

# Machine Condition Monitoring Market by Technique (Vibration Monitoring, Thermography, Oil Analysis, Ultrasound Emission), Offering (Vibration Sensors, Infrared Sensors, Spectrometers, Corrosion Probes, Spectrum Analyzers), Region - Global Forecast to 2029

<https://marketpublishers.com/r/M33F31C798EEN.html>

Date: January 2024

Pages: 270

Price: US\$ 4,950.00 (Single User License)

ID: M33F31C798EEN

## Abstracts

The global machine condition monitoring market size is expected to grow from USD 3.1 billion in 2024 to USD 4.7 billion by 2029, at a CAGR of 8.3% from 2024 to 2029. Condition monitoring focuses on monitoring the real-time conditions of machines, while predictive maintenance focuses on detecting and repairing faults before a failure occurs. Predictive maintenance is becoming popular in manufacturing firms globally owing to the benefits of this technique. For example, maintenance is carried out only when plant machinery requires repair services to avoid impending failures. Thus, the necessary, cost-effective downtime can be scheduled according to convenience.

“Motor current analysis segment is projected to grow at significant CAGR during the forecast period.”

The motor current analysis monitoring technique senses electrical signals that contain current components. These components are byproducts of unique rotating flux components caused by faults such as air gap eccentricity, broken rotor bars, and shorted turns in low-voltage stator windings. Motor current analysis enables the detection of such faults at an early stage, thereby avoiding the complete failure of machines. In the motor current analysis, current signals are processed to obtain the frequency spectrum, usually referred to as the current signature. To analyze this data and diagnose faults in machines, various advanced techniques are used, namely FFT,

Short-time Fourier Transform (STFT), Gabor transform, and wavelength transform.

' Online machine condition monitoring segment is projected to grow at an impressive CAGR during the forecast period.'

Online machine condition monitoring systems are deployed to monitor the health of critical equipment such as turbines, blowers, critical pumps, and compressors that directly impact the safety, environment, and production in different industrial plants. Online condition monitoring systems include a series of sensors permanently mounted on critical machines such as monitors, analyzers, and central servers of industrial plants to track their performance constantly. They transmit data to plant operators through either a wireless or a cabled network.

'Power generation industry is expected to hold largest market share during the forecast period.'

The modern power plants are comparatively complex, with sophisticated machinery and control systems and owing to the complexity of these plants it become more challenging to monitor the health of every equipment in the plants and identify potential problems before they lead to failures. machine condition monitoring systems helps to provide real-time data on the condition of critical equipment, and also provide the support to prevent unexpected downtime and improve overall plant reliability. Moreover, power generation companies are under increasing pressure to operate their plants reliably and efficiently. Machine condition monitoring systems can help to achieve these goals by providing early warning of potential problems, allowing for timely maintenance and repairs. This can help to prevent forced outages and reduce maintenance costs.

'The market in Europe is expected to grow at a impressive CAGR during the forecast period.'

Germany is one of the key economies in Europe. The country is specifically known for its strong automotive manufacturing sector. The Government of Germany has undertaken many initiatives to computerize its process industries to enhance resource efficiency and industrial output. The technological base for this project is cyber-physical systems, cloud computing, and the IoT. Its goal is to increase digitalization through smart factories and IoT. This will ultimately offer advanced solutions to carry out predictive maintenance and condition monitoring and prevent machine failures to increase operational efficiency. The increasing use of smart sensing technologies and

Industry 4.0 has significantly improved the monitoring techniques in Germany. Industry 4.0 helps digitalize industrial processes and improve plant performance and efficiency.

Breakdown of the profiles of primary participants:

By Company Type: Tier 1 - 40%, Tier 2 - 35%, and Tier 3 - 25%

By Designation: C-level Executives - 45%, Directors - 30%, and Others - 25%

By Region: North America - 35%, Europe - 30%, Asia Pacific - 25%, and RoW – 10%

Major players profiled in this report are as follows: Emerson Electric Co. (US), Honeywell International Inc. (US), SKF (Sweden), Amphenol Corporation (US), PARKER HANNIFIN CORP (US), General Electric (US), Rockwell Automation (US), Schaeffler AG (Germany), Siemens (Germany), Teledyne Technologies Incorporated (US), Analog Devices, Inc. (US) and others.

### Research Coverage

The machine condition monitoring market has been classified by applications, equipment procurement, deployment type, offering, monitoring process, monitoring technique, industry and region. The market by applications has been classified into pumps, chillers, motors, bearings, and other. The offering segment is divided into hardware, software, and services. The market has been divided into original equipment manufacturers and end-users by equipment procurement segment. The market by monitoring technique has been classified into vibration analysis, thermography, oil analysis, corrosion monitoring, ultrasound emission, and motor current analysis. The market by monitoring process has been classified into portable condition monitoring and online condition monitoring. Based on deployment type the market has been segmented into on-premises and cloud. Furthermore, the industry segment includes oil & gas, power generation, metals & mining, chemicals, automotive, aerospace, food & beverages, marine, and other Industries. The study also forecasts the market size in four key regions—North America, Europe, Asia Pacific, and RoW.

Key Benefits of Buying the Report:

The report provides insights on the following pointers:

*Machine Condition Monitoring Market by Technique (Vibration Monitoring, Thermography, Oil Analysis, Ultrasound...*

Analysis of key drivers (Advent of secured cloud computing platform to fuel market growth, Rising inclination towards wireless communication technology, Growing adoption of predictive maintenance techniques to reduce sudden breakdowns of equipment, Rising number of smart factories worldwide), restraints (Reliability issues in prediction capabilities of machine condition monitoring systems, Lack of availability of technical expertise to carry out data analysis), opportunities (Integration of big data analytics and machine learning in machine condition monitoring, Emergence of IIoT to drive new growth opportunities), and challenges ( Unavailability of technical expertise at remote locations, High cost associated with integration of machine condition monitoring systems with other maintenance systems) influencing the growth of the machine condition monitoring market

**Product Development/Innovation:** Detailed insights on new products, technologies, research & development activities, funding activities, industry partnerships, and new product launches in the machine condition monitoring market

**Market Development:** Comprehensive information about lucrative markets – the report analyses the machine condition monitoring market across regions such as North America, Europe, Asia Pacific, and RoW.

**Market Diversification:** Exhaustive information about new products & technologies, untapped geographies, recent developments, and investments in the machine condition monitoring market

**Competitive Assessment:** In-depth assessment of market position, growth strategies, and product offerings of leading players like Emerson Electric Co. (US), Honeywell International Inc. (US), SKF (Sweden), Amphenol Corporation (US) and among others in the machine condition monitoring market

**Strategies:** The report also helps stakeholders understand the pulse of the machine condition monitoring market and provides information on key market drivers, restraints, challenges, and opportunities.

