

Laser Interferometer Market with COVID-19 Impact Analysis by Interferometer Type (Michelson, Fabry-Perot, Fizeau, and Twyman-Green), Type, Application (Surface Topology, Engineering, and Science), End-User Industry, and Geography - Global Forecast to 2026

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Abstracts

The global laser interferometer market size is expected to grow from USD 245 million in 2021 to USD 335 million by 2026, at a CAGR of 6.5%. The market has a promising growth potential due to several factors, including growing demand for 3D metrology services, rising focus on quality control through automation in the manufacturing industry, and increasing expenditure on R&D activities. The tolerance level in the manufacturing industry is very low. Hence, there is a significant need for documentation and product tracking, which makes a surface measurement in the manufacturing process essential to enhance product durability and quality. The measurement of surface displacement is one of the quality control processes and is usually not a part of the actual production line. The contact-type surface measurement method is commonly used in quality control. The processes consume a lot of time in the case of human interaction. Therefore, to reduce or eliminate nonvalue-added time, effective measurement tools, quality inspection tools, and automation processes have been utilized. Companies are focusing on automating the measurement and production processes with the integration of laser interferometers that can capture accurate measurements. Thus, the quality control of each component surface measurement is ensured in a production line. For instance, in October 2021, Zygo Corporation (US), a provider of optical metrology solutions, launched Verifire Asphere+, an addition to its Verifire series of laser Fizeau interferometers. The Verifire Asphere+ (VFA+) builds upon the success of the Verifire Asphere Interferometer, which was made specifically

for fast, non-contact, high-resolution 3D metrology of aspheric surfaces. The VFA+ leverages the benefits of Fizeau interferometry through a unique combination of precise, high-resolution, fast, and full aperture metrology for axisymmetric aspheres.

The major factor restraining the growth of the laser interferometer market includes price sensitivity associated with laser interferometer solutions and using the white light interferometry method. The costs associated with setting-up measurement and calibration tools make it difficult to achieve the targeted ROI that fits within a business plan. Different types of measurements require various measuring devices that are expensive. Specialized professionals are required to operate this measuring equipment and measure the device under test in accordance with the applicable regulations and directives. Consumers in the measurement ecosystem usually opt for cost-effective, technologically-advanced measurement equipment. The demand for advanced specifications and features, as well as the increase in the number of applications, has compelled engineers and manufacturers to upgrade existing technologies on a wide scale. The laser interferometer market faces challenges during measurement and testing processes, due to the need for qualified operators and the associated high labor costs. Decreasing testing time, which produces substantial cost savings for OEMs, acts as a restraint for measurement equipment vendors. Moreover, measurement tools need high capital expenditure. In order to stay in line with innovative technologies, companies need to expand their product range, which results in recurrent software and hardware advancements, thereby increasing the overall maintenance costs.

The market declined in 2020, mainly due to the impact of COVID-19. The supply chains were disrupted in 2020 due to the lockdown imposed by various governments and labor shortages in these industries due to travel restrictions, which would affect the laser interferometer market. Though the market has been impacted in 2020, it is expected to fully recover by 2022.

“Heterodyne Interferometer: The larger segment of the laser interferometer market, by type”

A heterodyne interferometer measures mirror displacement by measuring phase change due to the Doppler effect, similar to a radar that measures the speed of a car. The heterodyne interferometer has emerged as a favorable option for geometric error measurement equipment, owing to its high resolution, high precision, and less sensitivity to environmental variations. Heterodyne interferometers are mostly used in precision instruments for modern industrial and scientific applications, which is expected to propel the growth of the laser interferometer market. In heterodyne interferometers,

only a single detector is required to measure both the displacement and the direction, which makes the alignment of an object easier. However, it requires a highly stabilized two-frequency-laser source and more sophisticated detector electronics. These features of the heterodyne interferometer give it an advantage over homodyne interferometers.

“Industrial: The fastest-growing segment of the laser interferometer market, by end-user industry”

The industrial segment is expected to grow at the highest CAGR during the forecast period. The manufacturing industry focuses on delivering high-quality machinery parts on time. Laser interferometers are used to inspect and measure integrated data in production processes and for quality control in general manufacturing and precision machining. The major industrial applications include in-process surface metrology, roughness measurement, 3D surface metrology in hard-to-reach spaces and in hostile environments, profilometry of surfaces with high aspect ratio features (grooves, channels, holes), and film thickness measurement.

“Europe has the largest market share in the laser interferometer market”

Europe accounted for the largest share of the laser interferometer market in 2020. Rapid technological developments and increased adoption of automation in the automotive and aerospace & defense industries in the region are the key factors expected to drive the growth of the market in Europe. Laser interferometer manufacturers are using advanced technologies to support smooth industrial operations. The laser interferometer market in Europe has been segmented into Germany, France, the UK, and the rest of Europe (including Italy, Sweden, Switzerland, Norway, Netherlands, Austria, and Finland). Germany and the UK are the major countries contributing to the laser interferometer market in Europe. These countries have a major presence of end-user industries, such as automotive, biomedical, and aerospace & defense. Moreover, the use of laser interferometers in water treatment plants and the automotive industry is expected to boost the growth of the laser interferometer market in the region. Improving economic conditions, coupled with the rising demand for passenger cars, are projected to provide an impetus to the growth of the laser interferometer market in the region. Some of the major players in the region include Renishaw (UK), Carl Zeiss (Germany), SIOS Meßtechnik GmbH (Germany), Taylor Hobson Ltd. (UK), and Status Pro Maschinenmesstechnik GmbH (Germany).

The study contains insights from various industry experts, ranging from component suppliers to Tier 1 companies. The break-up of the primaries is as follows:

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

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

By Region: North America – 40%, Europe – 32%, APAC – 23%, and RoW – 5%

The report profiles key players in the global Laser Interferometer market with their respective market share analysis. Prominent players profiled in this report are Renishaw PLC (UK), Keysight Technologies (US), Carl Zeiss (Germany), SIOS Meßtechnik GmbH (Germany), AMETEK, Inc. (US), Mahr Inc. (Germany), TOSEI ENGINEERING CORP. (Japan), QED Technologies (US), MÄLLER-WEDEL OPTICAL GmbH (Germany), SmarAct GmbH (Germany), Luna Innovations Incorporated (US), 4D Technology Corporation (US), PRE Instruments (US), Trioptics GmbH (Germany), AdlOptica Optical Systems GmbH (Germany), Logitech Limited (UK), Holmarc Opto-Mechatronics P Ltd (India), attocube systems AG (Germany), HighFinesse Laser and Electronics Systems GmbH (Germany), XONOX Technology GmbH (Germany), Thorlabs, Inc. (US), Automated Precision, Inc. (US), Lasertex Co. Ltd (Poland), and FUJIFILM Holdings Corporation (Japan).

