)

TABLE 91 EUROPE: BLACK PHOSPHORUS MARKET SIZE, BY COUNTRY,

2021–2027 (KILOGRAM)

TABLE 92 EUROPE: BLACK PHOSPHORUS MARKET SIZE, BY COUNTRY,
2017–2020 (USD THOUSAND)

TABLE 93 EUROPE: BLACK PHOSPHORUS MARKET SIZE, BY COUNTRY,
2021–2027 (USD THOUSAND)

9.4.2.1 Germany

9.4.2.1.1 Increasing demand from energy storage and sensors segments to drive market

TABLE 94 GERMANY: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION,
2017–2020 (KILOGRAM)

TABLE 95 GERMANY: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION,
2021–2027 (KILOGRAM)

TABLE 96 GERMANY: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION,
2017–2020 (USD THOUSAND)

TABLE 97 GERMANY: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION,
2021–2027 (USD THOUSAND)

9.4.2.2 France

9.4.2.2.1 Strong workforce, excellent industrial hub, and presence of international companies to drive market

TABLE 98 FRANCE: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION,
2017–2020 (KILOGRAM)

TABLE 99 FRANCE: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION,
2021–2027 (KILOGRAM)

TABLE 100 FRANCE: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION,
2017–2020 (USD THOUSAND)

TABLE 101 FRANCE: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION,
2021–2027 (USD THOUSAND)

9.4.2.3 UK

9.4.2.3.1 Government policies to promote sales of electric vehicles

TABLE 102 UK: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION,
2017–2020 (KILOGRAM)

TABLE 103 UK: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION,
2021–2027 (KILOGRAM)

TABLE 104 UK: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION,
2017–2020 (USD THOUSAND)

TABLE 105 UK: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION,
2021–2027 (USD THOUSAND)

9.5 REST OF WORLD

9.5.1 REST OF WORLD: BLACK PHOSPHORUS MARKET, BY APPLICATION

TABLE 106 REST OF WORLD: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (KILOGRAM)

TABLE 107 REST OF WORLD: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (KILOGRAM)

TABLE 108 REST OF WORLD: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2017–2020 (USD THOUSAND)

TABLE 109 REST OF WORLD: BLACK PHOSPHORUS MARKET SIZE, BY APPLICATION, 2021–2027 (USD THOUSAND)