## Contents

### 1 INTRODUCTION

1.1 STUDY OBJECTIVES

1.2 MARKET DEFINITION

1.3 INCLUSIONS AND EXCLUSIONS

1.4 MARKETS COVERED

FIGURE 1 MACHINE CONDITION MONITORING MARKET SEGMENTATION

1.4.1 REGIONAL SCOPE

FIGURE 2 MACHINE CONDITION MONITORING MARKET: REGIONAL SCOPE

1.4.2 YEARS CONSIDERED

1.5 CURRENCY CONSIDERED

1.6 STAKEHOLDERS

1.7 SUMMARY OF CHANGES

1.8 RECESSION IMPACT

### 2 RESEARCH METHODOLOGY

2.1 RESEARCH DATA

FIGURE 3 MACHINE CONDITION MONITORING MARKET: RESEARCH DESIGN

2.1.1 SECONDARY AND PRIMARY RESEARCH

FIGURE 4 MACHINE CONDITION MONITORING MARKET: RESEARCH APPROACH

2.1.2 SECONDARY DATA

2.1.2.1 List of major secondary sources

2.1.2.2 Key data from secondary sources

2.1.3 PRIMARY DATA

2.1.3.1 List of participants in primary interviews

2.1.3.2 Key data from primary sources

2.1.3.3 Key industry insights

2.1.3.4 Breakdown of primaries

2.2 MARKET SIZE ESTIMATION

2.2.1 TOP-DOWN APPROACH

2.2.1.1 Estimation of market size using top-down approach

FIGURE 5 MACHINE CONDITION MONITORING MARKET: TOP-DOWN APPROACH

2.2.2 BOTTOM-UP APPROACH

2.2.2.1 Estimation of market size using bottom-up approach

FIGURE 6 MACHINE CONDITION MONITORING MARKET: BOTTOM-UP APPROACH

FIGURE 7 MARKET SIZE ESTIMATION METHODOLOGY: SUPPLY-SIDE ANALYSIS

2.3 DATA TRIANGULATION

FIGURE 8 DATA TRIANGULATION

2.4 RESEARCH ASSUMPTIONS

FIGURE 9 RESEARCH ASSUMPTIONS

2.5 RESEARCH LIMITATIONS

2.6 PARAMETERS CONSIDERED TO ANALYZE IMPACT OF RECESSION ON  
MACHINE CONDITION MONITORING MARKET

2.7 RISK ASSESSMENT

TABLE 1 RISK ANALYSIS

### **3 EXECUTIVE SUMMARY**

FIGURE 10 MACHINE CONDITION MONITORING MARKET, 2020–2029 (USD  
BILLION)

FIGURE 11 ONLINE MACHINE CONDITION MONITORING SYSTEMS TO  
DOMINATE MARKET THROUGHOUT FORECAST PERIOD

FIGURE 12 VIBRATION MONITORING TECHNIQUE TO ACCOUNT FOR LARGEST  
MARKET SHARE IN 2024

FIGURE 13 POWER GENERATION INDUSTRY TO ACCOUNT FOR LARGEST  
MARKET SHARE IN 2024

FIGURE 14 NORTH AMERICA DOMINATED GLOBAL MACHINE CONDITION  
MONITORING MARKET IN 2023

### **4 PREMIUM INSIGHTS**

4.1 ATTRACTIVE OPPORTUNITIES FOR PLAYERS IN MACHINE CONDITION  
MONITORING MARKET

FIGURE 15 GROWING DEMAND FROM AUTOMOTIVE AND AEROSPACE  
INDUSTRIES TO DRIVE MARKET

4.2 MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE

FIGURE 16 VIBRATION MONITORING TECHNIQUE TO ACCOUNT FOR LARGEST  
MARKET SHARE IN 2029

4.3 MACHINE CONDITION MONITORING MARKET, BY INDUSTRY

FIGURE 17 POWER GENERATION INDUSTRY TO CAPTURE LARGEST MARKET  
SHARE IN 2029

4.4 MACHINE CONDITION MONITORING MARKET IN NORTH AMERICA, BY  
INDUSTRY AND COUNTRY

FIGURE 18 POWER GENERATION INDUSTRY AND US TO HOLD LARGEST SHARE

OF NORTH AMERICAN MACHINE CONDITION MONITORING MARKET IN 2029  
4.5 MACHINE CONDITION MONITORING MARKET, BY COUNTRY  
FIGURE 19 INDIA TO EXHIBIT HIGHEST CAGR IN GLOBAL MACHINE CONDITION MONITORING MARKET DURING FORECAST PERIOD