Research Coverage:

The report segments the Laser Interferometer market and forecasts its size, by value, based on region (North America, Europe, APAC, and ROW), by Interferometer Type (Michelson Interferometer, Fabry-Perot Interferometer, Fizeau Interferometer, Mach-Zehnder Interferometer, Sagnac Interferometer, Twyman-Green Interferometer), by Type (Homodyne, Heterodyne), by Application (Surface Topology, Engineering, Applied Science, Biomedical, Semiconductor Detection), by End-User Industry (Automotive, Aerospace & Defense, Industrial, Life Sciences, Electronics Manufacturing, Telecommunication). The report also provides a comprehensive review of market drivers, restraints, opportunities, and challenges in the laser interferometer market. The report also covers qualitative aspects in addition to the quantitative aspects of these markets.

Key Benefits of Buying the Report

The report will help the leaders/new entrants in this market with information on the closest approximations of the revenue numbers for the overall market and the sub-segments. This report will help stakeholders understand the competitive landscape and

gain more insights to better position their businesses and plan suitable go-to-market strategies. The report also helps stakeholders understand the pulse of the laser interferometer market and provides them information on key market drivers, restraints, challenges, and opportunities.

Contents

1 INTRODUCTION

- 1.1 STUDY OBJECTIVES
- 1.2 MARKET DEFINITION
- 1.3 STUDY SCOPE
 - 1.3.1 MARKET SEGMENTATION
 - 1.3.2 GEOGRAPHIC SCOPE
 - 1.3.3 INCLUSIONS AND EXCLUSIONS
 - 1.3.4 YEARS CONSIDERED FOR THE STUDY
- 1.4 CURRENCY
- 1.5 STAKEHOLDERS
- 1.6 SUMMARY OF CHANGES

2 RESEARCH METHODOLOGY

2.1 RESEARCH DATA

FIGURE 1 LASER INTERFEROMETER MARKET: RESEARCH DESIGN

- 2.1.1 SECONDARY DATA
 - 2.1.1.1 Secondary sources
- 2.1.2 PRIMARY DATA
 - 2.1.2.1 Primary interviews with experts
 - 2.1.2.2 Breakdown of primary interviews
 - 2.1.2.3 Key data from primary sources
 - 2.1.2.4 Key industry insights

2.2 MARKET SIZE ESTIMATION

FIGURE 2 LASER INTERFEROMETER MARKET: PROCESS FLOW OF MARKET SIZE ESTIMATION

- 2.2.1 TOP-DOWN APPROACH
 - 2.2.1.1 Approach for capturing market size by top-down analysis (supply side)

FIGURE 3 TOP-DOWN APPROACH: MARKET SIZE ESTIMATION METHODOLOGY: APPROACH 1 - SUPPLY SIDE

FIGURE 4 MARKET SIZE ESTIMATION METHODOLOGY: APPROACH 2 - SUPPLY SIDE

- 2.2.2 BOTTOM-UP APPROACH
 - 2.2.2.1 Approach for capturing market share by bottom-up analysis (demand side)

2.3 MARKET PROJECTIONS

2.4 MARKET BREAKDOWN AND DATA TRIANGULATION

FIGURE 5 DATA TRIANGULATION

2.5 RESEARCH ASSUMPTIONS

TABLE 1 ASSUMPTIONS FOR RESEARCH STUDY

2.6 LIMITATIONS

2.7 RISK FACTORS

3 EXECUTIVE SUMMARY

FIGURE 6 THE FIZEAU INTERFEROMETER SEGMENT TO GROW AT THE HIGHEST CAGR IN THE LASER INTERFEROMETER MARKET DURING THE FORECAST PERIOD

FIGURE 7 THE SURFACE TOPOLOGY SEGMENT IS EXPECTED TO GROW AT THE HIGHEST CAGR DURING THE FORECAST PERIOD

FIGURE 8 THE INDUSTRIAL END-USER INDUSTRY SEGMENT TO GROW AT THE HIGHEST CAGR IN THE LASER INTERFEROMETER MARKET DURING THE FORECAST PERIOD

FIGURE 9 EUROPE TO HOLD THE LARGEST SHARE OF THE LASER INTERFEROMETER MARKET DURING FORECAST PERIOD

TABLE 2 SCENARIOS IN TERMS OF RECOVERY OF GLOBAL ECONOMY

3.1 REALISTIC SCENARIO

3.2 OPTIMISTIC SCENARIO

3.3 PESSIMISTIC SCENARIO

FIGURE 10 GROWTH PROJECTIONS OF THE LASER INTERFEROMETER MARKET IN REALISTIC, OPTIMISTIC, AND PESSIMISTIC SCENARIOS

TABLE 3 LASER INTERFEROMETER MARKET-COVID 19 IMPACT ANALYSIS

FIGURE 11 LASER INTERFEROMETER MARKET IMPACT ANALYSIS OF COVID-19

4 PREMIUM INSIGHTS

4.1 ATTRACTIVE OPPORTUNITIES IN THE LASER INTERFEROMETER MARKET

FIGURE 12 GROWING INVESTMENTS IN THE DEVELOPMENT OF ADVANCED LASER INTERFEROMETERS TO PROVIDE GROWTH OPPORTUNITIES

4.2 LASER INTERFEROMETER MARKET, BY TYPE

FIGURE 13 THE HETERODYNE SEGMENT OF THE LASER INTERFEROMETER MARKET TO GROW AT A HIGHER CAGR DURING THE FORECAST PERIOD

4.3 LASER INTERFEROMETER MARKET IN NORTH AMERICA, BY INTERFEROMETER TYPE AND COUNTRY

FIGURE 14 THE FIZEAU INTERFEROMETER SEGMENT AND THE US CAPTURED THE LARGEST SHARE OF THE NORTH AMERICAN LASER INTERFEROMETER

MARKET IN 2020

4.4 COUNTRY-WISE LASER INTERFEROMETER MARKET GROWTH RATE

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

5 MARKET OVERVIEW

5.1 INTRODUCTION

5.2 MARKET DYNAMICS

FIGURE 16 IMPACT OF DRIVERS AND OPPORTUNITIES ON LASER INTERFEROMETER MARKET

FIGURE 17 IMPACT OF RESTRAINTS AND CHALLENGES ON LASER INTERFEROMETERS MARKET

5.2.1 DRIVERS

5.2.1.1 Growing demand for 3D metrology services

5.2.1.2 Rising focus on quality control through automation in the manufacturing industry

5.2.1.3 Increasing expenditure on R&D activities

5.2.2 RESTRAINTS

5.2.2.1 Price sensitivity associated with laser interferometer solutions

5.2.2.2 Using the white light interferometry method

5.2.3 OPPORTUNITIES

5.2.3.1 Growing demand for automobiles worldwide

FIGURE 18 GLOBAL AUTOMOBILE PRODUCTION, BY VEHICLE TYPE, 2016–2020 (MILLION UNITS)

5.2.3.2 Growing manufacturing industries in emerging countries

5.2.4 CHALLENGES

5.2.4.1 Increase in rental and leasing services

5.2.4.2 Short-term impact of COVID-19 on industrial applications

5.3 TRENDS/DISRUPTIONS IMPACTING CUSTOMER'S BUSINESS (YC-YCC SHIFT)

FIGURE 19 TRENDS/DISRUPTIONS IMPACTING CUSTOMER'S BUSINESS FOR THE LASER INTERFEROMETER MARKET

5.4 ASP ANALYSIS

5.5 VALUE CHAIN ANALYSIS

FIGURE 20 VALUE CHAIN ANALYSIS OF LASER INTERFEROMETER ECOSYSTEM: COMPONENT MANUFACTURERS AND MANUFACTURING PHASES CONTRIBUTE MAXIMUM VALUE