10 COMPETITIVE LANDSCAPE

10.1 INTRODUCTION

10.2 STRATEGIES ADOPTED BY KEY PLAYERS

TABLE 110 OVERVIEW OF STRATEGIES ADOPTED BY KEY BLACK PHOSPHORUS MANUFACTURERS

10.3 MARKET SHARE ANALYSIS

10.3.1 RANKING OF KEY MARKET PLAYERS, 2021

FIGURE 39 RANKING OF TOP 5 PLAYERS IN BLACK PHOSPHORUS MARKET, 2021

10.3.2 MARKET SHARE OF KEY PLAYERS

TABLE 111 BLACK PHOSPHORUS MARKET: DEGREE OF COMPETITION

FIGURE 40 OSSILA LTD. LED BLACK PHOSPHORUS MARKET IN 2021

10.3.2.1 Ossila Ltd.

10.3.2.2 Merck

10.3.2.3 Nanochemazone

10.3.2.4 American Elements

10.3.2.5 ACS Material, LLC

10.3.3 REVENUE ANALYSIS OF TOP 5 PLAYERS

FIGURE 41 REVENUE ANALYSIS OF TOP 5 COMPANIES IN LAST 5 YEARS

10.4 COMPANY PRODUCT FOOTPRINT ANALYSIS

FIGURE 42 BLACK PHOSPHORUS MARKET: COMPANY FOOTPRINT

TABLE 112 BLACK PHOSPHORUS MARKET: APPLICATION FOOTPRINT

TABLE 113 BLACK PHOSPHORUS MARKET: FORM FOOTPRINT

TABLE 114 BLACK PHOSPHORUS MARKET: COMPANY REGION FOOTPRINT

10.5 COMPANY EVALUATION QUADRANT (TIER 1)

10.5.1 STARS

10.5.2 EMERGING LEADERS

10.5.3 PARTICIPANTS

FIGURE 43 TIER 1 COMPANY EVALUATION QUADRANT FOR BLACK

PHOSPHORUS MARKET

10.6 COMPETITIVE BENCHMARKING

TABLE 115 BLACK PHOSPHORUS MARKET: DETAILED LIST OF KEY START-UPS/SMES

TABLE 116 BLACK PHOSPHORUS MARKET: COMPETITIVE BENCHMARKING OF KEY START-UPS/SMES

10.7 START-UP/SME EVALUATION QUADRANT

10.7.1 PROGRESSIVE COMPANIES

10.7.2 RESPONSIVE COMPANIES

10.7.3 STARTING BLOCKS

FIGURE 44 START-UP/SME EVALUATION QUADRANT FOR BLACK PHOSPHORUS MARKET

10.8 COMPETITIVE SITUATIONS & TRENDS

10.8.1 DEALS

TABLE 117 BLACK PHOSPHORUS MARKET: DEALS (2018–2022)

11 COMPANY PROFILES

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

11.1 OSSILA LTD.

TABLE 118 OSSILA LTD.: COMPANY OVERVIEW

11.2 ACS MATERIAL, LLC

TABLE 119 ACS MATERIAL, LLC: COMPANY OVERVIEW

11.3 NANOCHEMAZONE

TABLE 120 NANOCHEMAZONE: COMPANY OVERVIEW

11.4 AMERICAN ELEMENTS

TABLE 121 AMERICAN ELEMENTS: COMPANY OVERVIEW

11.5 MERCK

TABLE 122 MERCK: COMPANY OVERVIEW

11.6 HQ GRAPHENE

TABLE 123 HQ GRAPHENE: COMPANY OVERVIEW

11.7 HUNAN AZEAL MATERIALS CO. LTD.

TABLE 124 HUNAN AZEAL MATERIALS CO. LTD.: COMPANY OVERVIEW

11.8 STANFORD ADVANCED MATERIALS

TABLE 125 STANFORD ADVANCED MATERIALS: COMPANY OVERVIEW

11.9 MANCHESTER NANOMATERIALS

TABLE 126 MANCHESTER NANOMATERIALS: COMPANY OVERVIEW

11.10 NANJING XFNANO MATERIALS TECH CO. LTD

TABLE 127 NANJING XFNANO MATERIALS TECH CO. LTD.: COMPANY OVERVIEW

11.11 WEISTRON CO. LTD.

TABLE 128 WEISTRON CO. LTD.: COMPANY OVERVIEW

11.12 TAIZHOU SUNANO ENERGY CO., LTD.

TABLE 129 TAIZHOU SUNANO ENERGY CO., LTD.: COMPANY OVERVIEW

11.13 ULTRANANOTECH PRIVATE LIMITED

TABLE 130 ULTRANANOTECH PRIVATE LIMITED.: COMPANY OVERVIEW

11.14 SMART ELEMENTS

TABLE 131 SMART ELEMENTS: COMPANY OVERVIEW

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

12 ADJACENT & RELATED MARKETS

12.1 INTRODUCTION

12.2 LIMITATIONS

12.3 ELECTRONIC CHEMICALS AND MATERIALS MARKET

12.3.1 MARKET DEFINITION

12.3.2 MARKET OVERVIEW

12.3.3 ELECTRONIC CHEMICALS AND MATERIALS MARKET, BY REGION

TABLE 132 ELECTRONIC CHEMICALS AND MATERIALS MARKET SIZE, BY REGION, 2018–2025 (USD MILLION)

12.3.3.1 North America

TABLE 133 NORTH AMERICA: ELECTRONIC CHEMICALS AND MATERIALS MARKET SIZE, BY COUNTRY, 2018–2025 (USD MILLION)

12.3.3.2 Europe

TABLE 134 EUROPE: ELECTRONIC CHEMICALS AND MATERIALS MARKET SIZE, BY COUNTRY, 2018–2025 (USD MILLION)

12.3.3.3 APAC

TABLE 135 APAC: ELECTRONIC CHEMICALS AND MATERIALS MARKET SIZE, BY COUNTRY, 2018–2025 (USD MILLION)

12.3.3.4 Rest of World

TABLE 136 ROW: ELECTRONIC CHEMICALS AND MATERIALS MARKET SIZE, BY COUNTRY, 2018–2025 (USD MILLION)

13 APPENDIX

13.1 DISCUSSION GUIDE

13.2 KNOWLEDGESTORE: MARKETSDANDMARKETS' SUBSCRIPTION PORTAL

13.3 CUSTOMIZATION OPTIONS

13.4 RELATED REPORTS

13.5 AUTHOR DETAILS

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