## **5 MARKET OVERVIEW**

### 5.1 INTRODUCTION

### 5.2 MARKET DYNAMICS

FIGURE 20 GLOBAL MACHINE CONDITION MONITORING MARKET: DRIVERS, RESTRAINTS, OPPORTUNITIES, AND CHALLENGES

#### 5.2.1 DRIVERS

5.2.1.1 Increasing utilization of wireless sensor networks in industrial plants

5.2.1.2 Elevating demand for predictive maintenance techniques to reduce unexpected breakdowns

5.2.1.3 Rising number of smart factories worldwide

5.2.1.4 Increasing awareness about benefits of machine condition monitoring technology adoption

FIGURE 21 MACHINE CONDITION MONITORING MARKET: IMPACT ANALYSIS OF DRIVERS

#### 5.2.2 RESTRAINTS

5.2.2.1 High cost of integrating machine condition monitoring systems with machine maintenance systems

FIGURE 22 MACHINE CONDITION MONITORING MARKET: IMPACT ANALYSIS OF RESTRAINTS

#### 5.2.3 OPPORTUNITIES

5.2.3.1 Integration of big data analytics and machine learning into machine condition monitoring

5.2.3.2 Advent of secured cloud computing platform

5.2.3.3 Integration of IIoT systems with existing manufacturing systems

FIGURE 23 MACHINE CONDITION MONITORING MARKET: IMPACT ANALYSIS OF OPPORTUNITIES

#### 5.2.4 CHALLENGES

5.2.4.1 Unavailability of technical expertise at remote locations

5.2.4.2 Additional costs associated with retrofitting existing systems

FIGURE 24 MACHINE CONDITION MONITORING MARKET: IMPACT ANALYSIS OF CHALLENGES

### 5.3 VALUE CHAIN ANALYSIS

FIGURE 25 MACHINE CONDITION MONITORING VALUE CHAIN



## 5.4 ECOSYSTEM ANALYSIS

### FIGURE 26 ECOSYSTEM MAPPING

### TABLE 2 KEY COMPANIES AND THEIR ROLE IN ECOSYSTEM

## 5.5 PRICING ANALYSIS

### 5.5.1 AVERAGE SELLING PRICE TREND OF MACHINE CONDITION MONITORING SYSTEM

### FIGURE 27 AVERAGE SELLING PRICE OF MACHINE CONDITION MONITORING SYSTEM, 2019–2023

### 5.5.2 AVERAGE SELLING PRICE OF VIBRATION SENSORS PROVIDED BY KEY PLAYERS

### FIGURE 28 AVERAGE SELLING PRICE TREND OF VIBRATION SENSORS, BY KEY PLAYER

### TABLE 3 AVERAGE SELLING PRICE OF VIBRATION SENSORS OFFERED BY KEY PLAYERS

### TABLE 4 AVERAGE SELLING PRICES OF MACHINE CONDITION MONITORING HARDWARE EQUIPMENT

### 5.5.3 AVERAGE SELLING PRICE TREND, BY REGION

### TABLE 5 AVERAGE SELLING PRICE OF MACHINE CONDITION MONITORING SYSTEM, BY REGION

## 5.6 TRENDS/DISRUPTIONS IMPACTING CUSTOMER BUSINESS

### FIGURE 29 TRENDS INFLUENCING CUSTOMER BUSINESS

## 5.7 TECHNOLOGY ANALYSIS

### 5.7.1 INTERNET OF THINGS (IOT)

### FIGURE 30 UTILIZATION OF IOT PLATFORMS BY CONDITION MONITORING SYSTEM USERS

### 5.7.2 CLOUD COMPUTING TECHNOLOGY

### FIGURE 31 ADVANTAGES OF CLOUD-BASED MACHINE CONDITION MONITORING

### FIGURE 32 INDUSTRIAL DEVELOPMENT MODEL

### 5.7.3 MULTI-PARAMETER CONDITION MONITORING

### 5.7.4 CLOUD-BASED PREDICTIVE MAINTENANCE (MAINTENANCE-AS-A-SERVICE)

### FIGURE 33 DATA EXCHANGE IN CLOUD-BASED MAINTENANCE FRAMEWORK

## 5.8 PORTER'S FIVE FORCES ANALYSIS

### TABLE 6 MACHINE CONDITION MONITORING MARKET: PORTER'S FIVE FORCES ANALYSIS

### FIGURE 34 MACHINE CONDITION MONITORING MARKET: PORTER'S FIVE FORCES ANALYSIS

### 5.8.1 BARGAINING POWER OF SUPPLIERS



## 5.8.2 BARGAINING POWER OF BUYERS

## 5.8.3 THREAT OF NEW ENTRANTS

## 5.8.4 THREAT OF SUBSTITUTES

## 5.8.5 INTENSITY OF COMPETITIVE RIVALRY

## 5.9 KEY STAKEHOLDERS AND BUYING CRITERIA

### 5.9.1 KEY STAKEHOLDERS IN BUYING PROCESS

FIGURE 35 INFLUENCE OF STAKEHOLDERS ON BUYING PROCESS FOR TOP 3 INDUSTRIES

TABLE 7 INFLUENCE OF STAKEHOLDERS ON BUYING PROCESS, BY INDUSTRY

### 5.9.2 BUYING CRITERIA

FIGURE 36 KEY BUYING CRITERIA FOR TOP 3 INDUSTRIES

TABLE 8 KEY BUYING CRITERIA FOR TOP 3 INDUSTRIES

## 5.10 CASE STUDY ANALYSIS

TABLE 9 STEEL ROLLING MILL DEPLOYED ONLINE CONDITION MONITORING SYSTEM TO PREVENT CATASTROPHIC BEARING FAILURE

TABLE 10 EMERSON ELECTRIC INSTALLED VIBRATION TRANSMITTER IN BARKING POWER STATION TO REDUCE PLANT DOWNTIME

TABLE 11 SIG EMPLOYED APM STRATEGY SOLUTION TO REDUCE UNPLANNED DOWNTIME

## 5.11 TRADE ANALYSIS

### 5.11.1 IMPORT SCENARIO

FIGURE 37 IMPORT VALUE OF PARTS FOR MACHINE CHECKING AND MEASUREMENT, BY COUNTRY, 2018–2022 (USD MILLION)

### 5.11.2 EXPORT SCENARIO

FIGURE 38 EXPORTS VALUE OF PARTS FOR MACHINE CHECKING AND MEASUREMENT, BY COUNTRY, 2018–2022 (USD MILLION)

## 5.12 PATENT ANALYSIS

FIGURE 39 TOP 10 PATENT APPLICANTS IN LAST 10 YEARS

TABLE 12 TOP 20 PATENT OWNERS IN US IN LAST 10 YEARS (2014–2023)

FIGURE 40 NUMBER OF PATENTS GRANTED PER YEAR, 2014–2023

TABLE 13 INNOVATIONS AND PATENT REGISTRATIONS PERTAINING TO MACHINE CONDITION MONITORING, 2022–2023

## 5.13 KEY CONFERENCES AND EVENTS, 2024–2025

TABLE 14 LIST OF CONFERENCES AND EVENTS

## 5.14 TARIFFS, REGULATORY LANDSCAPE, AND STANDARDS

5.14.1 TARIFFS FOR HS CODE 903190-COMPLIANT PARTS FOR MACHINE CHECKING AND MEASURING

TABLE 15 AVERAGE TARIFF (ESTIMATED) APPLIED BY COUNTRY (%)

### 5.14.2 REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER

## ORGANIZATIONS

TABLE 16 NORTH AMERICA: LIST OF REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS

TABLE 17 EUROPE: LIST OF REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS

TABLE 18 ASIA PACIFIC: LIST OF REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS

TABLE 19 ROW: LIST OF REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS

### 5.14.3 STANDARDS

TABLE 20 MACHINE CONDITION MONITORING-RELATED STANDARDS

## **6 APPLICATIONS OF MACHINE CONDITION MONITORING SYSTEMS**

### 6.1 INTRODUCTION

FIGURE 41 PUMPS ACCOUNTED FOR LARGEST SHARE OF MACHINE CONDITION MONITORING MARKET, BY APPLICATION, IN 2023

#### 6.2 PUMPS

#### 6.3 CHILLERS

#### 6.4 MOTORS

#### 6.5 BEARINGS

#### 6.6 OTHER APPLICATIONS

## **7 PROCUREMENT MODELS USED IN MACHINE CONDITION MONITORING EQUIPMENT MARKET**

### 7.1 INTRODUCTION

FIGURE 42 ORIGINAL EQUIPMENT MANUFACTURERS CAPTURED MAJORITY OF MARKET SHARE IN 2023

#### 7.2 ORIGINAL EQUIPMENT MANUFACTURERS (OEMS)

#### 7.3 END USERS

## **8 MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE**

### 8.1 INTRODUCTION

FIGURE 43 MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE

FIGURE 44 VIBRATION MONITORING TECHNIQUE TO ACCOUNT FOR LARGEST MARKET SHARE IN 2029

TABLE 21 MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2020–2023 (USD MILLION)

TABLE 22 MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2024–2029 (USD MILLION)

## 8.2 VIBRATION MONITORING

8.2.1 INCLINATION TOWARD PREDICTIVE MAINTENANCE TO BOOST DEMAND FOR VIBRATION MONITORING TECHNIQUE

TABLE 23 VIBRATION MONITORING: MACHINE CONDITION MONITORING MARKET, BY OFFERING, 2020–2023 (USD MILLION)

TABLE 24 VIBRATION MONITORING: MACHINE CONDITION MONITORING MARKET, BY OFFERING, 2024–2029 (USD MILLION)

TABLE 25 VIBRATION MONITORING: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 26 VIBRATION MONITORING: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 27 VIBRATION MONITORING: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2020–2023 (USD MILLION)

TABLE 28 VIBRATION MONITORING: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2024–2029 (USD MILLION)

## 8.3 THERMOGRAPHY

8.3.1 RISING FOCUS ON COST SAVINGS AND ENERGY EFFICIENCY OPTIMIZATION TO ACCELERATE ADOPTION OF THERMOGRAPHY

TABLE 29 THERMOGRAPHY: MACHINE CONDITION MONITORING MARKET, BY OFFERING, 2020–2023 (USD MILLION)

TABLE 30 THERMOGRAPHY: MACHINE CONDITION MONITORING MARKET, BY OFFERING, 2024–2029 (USD MILLION)

TABLE 31 THERMOGRAPHY: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 32 THERMOGRAPHY: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 33 THERMOGRAPHY: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2020–2023 (USD MILLION)

TABLE 34 THERMOGRAPHY: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2024–2029 (USD MILLION)

## 8.4 OIL ANALYSIS

8.4.1 PRESENCE OF WEAR PARTICLES AND OTHER CONTAMINANTS IN OIL TO INCREASE DEMAND FOR OIL ANALYSIS TECHNIQUE

FIGURE 45 ADVANTAGES OF OIL ANALYSIS TECHNIQUE

TABLE 35 OIL ANALYSIS: MACHINE CONDITION MONITORING MARKET, BY

OFFERING, 2020–2023 (USD MILLION)

TABLE 36 OIL ANALYSIS: MACHINE CONDITION MONITORING MARKET, BY OFFERING, 2024–2029 (USD MILLION)

TABLE 37 OIL ANALYSIS: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 38 OIL ANALYSIS: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 39 OIL ANALYSIS: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2020–2023 (USD MILLION)