5.6 ECOSYSTEM/ MARKET MAP

FIGURE 21 LASER INTERFEROMETER MARKET PLAYER ECOSYSTEM**5.6.1 COMPONENT PROVIDERS****5.6.2 INTERFEROMETER MANUFACTURERS****5.6.3 END USERS****5.7 LASER INTERFEROMETER MARKET: SUPPLY CHAIN****5.8 TECHNOLOGY TRENDS****5.8.1 HIGH-RESOLUTION METROLOGY****5.8.2 PHASE SHIFTING INTERFEROMETRY****5.8.3 DIGITAL SPECKLE PATTERN INTERFEROMETRY (DSPI)****5.9 PATENT ANALYSIS****FIGURE 22 NUMBER OF PATENTS GRANTED FOR LASER INTERFEROMETER IN A YEAR OVER THE LAST 10 YEARS****5.9.1 LIST OF MAJOR PATENTS****TABLE 4 LIST OF MAJOR PATENTS GRANTED FOR LASER INTERFEROMETERS, 2017-2021****5.10 TRADE DATA****FIGURE 23 IMPORTS DATA FOR HS CODE 903100, BY COUNTRY, 2016–2020****TABLE 5 IMPORTS DATA FOR HS CODE 903100, BY COUNTRY, 2016–2020 (USD BILLION)****FIGURE 24 EXPORTS DATA FOR HS CODE 903100, BY COUNTRY, 2016–2020****TABLE 6 EXPORTS DATA FOR HS CODE 903100, BY COUNTRY, 2016–2020 (USD BILLION)****5.11 CASE STUDIES****5.11.1 THE US DEPARTMENT OF DEFENSE TO USE LASER-INTERFERENCE STRUCTURING (LIS) SYSTEM TO PREPARE SURFACES FOR PROTECTIVE COATINGS****5.11.2 MATERIAL INSPECTION MACHINES USE WHITE-LIGHT INTERFEROMETRY ACHIEVING FAST PRECISION MEASUREMENTS****5.11.3 A TEAM OF SCIENTISTS FROM GERMANY HAVE DEMONSTRATED ATOM INTERFEROMETRY IN SPACE****5.12 STANDARDS & REGULATIONS****5.12.1 EUROPE****5.12.2 NORTH AMERICA****5.12.3 APAC****5.12.4 GLOBAL****5.13 PORTER'S FIVE FORCES ANALYSIS****TABLE 7 PORTER'S FIVE FORCES IMPACT ON LASER INTERFEROMETER MARKET****FIGURE 25 PORTER'S FIVE FORCES ANALYSIS: LASER INTERFEROMETER**

MARKET

- 5.13.1 THREAT OF NEW ENTRANTS
- 5.13.2 THREAT OF SUBSTITUTES
- 5.13.3 BARGAINING POWER OF SUPPLIERS
- 5.13.4 BARGAINING POWER OF BUYERS
- 5.13.5 INTENSITY OF COMPETITIVE RIVALRY

6 LASER INTERFEROMETER MARKET, BY INTERFEROMETER TYPE

6.1 INTRODUCTION

FIGURE 26 FIZEAU INTERFEROMETER WAS THE LARGEST SEGMENT OF THE LASER INTERFEROMETER MARKET

TABLE 8 LASER INTERFEROMETER MARKET, BY INTERFEROMETER TYPE, 2017–2020 (USD MILLION)

TABLE 9 LASER INTERFEROMETER MARKET, BY INTERFEROMETER TYPE, 2021–2026 (USD MILLION)

6.2 FIZEAU INTERFEROMETER

6.2.1 FIZEAU LASER INTERFEROMETERS SUITABLE FOR OPTICAL AND SURFACE MEASUREMENT IN ENGINEERING AND INDUSTRIAL APPLICATIONS

FIGURE 27 THE FIZEAU INTERFEROMETER MARKET EXPECTED TO WITNESS THE HIGHEST GROWTH IN APAC DURING THE FORECAST PERIOD

TABLE 10 FIZEAU INTERFEROMETER MARKET, BY REGION, 2017–2020 (USD MILLION)

TABLE 11 FIZEAU INTERFEROMETER MARKET, BY REGION, 2021–2026 (USD MILLION)

TABLE 12 FIZEAU INTERFEROMETER MARKET SIZE IN TERMS OF VOLUME, 2020–2026 (UNITS)

6.3 MICHELSON INTERFEROMETER

6.3.1 USING A SINGLE-BEAM SPLITTER AND LIGHT SOURCE, MICHELSON INTERFEROMETERS OFFER PRECISE MEASUREMENTS OF INDUSTRIAL MACHINE PARTS

FIGURE 28 NORTH AMERICA EXPECTED TO WITNESS THE HIGHEST GROWTH IN THE MICHELSON INTERFEROMETER MARKET DURING THE FORECAST PERIOD

TABLE 13 MICHELSON INTERFEROMETER MARKET, BY REGION, 2017–2020 (USD MILLION)

TABLE 14 MICHELSON INTERFEROMETER MARKET, BY REGION, 2021–2026 (USD MILLION)

6.4 FABRY-PEROT INTERFEROMETER

6.4.1 FABRY-PEROT INTERFEROMETER HIGHLY RECOMMENDED FOR MEASURING WAVELENGTH OF LIGHT IN TELECOMMUNICATION

TABLE 15 FABRY-PEROT INTERFEROMETER MARKET, BY REGION, 2017–2020 (USD MILLION)

TABLE 16 FABRY-PEROT INTERFEROMETER MARKET, BY REGION, 2021–2026 (USD MILLION)

6.5 MACH–ZEHNDER INTERFEROMETER

6.5.1 MACH–ZEHNDER INTERFEROMETERS ARE SUITABLE FOR ERROR-FREE MEASUREMENTS AS THEY USE DUAL BEAM SPLITTERS TO ANALYZE OBJECTS

TABLE 17 MACH–ZEHNDER INTERFEROMETER MARKET, BY REGION, 2017–2020 (USD MILLION)

TABLE 18 MACH–ZEHNDER INTERFEROMETER MARKET, BY REGION, 2021–2026 (USD MILLION)

6.6 SAGNAC INTERFEROMETER

6.6.1 SAGNAC INTERFEROMETERS ARE WIDELY USED FOR ROTATIONAL MEASUREMENTS

TABLE 19 SAGNAC INTERFEROMETER MARKET, BY REGION, 2017–2020 (USD MILLION)

TABLE 20 SAGNAC INTERFEROMETER MARKET, BY REGION, 2021–2026 (USD MILLION)

6.7 TWYMAN–GREEN INTERFEROMETER

6.7.1 TWYMAN–GREEN INTERFEROMETER MAINLY USED FOR TESTING OPTICAL DEVICES

TABLE 21 TWYMAN–GREEN INTERFEROMETER MARKET, BY REGION, 2017–2020 (USD MILLION)