TABLE 40 OIL ANALYSIS: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2024–2029 (USD MILLION)

## 8.5 CORROSION MONITORING

8.5.1 EMPHASIS ON MAXIMIZING PLANT EFFICIENCY AND SAFETY TO PROMOTE USE OF CORROSION MONITORING TECHNIQUE

TABLE 41 CORROSION MONITORING: MACHINE CONDITION MONITORING MARKET, BY OFFERING, 2020–2023 (USD MILLION)

TABLE 42 CORROSION MONITORING: MACHINE CONDITION MONITORING MARKET, BY OFFERING, 2024–2029 (USD MILLION)

TABLE 43 CORROSION MONITORING: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 44 CORROSION MONITORING: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 45 CORROSION MONITORING: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2020–2023 (USD MILLION)

TABLE 46 CORROSION MONITORING: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2024–2029 (USD MILLION)

## 8.6 ULTRASOUND EMISSION

8.6.1 NEED TO DETECT DEFECTS IN ELECTRIC EQUIPMENT TO STIMULATE DEMAND FOR ULTRASOUND EMISSION TECHNIQUE

TABLE 47 ULTRASOUND EMISSION: MACHINE CONDITION MONITORING MARKET, BY OFFERING, 2020–2023 (USD MILLION)

TABLE 48 ULTRASOUND EMISSION: MACHINE CONDITION MONITORING MARKET, BY OFFERING, 2024–2029 (USD MILLION)

TABLE 49 ULTRASOUND EMISSION: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 50 ULTRASOUND EMISSION: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 51 ULTRASOUND EMISSION: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2020–2023 (USD MILLION)

TABLE 52 ULTRASOUND EMISSION: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2024–2029 (USD MILLION)

### 8.7 MOTOR CURRENT ANALYSIS

8.7.1 RISING UTILIZATION OF MOTOR CURRENT ANALYSIS FOR EARLY DETECTION OF FAULTS IN MACHINERY TO DRIVE MARKET

TABLE 53 MOTOR CURRENT ANALYSIS: MACHINE CONDITION MONITORING MARKET, BY OFFERING, 2020–2023 (USD MILLION)

TABLE 54 MOTOR CURRENT ANALYSIS: MACHINE CONDITION MONITORING MARKET, BY OFFERING, 2024–2029 (USD MILLION)

TABLE 55 MOTOR CURRENT ANALYSIS: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 56 MOTOR CURRENT ANALYSIS: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 57 MOTOR CURRENT ANALYSIS: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2020–2023 (USD MILLION)

TABLE 58 MOTOR CURRENT ANALYSIS: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2024–2029 (USD MILLION)

## 9 MACHINE CONDITION MONITORING MARKET, BY OFFERING

### 9.1 INTRODUCTION

FIGURE 46 MACHINE CONDITION MONITORING MARKET, BY OFFERING

FIGURE 47 HARDWARE SEGMENT TO HOLD LARGER MARKET SIZE IN 2029

TABLE 59 MACHINE CONDITION MONITORING MARKET, BY OFFERING, 2020–2023 (USD MILLION)

TABLE 60 MACHINE CONDITION MONITORING MARKET, BY OFFERING, 2024–2029 (USD MILLION)

TABLE 61 MACHINE CONDITION MONITORING MARKET, 2020–2023 (THOUSAND UNITS)

TABLE 62 MACHINE CONDITION MONITORING MARKET, 2024–2029 (THOUSAND UNITS)

### 9.2 HARDWARE

TABLE 63 MACHINE CONDITION MONITORING MARKET, BY HARDWARE TYPE, 2020–2023 (USD MILLION)

TABLE 64 MACHINE CONDITION MONITORING MARKET, BY HARDWARE TYPE, 2024–2029 (USD MILLION)

TABLE 65 HARDWARE: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2020–2023 (USD MILLION)

TABLE 66 HARDWARE: MACHINE CONDITION MONITORING MARKET, BY

## MONITORING TECHNIQUE, 2024–2029 (USD MILLION)

### 9.2.1 VIBRATION SENSORS

9.2.1.1 Rising use by automotive and oil & gas companies in process control and quality assurance applications to drive market

9.2.1.2 Accelerometers

9.2.1.3 Proximity probes

9.2.1.4 Tachometers

### 9.2.2 INFRARED SENSORS

9.2.2.1 Increasing deployment in thermography applications to spot unusual heat patterns to fuel segmental growth

9.2.2.2 Thermal infrared sensors

9.2.2.3 Quantum infrared sensors

### 9.2.3 SPECTROMETERS

9.2.3.1 Surging adoption to detect contamination, degradation, and cross-contamination in synthetic and petroleum-based lubricants and fluids to stimulate market growth

9.2.3.2 Infrared spectrometers

9.2.3.3 Ultraviolet spectrometers

9.2.3.4 Atomic spectrometers

9.2.3.5 Mass spectrometers

### 9.2.4 ULTRASOUND DETECTORS

9.2.4.1 Surging adoption of predictive maintenance and quality control measures by industrial players to boost demand

9.2.4.2 Sound pressure meters

9.2.4.3 Stethoscopes

9.2.4.4 Ultrasound leak detectors

### 9.2.5 SPECTRUM ANALYZERS

9.2.5.1 Significant focus on safe and efficient operation of industrial plants to drive market

9.2.5.2 Swept spectrum analyzers

9.2.5.3 Real-time spectrum analyzers

### 9.2.6 CORROSION PROBES

9.2.6.1 Pressing need to mitigate corrosion risks in petroleum and chemical processing plants to accelerate demand

### 9.2.7 OTHER HARDWARE PRODUCTS

## 9.3 SOFTWARE

9.3.1 INTEGRATION OF SOFTWARE INTO MACHINE CONDITION MONITORING SYSTEM TO SIMPLIFY DEFECT ANALYSIS PROCESS TO DRIVE MARKET

TABLE 67 LIST OF MACHINE CONDITION MONITORING SOFTWARE PROVIDERS



AND THEIR HEADQUARTERS

TABLE 68 SOFTWARE: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2020–2023 (USD MILLION)

TABLE 69 SOFTWARE: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2024–2029 (USD MILLION)

9.3.2 DATA INTEGRATION

9.3.3 DIAGNOSTIC REPORTING

9.3.4 ORDER TRACKING ANALYSIS

9.3.5 PARAMETER CALCULATION

9.4 SERVICES

9.4.1 STRONG FOCUS OF MANUFACTURERS ON LONG-TERM RELIABILITY, PERFORMANCE OPTIMIZATION, AND CUSTOMER SATISFACTION TO BOOST DEMAND

9.4.2 INSTALLATION

9.4.3 TRAINING

9.4.4 MAINTENANCE

## **10 MACHINE CONDITION MONITORING MARKET, BY DEPLOYMENT MODE**

10.1 INTRODUCTION

FIGURE 48 MACHINE CONDITION MONITORING MARKET, BY DEPLOYMENT MODE

FIGURE 49 ON-PREMISES SEGMENT TO HOLD LARGER MARKET SHARE THROUGHOUT FORECAST PERIOD

TABLE 70 MACHINE CONDITION MONITORING MARKET, BY DEPLOYMENT MODE, 2020–2023 (USD MILLION)

TABLE 71 MACHINE CONDITION MONITORING MARKET, BY DEPLOYMENT MODE, 2024–2029 (USD MILLION)

10.2 ON-PREMISES

10.2.1 SIGNIFICANT FOCUS ON ENSURING COMPLETE DATA CONTROL AND SECURITY TO ACCELERATE SEGMENTAL GROWTH

FIGURE 50 LIMITATIONS OF ON-PREMISES DEPLOYMENT

10.3 CLOUD

10.3.1 SUPERIOR FLEXIBILITY, CONVENIENCE, AND SCALABILITY TO INCREASE ADOPTION OF CLOUD MODEL

FIGURE 51 ADVANTAGES OF CLOUD DEPLOYMENT

## **11 MACHINE CONDITION MONITORING MARKET, BY TYPE**



## 11.1 INTRODUCTION

FIGURE 52 MACHINE CONDITION MONITORING MARKET, BY TYPE

FIGURE 53 ONLINE SEGMENT TO LEAD MACHINE CONDITION MONITORING MARKET FROM 2024 TO 2029

TABLE 72 MACHINE CONDITION MONITORING MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 73 MACHINE CONDITION MONITORING MARKET, BY TYPE, 2024–2029 (USD MILLION)

## 11.2 ONLINE

11.2.1 NEED FOR REAL-TIME DATA REGARDING VARIATIONS IN MACHINE PERFORMANCE FOR PROMPT DECISION-MAKING TO DRIVE MARKET

TABLE 74 ONLINE: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2020–2023 (USD MILLION)

TABLE 75 ONLINE: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2024–2029 (USD MILLION)

TABLE 76 ONLINE: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2020–2023 (USD MILLION)

TABLE 77 ONLINE: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2024–2029 (USD MILLION)

## 11.3 PORTABLE

11.3.1 COST-EFFECTIVENESS AND MAXIMIZED PRODUCTION OUTPUT TO BOOST DEMAND

TABLE 78 PORTABLE: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2020–2023 (USD MILLION)

TABLE 79 PORTABLE: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2024–2029 (USD MILLION)

TABLE 80 PORTABLE: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2020–2023 (USD MILLION)

TABLE 81 PORTABLE: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2024–2029 (USD MILLION)

## 12 MACHINE CONDITION MONITORING MARKET, BY INDUSTRY

### 12.1 INTRODUCTION

FIGURE 54 MACHINE CONDITION MONITORING MARKET, BY INDUSTRY

FIGURE 55 AUTOMOTIVE INDUSTRY TO RECORD HIGHEST CAGR IN MACHINE CONDITION MONITORING MARKET FROM 2024 TO 2029

TABLE 82 MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2020–2023 (USD MILLION)

TABLE 83 MACHINE CONDITION MONITORING MARKET, BY INDUSTRY,  
2024–2029 (USD MILLION)

## 12.2 OIL & GAS

12.2.1 RISING ADOPTION OF SMART FACTORY SOLUTIONS TO BOOST  
CONDITION MONITORING SYSTEM DEMAND

TABLE 84 OIL & GAS: MACHINE CONDITION MONITORING MARKET, BY  
MONITORING TECHNIQUE, 2020–2023 (USD MILLION)

TABLE 85 OIL & GAS: MACHINE CONDITION MONITORING MARKET, BY  
MONITORING TECHNIQUE, 2024–2029 (USD MILLION)

TABLE 86 OIL & GAS: MACHINE CONDITION MONITORING MARKET, BY TYPE,  
2020–2023 (USD MILLION)

TABLE 87 OIL & GAS: MACHINE CONDITION MONITORING MARKET, BY TYPE,  
2024–2029 (USD MILLION)

TABLE 88 OIL & GAS: MACHINE CONDITION MONITORING MARKET, BY REGION,  
2020–2023 (USD MILLION)

TABLE 89 OIL & GAS: MACHINE CONDITION MONITORING MARKET, BY REGION,  
2024–2029 (USD MILLION)

## 12.3 POWER GENERATION

12.3.1 INCREASING FOCUS ON IMPROVING POWER PLANT EFFICIENCY AND  
RELIABILITY TO PROMOTE ADOPTION OF MACHINE MONITORING SYSTEMS

TABLE 90 POWER GENERATION: MACHINE CONDITION MONITORING MARKET,  
BY MONITORING TECHNIQUE, 2020–2023 (USD MILLION)

TABLE 91 POWER GENERATION: MACHINE CONDITION MONITORING MARKET,  
BY MONITORING TECHNIQUE, 2024–2029 (USD MILLION)

TABLE 92 POWER GENERATION: MACHINE CONDITION MONITORING MARKET,  
BY TYPE, 2020–2023 (USD MILLION)

TABLE 93 POWER GENERATION: MACHINE CONDITION MONITORING MARKET,  
BY TYPE, 2024–2029 (USD MILLION)

TABLE 94 POWER GENERATION: MACHINE CONDITION MONITORING MARKET,  
BY REGION, 2020–2023 (USD MILLION)

TABLE 95 POWER GENERATION: MACHINE CONDITION MONITORING MARKET,  
BY REGION, 2024–2029 (USD MILLION)

## 12.4 METALS & MINING

12.4.1 GREATER EMPHASIS ON PREVENTING CATASTROPHIC SYSTEM  
FAILURES AND UNSCHEDULED DOWNTIME TO BOOST DEPLOYMENT OF  
VIBRATION SENSORS

TABLE 96 METALS & MINING: MACHINE CONDITION MONITORING MARKET, BY  
MONITORING TECHNIQUE, 2020–2023 (USD MILLION)

TABLE 97 METALS & MINING: MACHINE CONDITION MONITORING MARKET, BY

MONITORING TECHNIQUE, 2024–2029 (USD MILLION)

TABLE 98 METALS & MINING: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 99 METALS & MINING: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 100 METALS & MINING: MACHINE CONDITION MONITORING MARKET, BY REGION, 2020–2023 (USD MILLION)

TABLE 101 METALS & MINING: MACHINE CONDITION MONITORING MARKET, BY REGION, 2024–2029 (USD MILLION)

## 12.5 CHEMICALS

12.5.1 HIGH ADOPTION OF AUTOMATION SOLUTIONS BY CHEMICAL MANUFACTURERS TO CREATE NEED FOR MACHINE MONITORING SYSTEMS

TABLE 102 CHEMICALS: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2020–2023 (USD MILLION)

TABLE 103 CHEMICALS: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2024–2029 (USD MILLION)

TABLE 104 CHEMICALS: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 105 CHEMICALS: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 106 CHEMICALS: MACHINE CONDITION MONITORING MARKET, BY REGION, 2020–2023 (USD MILLION)

TABLE 107 CHEMICALS: MACHINE CONDITION MONITORING MARKET, BY REGION, 2024–2029 (USD MILLION)

## 12.6 AUTOMOTIVE

12.6.1 GROWING DEPLOYMENT OF IIOT TO AUTOMATE AND DIGITALIZE MANUFACTURING PROCESSES TO CREATE OPPORTUNITIES FOR MARKET PLAYERS

TABLE 108 AUTOMOTIVE: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2020–2023 (USD MILLION)

TABLE 109 AUTOMOTIVE: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2024–2029 (USD MILLION)

TABLE 110 AUTOMOTIVE: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 111 AUTOMOTIVE: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 112 AUTOMOTIVE: MACHINE CONDITION MONITORING MARKET, BY REGION, 2020–2023 (USD MILLION)

TABLE 113 AUTOMOTIVE: MACHINE CONDITION MONITORING MARKET, BY

REGION, 2024–2029 (USD MILLION)

## 12.7 AEROSPACE

12.7.1 RISING ADOPTION OF AI AND IOT TECHNOLOGIES BY AEROSPACE COMPANIES TO ELEVATE DEMAND FOR MACHINE MONITORING SOLUTIONS

TABLE 114 AEROSPACE: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2020–2023 (USD MILLION)

TABLE 115 AEROSPACE: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2024–2029 (USD MILLION)