TABLE 22 TWYMAN–GREEN INTERFEROMETER MARKET, BY REGION, 2021–2026 (USD MILLION)

6.8 IMPACT OF COVID-19 ON VARIOUS INTERFEROMETER TYPES

7 LASER INTERFEROMETER MARKET, BY TYPE

7.1 INTRODUCTION

FIGURE 29 THE HETERODYNE SEGMENT IS EXPECTED TO GROW AT HIGHER CAGR DURING THE FORECAST PERIOD

TABLE 23 LASER INTERFEROMETER MARKET, BY TYPE, 2017–2020 (USD MILLION)

TABLE 24 LASER INTERFEROMETER MARKET, BY TYPE, 2021–2026 (USD MILLION)

7.2 HOMODYNE INTERFEROMETER

7.2.1 HOMODYNE INTERFEROMETER PROVIDES ACCURATE MEASUREMENT USING A SINGLE LIGHT SOURCE

7.3 HETERODYNE INTERFEROMETER

7.3.1 HETERODYNE INTERFEROMETER SUITABLE FOR METROLOGICAL ESTIMATION IN MANUFACTURING APPLICATIONS

8 LASER INTERFEROMETER MARKET, BY APPLICATION

8.1 INTRODUCTION

FIGURE 30 SURFACE TOPOLOGY APPLICATION CAPTURES LARGEST SHARE OF LASER INTERFEROMETER MARKET

TABLE 25 LASER INTERFEROMETER MARKET, BY APPLICATION, 2017–2020 (USD MILLION)

TABLE 26 LASER INTERFEROMETER MARKET, BY APPLICATION, 2021–2026 (USD MILLION)

8.2 SURFACE TOPOLOGY

8.2.1 SOURCE TOPOLOGY

8.2.1.1 LASER INTERFEROMETERS USED IN SOURCE TOPOLOGY PROVIDE PRECISE MEASUREMENTS OF OBJECTS

8.2.2 SURFACE DETECTION

8.2.2.1 SURFACE DETECTION FACILITATES THE MONITORING AND INSPECTING OF FLATNESS OF SURFACES

8.2.3 ROUGHNESS DETECTION

8.2.3.1 LASER INTERFEROMETERS WIDELY USED FOR ROUGHNESS DETECTION IN THE AUTOMOBILES AND MANUFACTURING INDUSTRY

8.2.4 CURVATURE RADIUS DETECTION

8.2.4.1 CURVATURE RADIUS DETECTION OFFERS HIGH-ACCURACY MEASUREMENT OF RADIUS OF CURVATURE IN AUTONOMOUS DRIVING AND ADVANCED DRIVER ASSISTANCE (ADAS) BASED APPLICATIONS

8.3 ENGINEERING

8.3.1 USE OF LASER INTERFEROMETERS IN ENGINEERING APPLICATIONS FACILITATE INSPECTION OF MACHINE PARTS FOR STRAIGHTNESS AND PARALLELISM

8.4 APPLIED SCIENCE

8.4.1 LASER INTERFEROMETERS ARE USED IN MANY HIGH-PRECISION MEASURING SYSTEMS AND SENSORS

8.5 BIOMEDICAL

8.5.1 LASER INTERFEROMETERS ARE EXTENSIVELY USED IN PROBES FOR DETERMINING CELLULAR AND TISSUE STRUCTURE

8.6 SEMICONDUCTOR DETECTION

8.6.1 LASER INTERFEROMETERS FACILITATE THE DETECTION AND IDENTIFICATION OF NANOPARTICLES IN SEMICONDUCTOR MANUFACTURING

9 LASER INTERFEROMETER MARKET, BY END-USER INDUSTRY

9.1 INTRODUCTION

FIGURE 31 AUTOMOTIVE EXPECTED TO BE THE LARGEST SEGMENT OF THE LASER INTERFEROMETER MARKET

TABLE 27 LASER INTERFEROMETER MARKET, BY END-USER INDUSTRY, 2017–2020 (USD MILLION)

TABLE 28 LASER INTERFEROMETER MARKET, BY END-USER INDUSTRY, 2021–2026 (USD MILLION)

9.2 AUTOMOTIVE

9.2.1 THE NEED FOR PRECISE DIMENSIONAL MEASUREMENT DRIVES THE MARKET IN THE AUTOMOTIVE SEGMENT

FIGURE 32 APAC EXPECTED TO WITNESS THE HIGHEST GROWTH IN THE LASER INTERFEROMETER MARKET FOR AUTOMOTIVE DURING THE FORECAST PERIOD

TABLE 29 LASER INTERFEROMETER MARKET FOR AUTOMOTIVE, BY REGION, 2017–2020 (USD MILLION)

TABLE 30 LASER INTERFEROMETER MARKET FOR AUTOMOTIVE, BY REGION, 2021–2026 (USD MILLION)

TABLE 31 LASER INTERFEROMETER MARKET FOR AUTOMOTIVE IN NORTH AMERICA, BY COUNTRY, 2017–2020 (USD MILLION)

TABLE 32 LASER INTERFEROMETER MARKET FOR AUTOMOTIVE IN NORTH AMERICA, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 33 LASER INTERFEROMETER MARKET FOR AUTOMOTIVE IN EUROPE, BY COUNTRY, 2017–2020 (USD MILLION)

TABLE 34 LASER INTERFEROMETER MARKET FOR AUTOMOTIVE IN EUROPE, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 35 LASER INTERFEROMETER MARKET FOR AUTOMOTIVE IN APAC, BY COUNTRY, 2017–2020 (USD MILLION)

TABLE 36 LASER INTERFEROMETER MARKET FOR AUTOMOTIVE IN APAC, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 37 LASER INTERFEROMETER MARKET FOR AUTOMOTIVE IN ROW, BY REGION, 2017–2020 (USD MILLION)

TABLE 38 LASER INTERFEROMETER MARKET FOR AUTOMOTIVE IN ROW, BY REGION, 2021–2026 (USD MILLION)

9.3 AEROSPACE & DEFENSE

9.3.1 INCREASE IN THE DEMAND FOR LASER INTERFEROMETERS FOR DETAILED MEASUREMENT OF AIRCRAFT COMPONENTS TO DRIVE THE GROWTH OF THE MARKET IN THE AEROSPACE & DEFENSE SEGMENT

FIGURE 33 APAC TO GROW AT HIGHEST CAGR FOR LASER INTERFEROMETER MARKET FOR AEROSPACE & DEFENSE APPLICATION DURING FORECAST PERIOD

TABLE 39 LASER INTERFEROMETER MARKET FOR AEROSPACE & DEFENSE, BY REGION, 2017–2020 (USD MILLION)

TABLE 40 LASER INTERFEROMETER MARKET FOR AEROSPACE & DEFENSE, BY REGION, 2021–2026 (USD MILLION)

TABLE 41 LASER INTERFEROMETER MARKET FOR AEROSPACE & DEFENSE IN NORTH AMERICA, BY COUNTRY, 2017–2020 (USD MILLION)