TABLE 116 AEROSPACE: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 117 AEROSPACE: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 118 AEROSPACE: MACHINE CONDITION MONITORING MARKET, BY REGION, 2020–2023 (USD MILLION)

TABLE 119 AEROSPACE: MACHINE CONDITION MONITORING MARKET, BY REGION, 2024–2029 (USD MILLION)

## 12.8 FOOD & BEVERAGES

12.8.1 SURGING DEMAND FOR FOOD PRODUCTS WITH LONGER SHELF LIFE TO FACILITATE ADOPTION OF MACHINE MONITORING SOLUTIONS

TABLE 120 FOOD & BEVERAGES: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2020–2023 (USD MILLION)

TABLE 121 FOOD & BEVERAGES: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2024–2029 (USD MILLION)

TABLE 122 FOOD & BEVERAGES: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 123 FOOD & BEVERAGES: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 124 FOOD & BEVERAGES: MACHINE CONDITION MONITORING MARKET, BY REGION, 2020–2023 (USD MILLION)

TABLE 125 FOOD & BEVERAGES: MACHINE CONDITION MONITORING MARKET, BY REGION, 2024–2029 (USD MILLION)

## 12.9 MARINE

12.9.1 GROWING RELIANCE ON PREDICTIVE MAINTENANCE MODEL TO AUGMENT ADOPTION OF MACHINE MONITORING SYSTEMS

TABLE 126 MARINE: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2020–2023 (USD MILLION)

TABLE 127 MARINE: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2024–2029 (USD MILLION)

TABLE 128 MARINE: MACHINE CONDITION MONITORING MARKET, BY TYPE,

2020–2023 (USD MILLION)

TABLE 129 MARINE: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 130 MARINE: MACHINE CONDITION MONITORING MARKET, BY REGION, 2020–2023 (USD MILLION)

TABLE 131 MARINE: MACHINE CONDITION MONITORING MARKET, BY REGION, 2024–2029 (USD MILLION)

12.10 OTHER INDUSTRIES

TABLE 132 OTHER INDUSTRIES: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2020–2023 (USD MILLION)

TABLE 133 OTHER INDUSTRIES: MACHINE CONDITION MONITORING MARKET, BY MONITORING TECHNIQUE, 2024–2029 (USD MILLION)

TABLE 134 OTHER INDUSTRIES: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2020–2023 (USD MILLION)

TABLE 135 OTHER INDUSTRIES: MACHINE CONDITION MONITORING MARKET, BY TYPE, 2024–2029 (USD MILLION)

TABLE 136 OTHER INDUSTRIES: MACHINE CONDITION MONITORING MARKET, BY REGION, 2020–2023 (USD MILLION)

TABLE 137 OTHER INDUSTRIES: MACHINE CONDITION MONITORING MARKET, BY REGION, 2024–2029 (USD MILLION)

## **13 MACHINE CONDITION MONITORING MARKET, BY REGION**

13.1 INTRODUCTION

FIGURE 56 MACHINE CONDITION MONITORING MARKET, BY REGION

FIGURE 57 INDIA TO EXHIBIT HIGHEST CAGR IN GLOBAL MACHINE CONDITION MONITORING MARKET DURING FORECAST PERIOD

TABLE 138 MACHINE CONDITION MONITORING MARKET, BY REGION, 2020–2023 (USD MILLION)

TABLE 139 MACHINE CONDITION MONITORING MARKET, BY REGION, 2024–2029 (USD MILLION)

13.2 NORTH AMERICA

13.2.1 NORTH AMERICA: RECESSION IMPACT

FIGURE 58 NORTH AMERICA: MACHINE CONDITION MONITORING MARKET SNAPSHOT

FIGURE 59 US TO ACCOUNT FOR LARGEST SHARE OF NORTH AMERICAN MARKET THROUGHOUT FORECAST PERIOD

TABLE 140 NORTH AMERICA: MACHINE CONDITION MONITORING MARKET, BY COUNTRY, 2020–2023 (USD MILLION)

TABLE 141 NORTH AMERICA: MACHINE CONDITION MONITORING MARKET, BY COUNTRY, 2024–2029 (USD MILLION)

TABLE 142 NORTH AMERICA: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2020–2023 (USD MILLION)

TABLE 143 NORTH AMERICA: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2024–2029 (USD MILLION)

### 13.2.2 US

13.2.2.1 Increasing adoption of IIoT technologies by manufacturing firms to drive market

### 13.2.3 CANADA

13.2.3.1 Rising deployment of smart factory solutions to fuel market growth

### 13.2.4 MEXICO

13.2.4.1 Growing implementation of automation solutions in industrial plants to support market growth

## 13.3 EUROPE

### 13.3.1 EUROPE: RECESSION IMPACT

FIGURE 60 EUROPE: MACHINE CONDITION MONITORING MARKET SNAPSHOT

FIGURE 61 GERMANY TO LEAD EUROPEAN MARKET THROUGHOUT FORECAST PERIOD

TABLE 144 EUROPE: MACHINE CONDITION MONITORING MARKET, BY COUNTRY, 2020–2023 (USD MILLION)

TABLE 145 EUROPE: MACHINE CONDITION MONITORING MARKET, BY COUNTRY, 2024–2029 (USD MILLION)

TABLE 146 EUROPE: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2020–2023 (USD MILLION)

TABLE 147 EUROPE: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2024–2029 (USD MILLION)

### 13.3.2 GERMANY

13.3.2.1 Thriving automotive sector to contribute to market growth

### 13.3.3 UK

13.3.3.1 Rising use of IoT devices by manufacturers to foster market growth

### 13.3.4 FRANCE

13.3.4.1 Booming aerospace industry to create opportunities for machine condition monitoring system providers

### 13.3.5 REST OF EUROPE

## 13.4 ASIA PACIFIC

### 13.4.1 ASIA PACIFIC: RECESSION IMPACT

FIGURE 62 ASIA PACIFIC: MACHINE CONDITION MONITORING MARKET SNAPSHOT



FIGURE 63 CHINA TO GAIN LARGEST MARKET SHARE IN ASIA PACIFIC THROUGHOUT FORECAST PERIOD

TABLE 148 ASIA PACIFIC: MACHINE CONDITION MONITORING MARKET, BY COUNTRY, 2020–2023 (USD MILLION)

TABLE 149 ASIA PACIFIC: MACHINE CONDITION MONITORING MARKET, BY COUNTRY, 2024–2029 (USD MILLION)

TABLE 150 ASIA PACIFIC: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2020–2023 (USD MILLION)

TABLE 151 ASIA PACIFIC: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2024–2029 (USD MILLION)

#### 13.4.2 CHINA

13.4.2.1 Surging adoption of automation technologies owing to increasing labor costs to drive market

#### 13.4.3 JAPAN

13.4.3.1 Shrinking workforce and aging population to boost adoption of advanced machine condition monitoring systems in smart factories

#### 13.4.4 INDIA

13.4.4.1 Digital India and Make in India initiatives to create opportunities for market players

#### 13.4.5 REST OF ASIA PACIFIC

### 13.5 REST OF THE WORLD (ROW)

#### 13.5.1 ROW: RECESSION IMPACT

FIGURE 64 GCC COUNTRIES TO DOMINATE MARKET IN ROW IN 2024

TABLE 152 ROW: MACHINE CONDITION MONITORING MARKET, BY GEOGRAPHY, 2020–2023 (USD MILLION)

TABLE 153 ROW: MACHINE CONDITION MONITORING MARKET, BY GEOGRAPHY, 2024–2029 (USD MILLION)

TABLE 154 ROW: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2020–2023 (USD MILLION)