TABLE 42 LASER INTERFEROMETER MARKET FOR AEROSPACE & DEFENSE IN NORTH AMERICA, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 43 LASER INTERFEROMETER MARKET FOR AEROSPACE & DEFENSE IN EUROPE, BY COUNTRY, 2017–2020 (USD MILLION)

TABLE 44 LASER INTERFEROMETER MARKET FOR AEROSPACE & DEFENSE IN EUROPE, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 45 LASER INTERFEROMETER MARKET FOR AEROSPACE & DEFENSE IN APAC, BY COUNTRY, 2017–2020 (USD MILLION)

TABLE 46 LASER INTERFEROMETER MARKET FOR AEROSPACE & DEFENSE IN APAC, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 47 LASER INTERFEROMETER MARKET FOR AEROSPACE & DEFENSE IN ROW, BY REGION, 2017–2020 (USD MILLION)

TABLE 48 LASER INTERFEROMETER MARKET FOR AEROSPACE & DEFENSE IN ROW, BY REGION, 2021–2026 (USD MILLION)

9.4 INDUSTRIAL

9.4.1 HIGH DEMAND FOR LASER INTERFEROMETERS IN SURFACE TOPOGRAPHY AND DIMENSION MEASUREMENT TO DRIVE THE GROWTH OF THE SEGMENT

FIGURE 34 APAC TO WITNESS HIGHEST GROWTH IN THE LASER INTERFEROMETER MARKET FOR INDUSTRIAL DURING FORECAST PERIOD

TABLE 49 LASER INTERFEROMETER MARKET FOR INDUSTRIAL, BY REGION, 2017–2020 (USD MILLION)

TABLE 50 LASER INTERFEROMETER MARKET FOR INDUSTRIAL, BY REGION, 2021–2026 (USD MILLION)

TABLE 51 LASER INTERFEROMETER MARKET FOR INDUSTRIAL IN NORTH AMERICA, BY COUNTRY, 2017–2020 (USD MILLION)

TABLE 52 LASER INTERFEROMETER MARKET FOR INDUSTRIAL IN NORTH AMERICA, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 53 LASER INTERFEROMETER MARKET FOR INDUSTRIAL IN EUROPE, BY COUNTRY, 2017–2020 (USD MILLION)

TABLE 54 LASER INTERFEROMETER MARKET FOR INDUSTRIAL IN EUROPE, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 55 LASER INTERFEROMETER MARKET FOR INDUSTRIAL IN APAC, BY COUNTRY, 2017–2020 (USD MILLION)

TABLE 56 LASER INTERFEROMETER MARKET FOR INDUSTRIAL IN APAC, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 57 LASER INTERFEROMETER MARKET FOR INDUSTRIAL IN ROW, BY REGION, 2017–2020 (USD MILLION)

TABLE 58 LASER INTERFEROMETER MARKET FOR INDUSTRIAL IN ROW, BY REGION, 2021–2026 (USD MILLION)

9.5 LIFE SCIENCES

9.5.1 INCREASED USE OF INTERFEROMETERS FOR IMAGING PURPOSES TO BOOST THE MARKET IN THE LIFE SCIENCES INDUSTRY

TABLE 59 LASER INTERFEROMETER MARKET FOR LIFE SCIENCES, BY REGION, 2017–2020 (USD MILLION)

TABLE 60 LASER INTERFEROMETER MARKET FOR LIFE SCIENCES, BY REGION, 2021–2026 (USD MILLION)

TABLE 61 LASER INTERFEROMETER MARKET FOR LIFE SCIENCES IN NORTH AMERICA, BY COUNTRY, 2017–2020 (USD MILLION)

TABLE 62 LASER INTERFEROMETER MARKET FOR LIFE SCIENCES IN NORTH AMERICA, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 63 LASER INTERFEROMETER MARKET FOR LIFE SCIENCES IN EUROPE, BY COUNTRY, 2017–2020 (USD MILLION)

TABLE 64 LASER INTERFEROMETER MARKET FOR LIFE SCIENCES IN EUROPE, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 65 LASER INTERFEROMETER MARKET FOR LIFE SCIENCES IN APAC, BY COUNTRY, 2017–2020 (USD MILLION)

TABLE 66 LASER INTERFEROMETER MARKET FOR LIFE SCIENCES IN APAC, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 67 LASER INTERFEROMETER MARKET FOR LIFE SCIENCES IN ROW, BY REGION, 2017–2020 (USD MILLION)

TABLE 68 LASER INTERFEROMETER MARKET FOR LIFE SCIENCES IN ROW, BY REGION, 2021–2026 (USD MILLION)

9.6 ELECTRONICS MANUFACTURING

9.6.1 RISE IN DEMAND FOR MINIATURE ELECTRONICS TO BOOST DEMAND

FOR LASER INTERFEROMETERS**TABLE 69 LASER INTERFEROMETER MARKET FOR ELECTRONICS
MANUFACTURING, BY REGION, 2017–2020 (USD MILLION)****TABLE 70 LASER INTERFEROMETER MARKET FOR ELECTRONICS
MANUFACTURING, BY REGION, 2021–2026 (USD MILLION)****TABLE 71 LASER INTERFEROMETER MARKET FOR ELECTRONICS
MANUFACTURING IN NORTH AMERICA, BY COUNTRY, 2017–2020 (USD MILLION)****TABLE 72 LASER INTERFEROMETER MARKET FOR ELECTRONICS
MANUFACTURING IN NORTH AMERICA, BY COUNTRY, 2021–2026 (USD MILLION)****TABLE 73 LASER INTERFEROMETER MARKET FOR ELECTRONICS
MANUFACTURING IN EUROPE, BY COUNTRY, 2017–2020 (USD MILLION)****TABLE 74 LASER INTERFEROMETER MARKET FOR ELECTRONICS
MANUFACTURING IN EUROPE, BY COUNTRY, 2021–2026 (USD MILLION)****TABLE 75 LASER INTERFEROMETER MARKET FOR ELECTRONICS
MANUFACTURING IN APAC, BY COUNTRY, 2017–2020 (USD MILLION)****TABLE 76 LASER INTERFEROMETER MARKET FOR ELECTRONICS
MANUFACTURING IN APAC, BY COUNTRY, 2021–2026 (USD MILLION)****TABLE 77 LASER INTERFEROMETER MARKET FOR ELECTRONICS
MANUFACTURING IN ROW, BY REGION, 2017–2020 (USD MILLION)****TABLE 78 LASER INTERFEROMETER MARKET FOR ELECTRONICS
MANUFACTURING IN ROW, BY REGION, 2021–2026 (USD MILLION)****9.7 TELECOMMUNICATION****9.7.1 INCREASED REQUIREMENT FOR INTERFEROMETRY IN WAVELENGTH
DIVISION MULTIPLEXING TO PROPEL THE MARKET IN THE
TELECOMMUNICATION INDUSTRY****TABLE 79 LASER INTERFEROMETER MARKET FOR TELECOMMUNICATION, BY
REGION, 2017–2020 (USD MILLION)****TABLE 80 LASER INTERFEROMETER MARKET FOR TELECOMMUNICATION, BY
REGION, 2021–2026 (USD MILLION)****TABLE 81 LASER INTERFEROMETER MARKET FOR TELECOMMUNICATION IN
NORTH AMERICA, BY COUNTRY, 2017–2020 (USD MILLION)****TABLE 82 LASER INTERFEROMETER MARKET FOR TELECOMMUNICATION IN
NORTH AMERICA, BY COUNTRY, 2021–2026 (USD MILLION)****TABLE 83 LASER INTERFEROMETER MARKET FOR TELECOMMUNICATION IN
EUROPE, BY COUNTRY, 2017–2020 (USD MILLION)****TABLE 84 LASER INTERFEROMETER MARKET FOR TELECOMMUNICATION IN
EUROPE, BY COUNTRY, 2021–2026 (USD MILLION)****TABLE 85 LASER INTERFEROMETER MARKET FOR TELECOMMUNICATION IN
APAC, BY COUNTRY, 2017–2020 (USD MILLION)**

TABLE 86 LASER INTERFEROMETER MARKET FOR TELECOMMUNICATION IN APAC, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 87 LASER INTERFEROMETER MARKET FOR TELECOMMUNICATION IN ROW, BY REGION, 2017–2020 (USD MILLION)

TABLE 88 LASER INTERFEROMETER MARKET FOR TELECOMMUNICATION IN ROW, BY REGION, 2021–2026 (USD MILLION)

9.8 IMPACT OF COVID-19 ON VARIOUS END-USER INDUSTRIES

10 GEOGRAPHIC ANALYSIS

10.1 INTRODUCTION

FIGURE 35 EUROPE TO LEAD THE LASER INTERFEROMETER MARKET DURING THE FORECAST PERIOD

TABLE 89 LASER INTERFEROMETER MARKET, BY REGION, 2017–2020 (USD MILLION)

TABLE 90 LASER INTERFEROMETER MARKET, BY REGION, 2021–2026 (USD MILLION)

10.2 NORTH AMERICA

FIGURE 36 LASER INTERFEROMETER MARKET IN NORTH AMERICA: SNAPSHOT

TABLE 91 LASER INTERFEROMETER MARKET IN NORTH AMERICA, BY COUNTRY, 2017–2020 (USD MILLION)

TABLE 92 LASER INTERFEROMETER MARKET IN NORTH AMERICA, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 93 LASER INTERFEROMETER MARKET IN NORTH AMERICA, BY INTERFEROMETER TYPE, 2017–2020 (USD MILLION)

TABLE 94 LASER INTERFEROMETER MARKET IN NORTH AMERICA, BY INTERFEROMETER TYPE, 2021–2026 (USD MILLION)

TABLE 95 LASER INTERFEROMETER MARKET IN NORTH AMERICA, BY END-USER INDUSTRY, 2017–2020 (USD MILLION)

TABLE 96 LASER INTERFEROMETER MARKET IN NORTH AMERICA, BY END-USER INDUSTRY, 2021–2026 (USD MILLION)

10.2.1 US

10.2.1.1 The US expected to be the largest market for laser interferometers during the forecast period

TABLE 97 LASER INTERFEROMETER MARKET IN US, BY END-USER INDUSTRY, 2017–2020 (USD MILLION)

TABLE 98 LASER INTERFEROMETER MARKET IN US, BY END-USER INDUSTRY, 2021–2026 (USD MILLION)

10.2.2 CANADA

10.2.2.1 Growing demand for extensive surface roughness measurement to drive market

TABLE 99 LASER INTERFEROMETER MARKET IN CANADA, BY END-USER INDUSTRY, 2017–2020 (USD MILLION)

TABLE 100 LASER INTERFEROMETER MARKET IN CANADA, BY END-USER INDUSTRY, 2021–2026 (USD MILLION)

10.2.3 MEXICO

10.2.3.1 Increasing industrialization drives the market growth in the country

TABLE 101 LASER INTERFEROMETER MARKET IN MEXICO, BY END-USER INDUSTRY, 2017–2020 (USD MILLION)

TABLE 102 LASER INTERFEROMETER MARKET IN MEXICO, BY END-USER INDUSTRY, 2021–2026 (USD MILLION)

10.3 EUROPE

FIGURE 37 LASER INTERFEROMETER MARKET IN EUROPE: SNAPSHOT

TABLE 103 LASER INTERFEROMETER MARKET IN EUROPE, BY COUNTRY, 2017–2020 (USD MILLION)

TABLE 104 LASER INTERFEROMETER MARKET IN EUROPE, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 105 LASER INTERFEROMETER MARKET IN EUROPE, BY INTERFEROMETER TYPE, 2017–2020 (USD MILLION)

TABLE 106 LASER INTERFEROMETER MARKET IN EUROPE, BY INTERFEROMETER TYPE, 2021–2026 (USD MILLION)

TABLE 107 LASER INTERFEROMETER MARKET IN EUROPE, BY END-USER INDUSTRY, 2017–2020 (USD MILLION)

TABLE 108 LASER INTERFEROMETER MARKET IN EUROPE, BY END-USER INDUSTRY, 2021–2026 (USD MILLION)

10.3.1 GERMANY

10.3.1.1 Germany expected to lead European market due to the presence of major automotive manufacturers in the country

TABLE 109 LASER INTERFEROMETER MARKET IN GERMANY, BY END-USER INDUSTRY, 2017–2020 (USD MILLION)

TABLE 110 LASER INTERFEROMETER MARKET IN GERMANY, BY END-USER INDUSTRY, 2021–2026 (USD MILLION)

10.3.2 UK

10.3.2.1 Manufacturers in the country are increasingly deploying laser interferometers to improve product quality

TABLE 111 LASER INTERFEROMETER MARKET IN UK, BY END-USER INDUSTRY, 2017–2020 (USD MILLION)

TABLE 112 LASER INTERFEROMETER MARKET IN UK, BY END-USER INDUSTRY,

2021–2026 (USD MILLION)

10.3.3 FRANCE

10.3.3.1 Increasing use of laser interferometers to create significant demand in the aerospace and healthcare industries

TABLE 113 LASER INTERFEROMETER MARKET IN FRANCE, BY END-USER INDUSTRY, 2017–2020 (USD MILLION)

TABLE 114 LASER INTERFEROMETER MARKET IN FRANCE, BY END-USER INDUSTRY, 2021–2026 (USD MILLION)

10.3.4 REST OF EUROPE

10.3.4.1 Growing investment in manufacturing industries is driving the demand for laser interferometers in the Rest of Europe

TABLE 115 LASER INTERFEROMETER MARKET IN REST OF EUROPE, BY END-USER INDUSTRY, 2017–2020 (USD MILLION)

TABLE 116 LASER INTERFEROMETER MARKET IN REST OF EUROPE, BY END-USER INDUSTRY, 2021–2026 (USD MILLION)

10.4 ASIA PACIFIC

FIGURE 38 LASER INTERFEROMETER MARKET IN ASIA PACIFIC: SNAPSHOT

TABLE 117 LASER INTERFEROMETER MARKET IN ASIA PACIFIC, BY COUNTRY, 2017–2020 (USD MILLION)

TABLE 118 LASER INTERFEROMETER MARKET IN ASIA PACIFIC, BY COUNTRY, 2021–2026 (USD MILLION)