TABLE 155 ROW: MACHINE CONDITION MONITORING MARKET, BY INDUSTRY, 2024–2029 (USD MILLION)

#### 13.5.2 GCC COUNTRIES

13.5.2.1 Strong presence of oil & gas industry to fuel market growth

TABLE 156 MACHINE CONDITION MONITORING MARKET, BY GCC COUNTRY, 2020–2023 (USD MILLION)

TABLE 157 MACHINE CONDITION MONITORING MARKET, BY GCC COUNTRY, 2024–2029 (USD MILLION)

#### 13.5.2.2 Saudi Arabia

13.5.2.2.1 Strong focus on oil production activities to boost adoption of machine



condition monitoring systems

13.5.2.3 UAE

13.5.2.3.1 Booming manufacturing sector to drive market

13.5.2.4 Rest of GCC countries

13.5.3 REST OF MIDDLE EAST & AFRICA

13.5.3.1 Flourishing mining industry to support market growth

13.5.4 SOUTH AMERICA

13.5.4.1 Emergence of region as manufacturing hub to create growth opportunities

## **14 COMPETITIVE LANDSCAPE**

14.1 INTRODUCTION

14.2 STRATEGIES ADOPTED BY KEY PLAYERS

TABLE 158 OVERVIEW OF STRATEGIES ADOPTED BY KEY PLAYERS

14.3 REVENUE ANALYSIS OF KEY PLAYERS IN MACHINE CONDITION MONITORING MARKET

FIGURE 65 FIVE-YEAR REVENUE ANALYSIS OF KEY PLAYERS IN MACHINE CONDITION MONITORING MARKET, 2018–2022

14.4 MARKET SHARE ANALYSIS, 2023

TABLE 159 MACHINE CONDITION MONITORING MARKET SHARE ANALYSIS (2023)

FIGURE 66 INDUSTRY CONCENTRATION, 2023

14.5 EVALUATION MATRIX FOR KEY COMPANIES, 2023

14.5.1 STARS

14.5.2 EMERGING LEADERS

14.5.3 PERVASIVE PLAYERS

14.5.4 PARTICIPANTS

FIGURE 67 MACHINE CONDITION MONITORING MARKET: KEY COMPANY EVALUATION MATRIX, 2023

14.5.5 COMPANY FOOTPRINT ANALYSIS

TABLE 160 OVERALL FOOTPRINT: KEY COMPANIES (25 COMPANIES)

TABLE 161 INDUSTRY FOOTPRINT: KEY COMPANIES (25 COMPANIES)

TABLE 162 REGION FOOTPRINT: KEY COMPANIES (25 COMPANIES)

14.6 EVALUATION MATRIX FOR STARTUPS/SMES, 2023

14.6.1 PROGRESSIVE COMPANIES

14.6.2 RESPONSIVE COMPANIES

14.6.3 DYNAMIC COMPANIES

14.6.4 STARTING BLOCKS

FIGURE 68 MACHINE CONDITION MONITORING MARKET: STARTUPS/SMES

**EVALUATION MATRIX, 2023****14.6.5 COMPETITIVE BENCHMARKING**

TABLE 163 DETAILED LIST OF KEY STARTUPS/SMES

TABLE 164 COMPETITIVE BENCHMARKING OF KEY STARTUPS/SMES (5 COMPANIES)

TABLE 165 OVERALL FOOTPRINT: STARTUPS/SMES (5 COMPANIES)

**14.7 COMPETITIVE SCENARIO AND TRENDS**

TABLE 166 MACHINE CONDITION MONITORING MARKET: PRODUCT LAUNCHES

TABLE 167 MACHINE CONDITION MONITORING MARKET: DEALS

**15 COMPANY PROFILES****15.1 KEY PLAYERS**

(Business Overview, Products/Services/Solutions Offered, MnM View, Key Strengths and Right to Win, Strategic Choices Made, Weaknesses and Competitive Threats, Recent Developments)\*

**15.1.1 BAKER HUGHES COMPANY**

TABLE 168 BAKER HUGHES COMPANY: COMPANY OVERVIEW

FIGURE 69 BAKER HUGHES COMPANY: COMPANY SNAPSHOT

TABLE 169 BAKER HUGHES COMPANY: PRODUCTS OFFERED

**15.1.2 EMERSON ELECTRIC CO.**

TABLE 170 EMERSON ELECTRIC CO.: COMPANY OVERVIEW

FIGURE 70 EMERSON ELECTRIC CO.: COMPANY SNAPSHOT

TABLE 171 EMERSON ELECTRIC CO.: PRODUCTS OFFERED

TABLE 172 EMERSON ELECTRIC CO.: PRODUCT LAUNCHES

TABLE 173 EMERSON ELECTRIC CO.: DEALS

**15.1.3 AMPHENOL CORPORATION**

TABLE 174 AMPHENOL CORPORATION: COMPANY OVERVIEW

FIGURE 71 AMPHENOL CORPORATION: COMPANY SNAPSHOT

TABLE 175 AMPHENOL CORPORATION: PRODUCTS OFFERED

TABLE 176 AMPHENOL CORPORATION: PRODUCT LAUNCHES

**15.1.4 HONEYWELL INTERNATIONAL INC.**

TABLE 177 HONEYWELL INTERNATIONAL INC.: COMPANY OVERVIEW

FIGURE 72 HONEYWELL INTERNATIONAL INC.: COMPANY SNAPSHOT

TABLE 178 HONEYWELL INTERNATIONAL INC.: PRODUCTS OFFERED

TABLE 179 HONEYWELL INTERNATIONAL INC.: PRODUCT LAUNCHES

**15.1.5 SKF**

TABLE 180 SKF: COMPANY OVERVIEW

FIGURE 73 SKF: COMPANY SNAPSHOT

TABLE 181 SKF: PRODUCTS OFFERED

TABLE 182 SKF: PRODUCT LAUNCHES

TABLE 183 SKF: DEALS

15.1.6 ANALOG DEVICES, INC.

TABLE 184 ANALOG DEVICES, INC.: COMPANY OVERVIEW

FIGURE 74 ANALOG DEVICES, INC.: COMPANY SNAPSHOT

TABLE 185 ANALOG DEVICES, INC.: PRODUCTS OFFERED

15.1.7 GENERAL ELECTRIC

TABLE 186 GENERAL ELECTRIC: COMPANY OVERVIEW

FIGURE 75 GENERAL ELECTRIC: COMPANY SNAPSHOT

TABLE 187 GENERAL ELECTRIC: PRODUCTS OFFERED

15.1.8 PARKER HANNIFIN CORP

TABLE 188 PARKER HANNIFIN CORP: COMPANY OVERVIEW

FIGURE 76 PARKER HANNIFIN CORP: COMPANY SNAPSHOT

TABLE 189 PARKER HANNIFIN CORP: PRODUCTS OFFERED

15.1.9 ROCKWELL AUTOMATION

TABLE 190 ROCKWELL AUTOMATION: COMPANY OVERVIEW

FIGURE 77 ROCKWELL AUTOMATION: COMPANY SNAPSHOT

TABLE 191 ROCKWELL AUTOMATION: PRODUCTS OFFERED

15.1.10 SCHAEFFLER AG

TABLE 192 SCHAEFFLER AG: COMPANY OVERVIEW

FIGURE 78 SCHAEFFLER AG: COMPANY SNAPSHOT

TABLE 193 SCHAEFFLER AG: PRODUCTS OFFERED

TABLE 194 SCHAEFFLER AG: PRODUCT LAUNCHES

15.1.11 SIEMENS

TABLE 195 SIEMENS: COMPANY OVERVIEW

FIGURE 79 SIEMENS: COMPANY SNAPSHOT

TABLE 196 SIEMENS: PRODUCTS OFFERED

TABLE 197 SIEMENS: DEALS

15.1.12 TELEDYNE TECHNOLOGIES INCORPORATED

TABLE 198 TELEDYNE TECHNOLOGIES INCORPORATED: COMPANY OVERVIEW

FIGURE 80 TELEDYNE TECHNOLOGIES INCORPORATED: COMPANY SNAPSHOT

TABLE 199 TELEDYNE TECHNOLOGIES INCORPORATED: PRODUCTS OFFERED

\*Business Overview, Products/Services/Solutions Offered, MnM View, Key Strengths and Right to Win, Strategic Choices Made, Weaknesses and Competitive Threats, Recent Developments might not be captured in case of unlisted companies.