TABLE 119 LASER INTERFEROMETER MARKET IN ASIA PACIFIC, BY INTERFEROMETER TYPE, 2017–2020 (USD MILLION)

TABLE 120 LASER INTERFEROMETER MARKET IN ASIA PACIFIC, BY INTERFEROMETER TYPE, 2021–2026 (USD MILLION)

TABLE 121 LASER INTERFEROMETER MARKET IN ASIA PACIFIC, BY END-USER INDUSTRY, 2017–2020 (USD MILLION)

TABLE 122 LASER INTERFEROMETER MARKET IN ASIA PACIFIC, BY END-USER INDUSTRY, 2021–2026 (USD MILLION)

10.4.1 JAPAN

10.4.1.1 Japan to witness high demand for laser interferometers from optics and semiconductor industries during the forecast period

TABLE 123 LASER INTERFEROMETER MARKET IN JAPAN, BY END-USER INDUSTRY, 2017–2020 (USD MILLION)

TABLE 124 LASER INTERFEROMETER MARKET IN JAPAN, BY END-USER INDUSTRY, 2021–2026 (USD MILLION)

10.4.2 CHINA

10.4.2.1 Major industrial base and growing manufacturing activities to drive market

TABLE 125 LASER INTERFEROMETER MARKET IN CHINA, BY END-USER

INDUSTRY, 2017–2020 (USD MILLION)

TABLE 126 LASER INTERFEROMETER MARKET IN CHINA, BY END-USER

INDUSTRY, 2021–2026 (USD MILLION)

10.4.3 INDIA

10.4.3.1 Growing manufacturing industries in India expected to drive the market during the forecast period

TABLE 127 LASER INTERFEROMETER MARKET IN INDIA, BY END-USER

INDUSTRY, 2017–2020 (USD MILLION)

TABLE 128 LASER INTERFEROMETER MARKET IN INDIA, BY END-USER

INDUSTRY, 2021–2026 (USD MILLION)

10.4.4 REST OF APAC

10.4.4.1 Increasing number of production-based companies in the rest of APAC countries is accelerating the growth of the laser interferometer market

TABLE 129 LASER INTERFEROMETER MARKET IN REST OF APAC, BY END-USER

INDUSTRY, 2017–2020 (USD MILLION)

TABLE 130 LASER INTERFEROMETER MARKET IN REST OF APAC, BY END-USER

INDUSTRY, 2021–2026 (USD MILLION)

10.5 REST OF THE WORLD

TABLE 131 LASER INTERFEROMETER MARKET IN REST OF THE WORLD, BY REGION, 2017–2020 (USD MILLION)

TABLE 132 LASER INTERFEROMETER MARKET IN REST OF THE WORLD, BY REGION, 2021–2026 (USD MILLION)

TABLE 133 LASER INTERFEROMETER MARKET IN REST OF THE WORLD, BY INTERFEROMETER TYPE, 2017–2020 (USD MILLION)

TABLE 134 LASER INTERFEROMETER MARKET IN REST OF THE WORLD, BY INTERFEROMETER TYPE, 2021–2026 (USD MILLION)

TABLE 135 LASER INTERFEROMETER MARKET IN REST OF THE WORLD, BY END-USER INDUSTRY, 2017–2020 (USD MILLION)

TABLE 136 LASER INTERFEROMETER MARKET IN REST OF THE WORLD, BY END-USER INDUSTRY, 2021–2026 (USD MILLION)

10.5.1 SOUTH AMERICA

10.5.1.1 Implementation of laser interferometers in automotive and industrial sectors drives the market growth

TABLE 137 LASER INTERFEROMETER MARKET IN SOUTH AMERICA, BY END-USER INDUSTRY, 2017–2020 (USD MILLION)

TABLE 138 LASER INTERFEROMETER MARKET IN SOUTH AMERICA, BY END-USER INDUSTRY, 2021–2026 (USD MILLION)

10.5.2 MIDDLE EAST & AFRICA

10.5.2.1 The Middle East & Africa to witness increasing demand for laser

interferometers during the forecast period

TABLE 139 LASER INTERFEROMETER MARKET IN MIDDLE EAST & AFRICA, BY
END-USER INDUSTRY, 2017–2020 (USD MILLION)

TABLE 140 LASER INTERFEROMETER MARKET IN MIDDLE EAST & AFRICA, BY
END-USER INDUSTRY, 2021–2026 (USD MILLION)

10.6 IMPACT OF COVID-19 ON LASER INTERFEROMETER MARKET IN
DIFFERENT REGIONS

11 COMPETITIVE LANDSCAPE

11.1 OVERVIEW

11.2 KEY PLAYER STRATEGIES/MARKET EVALUATION FRAMEWORK

TABLE 141 OVERVIEW OF STRATEGIES DEPLOYED BY KEY LASER
INTERFEROMETERS MANUFACTURERS

11.2.1 PRODUCT PORTFOLIO

11.2.2 REGIONAL FOCUS

11.2.3 MANUFACTURING FOOTPRINT

11.2.4 ORGANIC/INORGANIC GROWTH STRATEGIES

11.3 MARKET SHARE ANALYSIS: LASER INTERFEROMETER MARKET, 2020

FIGURE 39 MARKET SHARE ANALYSIS: LASER INTERFEROMETER MARKET,
2020

TABLE 142 DEGREE OF COMPETITION, 2020

11.4 FIVE-YEAR COMPANY REVENUE ANALYSIS

FIGURE 40 FIVE-YEAR SEGMENTAL REVENUE ANALYSIS OF TOP FIVE PLAYERS
IN LASER INTERFEROMETER MARKET

11.5 COMPANY EVALUATION QUADRANT

11.5.1 STAR

11.5.2 EMERGING LEADER

11.5.3 PERVASIVE

11.5.4 PARTICIPANT

FIGURE 41 LASER INTERFEROMETER COMPANY EVALUATION QUADRANT, 2020

11.5.5 COMPANY FOOTPRINT

FIGURE 42 OVERALL COMPANY FOOTPRINT

TABLE 143 FOOTPRINT OF DIFFERENT COMPANIES FOR VARIOUS
APPLICATIONS

TABLE 144 FOOTPRINT OF DIFFERENT COMPANIES FOR VARIOUS END-USER
INDUSTRY

TABLE 145 FOOTPRINT OF DIFFERENT COMPANIES FOR VARIOUS REGIONS

11.6 START-UP/SME EVALUATION MATRIX

TABLE 146 LIST OF START-UP COMPANIES IN THE LASER INTERFEROMETER MARKET

11.6.1 PROGRESSIVE COMPANIES

11.6.2 RESPONSIVE COMPANIES

11.6.3 DYNAMIC COMPANIES

11.6.4 STARTING BLOCKS

FIGURE 43 LASER INTERFEROMETER MARKET, STARTUP/SME EVALUATION MATRIX, 2020**11.7 COMPETITIVE SITUATIONS AND TRENDS**

11.7.1 PRODUCT LAUNCHES

TABLE 147 PRODUCT LAUNCHES, 2020–2021

11.7.2 DEALS

TABLE 148 PARTNERSHIPS AND COLLABORATIONS, 2018–2021**12 COMPANY PROFILE****12.1 KEY COMPANIES**

(Business overview, Products/Solutions/Services offered, Recent Developments, COVID-19 Related Developments, MNM view)*