15.2 OTHER COMPANIES

15.2.1 3D SIGNALS

15.2.2 BANNER ENGINEERING CORP.

- 15.2.3 CRYSTAL INSTRUMENTS
- 15.2.4 ECOLIBRIUM
- 15.2.5 FLUKE CORPORATION
- 15.2.6 IFM ELECTRONIC GMBH
- 15.2.7 LOGILUBE, LLC
- 15.2.8 MACHINE SAVER
- 15.2.9 PETASENSE INC.
- 15.2.10 SAMOTICS
- 15.2.11 SPM INSTRUMENT AB
- 15.2.12 SYMPHONYAI
- 15.2.13 UPTIMEWORKS

## **16 ADJACENT AND RELEVANT MARKETS**

### 16.1 INTRODUCTION

### 16.2 TEST AND MEASUREMENT EQUIPMENT MARKET, BY REGION

#### 16.2.1 INTRODUCTION

TABLE 200 TEST AND MEASUREMENT EQUIPMENT MARKET, BY REGION, 2019–2022 (USD MILLION)

TABLE 201 TEST AND MEASUREMENT EQUIPMENT MARKET, BY REGION, 2023–2028 (USD MILLION)

#### 16.2.2 NORTH AMERICA

TABLE 202 NORTH AMERICA: TEST AND MEASUREMENT EQUIPMENT MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 203 NORTH AMERICA: TEST AND MEASUREMENT EQUIPMENT MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 204 NORTH AMERICA: TEST AND MEASUREMENT EQUIPMENT MARKET, BY TYPE, 2019–2022 (USD MILLION)

TABLE 205 NORTH AMERICA: TEST AND MEASUREMENT EQUIPMENT MARKET, BY TYPE, 2023–2028 (USD MILLION)

TABLE 206 NORTH AMERICA: TEST AND MEASUREMENT EQUIPMENT MARKET, BY PRODUCT TYPE, 2019–2022 (USD MILLION)

TABLE 207 NORTH AMERICA: TEST AND MEASUREMENT EQUIPMENT MARKET, BY PRODUCT TYPE, 2023–2028 (USD MILLION)

##### 16.2.2.1 US

16.2.2.1.1 Increasing use of communication test and measurement equipment to supply high-quality voice, video, and data center services to drive market

##### 16.2.2.2 Canada

16.2.2.2.1 Rising demand for broadband services and communication testing to fuel

market growth

16.2.2.3 Mexico

16.2.2.3.1 Increasing demand for compact cars to support market growth

## **17 APPENDIX**

17.1 INSIGHTS FROM INDUSTRY EXPERTS

17.2 DISCUSSION GUIDE

17.3 KNOWLEDGESTORE: MARKETSandMARKETS' SUBSCRIPTION PORTAL

17.4 CUSTOMIZATION OPTIONS

17.5 RELATED REPORTS

17.6 AUTHOR DETAILS

## About

According to the new market research report on the "Machine Condition Monitoring Market by Monitoring Technique (Vibration Monitoring, Thermography, Oil Analysis, MCA), Deployment (On Premise, Cloud), Monitoring Process (Online, Portable), Offering, Industry, and Region - Global Forecast to 2024", The machine condition monitoring market is estimated to grow from USD 2.38 Billion in 2018 to USD 3.50 Billion by 2024, at a CAGR of 6.7% between 2018 and 2024. Factors such as the development of a secure cloud computing platform, increased use of wireless communication technology for condition monitoring of equipment, and inclination of end users toward predictive maintenance are driving the growth of the machine condition monitoring market at present.

### **Major players operating in the machine condition monitoring market include:**

ALS Limited (Australia),  
Emerson Electric (US),  
General Electric (US),  
Honeywell (US),  
Meggitt (UK),  
National Instruments (US),  
Parker-Hannifin (US),  
Rockwell Automation (US),  
Schaeffler (Germany),  
SKF (Sweden),  
Azima DLI (US),  
Briel & Kjaer (Denmark), and

Fluke (US).

**The motor current analysis technique is expected to witness the highest CAGR during the forecast period**

The market for the motor current analysis technique is expected to grow at the highest CAGR between 2018 and 2024. Defects such as current imbalance and loading issues in motors, circuitry and motor insulation degradation, rotor damage, eccentricity in rotors, belt defects, and gearing defects can be detected by the motor current analysis technique, thereby resulting in high demand in the machine condition monitoring market.

**The market for software is expected to grow at a higher CAGR during the forecast period**

The market for software is expected to grow at a higher CAGR during the forecast period. Machine condition monitoring software help companies to calculate equipment reliability parameters such as rotating speed, vibration frequency, bearing faults, shaft misalignment, and temperature of machines. Also, machine condition monitoring software generates a comprehensive report of the final result after executing the analysis of all algorithms. The diagnostic report helps plant operators to predict an impending failure and avoid any breakdown situation.

**The market for cloud-based machine condition monitoring solutions is expected to grow at a higher CAGR during the forecast period**

Cloud-based monitoring is expected to exhibit a higher CAGR in the machine condition monitoring market during the forecast period. Cloud-based deployment benefits organizations with the increased scalability, speed, 24/7 service, and enhanced IT security. The growing adoption of Software-as-a-Service (SaaS) applications by enterprises is bringing out huge growth prospects for cloud-based machine condition monitoring solutions.

**The market for online machine condition monitoring solutions is expected to**



### **grow at a higher CAGR during the forecast period**

The market for online machine condition monitoring solutions is expected to grow at a higher CAGR during the forecast period. Online machine condition monitoring provides real-time data to operators in the plant and is the most preferred monitoring process in critical plants that work continuously and are highly prone to defects.

### **The market for the automotive industry is expected to grow at the highest CAGR during the forecast period**

The market for the automotive industry is expected to grow at the highest CAGR during the forecast period. The automotive industry depends on the performance of assets to effectively perform their core business activities as a system downtime can affect the revenue of the organization. In the automotive industry, time plays a crucial role, and any unplanned asset breakdown can heavily impact its brand image and sales, resulting in the high adoption of the machine condition monitoring technique in the automotive industry.

### **The market in APAC is expected to grow at the highest CAGR during the forecast period**

China and India are the fastest-growing economies that are witnessing a rapid penetration of Internet of Things (IoT) in APAC. High high adoption of modern technologies for smart manufacturing, reduction in operational costs, and importance of security measures at workplaces drive the demand for machine condition monitoring solutions in the APAC region, thereby making this region the fastest-growing market for machine condition monitoring solutions.

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Product name: Machine Condition Monitoring Market by Technique (Vibration Monitoring, Thermography, Oil Analysis, Ultrasound Emission), Offering (Vibration Sensors, Infrared Sensors, Spectrometers, Corrosion Probes, Spectrum Analyzers), Region - Global Forecast to 2029

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