12.1.1 RENISHAW PLC

TABLE 149 RENISHAW PLC: BUSINESS OVERVIEW**FIGURE 44 RENISHAW PLC: COMPANY SNAPSHOT****TABLE 150 ABB RENISHAW PLC PRODUCT/SOLUTIONS/SERVICES OFFERINGS****TABLE 151 RENISHAW PLC: PRODUCT LAUNCHES****TABLE 152 RENISHAW PLC: DEALS****TABLE 153 RENISHAW PLC: COVID-19 RELATED DEVELOPMENTS**

12.1.2 KEYSIGHT TECHNOLOGIES

TABLE 154 KEYSIGHT TECHNOLOGIES: BUSINESS OVERVIEW**FIGURE 45 KEYSIGHT TECHNOLOGIES: COMPANY SNAPSHOT****TABLE 155 KEYSIGHT TECHNOLOGIES: PRODUCT/SOLUTIONS/SERVICES OFFERINGS****TABLE 156 KEYSIGHT TECHNOLOGIES: PRODUCT LAUNCHES****TABLE 157 KEYSIGHT TECHNOLOGIES: DEALS****TABLE 158 KEYSIGHT TECHNOLOGIES: OTHERS****TABLE 159 KEYSIGHT TECHNOLOGIES: COVID-19 RELATED DEVELOPMENTS**

12.1.3 CARL ZEISS

TABLE 160 CARL ZEISS: BUSINESS OVERVIEW**FIGURE 46 CARL ZEISS: COMPANY SNAPSHOT****TABLE 161 CARL ZEISS: PRODUCT/SOLUTIONS/SERVICES OFFERINGS**

TABLE 162 CARL ZEISS: PRODUCT LAUNCHES

TABLE 163 CARL ZEISS: DEALS

TABLE 164 CARL ZEISS: OTHERS

TABLE 165 CARL ZEISS: COVID-19 RELATED DEVELOPMENTS

12.1.4 SIOS ME?TECHNIK GMBH

TABLE 166 SIOS ME?TECHNIK GMBH: BUSINESS OVERVIEW

TABLE 167 SIOS ME?TECHNIK GMBH: PRODUCT/SOLUTIONS/SERVICES OFFERINGS

TABLE 168 SIOS ME?TECHNIK GMBH: PRODUCT LAUNCHES

12.1.5 AMETEK, INC.

TABLE 169 AMETEK, INC.: BUSINESS OVERVIEW

FIGURE 47 AMETEK, INC.: COMPANY SNAPSHOT

TABLE 170 AMETEK, INC.: PRODUCT/SOLUTIONS/SERVICES OFFERINGS

TABLE 171 AMETEK, INC.: PRODUCT LAUNCHES

TABLE 172 AMETEK, INC.: COVID-19 RELATED DEVELOPMENTS

12.1.6 MAHR INC.

TABLE 173 MAHR INC.: BUSINESS OVERVIEW

TABLE 174 MAHR INC.: PRODUCT/SOLUTIONS/SERVICES OFFERINGS

TABLE 175 MAHR INC.: PRODUCT LAUNCHES

TABLE 176 MAHR INC.: COVID-19 RELATED DEVELOPMENTS

12.1.7 TOSEI ENGINEERING CORP.

TABLE 177 TOSEI ENGINEERING CORP.: BUSINESS OVERVIEW

TABLE 178 TOSEI ENGINEERING CORP.: PRODUCT/SOLUTIONS/SERVICES OFFERINGS

12.1.8 OPTODYNE, INC.

TABLE 179 OPTODYNE, INC.: BUSINESS OVERVIEW

TABLE 180 OPTODYNE, INC.: PRODUCT/SOLUTIONS/SERVICES OFFERINGS

12.1.9 QED TECHNOLOGIES

TABLE 181 QED TECHNOLOGIES: BUSINESS OVERVIEW

TABLE 182 QED TECHNOLOGIES: PRODUCT/SOLUTIONS/SERVICES OFFERINGS

12.1.10 M?LLER-WEDEL OPTICAL GMBH

TABLE 183 M?LLER-WEDEL OPTICAL GMBH: BUSINESS OVERVIEW

TABLE 184 M?LLER-WEDEL OPTICAL GMBH: PRODUCT/SOLUTIONS/SERVICES OFFERINGS

12.2 OTHER PLAYERS

12.2.1 SMARACT GMBH

TABLE 185 SMARACT GMBH: COMPANY OVERVIEW

12.2.2 LUNA INNOVATIONS INCORPORATED

TABLE 186 LUNA INNOVATIONS INCORPORATED: COMPANY OVERVIEW

12.2.3 4D TECHNOLOGY CORPORATION

TABLE 187 4D TECHNOLOGY CORPORATION: COMPANY OVERVIEW

12.2.4 ?PRE INSTRUMENTS

TABLE 188 ?PRE INSTRUMENTS: COMPANY OVERVIEW

12.2.5 TRIOPTICS GMBH

TABLE 189 TRIOPTICS GMBH: COMPANY OVERVIEW

12.2.6 ADLOPTICA OPTICAL SYSTEMS GMBH

TABLE 190 ADLOPTICA OPTICAL SYSTEMS GMBH: COMPANY OVERVIEW

12.2.7 LOGITECH LIMITED

TABLE 191 LOGITECH LIMITED: COMPANY OVERVIEW

12.2.8 HOLMARC OPTO-MECHATRONICS P LTD

TABLE 192 HOLMARC OPTO-MECHATRONICS P LTD: COMPANY OVERVIEW

12.2.9 ATTOCUBE SYSTEMS AG

TABLE 193 ATTOCUBE SYSTEMS AG: COMPANY OVERVIEW

12.2.10 HIGHFINESSE GMBH

TABLE 194 HIGHFINESSE GMBH: COMPANY OVERVIEW

12.2.11 XONOX TECHNOLOGY GMBH

TABLE 195 XONOX TECHNOLOGY GMBH: COMPANY OVERVIEW

12.2.12 THORLABS, INC.

TABLE 196 THORLABS, INC.: COMPANY OVERVIEW

12.2.13 AUTOMATED PRECISION, INC (API)

TABLE 197 AUTOMATED PRECISION, INC (API): COMPANY OVERVIEW

12.2.14 LASERTEX CO. LTD

TABLE 198 LASERTEX CO. LTD: COMPANY OVERVIEW

12.2.15 FUJIFILM HOLDINGS CORPORATION

TABLE 199 FUJIFILM HOLDINGS CORPORATION: COMPANY OVERVIEW

*Details on Business overview, Products/Solutions/Services offered, Recent Developments, COVID-19 Related Developments, MNM view might not be captured in case of unlisted companies.

13 APPENDIX

13.1 DISCUSSION GUIDE

13.2 KNOWLEDGE STORE: MARKETSANDMARKETS' SUBSCRIPTION PORTAL

13.3 AVAILABLE CUSTOMIZATIONS

13.4 RELATED REPORTS

13.5 AUTHOR DETAILS

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